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THE LAUDER GLOBAL BUSINESS INSIGHT REPORT | 2022

Building a Better Future

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Building a Better Future

There is much to worry about in 2022. The world is in its third year of a deadly and divisive pandemic, climate change is an existential threat, the inequality gap is growing, and political tensions are rising. It's hard to find the positive amid such chaos and despair, yet hope flourishes for those who dare to look. In this report, the students at the Joseph H. Lauder Institute for Management & International Studies reveal the stories hidden beneath the headlines and show how nations, industries, organizations, and individuals are building toward a better future.

Latin American economies are modernizing and adapting to consumer demand. In Africa, several countries are using what they've learned from past disease outbreaks to stay ahead of COVID-19's deadly curve. And in a reversal from history, China is now encouraging families to have three children. The indomitable human spirit is accelerating change around the world, and there are no signs of a slowdown.

This edition of The Lauder Global Business Insight Report is itself a reflection of change. For years, this report has been the result of months of work from students who immerse themselves in an intensive course in their program of concentration, then follow up with field study that takes them to various parts of the world. But the pandemic limited travel and pushed many activities online. The students, much like the nations and people they studied, learned to rise to the challenge.

Without the option of field study, the students conducted interviews via phone and video with experts and sources who described what they could not witness for themselves. Without a physical classroom, they used every digital tool available to collaborate on their articles, learning to work together in the new normal created by the disease. Their efforts reflect a microcosm that is being repeated in grand scale around the world.

Contemporary English philosopher Alan Watts said, "The only way to make sense out of change is to plunge into, move with it, and join the dance." The students of the Lauder Institute have taken this sentiment to heart, and they offer the following articles that cast a hopeful eye on the future.

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The Business of War: The Rise of the Private Mercenary Industry in Colombia

Colombia's highly skilled soldiers are the byproduct of more than a half-century of civil war. This article explains why so many of these former soldiers have turned to the private security sector.

Early in the morning of July 7, 2021, men disguised as agents of the U.S. Drug Enforcement Administration entered the private residence of Haiti's president in Port-au-Prince. Encountering minimal resistance, they quickly made their way to the president's room. Around 1 a.m., shots rang out. President Jovenel Moïse was dead. The first lady, Martine Moïse, was also shot but survived. Their daughter was in the house but managed to hide.

Of the 28 men that entered the President's home, two were Haitian American. The other 26 were Colombian mercenaries.

In the weeks that followed, news began to circulate. Interim Prime Minister Claude Joseph declared a state of siege, placing the army in charge of security and limiting freedom of information. Joseph took charge of the government but stepped aside later in July in favor of Ariel Henry, whom Moïse had appointed as prime minister the day before his assassination. A Haitian American doctor was suspected of ordering the attack as part of a plot to take over the presidency. In the months leading up to the assassination, President Moïse had become deeply unpopular, and Haiti had dealt with an economic crisis and criminal gangs. Violent protests erupted over allegations of government corruption as well as the president's refusal to step down in a dispute over when his term should end.

After processing the cold-blooded assassination of a national leader, the world turned to the next obvious question: What were 26 Colombian ex-soldiers doing in Haiti?

A Long War

The answer to this question ties back to Colombia's more than 52-year civil conflict, which dominated the country during the second half of the 20th century and produced the most professional and highly skilled military in Latin America. This military became home to a group of highly trained soldiers who, upon retiring, have transitioned in increasingly greater numbers to the private security industry. Colombia went from an importer of private security throughout the 1980s and 1990s to an exporter, sending highly trained soldiers around the world at a fraction of previous costs.

Since the 1948 assassination of populist leader Jorge Eliécer Gaitan, Colombia has been embroiled in a violent internal conflict that has killed over 200,000 and injured and displaced countless more. The war, which has been financed largely by narcotics trafficking, has seen whole sections of the country cordoned off by Marxist guerillas, weakening nearly to breaking point the power and legitimacy of the government. For more than half a century, the Colombian armed forces have waged war and sustained large casualties, forging by fire the third-largest and one of the strongest and well-equipped professional armies of the region, standing 300,000 strong. Today, after the 2016 peace treaty with the oldest Marxist guerilla group in the world, the FARC (Fuerzas Armadas Revolucionarias de Colombia), Colombia has become "a net-exporter of security," as U.S. Navy Adm. Kurt W. Tidd told a Congressional hearing in 2018.

Professionalization of the Army and the Cost of War

The modernization of the armed forces can be traced to a change in national perception of security after a failed attempt at peace. According to an article by Elvira Maria Restrepo, associate professor of international studies at George Washington University and former special counsel to Colombian President Juan Manuel Santos (2016-2017), in the aftermath of the failed peace agreement at Caguán by President Andres Pastrana, one of the four separate attempts at peace processes since 1982, military aid aimed at ramping up a war on drugs turned the tide of the conflict in Colombia and helped form the armed forces of today. The failure of the peace agreement led to a change in the national psyche towards a preference for the hard-nosed national security doctrine that would characterize Alvaro Uribe's presidency. Uribe's election in 2002, under the slogan "mano firme, corazon grande" ("firm hand, big heart"), propelled the country into an age of militarization that transformed the army and allowed for the government to regain control of the country. Fueled by a U.S. aid package originally negotiated by Pastrana, named Plan Colombia, the Colombian armed forces cemented a deep relationship with the United States and brought large swaths of territory once again under the control of the central government. The military victories achieved under Uribe's presidency would set the stage for the successful negotiation of peace with the FARC by President Santos between 2012 and 2017.

U.S. military training and aid proved vital in the professionalization of the armed forces of Colombia. Gen. Alberto Mejia, ex-commander of the Colombian armed forces between 2017 and 2018, said in an interview that soldiers trained by the U.S. were the "tip of the spear in fighting terrorism and narcotraffic in Colombia." However, the resourcefulness and adaptability that make Colombian soldiers such skilled fighters are uniquely Colombian. These are men capable of surviving in the jungle, the desert, and high altitudes, who can, in Mejia's words, "set up a system of communication in a matter of minutes" and pilot Black Hawk helicopters through difficult terrain. The combined $7 billion in U.S. aid has accounted for only 4% of the defense budget; the rest has been funded by Colombians through tax revenue

> "Colombian men and women continue to be caught up in the business of war."

However, as Restrepo said in an interview, the price of war has been costly in Colombia. According to the Stockholm International Peace Research Institute, military expenditure in Colombia represented on average 11.2% of government spending between 2002 and 2021, which is the highest amount in the region as a percentage of GDP (3.4%). Additionally, its partnership with the United States led to demands that crossed sovereign boundaries. For example, Colombia was the only country in the world to allow a foreign power to conduct aerial fumigation of crops within its national territory. Glyphosate fumigation by the United States aimed at destroying coca crops between 1994 and 2015 has severely damaged the Colombian ecosystem and led to health problems for farmers whose crops were purposefully or accidentally fumigated, all without effectively reducing coca cultivation.

Further, the incentive structure that allowed the military to become a highly effective fighting force also led to human rights abuses that inflated the body count (as was the case for the U.S. in Vietnam). In what is known as the "false positive scandal," military officers executed civilian men who were falsely accused of being enemy combatants. The silver lining in all this national pain is that today the Colombian army plays a role in training and peace keeping internationally, by exporting security and training Central American armies alongside the United States.

Currently, the Colombian armed forces are the only Latin American army to be a partner to NATO and have served as a proxy for U.S. troops in more than 40 countries, training local military forces. In a U.S. House of Representatives 2014 subcommittee hearing, Gen. John F. Kelly of the U.S. Southern Command praised the training efforts of the Colombian military in Central America, saying that Colombian soldiers "are such good partners with us (that) when we ask them to go somewhere else and train the Mexicans, the Hondurans, the Guatemalans, the Panamanians, they will do it almost without asking, and they will do it on their own." While the war with the FARC has ended, the role of the army in Colombian life nationally has not changed. Military spending has not significantly decreased since the signing of the peace treaty in 2016, with military spending still accounting for 3.4% of the GDP in 2020, or $9.2 million. Colombian men and women continue to be caught up in the business of war.

> "Decades of war are not easily dismissed by those who devoted their lives to it."

The Human Factor

While the end of war has been long awaited, it has also resulted in an increasingly large number of private soldiers. According to the General Command of the Military Forces, there has been a reduction of approximately 30,000 officers during 2013-17, with the biggest annual drops observed since 2008.

But decades of war are not easily dismissed by those who devoted their lives to it. Layoffs and comparable low pay could create an incentive for former soldiers to put their skills to use elsewhere. According to Restrepo, "The peace agreement hadn't foreseen a private security sector reform, or anything that would reincorporate professionals from the army and police that would no longer be necessary with the end of the war and give them a dignified way out the same way that it was given to the former guerrilleros."

With the newly established peace, there was significant positive speculation on Colombia's economy. The National Planning Department (DNP) forecasted a permanent increase of 1.1% to 1.9% to the GDP. According to the World Bank, Colombia sustained unprecedented levels of foreign direct investment, a signal of confidence in the country's stability. "Many of the professionals that were leaving the army and police had the possibility of joining a regular work life and having a more or less normal life," Restrepo said about the positive outlook. However, the COVID-19 pandemic has brought economic instability to Colombia. In 2020, according to the World Bank, Colombia experienced its first recession since 1999, observing a 6.8% reduction in GDP. Unemployment rose over five percentage points to 15% of the workforce. In this new climate, retiring soldiers are encountering inhospitable employment prospects and are more likely to turn to the private security sector and the attractive salary that it brings.

The Plan for Reintegration

When Colombian soldiers retire after 18 to 20 years of service, they receive different standard pensions based on their rank. For public officials and military officers, the standard pension is the basic monthly salary, currently established at 908,526 pesos (approximately $240), with different premiums based on seniority, activity, family, disability, etc. For professional soldiers, the standard pension is 70% of their monthly salary (currently established at a 40% increase of the basic salary), 38.5% of their seniority premium, and potential additional premiums similar to that of public officials and military officers.

The financial compensation of the Colombian armed forces has remained relatively stable since the peace accords. However, a 2016 veteran's law aiming at honoring the work done by the Veterans of the Public Force provided new social benefits and welfare through state programs. These benefits range from access to digital media platforms to access to basic and higher education. As mentioned by Gen. Mejia, "For those who reach the term of 20 years, of which there are thousands, the military does something extraordinary. In their last year, when they have completed 19 years of service, they are sent to study for a year at SENA (Servicio Nacional de Aprendizaje); they can choose where and what to study. The government gives them this year as a tool so they can find a dignified job at the time of retirement." This program aims to help soldiers reintegrate into society and find a civilian job.

Although the new veteran's law establishes a positive trend towards the reintegration of Colombian soldiers in society, it does not fully address the issue. Neither did the peace accord. While the agreement prioritized establishing peace, Restrepo noted, it failed to address what would happen to these highly skilled and technical soldiers now that their primary purpose had been accomplished. Furthermore, the armed forces purposely refrained from including army personnel decisions in the accord to avoid being treated at an equal level to the FARC fighters.

The challenge that stems from the current situation is twofold. Firstly, the current reintegration plan only applies to those soldiers who remain in the army for over 20 years. However, there are thousands of soldiers who leave the armed forces before that. Mejia confirmed that the military completely loses touch with them once they do. Secondly, the transition to civilian life can prove difficult, both financially and emotionally, even with training. These factors, when combined with high unemployment, the flood of Venezuelan refugees into Colombia, and a global pandemic, significantly limit the options for retired soldiers. By entering the private security industry, these retired soldiers can often earn more than five times their regular income, significantly enhancing their economic prospects.

A Global Problem

As in any market, supply and demand are the norm, and Colombia is not unique in having thousands of experienced special forces looking for employment in higher paying markets. The pull that the private security industry has on retiring soldiers is a phenomenon faced by countries around the globe. Private security companies such as the Russian-based Wagner Group, London-based Aegis Defense Services, and U.S.-based Triple Canopy Inc. all recruit former special operations forces from the U.S., British, and Russian military forces, among other nationalities. This industry is not new. In the 1980s, Israeli soldiers for hire were discovered to be training "murder teams" for narcotraffickers in Colombia.

Moïse's assassination putting the spotlight on Colombia's growing pool of former soldiers for hire, but Mejia points out that these few men cannot be associated with the immense majority of professional soldiers and retired military personnel who are working appropriately, professionally, and ethically in Colombia or elsewhere. These soldiers take these fully legal jobs to support their families and should not be scapegoated because of the incident in Haiti. For example, Colombian ex-soldiers were hired by Erik Prince, the founder of private military company Blackwater (now known as Academi), to work in the United Arab Emirates. The force was intended to conduct special operations missions inside and outside the country, defend oil pipelines and skyscrapers from terrorist attacks, and put down interval revolts, according to a 2011 *New York Times* article. However, the newspaper also reported that the UAE secretly dispatched hundreds of Colombian and other Latin American private soldiers to Yemen to intervene in its civil war and fight Houthi rebels, increasing the complexity of a proxy war involving the U.S. and Iran. In recent years, Colombian private soldiers have been in conflicts in several other countries in the Middle East, including Iraq, Libya and Afghanistan, according to reporting by The New Arab.

It could be argued that with or without Colombian private soldiers, the UAE would have found a way to intervene in the conflict in Yemen. But, as Gen. Mejia points out, these soldiers were treated as full members of the UAE army, and their generous compensation gave them a stronger economic base when they returned home. Monetary incentives are and will remain an attractive alternative for professional soldiers who have suddenly found their advanced skill set without use domestically but in high demand in so-called "conflict markets," and Colombia is not unique in this regard.

What Comes Next?

Three of the Colombian mercenaries were killed by police in Haiti the morning after the assassination. Another 18 were taken into custody and currently await trial. There are still many unanswered questions. How much did the soldiers know about what they were paid to do? How much were they paid? Due to Haiti's political climate and continued instability, there is a chance that we will never get the answers to these questions.

In the meantime, Colombia will continue to grapple with its role as one of the leading military forces in Latin America.

While this presents opportunities for peacebuilding across the region, it comes with a set of challenges familiar to any military power tasked with reintegrating soldiers into civilian society. Private security will always be there as a legal option for retired soldiers. The real question is how to prevent highly trained soldiers from being lured into illegal missions in search of economic incentives. This question is not new, and the answer has eluded many countries before, but it is one that Colombia should try to solve if it hopes to maintain its position of influence in the region.

This article was written by Lola Basabe, Julia Berbel, Mariana Pavia, Mateo Sasse, and Hannah Sherman, members of the Lauder Class of 2023.

How China and Japan are Using Robots to Fill Gaps in the Workforce

Facing an aging population and a shrinking worker pool, China and Japan are turning to robots to help keep their economies strong. This article explores the development of automation in both nations.

As the world's second- and third-largest economies, China and Japan have relied on their large workforces to drive economic growth over the past few decades. Both countries now face the challenges of an aging population and a shrinking workforce. These trends have led to a twofold issue — social systems burdened with elder care and factories that need laborers. To address these challenges, China and Japan have turned to automation, albeit in remarkably different ways. While Chinese policies encourage support from national and municipal governments in the form of direct investment into automation, Japan's policies have been markedly less interventionist: The government has provided subsidies, regulation removal, and guidelines in an effort to foster private innovation. These different approaches to automation ultimately serve to guide industrialized and newly industrialized countries that face similar population and demographic challenges.

China's Demographic History

China's demographic experiment is unlike any other in the world. The history of China's demographic evolution dates back to 1949. After taking control of the country in October of that year, the Chinese Communist Party swiftly implemented controversial economic and social policies, resulting in long-term consequences on the course of history for the country. Despite intending to transform the previously feudal and agrarian country into a planned economy, programs such as the Great Leap Forward and the Cultural Revolution had disastrous effects on the economic output of the country: Famines were widespread, the economy shrank, and in 1970, China ranked amongst the poorest countries in the world, according to the United Nations. These calamitous impacts on the economy, coupled with the country's rapidly growing population, led the Communist party to decisively implement the One-Child Policy in 1979, one of the world's first, most extreme, and most controversial cases of government-mandated family planning. With few exceptions (for minority groups and rural villagers), the One-Child Policy mandated that each family have no more than one child. Those in violation of the policy would face hefty fines (estimated at 3 to 6 times the annual income), forced abortions, and in some cases, mandated sterilizations.

Over the next 30 years, the One-Child Policy shaped the demographics of modern-day China, greatly reducing the country's population growth. According to the United Nations, total fertility dropped from nearly 6 births per woman in 1960 to consistently below 2 in 1990. By some estimates from the Chinese central government, nearly 400 million births were prevented during this period due to the policy. At the same time, the economy grew rapidly and has since become one of the largest in the world. Now an industrialized economy, the country faces a different demographic issue. In China's most recent census, the population of 60 and older grew by 5.44%, while the population between 15 to 59 shrunk by 6.79%. This shrinking population of working-age adults and growing population of elderly retirees has put pressure on the country's workforce and social security system. In an effort to counteract some of these pressures, the government has taken targeted measures to reverse some of the impacts from the One-Child Policy. The country introduced a Two-Child Policy in 2015 and a Three-Child Policy in May 2021. At the same time, both private and public enterprises have worked to adopt uniquely innovative and automated solutions to address these issues.

China's Public and Private Sector

In 2014, President Xi Jingping called for a "robot revolution" that would transform China and the world. In order to address its demographic challenges and increase its competitiveness globally, the Chinese government started the "Made in China 2025" initiative to push for high-tech manufacturing and gradually replace manual labor with robots. Local governments began to offer generous subsidies in order to promote conversion to automation. In 2017, the city of Dongguan, in the heart of the industrial hub of Guangdong province, invested ¥385 million ($56 million) toward the automation of factories, according to the *South China Morning Post*.

Private companies have been driving automation to supplement their shortage of workers. Jennifer Pak, a China correspondent for Marketplace.com, reported in a 2018 interview that to many Chinese factories, "automating is not so much about saving money; it's a matter of survival." Otherwise, they would have to shut down due to lack of a stable workforce. For example, Ying Ao, a sink manufacturer company quoted in the *Financial Times*, spent more than $3 million between 2012 and 2016 to replace the jobs of 140 workers with nine robots.

"Private companies have been driving automation to supplement their shortage of workers."

A 2018 study by the Boston Consulting Group reported that Chinese manufacturers have invested heavily in the past decade to develop automation capabilities across different industries, such as the automotive industry. Between 2011 and 2016, Chinese automakers went from having one-third of the industrial robots that the U.S, automakers had, to reaching parity with the United States. By 2025, it is estimated that 5% of China's workforce will be replaced by machines. By 2027, 2.28 million jobs in China's banking, insurance, and securities sectors will be automated, "particularly those involving mechanical and repetitious operations."

To Chinese people, this transformation will have mixed effects on their welfare. The Chinese government is invested in retraining its workforce, and it is offering subsidies to companies that reemploy laid off workers. According to Jenny Chan, an assistant professor of sociology at Hong Kong Polytechnic University, people who are losing their jobs to automation are trying to convert to jobs in the growing service sector; however, due to the low-skill nature of the jobs, they often struggle to make a living wage. An optimistic view is that by automating low-skilled jobs, workers will be free to be entrepreneurs, create new companies, and drive innovation. The next decade will be critical in determining the future of China's workforce and the relationship between it and technology. For a country that has so heavily relied on its cheap labor to drive economic development, China will inevitably be forced to adapt to a new landscape over the next few decades.

Japan's Demographic History

Japan faces a unique set of demographic challenges that threatens its long-term working-age population. This shortage is caused by Japan's gradually declining population coupled with a rapidly aging population. Factors such as low birth rates and low immigration are key for the former, whereas the latter is compounded by long life expectancy and high standards of elderly care.

Figures from the Japanese Statistics Bureau in 2020 show that since peaking at 128 million people in 2010, Japan's population has been declining steadily, with the latest census in 2019 coming in at 126 million people. Crucially, this trend is expected to continue with the population projected to decline to 119 million by 2030 and even further to 93 million by 2060.

The data also show that Japan's population growth throughout the 20th century was driven mainly by two baby booms in the post-war era (1947-1949 and 1971-1974). However, birth rates have gradually declined since then, reaching a pivot in 2005 where death rates exceeded birth rates for the first time — a trend that has continued. As reported in *The New York Times* in December 2018, historically restrictive immigration policies arising from domestic opposition have also prevented an external solution to the shrinking population, although recent changes are attempting to reverse that trend.

Japan's aging population has also never been higher. As of 2019, 28.4% of the population was above the age of 65, far exceeding that of other developed nations such as the U.S. (14.6%), France 18.9%), and Germany (21.2%). Exacerbating this, the population of children (ages 0-14) in Japan reached a record low, at 12.1% of the total population. The resulting workforce shortage is expected to affect sectors such as caregiving, construction, agriculture, and shipbuilding, with Prime Minister Shinzo Abe remarking in 2018 that Japan has to look at several measures including increasing female participation in the workforce, delaying retirement, and increasing the use of robots.

Japan's Public Sector

The Japanese government sees that robot technologies possess the potential for solving social and demographic challenges. In 2015, the Japanese Ministry of Economy, Trade and Industry (METI) published the "New Robot Strategy" and established the Robot Revolution Initiative (RRI) with 226 members from enterprises, governmental stakeholders, research institutions, and individuals. This membership had grown to 560 as of September 2021.

In the 2015 report, METI established five sector focus areas for Japan's Robot Strategy: (1) manufacturing, (2) service, (3) nursing and medical fields, (4) infrastructure, disaster response, and construction fields, and (5) agriculture, forestry, fishery, and food industry.

METI planned to provide R&D subsidies, standards development, removal of regulatory barriers, user-driven design, pilots and "social verification" projects. METI also planned to promote international collaboration, competition among research institutes by contest and award scheme, and introduce open innovation. The Robot Revolution Realization Council, hosted by the Prime Minister's Office, oversees the progress, and METI is responsible for the implementation of the strategy.

In the nursing and medical fields, METI's motivation is for robots to reduce the physical and mental burden of care workers, improve the quality of life of elderly, and enhance productivity and efficiency. METI also planned to provide acceleration of medical product approval process for care robots and to make rental of care robots eligible for public medical insurance. METI aimed nursing care robots to achieve market share of ¥50 billion by 2020.

In 2018, the government announced a robot hospital project with a target of establishing 10 model hospitals by the end of 2022. Per Nikkei Asia, the project is worth ¥100 billion through solicitation of private investments in robot development.

There have not been updates on the robot strategy. Due to the coronavirus pandemic, the World Robot Summit 2020 has been postponed, and METI has yet to establish when it will be held again. However, at the Robot Revolution and Industrial IoT International Symposium 2020, RRI did stress that automation will be accelerated by COVID-19, and that the goal is not just to overcome the crisis post COVID-19, but to become more resilient to crisis.

As the declining birth rates, aging society, and shrinking population of productive age advance, the Japanese government is investing in robot technologies to solve social challenges such as labor shortages, overwork, and productivity growth. The RRI envisions a society where "robots can be found in every corner of Japan." As other countries are concerned with rising unemployment due to the robot revolution and automation, Japan is confident that the revolution would not impact the job market in the country. The unemployment rate in Japan continues to see a steady decline as robotic automation grows in the country. Perhaps Japan can set an example for other countries that are going through similar demographic changes.

> "The Japanese government sees that robot technologies possess the potential for solving social and demographic challenges."

Japan's Private Sector

While the Japanese government is taking extensive measures to advance automation, much work is left to be done in the private sector. McKinsey & Company published a report stating that Japan has massive potential for automation, and "researchers estimated that automation could displace around 57 percent of the work activities being done across Japan, enabling companies to lower costs and boost productivity despite a shrinking workforce." The largest area of potential for automation is in physical labor, and a number of companies are beginning to take action.

Telexistence, a robotics company, is using automation to displace work activities in one of the most visible places in Japan: convenience stores. Backed by the Softbank Group, Telexistence created a kangaroo-shaped robot called Model T that can stack food and drinks on shelves throughout stores. A leading convenience store company, FamilyMart, plans to roll out the Model T in 20 of its stores in Tokyo by 2022. With over 56,000 across the country, convenience stores are an integral part of everyday life and a substantial part of the country's retail sector. Advancing automation will not only support the workforce in this area, but also familiarize the general public with interacting with robots.

Robots and automation are also being applied at greater scale in the building sector. *The Japan Times* reported that only 10% of construction workers in Japan are under 30 years old. Tracy Staedter of Northrop Grumman expounded on how major construction corporations like Obayashi, Kajima, and Shimizu Corporation have invested billions of dollars in robotics to counteract the problem of a shrinking labor force. Obayashi developed robots to make concrete dams; Kajima developed self-driving bulldozers to excavate and dump materials; and Shimizu Corporation developed Robo-Welder and Robo-Buddy to continuously weld and bolt materials. Labor shortages have forced Japan to produce innovative solutions, and with many countries soon to face the same problem of aging populations, the Japanese private-sector companies have laid out a template to follow to compensate for the shrinking workforce.

Conclusion

China and Japan have turned to automation to address the issue of a shrinking working-age population. In some ways, they have taken similar approaches by advancing the manufacturing, construction, and service sectors, and both countries are using robots to meet the inevitable gap in the workforce supply. However, they also differ in approach, with the Chinese government making direct investment and subsidies for automation efforts, compared with Japanese companies using their own capital to develop specialized solutions to the shrinking workforce. While efforts are underway to progress automation to fill the gap in resources caused by a shrinking working-age population, it will take time to realize the full potential. Nevertheless, China and Japan stand out among industrialized nations for taking a proactive stance in solving a fundamental economic problem.

This article was written by Austin Allen, Mintai Bautista, Peter Jin, Shannon Julian, and Elliott Ng, members of the Lauder Class of 2023.

In Latin America, Demand for Plant-Based Foods is Upending the Market

Plant-based food and drinks are gaining in popularity across Latin America, where animal proteins have been a dietary staple for hundreds of years. This article looks at the growth of industry through the lens of NotCo, one of the most successful food-tech firms.

Across the U.S. and Europe, one of the biggest trends in food and beverage over the past two decades has been rising consumer interest in plant-based products. The reasons are numerous, from long-standing moral appeals for animal rights to more recent scientific evidence of greater environmental sustainability and promises of better physical health. Chief among them seems to be a large and rapidly growing base of consumers who prioritize sustainability and ethical considerations over other concerns. Innova Market Insights' Top Consumer Trends for 2022 and Vegconomist suggest environmental sustainability for the first time is poised to overtake personal health as consumers' top-cited reason for shifting to a more plant-based diet. Following these vocal consumers, savvy investors and innovative entrepreneurs are stepping up to the plate to meet the demand for more and better plant-based products.

But is the trend towards plant-based food and beverage relegated to highly developed, established markets and their more affluent consumer bases? The case of Latin America suggests otherwise. Regional consumer trends have paved the way for a new breed of plant-based food products manufacturers that are able to achieve scale without the support of distribution giants such as Unilever and Nestlé. In fact, the continent recently minted its first food-tech unicorn this year: Chile's plant-based NotCo. In 2021, just six years after its founding, NotCo attained a $1.5 billion valuation built on a wide and innovative product portfolio that includes milk, burgers, mayonnaise, and ice cream. Until recently, all this growth was homegrown in Latin America.

Clearly, consumers across Latin America are not just interested in more and better plant-based products. They're hungry for them. Gone are the days of soy milk being the only available dairy alternative and veggie burgers tasting like cardboard. From coconut and almond to oat and pea, dairy disruptors are garnering multibillion-dollar valuations, and plant burgers that "bleed" are upending the very definition of meat.

American Giants

The popularity of plant-based foods didn't happen overnight. Historically, countries like the United States, China, Canada, Argentina, Brazil, and Chile have had some of the highest daily meat consumption per capita in the world. However, global trends towards healthier, plant-based foods have created space for tech-centric, AI-empowered food-tech companies to engineer plant-based plates to perfection. The supermarket aisles are filled with popular brands including Oatly, Beyond Meat, Blue Diamond Almond Breeze, and Morningstar Farms.

> "Consumers across Latin America are not just interested in more and better plant-based products. They're hungry for them."

Impossible Foods, one of the most well-funded and well-known plant-based companies, is on a mission to "transform the global food system" with their array of products. To date, the company has focused on meat substitutes, emphasizing healthy, sustainable products that consumers can afford. Though they are U.S.-based and primarily serve the American market, the company is expanding into China. A member of Impossible Foods' International Strategy team emphasized the exciting challenge of serving plant-based chicken, beef, and fish substitutes across a region with deep cultural alignment to alternative proteins.

While Impossible is gaining shelf space in the North America and Asia, NotCo is dominating the South American region. Founded in 2011, the company has expanded from its first product, NotMayo, to add three new products to their South American portfolio: NotIceCream, NotMilk, and NotBurger. According to Martín Bergada, senior manager for Strategic Planning, NotCo decided to attack the meat and dairy categories simultaneously to raise brand awareness, leverage their strong R&D capabilities, and address the market with a holistic approach to plant-based diets. Last year, the company expanded to the U.S. market with their NotMilk drink. Wearing the badge of Chile's first unicorn company, NotCo is planning to expand in Latin America through partnerships with quick-serve restaurants (QSRs). They also plan to continue to leverage Giuseppe, their proprietary "AI chef" that analyzes the molecular structure of traditional foods, to find the perfect combination of ingredients to build tasty, plant-based alternatives to dairy and meat.

"Consumption trends signal an inevitable shift towards more plant-based food."

While both Impossible and NotCo have had tremendous track records in both the board room and the dining room, they face challenges around company identity and product market fit as they scale.

Nontraditional CPG

Consumer hunger demands not only a wide offering of plant-based products but also a long-term sustainable vision of the companies that sell them. While their present is certainly exciting, what does the future look like for companies like Impossible Foods and NotCo?

On one hand, there is pressure to follow the traditional consumer packaged goods (CPG) industry path in pursuit of profitability and continued revenue growth. On the other hand, these companies have been industry pioneers by introducing groundbreaking products developed through complex, proprietary technologies.

To understand the effects of the positioning between these two paths, it is important to review some of the key implications and motivations that could arise from this decision. First, in terms of valuation, positioning a company that is following a tech path could yield higher valuation as multiples in the tech space are generally higher than traditional players. In other words, investors that view a new plant-based company as a tech company would be willing to pay more to own a stake than those that view the company as a more traditional CPG. Therefore, a company with the same net profits could attract more investment just by positioning itself as a tech firm rather than a consumer products firm.

Second, there are also cultural implications that trickle down to staff. For instance, younger generations of talent might be attracted to tech companies that want to challenge the status quo. Bergada said target customers believe there is a need to switch from traditional models towards sustainable models to generate a positive change in the world. An innovative company committed to this cause can be attractive to this type of customer, especially younger consumers living in the larger urban centers. Third, the goal of reaching a massive client base across the world resonates with positioning as a purely traditional consumer company. In order to have a robust execution, companies will need to lean on expertise from large CPG companies and use those market strategies for expansion. Although it is clear that a focus should be made to reach unpenetrated markets, this strategy can make the spirit of the company less innovative.

Having analyzed this framework, it is unclear the path that companies in the industry should follow in the next few years as there is still room to innovate and to penetrate underserved markets. They will have to balance pursuit of profitability with continued growth and investment.

An Inevitable Shift?

Consumption trends signal an inevitable shift towards more plant-based food. Moreover, these trends are accelerating. In the two years from 2019 to 2020, plant-based food retail sales increased 43% in the United States, which is nine times faster than total food sales). Players in this industry are already positioning themselves in different geographical regions and consumer segments with a wide array of products.

At first glance, Latin America might not seem to be the most attractive market for a startup in this industry, owing to a lower purchasing power and degree of awareness on the environmental impact of animal-based food relative to other regions of the world such as Europe or the United States. Furthermore, a strong culture and tradition of red meat consumption in countries such as Argentina, Brazil, and Chile, poses additional obstacles for plant-based food penetration. However, NotCo is experiencing significant demand traction in large Latin American urban centers like Buenos Aires, Santiago, and São Paulo, especially among younger generations. Initially, this Chilean company targeted vegetarian and nutrition-conscious consumers, but Bergada said they are experiencing a surging demand from young, nonvegetarian customers who assign a higher value to environmentally friendly products. By providing a high-quality product that mimics taste, texture, indulgence, appearance, and nutritional content, the company has succeeded in supplying a demanding consumer that, according to NotCo's statistics, 40% of the time did not buy plant-based products again because they did not taste good or failed in some of these categories.

The portfolio of products also varies substantially by company. Firms such as Impossible Foods or Beyond Meat are focusing on marketing substitutes for meat, while others, such as Oatly, are concentrating on dairy products. NotCo is not only marketing plant-based substitutes for meat but also dairy products. Bergada highlighted the importance of understanding how consumer preferences vary between geographies, a reasoning that guided NotCo's decision to enter the United States market in 2021 solely with their milk product line in a first stage, so as to better interpret demand response before expanding to other categories.

Challenges and Opportunities for Embracing a More Plant-Based Future

An important takeaway from the industry today is the role of new businesses in shaping the global market. Although historically entrenched multinationals like Nestlé and Unilever have led the penetration of food and beverage products across Latin America, it seems that in the growing niche of plant-based foods, a more diverse base of fast-growing startups has led the charge. As consumer preferences in the region grow beyond local and more traditional foods, these new firms seem well-poised to shape the future of Latin America's consumption trends and habits.

As new players enter and disrupt existing markets in agriculture and food manufacturing, the conversation continues to shift away from traditional consumer products and more towards technology. As the market moves forward, it is becoming more and more important to consider whether existing players in food production and distribution will engage this growing field and begin to develop capabilities of their own.

Similar to Tesla in the automotive industry or Everlane in clothing and apparel, companies such as Impossible Foods and NotCo are increasingly threatening established giants in their industry. Whether or not they will one day eclipse their more traditional industry counterparts is yet to be seen. The range of consumer habits that vary across countries and regions make addressing a global market with a uniform product difficult. Nevertheless, it's clear that the future of this sector is full of promise. As product quality improves and the consumer base for plant-based foods continues to evolve, the future of the industry looks brighter than ever.

This article was written by Nader Sharif-Emami, Mateo Menna, Sophie Dezen, Cristobal de Atucha, and Alexander Robinson, members of the Lauder Class of 2023.

Is Edtech Flourishing in Latin America and Africa?

Education technology companies are popping up across Latin America and Africa, seizing the opportunity to fill the educational gaps created by governments. But drawing investors remains a top challenge because of infrastructure. This article examines the edtech market in both regions.

Despite leaps and bounds in recent years, the global education technology (edtech) market still has a long way to go to deliver significant change in emerging economies. Edtech was valued at nearly $1 billion in 2020 and is expected to increase at a compound annual growth rate of 19.9% between 2021 and 2028, according to estimates that indicate the breadth of the market. While edtech has created more innovative methods of delivering education in emerging markets by introducing stronger digital elements and enhancing access across economic segments, it has yet to bring a substantial shift in democratizing education. The COVID-19 pandemic helped catalyze change, albeit rather slowly given the adoption and access issues that are the core problems of the industry in the developing world, as pointed out by *The Economist*.

"The main constraint to scaling edtech investments is the lack of digitalization and the accompanying infrastructure in emerging economies."

High literacy rates are crucial to achieving sustainable development, according to UNESCO, yet they are stagnating across the developing world, with figures near 50% in many African countries. Graduation rates in emerging economies appear to remain low overall. In Latin America, where literacy rates are high and education is valued, only half of the students managed to graduate from secondary education institutions as of 2017. Equity and quality of education remain the main problem as governments in developing countries fail to invest the funds required to enhance the education system or build the infrastructure needed to improve accessibility. Governments in emerging economies, especially in Africa and Latin America, are often unable to leverage the increased investment in edtech in their respective regions. The managing director of a large impact investment private equity fund explained to *Lauder Global Business Insight* that, while there is goodwill to invest in the education space in those regions, they lack the infrastructure required to make the returns desired by private investors.

The main constraint to scaling edtech investments is the lack of digitalization and the accompanying infrastructure in emerging economies. Across Africa and Latin America, insufficient government spending on critical digital infrastructure hinders the rollout of innovative educational tools. The education sector is recognized as an essential enabler for people in emerging markets looking to break the cycle of poverty and improve their lives, particularly where continuing professional development is concerned. Impact investors operating in this space promote these benefits, providing funding for innovative and early-stage projects that governments may not necessarily invest in. Nonetheless, until governments in these markets prioritize widespread internet access, digital tools, and regulatory environments, these economies will not benefit fully from the positive impacts and multiplier effects offered by edtech. According to a senior director of an impact venture capital fund, large funds will keep shying away from these markets due to the lack of infrastructure that enables these technologies on a large and equitable scale.

Investing in the Future

On the investor side, activity has proven to have high potential under the right conditions in the ecosystem. This year, Peruvian edtech platform Crehana announced the largest Series B fundraising in Latin America to date, valued at $70 million. Crehana is an edtech platform that focuses on reskilling and upskilling individuals across Latin America, delivering a seamless experience for enterprises seeking to assist employee learning and development. The company partners with over 400 experts to offer continuing professional development courses, and it achieved triple-digit growth in 2020. Crehana's landmark $70 million investment shines a light on the importance of edtech companies and the keen interest from impact investing firms to support them in Latin America. Luis Cervantes, managing director for General Atlantic, a growth equity firm that led the round, said that "we believe digital education will increase access to life-changing opportunities for lower-income populations across Latin America."

Behind the forces pouring money into edtech investments, impact-focused funds and venture capitals with an impact-oriented thesis play a considerable role, with investors such as IFC, ALIVE Ventures, and Rethink Education. Luis Narro, a venture partner at ALAYA Capital, said he sees investors with an impact-oriented thesis playing an even more prominent role in venture capital investments in Latin America in the future. In particular, edtech represents a massive area of growth due to the opportunity for positive social impact in Latin America combined with the tailwinds of high mobile penetration and government support. However, Latin America is not a solitary example. In Africa, the industry saw a nearly 90% increase in funding, from $7.6 million in 2019 to $13.7 million in 2020, and a year-on-year increase of 89.5% in January to May funding 2020 and 2021. Both continents are expected to continue this rapid rise in impact investing in edtech in similar yet different paths.

As evidenced by the scale of VC investment in edtech across Latin America and Africa, there is a clear demand for investment in the sector to help bridge educational gaps. Access to education is a fundamental building block of job creation across global emerging markets. The need for innovative solutions in education has never been more pertinent. According to UNICEF, the COVID-19 pandemic further catalyzed the need for advancement in the education sector, where school closures have left over 100 million children without in-person schooling in Latin America. However, the education sector in emerging markets is still heavily reliant on government investments and policy to further its development. According to LEK Consulting, nearly 80% of spending in the education sector is driven by governments, as opposed to 60% in health care, meaning the number of investable projects is lower. The education sector in emerging markets has traditionally been the sole responsibility of governments and international aid agencies. Impact funds have been solving this challenge by investing in ancillary education services such as teachers' training. Investisseurs et Partenaires (I&P), an Africa-focused impact investment group, has a dedicated education fund to promote education initiatives in sub-Saharan Africa. According to Emilie Debled, I&P's Executive Director for Strategic Development and Partnerships, tertiary education and professional development have also seen a significant boost in demand and innovation in response to the pandemic. However, Debled also explained that a visibility study conducted by her company revealed a lack of investment opportunities in Africa within the education space, which reflects the currently limited infrastructure and lack of government promotion of investment ecosystems. As a result, I&P created a grant to support education businesses and prepare them for the next stage of growth. Grant funding will support 45 companies, mainly in West Africa, and I&P will provide technical support and mentoring to these businesses. I&P will be looking to make equity and quasi-equity investments from its €50 million fund, which will be used for investments in Francophone African-based education companies.

Another vehicle of edtech innovation is specialized vocational training as workers seek to equip themselves with the right skills to succeed in a digital world. The public sector has an important role in ensuring that policy frameworks are crafted to support professional skills development for the population. According to the Organisation for Economic Co-operation and Development, Chile has been particularly progressive in this regard. Its government has incorporated "computational thinking" into the national curriculum as part of a coordinated effort across Chilean ministries to prepare the country for the global transition to a digital system. Across the rest of Latin America, the response to digitalization has been somewhat slower, putting the drive for relevant educational solutions in the hands of the private sector. CreaCode, an initiative co-founded in

Peru by Lauder Institute graduate Dolores de Goytisolo, offers courses and workshops for children to develop computer programming skills. According to de Goytisolo, Latin American governments are cognizant of the need to adopt computing courses into school curricula, but they are constrained by a lack of digital infrastructure and connectivity across national school systems. Until enough infrastructure is deployed in a collective private and public effort, innovative solutions like CreaCode will face barriers in reaching their maximum potential impact.

Democratizing Education

More broadly, innovation in education is driving the democratization of access to quality education for all. Education is a crucial area of focus within the United Nations 2030 Sustainable Development Goals (SDG 4: Inclusive and Equitable Quality Education), which provides a standardized framework to foster collaborative partnerships between impact investment funds and educational initiatives. Multilateral development institutions play an essential role in promoting larger-scale investments, such as International Finance Corporation's $40 million investment in Peru's Universidad de Lima. Targeted initiatives are increasingly helping encourage inclusion in the education system for women, children from low-income families, and those who live in remote rural areas.

> "Innovation in education is driving the democratization of access to good quality education for all."

One concern commonly raised regarding impact investing is the level of returns that a specific project can offer investors. According to the Global Impact Investing Network's website, 67% of the global impact investing market seeks risk-adjusted, market-rate returns. While investments in the education space offer potential to deliver significant social benefits, they often do not act as profit maximizers and thus can seem unattractive on a financial risk-reward basis. However, this is not necessarily the case. There are plenty of opportunities in impact investing that allow returns aligned with the markets while also creating social and environmental value. According to Juan Pablo Baraona and Gerardo Wijnant, education leaders at Doble Impacto, a crowdlending platform for impact investing in Chile, this trend is evident. Doble Impacto connects credit-seeking environmentally and socially conscious projects with retail and institutional investors; they see that credit risk can be lower than a traditional non-impact investment, as projects are often subject to scrutiny.

Furthermore, Doble Impacto affirms that the platform has seen significant demand for projects in the education sector. Baraona said the key is knowing how to identify, develop, and monitor solid projects in education because many of them fail to have a robust plan in terms of both impact and economics. To be successful in this space, he said, it is necessary to have sound frameworks in both these dimensions to evaluate the risk-return profile of the project, which is something that traditional banking and investors often do not have or have not yet fully developed. Furthermore, if education institutions lag in technology and management capacity, it will become increasingly challenging to supply projects for the current large appetite from investors.

Conclusion

The COVID-19 pandemic has triggered investment funds to increase their investment in social-impact causes, notably in education in emerging markets. Latin America and Africa are in the spotlight as a result, given the number of emerging economies in those regions and the potential to make a significant impact. With a workforce expected to grow by 15 and 20 million people in the next two decades in Africa, and an ever-expanding workforce in Latin America, the need to provide technological solutions to education is significant. However, companies in the space will have to find ways to incentivize investments to attract them, while funds will need to work with investment companies to create a new model that emphasizes impact and long-term growth rather than short-term gains. If tied accurately to quantitative and qualitative measurements, such as the U.N. Sustainable Development Goals, funds will be able to assess and monitor their investments and measure them by different performance standards. However, the question remains whether existing initiatives are impactful enough to make a long-term difference in expanding access, adoption, and infrastructure. Public-sector support and partnerships are crucial in ensuring the success of these initiatives. Sierra Leone is a leading example of effective public-sector support for educational initiatives through the country's technology-supported teacher professional development program. In addition, the Sierra Leone government also launched a phased Free Quality School Education (FQSE) initiative to provide free admission and tuition to all children in government-approved schools.

Collaboration between the private sector and governments is needed in Latin America and Africa. Governments from both continents need to enact enabling policies, create infrastructure for education-focused businesses, and help impact funds to thrive. Edtech initiatives in the two continents have the potential to enable personalized, mastery-based learning and equip students with the digital skills they will need for 21st-century careers. However, it must be matched with access to critical infrastructures such as internet and power connectivity.

This article was written by Dolapo Salawu, Jasmine Valeria Helme, Joaquín Campos Parodi, Michael Cheuk Hei To, and M.E. Lavi, members of the Lauder Class of 2023.

Mind the EV Gap

The worldwide adoption of electric vehicles is a critical step in reducing energy consumption and carbon emissions, but there are myriad challenges for both consumers and automakers. This article examines the long road ahead for EV adoption.

The electric vehicle (EV) industry has garnered a lot of interest in recent years, and there has been growing competition across different geographies. This has been particularly the case in relation to the fight against climate change, which is continually gaining momentum. The Chinese EV market has had phenomenal growth sustained by state support in the past few years, but a recent slowdown has resulted from diminished state subsidies, stuttering infrastructure development, and intensive competition. On the other hand, the United States and Europe, seen as frontrunners in the EV race, have also experienced their share of challenges ranging from consumer demand to commercial aspects. Around the world, the adoption of EVs has not gone as smoothly as investors or consumers may have hoped.

The invention of EVs cannot be attributed to one specific person; innovators from across the globe toyed with the idea of building battery-operated cars for years. EVs became popular in the U.S. in the early 1900s, given their ease of use compared with gasoline cars. However, this was short-lived when Henry Ford successfully mass-produced the Model T in 1908 for $650. Despite the dark ages that the EV industry went through after the discovery of oil in Texas and the continued innovation of traditional car makers, gasoline shortages resulting from the 1973 Arab Oil Embargo revived curiosity around this industry.

Since the successful production in Japan in 1997 of the Toyota Prius — the world's first hybrid car — and the innovative breakthrough by a small startup called Tesla in 2006, the market for EVs has resurged. Today, it is flooded with options for consumers. According to an article from the U.S. Department of Energy, there are more than 200,000 fully chargeable cars on the road and 3.3 million hybrid cars in the U.S. alone. With climate change at the forefront of global politics and increased technological innovations, the future of EVs looks brighter than ever. However, many challenges remain despite vast investment and interest.

Policy Fuel for the Electric Revolution

Over the past decade, governments around the world have attempted to encourage the shift towards EVs, particularly in three of the biggest EV markets of China, the U.S., and Europe.

Take China first: Under the country's long-term national strategy to revitalize its auto industry, and urged by a growing domestic energy shortage, China has supported a shift towards new energy electric vehicles (NEVs) gradually substituting conventional car sales. The Xi administration, through the Ministry of Industry and Information Technology, has announced a national target of 20% of all car sales to be NEVs by 2025. In spite of manufacturing challenges in core technologies such as chips, sensors, assembly, and software, China's regulatory environment has been favorable to both the supply (manufacturers and original equipment manufacturers) and the demand sides (consumers) to realize the country's ambitious EV targets. On the supply side, regulations support cleaner manufacturing and the expansion of EV production, while subsidies on national and local levels incentivize OEMs. Regulations include emissions credits, which conventional carmakers must earn to remain environmentally compliant each year. China has also selected 11 pilot cities with percentage targets for annual EV sales.

On the demand side, Chinese consumers are also heavily incentivized to purchase EVs. EV owners enjoy parking and charging privileges and priority quotas for registration in major cities, on top of a lower transaction tax (at 5% – 10%) compared with internal combustion vehicle (ICV) buyers. Some provincial governments provide additional incentives to consumers to support the national EV push. And when it comes to policy implementation, the government shows no favoritism between domestic players, such as NIO Inc., Li Auto, and Xpeng, and foreign players. This can be seen in Tesla's significant success in the Chinese market; adaptability to the local policy environment is key to success for EV carmakers.

Favorable regulations have allowed China's EV industry to grow in the past years. But faced with other investment priorities such as in Africa or Latin America, the Chinese Communist Party has channeled much of its resources away from EV. Demand incentives such as reduced sales tax were halted, while subsidies on the supply side were also slashed. Other unfavorable regulatory trends in China include declining incentives for OEMs in light of growing subsidy fraud. Some players' attempts to cheat the subsidy system, resulting in overcapacity and potential closures.

By comparison, although the U.S. has seen significant growth in EVs, mostly attributable to the private sector, government support has been limited. The Obama administration rolled out loans to support the initial growth of EV manufacturers. More recently, the Biden administration made further commitments by announcing a target of 50% of all new vehicles sold by 2030 to be electric, and allocating billions of dollars toward EV adoption in the Infrastructure Investment and Jobs Act, which was signed into law in November 2021. However, more could be done from a policy perspective for the U.S. to stay ahead in the global EV race. Despite some consumer subsidies — such as the federal tax credit of $7,500, the California state-level clear-air credit of $1,500, and other benefits for charging and energy consumption on the federal and local levels — the incentive structure has been fragmented. More coordination among states, the federal government, counties, and cities would certainly help standardize the incentive structures and push the country's EV commitment more efficiently.

The European market has a similar dynamic to the U.S., where regulation has not had a significant impact. Instead, demand is driving the change. OEMs have incentives to reduce their CO_2 emission by 15% by 2025 and by 37.5% by 2030, under COP 21 agreements. However, companies are free to choose compliance strategies, so they can select different pathways for the mix of their new car sales and overall vehicle fleets. An example of this flexibility is the increase in the number of new hybrid vehicles launched to comply with European standards of less than 95 grams of CO_2/km.

On the other hand, the European Union is increasing its investments to boost research on batteries. In 2019, it approved a payment by member states of €3.2 billion to help establish battery production plants. A new public fund of €2.9 billion will be added to support research on batteries, additional to regulation securing supplies of raw materials, recycling, and training. With this project, called European Battery Innovation, the European Commission wants to federate companies and block Chinese and Korean giants currently dominating the market. A total of 42 companies, including BMW, Fiat, Tesla, and Swedish battery specialist Northvolt, have already joined the project. According to the European Automobile Manufacturers' Association (ACEA), EV sales doubled in Europe in 2020 and those of plug-in hybrids tripled, exceeding a total of 1 million vehicles sold despite the COVID-19 pandemic. Ultimately, the EU's goal is to be able to power at least 7 million electric cars by 2025. In a joint article published on March 12, 2021, in the French newspaper *Les Echos* and the German newspaper *Handelsblatt*, Bruno Le Maire, the French minister of the economy, Peter Altmaier, his German counterpart, and Maroš Šefčovič, vice president of the European Commission wrote: "By 2025, the European Union should be manufacturing enough batteries to equip at least 7 million electric cars every year."

To stimulate demand, EU governments have taken steps to provide price incentives, though at varying degrees. According to ACEA, 26 out of the 27 EU member countries offer incentives for chargeable cars. Out of these, 20 members offer direct discounts such as bonus payments or premiums to EV buyers, while the remaining six (Belgium, Bulgaria, Cyprus, Denmark, Latvia, and Malta) grant tax deductions or exemptions for EVs. Lithuania is the only member to not provide any tax benefits or incentives. This relative fragmentation of regulatory incentives could be improved by standardizing incentives throughout the EU. Yet even when subsidized, the price of an EV remains high.

In comparison to the EU, the best-in-class country in Europe in the field of EVs is Norway, which has a steadily growing field of electric vehicles. In 2020, more than 50% of vehicle sales there are EVs. While 97% of EV owners charge their vehicles at home, relative to 11% who say they charge in public stations, Norway is also moving towards equipping collective housing with charging stations. Norway's stellar performance is primarily due to the power of its incentives, including single and cumulative tax incentives and exemptions, value-added tax (VAT), and free parking. These elements have allowed the network to be deployed in such a way that it has reached a new level of profitability, including for private operators.

Roadblocks on the Way to Electrification

Regional regulations are designed to promote the transition from gas-powered vehicles to EVs, ultimately reducing carbon emissions. Transportation accounts for approximately 24% of worldwide CO2 emissions. In addition to the shifting regulatory landscape, challenges exist in consumer behavior, the business model for car manufacturers, and the environmental track record of the vehicle and its production.

> "EV sales are still relatively low, posing a problem for the capital-intensive automakers."

Take consumer behavior first. In the U.S., one of the biggest barriers is charging. EVs require a charging behavior that is fundamentally different from what consumers are generally accustomed to. Drivers are used to traveling to gas stations in order to refuel their car, so the tendency when considering an EV purchase is to apply the same framework to the idea of charging. This leads to anxieties concerning the availability of charging stations, and the perception that the charging infrastructure is insufficient to support large-scale adoption of EVs in the U.S. In fact, charging is generally done at home. In a study by the Idaho National Laboratory, it was found that the majority of charging was done at home or at work. This reduces the infrastructure hurdle — the need for an extensive network of charging ports around the country — significantly. The general driving behavior of most EV owners does not require a charge greater than what can be provided overnight at home through the power outlet, though for longer road trips, a visit to the charging station is needed. This particular challenge for long-distance road trips is exacerbated by the fragmented infrastructure in the U.S. Although Tesla, for instance, has its Supercharger network throughout the country, its proprietary charging ports means that other EV models cannot use this network, posing a legitimate barrier to non-Tesla owners. The EU, conversely, does not have this problem due to its standardized charging ports.

Challenges to EV adoption also exist in the business incentives for OEMs. EV sales are still relatively low, posing a problem for the capital-intensive automakers. One of the primary levers for EV players to use to achieve profitability is the emission credits trading system. These credits are generated for car manufacturers for their production of zero-emission vehicles (ZEVs) and can be traded between OEMs to fulfil regulatory emissions requirements. Players like Tesla are able to make significant profits through this, with revenues from credit trading of up to $2 billion in 2021, according to Bloomberg. As a result, in spite of relatively low sales, EV manufacturers are able to stay in business and, as Tesla has, become as much a household name as the OEMs only slowly transitioning their fleets. Meant to incentivize OEMs to produce more EVs, the credit trading system currently enables a small number of EV makers to stay in business, while allowing traditional OEMs to skirt the issue of fleet electrification.

Additionally, new innovations in production that would support the EV transition or reduce the carbon footprint of internal combustion vehicles (ICVs) are only slowly trickling through. Vehicle production is capital-intensive and lead times are long before innovations make it onto the production band. An example of such an innovation is the in-wheel drivetrain developed by Protean Electric, a U.K.-based company with operations in the U.S. and China. Protean Electric CEO Andrew Whitehead noted that the long lead time for adoption into production processes means that it will be years before the technology will be seen regularly on the road. Though Protean's technology has been in development since 2008, it is up to the traditional OEMs to integrate this technology into their production lines.

A third challenge exists in the emissions-intensive production of EVs, compared with the total emissions footprint of ICVs. Carbon emissions for vehicles come from two sources: the manufacturing process, and the refilling and maintenance process during the car's life-cycle. Several reports have found that hybrid electric vehicles, plug-in hybrids, and full-electric vehicles generate more carbon emissions during their production than current

ICVs. The consensus from some studies is that emissions from EV production are higher than for ICV production. This higher carbon footprint arises from the process of battery production for the EVs. Firstly, the battery production for EVs involves lithium batteries, the sourcing of which requires metal extraction, which is highly harmful to the environment with effects such as ground water and air contamination. Secondly, the battery's weight requires changes to the production processes of other car parts to make these lighter. Additional emissions are generated in order to achieve a lower weight for the non-battery parts of the EV and maintain a comparative fuel efficiency with ICVs. Finally, the production processes of ICVs are generally more streamlined and efficient, while the newer ones of EVs are early in the optimization process. Emissions are expected to go down with technological improvements and favorable regulations. The vast majority of the emissions associated with the production of EVs is associated with the production and supply chain steps before the car is ever delivered to the customer, with some estimates on emissions reaching as high as the emissions given off by ICVs throughout their entire life cycle.

Each of these challenges in the production process for EVs can result in the perception that the saved carbon emissions through owning an EV are not as high as often claimed. However, even though EV production emits more carbon dioxide than ICV production, throughout the car's lifetime (estimated at around 200,000 miles or the life cycle of one battery), EVs are significantly more carbon-efficient than ICVs, based on a study by the International Council on Clean Transportation. Emissions are heavily impacted by the energy mix used to generate the battery power and power the EV throughout its life-cycle. In regions with high renewable energy sources, like Europe and the Pacific Northwest in the U.S., the difference in emissions between EVs and ICVs can be more than 60% over the lifetime of the car. Even in China and India, where more than 80% of energy is nonrenewable, savings range from 10% to 30%. Overall, EVs are capable of reducing emissions substantially in the long run, though this is dependent in part on the surrounding energy generation conditions.

> "Regulations should go hand-in-hand with technological advancements and incentives to drive adoption."

Nevertheless, for the U.S. to meet its commitments to the Paris Climate Agreement to limit gas emission to 39 gigatons, EVs represent a critical lever. Even with EVs, the solution must be adopting California's model of 100% of new cars being EVs by 2030 or following a mix of EV promotion and other strategies to reduce emissions. These could include improving fuel efficiency, reducing the weight, and decreasing miles traveled per person. Regulations should go hand-in-hand with technological advancements and incentives to drive adoption. Over time, the electrification of vehicles must accelerate more than it has thus far. Governments have done much in the past years to incentivize customers to own EVs. However, recent rollbacks of incentives and other challenges have set up roadblocks. These must be removed through regulatory and infrastructure standardization in the U.S. and Europe, or other measures implemented to highlight the lifetime environmental benefits of EVs. Now is not the time to slow down the electrification of vehicles. In order to reach the climate goal, electric wheels have to continue spinning.

This article was written by Mariama Diallo, Hana Do, Arelyss Eblohoue, Delfina Mattern, and Roy Wang, members of the Lauder Class of 2023.

Sky's the Limit: How the Boeing-Airbus Trade Deal Impacts US-EU Relations

The longstanding rivalry between Boeing and Airbus ended last year with an agreement that has international implications. While it signals renewed cooperation between the U.S. and the European Union, other factors are at play, most considerably China's burgeoning influence.

Boeing and Airbus, two of the largest aerospace companies in the world located in the United States and France, respectively, have been in competition since Airbus' founding over 50 years ago. Airbus began as a consortium of European aircraft manufacturers that was developed to compete with McDonnell Douglas, Boeing, and Lockheed. This long-standing duopoly between the American and European commercial aerospace market was solidified in 1996, after Boeing merged with McDonnell Douglas and Lockheed exited the commercial aviation market. Competition between Airbus and Boeing has grown fiercer over time, as each company has continued to innovate in direct competition with the other by developing new aircraft with enhanced capabilities that include increased passenger capacity, range, and fuel efficiency.

> "Eventually, the Airbus and Boeing trade war became the contemporary world's largest-ever corporate trade dispute."

The origins of the trade war began more recently in 2004. Competitive tensions escalated when both sides filed complaints to with the World Trade Organization after the U.S. walked back support for a 16-year-old agreement with the European Union that institutionalized governmental support for both companies. The U.S. accused the EU of providing direct subsidies to Airbus, while the EU accused the U.S. of providing military-funded support. At the time, Airbus was developing the A380 jumbo jet to rival Boeing's 747, which dominated that segment of the commercial aviation market. While the EU would have favored avoiding taking legal action, U.S. Trade Representative Robert Zoellick filed an initial complaint with the WTO in October 2004. In response, the EU filed a parallel complaint to object to the alleged U.S. support for Boeing. Trade experts were skeptical when the U.S. initially decided to bring the case forward to the WTO, as any penalties determined would be mutually detrimental. At the time, Claude E. Barfield, a trade expert at the think tank American Enterprise Institute, commented, "It is irresponsible for both sides to let this go through the WTO. These are … the elephants of the industry. What happens if penalties are levied against either of them? We all lose."

As predicted, the 17 years that followed the 2004 conflict consisted of a string of seemingly endless, mutually damaging, and retaliatory actions between the U.S. and the EU. Eventually, the Airbus and Boeing trade war became the contemporary world's largest-ever corporate trade dispute.

These disagreements came to a head in 2018 when the WTO first ruled that subsidies received by Airbus impeded Boeing sales. In response, the U.S. levied tariffs against $7.5 billion of EU exports annually. The next year, the WTO ruled that Boeing had received illegal subsidies, leading the EU to institute retaliatory tariffs on $4 billion of U.S. goods. From 2018 to 2020, similar retaliatory tariffs between the U.S. and EU remained ongoing, with wide-ranging economic impacts beyond commercial aviation.

A Historic Agreement Two Decades in the Making

After 17 years, intensive negotiations in Brussels in June 2021 led to an end of the dispute. This marked an important milestone in U.S. President Joe Biden's first term in office, reflecting what many thought to be a significant policy change after the trade dispute had escalated under President Trump's administration. Additionally, under the Trump administration, the U.S. had further blunted the WTO's effectiveness by refusing to allow vacancies in the WTO appellate body to be filled. This new trade deal codified a five-year agreement to suspend punitive tariffs linked to the original dispute, and it established the creation of a senior-level working group to discuss subsidy limits and provide a forum for any future disputes between the U.S. and the EU. Furthermore, the deal provided economic relief to a wide array of national industries that had been drawn into the dispute, including French wine and German industrial equipment.

When the deal was first announced, it seemed to signal a new chapter in U.S. and EU relations. The potential for a return to stronger transatlantic cooperation was initially well-received after the trade policies and tariffs enacted by the Trump administration. However, the ultimate catalyst of this agreement may not have been the Biden administration's desire to repair ailing relations, but rather the motivation from an external threat: China.

As discussed, the aviation industry has long been dominated by the duopoly of Boeing and Airbus, but the emergence of state-backed aerospace manufacturer, the Commercial Aircraft Corporation of China (Comac) has threatened to challenge this dominance. Comac's first passenger jet, the single-aisle C919, is close to achieving approval for commercial flights after over a decade in development and up to $72 billion in state support, as estimated by the Center for Strategic and International Studies, a U.S. think tank. While the C919's approval continues to experience delays, especially as a result of tough U.S. export rules, the existential threat of a new entrant in the Chinese market was enough to accelerate the trade discussions between the U.S. and the EU. Though the competitive threat from Comac may be limited to China for the time being, the company's recent progress in the country may be enough to justify changes in the behavior of both companies given the size of the Chinese market. In fact, Boeing's near-term forecast from last year indicates their belief that China will become "the world's number one passenger market [over] the next few years."

In the months following the Boeing-Airbus agreement, relations between the U.S. and EU have not proceeded as smoothly towards a full reconciliation of prior trade policy. The U.S. continues to prioritize national interests over improved transatlantic trade relations. Trump-era tariffs on EU steel have remained in place, continuing to anger European nations, and a lack of communication around the U.S. withdrawal from Afghanistan has further shaken Europe's faith in the Biden administration. More recently, the submarine manufacture and supply deal among the U.S., the United Kingdom, and Australia that was announced in September 2021 has further widened the rift between the U.S. and the E.U. This deal made very clear that confronting China is a key priority for the U.S. and reframes the Boeing-Airbus agreement to be less of a new chapter in U.S.-EU relations and more of a strategic play to counter China.

> "The current relationship between the U.S. and the EU is one of cautious optimism."

Despite Progress, Tensions Remain

The current relationship between the U.S. and the EU is one of cautious optimism. Many issues continue to confound relations between the two parties, including the handling of China's abuse of economic policy tools, competing national security concerns, automobile semiconductor supply chain issues, and the lingering tariffs of the former Boeing-Airbus dispute.

To address these challenges, a new forum, the Trade and Technology Council, was conceived. The TTC is led by the U.S. president (Biden), the president of the European Commission (Ursula von der Leyen), and the president of the European Council (Charles Michael), who held their first meeting in September 2021 in Pittsburgh, Pennsylvania, a former powerhouse in the global steel and aluminum industries.

One of the greatest sources of ongoing tension remains tariffs on steel and aluminum that were implemented in 2018 under Trump. Following a stated goal of enhanced national security through protection of vital industries, the U.S. placed a 25% tariff on imported steel and a 10% tariff on imported aluminum. Throughout 2021, there was significant pressure from interest groups and European exporting nations to remove these tariffs, though Biden originally resisted their removal to placate steelworkers and other unions. However, the TTC set as one of its major objectives a resolution by the end of the year. On October 31, 2021, the U.S. and the EU announced that an agreement had been reached for the rollback of tariffs on European steel and aluminum exports, a welcome development in this saga.

Another obstacle that may prevent these governing bodies from working together harmoniously is a new partnership among the U.S., the U.K. and Australia to provide Australia with nuclear powered submarines. Stylized as AUKUS, the partnership's intentions are to maintain "peace and stability in the Indo-Pacific [region] over the long term." However, it seems likely that a priority for the partnership is to act as a deterrent to any escalated conflict with China across the region. The AUKUS agreement also nullified a $90 billion submarine supply contract between France and Australia, just two weeks before the TTC's first planned session. As a result, France took several swift actions to demonstrate its disapproval, including recalling the French ambassador to the U.S. and calling for a European boycott of TTC proceedings. In the end, French tensions were assuaged and the TTC's agenda has continued to move forward. While not directly related to the legacy Boeing-Airbus dispute, this occurrence would seem to indicate that, for the time being, U.S. intentions are more closely aligned with protecting its own national security as it relates to Chinese economic and military power than wholesale U.S.-EU reconciliation.

What Does the Future Hold for U.S.-EU Relations?

The global trade environment is multifaceted with many nuances and diverging interests among countries and blocks of power, but recent events illustrate that U.S.-Chinese relations will be a central factor shaping global trade in the coming decades.

As discussed previously, the most important trade issues since the beginning of 2021 have often been driven by the U.S. desire to counter China; however, the simultaneity of reconciliatory tariff actions and the AUKUS agreement makes it challenging to anticipate where Washington's priorities lie. Adding a bit of clarity, a senior Biden administration official recently indicated, "Europe and the United States have a shared interest in ensuring that others abide by [the] rules of the road," without naming a particular foreign power.

The question in terms of reconciliation now remains, is the European Union as concerned with China as is the U.S.? EU Foreign Policy Chief Josep Borrell said in September 2021 that the EU's "strategy is not a strategy of confrontation. It is a strategy of cooperation," when the bloc articulated a new approach to the Indo-Pacific region, including China. Despite the EU's recent decision to freeze a trade deal due to human rights concerns, China remains the EU's biggest trading partner, and many in Europe believe that spending too much energy in the U.S.-China dispute will distract from important European issues involving Russia and Ukraine. Indicating further distancing from the U.S. administration, the EU has not followed the U.S. ban on sensitive Chinese technology.

Additionally, the U.S., Europe, and China have different comparative advantages, reflected in the composition of their exports. Europe specializes in high-end consumer goods and machinery; the United States in agricultural products, high-tech components, and services; and China in basic manufactured consumer goods and inputs. Europe and the United States are historic allies and may have shared long-term objectives in dealing with China, but Europe's higher trade and economic integration with China suggests that the competitive aspect of their relationship offers more potential for near-term, mutual benefit.

AUKUS arguably shows that the U.S. will grab opportunities to counter China, even if it means weakening its ties with its European allies. Sooner or later, the EU will need to develop more clarity on its own global trade agenda, especially with regards to China, instead of what has appeared to be a reactive policy towards U.S. decisions. However, Europe is not alone in its frustration with the White House's foreign policy decisions. A median of 68% of polled countries believe that it is not China but the U.S. that has disturbed world trade in the past years by launching a trade war, raising tariffs, and nullifying the WTO's dispute settlement system. If the world is indeed facing a new type of cold war between democratic and more autocratic governments, the path forward for the U.S. may be more effective if it considers the interests of its democratic allies, understanding that not all may be equally concerned with the rise of China's global influence.

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China's Three-Child Policy: Passive Permission vs. Active Incentive

The ramifications of China's One-Child Policy from 1980 are still creating socioeconomic and political challenges today. These factors are driving China's new three-child policy in 2021, but the Chinese Communist Party will need to do more to incentivize citizens to have more children.

China's new three-child policy is an acknowledgment by the governing Communist Party that the shrinking population jeopardizes the country's economic future because it reduces the skilled labor force. On May 31, 2021, China's Communist Party Politburo, the nation's top decision-making body led by President Xi Jinping, officially announced that it would allow all married Chinese couples to have up to three children. The policy was formally passed into law by the National People's Congress, the national legislature of China, on August 20, 2021. However, it remains to be seen if the new policy will yield better results. The end of China's one-child policy and beginning of its two-child policy in 2015 has failed to raise the country's declining birthrates and prevent a looming demographic crisis that could turn out to be the Achilles heel of China's incredible economic transformation over the last 40 years, according to a *New York Times* article. "China's economic expansion has created a society where many young couples now struggle with economic pressures — including rising education and housing costs — making it difficult to have even one child, let alone two," the article stated.

"With fewer workers in the future, the government could struggle to pay for a population that is growing older as well as living longer."

The Chinese Communist Party first imposed a one-child policy in 1980 to mitigate the growth of the world's most populous nation, which was nearing 1 billion people, after failed party policies of the Cultural Revolution and Great Leap Forward led to 88% of China's population under poverty by 1981, as measured by the World Bank's Poverty and Equity Database. While the one-child policy did bolster economic development and social mobility (consolidating the combined wealth of two previous generations into the investment of one child), with the poverty rate reduced to under 1% percent by 2016 World Bank data, the policy created a whole new set of challenges for the Politburo: Births in China have fallen for four consecutive years, including in 2020, when the 12 million babies born marked the lowest number since the Mao era in 1961. Births have also been below projections by China's National Health and Family Planning Commission.

According to the United Nations Population Division, China's total fertility rate — an estimate of the number of children born over a woman's lifetime — now stands at 1.3. This is officially considered "lowest-low fertility" and is well below the replacement rate of 2.1 — defined as replacement level fertility for each generation to exactly replace itself — raising the possibility of a shrinking population over time. Chinese women born during the years following the one-child policy are now reaching or have already passed their peak fertility age. As a result, there are not enough Chinese women to sustain the country's population level, despite new efforts by the government to encourage families to have three children.

> "The Chinese government may be missing the point."

The decline in the birthrate, along with an increase in life expectancy, also means there will soon be too few in the labor force to support an enormous and aging population, according to a report issued in January 2020 by the Chinese Academy of Social Sciences. The academy estimated the contraction would begin in 2027, though experts believe it could be sooner or has already begun.

The declining population could create an even greater burden on Chinese society. With fewer workers in the future, the government could struggle to pay for a population that is growing older as well as living longer. A decline in the working-age population could also slow consumer spending and therefore have an impact on the economy in China and beyond.

Missing the Point

The Chinese government may be missing the point. While implementing a three-child policy is a step in the right direction to reversing a precipitous slowdown in birthrates among Chinese women over the last three decades, one policy will do little to change the attitudes of women who refuse to have more than one child, if any. Dr. Yun Zhou, a social demographer and family sociologist specializing in Chinese family units, writes in *The Washington Post* that college-educated urban Chinese women have cited "high housing costs and long work hours" as key constraints against having more than one child. This is even among women who viewed having one child as the "natural next step after marriage." After a 40-year legacy of severe penalties for having more than one child, there is no guarantee that governmental support will translate into fertility behavior. The Chinese government needs to provide robust socioeconomic incentives that specifically relieve the financial demands of housing and day care — key costs that negatively influence the outlook on raising families in China. However, even if Beijing subsidizes housing and day care, the private-sector ramifications for women may be significant.

James Liang, economics professor at Peking University, has said that China will need to spend about 5% of its GDP, compared with "practically 0% now," in "cash, tax breaks, housing subsidies, and day care incentives" to increase the Chinese fertility rate to 1.6 children per women. Liang also proposes the government step in to build day care centers and kindergartens to allay fears of a high cost burden among prospective Chinese families. Even with a prospective government investment of $736 billion, or 5% of China's GDP, 1.6 children per woman is well below the 2.1 replacement rate — a rate not seen since 1992, according to the World Bank.

The Chinese government has indicated that far more than a three-child allowance is in the works. In a readout from a 2021 Politburo meeting, President Xi stated that China would "lower educational costs, step up tax and housing support, and guarantee the legal interests of working women," but his committee gave no proposals on a course of action at the national level. However, there has already been action at the local government level to encourage an increase in fertility among women.

According to the *South China Morning Post*, in late July 2020, the city of Panzhihua in Sichuan committed to giving local women an extra month off and $80 monthly stipends for second and third children until the age of three. While an important move, government action at a higher level is necessary to address the broader systemic issues of housing and child care accessibility, particularly in larger cities.

Because the CCP has yet to lay out a plan for subsidizing child care and housing, the size and scope of the impacts of government involvement are difficult to understand. But it is not hard to see why the economic impacts will be very significant.

Data from the World Bank shows that while average annual wages for full-time employees in Shanghai have amounted to approximately ¥90,000 as of 2017, the average price for a new, centrally located residential property in Shanghai in 2020 was ¥118,510 per square meter. Properties outside of the center ring are still ¥26,740 per square meter. Ma Chunhua, a sociology professor at the Chinese Academy of Social Sciences, has discovered that low-income families (defined as having household income of less than ¥50,000) spend on average 70% of their earnings on their children, including child care. Understandably, the Chinese government must consider how much of its national income it wants to earmark and what the minimum amount is to increase the birthrate to replacement levels.

It is not hard to see that real estate and child care are big industries in China, and there has been concern of China crowding out large, private players in these industries. Nevertheless, the economic ramifications of government non-intervention to bring down child care and housing costs to boost the working population are even more drastic. According to scholar X Yu, by 2050 it is expected that there will be over 100 million Chinese retirees needing ¥800 billion in pensions — 20 times the 1993 amount. The Chinese government must decide whether it wants to commit to the upfront cost of subsidizing its future population growth or deal with the cost of a retired population that will account for more than 10% of national income.

Tackling the Economics of Education

In addition to lowering the cost of housing and child care, raising China's fertility rate will require addressing the thorny issue of the cost of education. Although most children attend free public schools during the day, the vast majority of parents choose to send their children to private "cram schools" after their regular school day ends. Private schooling options exist but are strictly regulated by local governments and do not enroll many students. According to a 2021 survey conducted by the China Education Paper, 92% of parents enrolled their children in additional classes outside of school and roughly half spent $1,500 a year or more on expenses. With each additional child, these costs grow. The entire K-12 education system in China is geared towards preparing students for the single future-defining exam that students take in their final year of high school, known as the gaokao. The exam controls entrance to university, and graduates from the top schools are all but guaranteed well-paying and secure careers. Without a reliable pension system to fall back on, parents are forced to rely on their children to support them in elderly years and view education as the key to ensuring their children are successful. Anxieties about the future fuel an educational arms race among parents, with exam preparation courses beginning as early as kindergarten. A hypercompetitive culture and educational system geared towards a single test puts parents under severe pressure to provide as many educational resources to their children as possible, both for the sake of their child as well as their own future financial stability. The competition is fiercest in big cities such as Beijing and Shanghai, where average incomes are higher and options for tutoring and exam preparation courses abound. In response to this incredible demand, the for-profit private education industry in China has grown to be worth over $150 billion.

In July, the Chinese government announced measures aimed at curbing the industry as part of an effort to lower the cost (and stress) of having children. The move bans for-profit companies from teaching core subjects, bans foreign investment in the industry, and forces all existing educational companies to register as nonprofits. The announcement caused shares of educational companies in China to fall as much as 60%.

Anxieties around education are closely linked to rising housing prices in some areas as well. In 2019, for example, houses in the top school districts in Beijing cost nearly three times as much per square foot as the city-wide average price, prompting the government to take steps to combat the soaring prices. In January 2019, Beijing implemented price controls on houses in certain districts. Many cities have also implemented rules that force schools to allocate seats to students outside of their school districts, so that owning a home near a school no longer ensures admission to that school. In Shanghai, some of the top schools allocate 50% of their seats to students outside their district.

Although these are significant steps in the right direction, they do not solve the underlying structural issues with the educational system that cause the frenzied pursuit of educational resources to begin with. With so much of a child's future riding on a single exam, it is only natural for parents to pour resources into ensuring their children's success. The demand for additional educational resources did not shrink after restrictions were placed on the for-profit education industry, and private tutoring may rise as an outlet for pent-up demand, further entrenching the advantages of wealthy families. Ironically, if China succeeds in raising the fertility rate, it could increase the competition for seats at the top universities and further exacerbate the problem of rising educational costs. Unless there are more structural changes, the pressure — both emotional and financial — associated with raising a child will not be reduced and will therefore remain an obstacle for families considering having more children.

China's low fertility rate and aging population pose significant challenges for the future of China's economy — and the popularity of the ruling CCP. While the CCP has clearly identified the issue and begun to take measures to address it, the actions taken so far are not sufficient. Rory Green, senior China economist at macroeconomic forecasting firm TS Lombard, told CNBC that the new policy alone is "completely inadequate to reverse the demographic decline" without further structural changes. Adequate measures will have to impact other key areas of China's society and economy, primarily housing, child care, and education. Managing this growing issue will be among the CCP's biggest challenges in ensuring the continued success and growth of China, and their own popularity.

This article was written by Christian Anthony, Kevin Ke, and Matthew Griffith, members of the Lauder Class of 2023.

Football in the Pursuit of Soft Power

The oil-rich nation of Qatar has become increasingly isolated over its support of religious extremism and treatment of migrant workers. By hosting the next FIFA World Cup, Qatar hopes to draw tourists, attract foreign investment, and score diplomatic points around the world.

Qatari football has long been seen as a bastion of international mercenaries who have virtually no ties to the country. The claim is not unreasonable: There are only a handful of homegrown players on the country's football team, and they are children of immigrants who were naturalized over time. The majority of the players who don the Qatari jersey are foreign recruits earning a lucrative paycheck. Yet Qatar now finds itself at the threshold of hosting football's most premier event, the 2022 FIFA World Cup. It's the first time a Middle Eastern nation will host the competition since it began in 1930.

The World Cup in Qatar is hardly about football, however. It is the tiny kingdom's big bet on sports diplomacy and projection of soft power, which in this context implies the strategic use of sports to enhance nation branding, commerce, and global diplomacy.

The notion of soft power is particularly poignant in the Qatari context. While not lacking in economic prosperity owing to its vast natural gas reserves, Qatar has emerged as a pariah in the context of its Gulf Cooperation Council neighbors, especially the other oil-rich states of Saudi Arabia and the United Arab Emirates. The Kingdom's long patronage of the Muslim Brotherhood and Sunni extremism led to it being completely ostracized both diplomatically and economically by five of its Arab neighbors in 2017 as well as strained relations with the United States and NATO. Relations have somewhat normalized lately, but by no means can be considered harmonious. In addition to this relatively acrimonious political environment, Qatar also finds itself trailing Saudi Arabia and the UAE in aggressive socioeconomic reform programs launched by these nations to diversify their economies away from fossil fuels and attract foreign direct investments (FDI) over the next two decades.

The Qatari polity hopes that a successful football World Cup would manifest into enhanced FDI, tourism, and overall prestige for the country. However, as the window to the World Cup approaches and Qatar finds itself increasingly under the world's magnifying glass, significant issues remain to be addressed that can severely impact the kingdom's pursuit of soft power. Key among these are the treatment of migrant labor in the country, as well as the clash between the social norms of the World Cup versus the conservative, Islamic principles of the Qatari state.

World-cup Building Spree

In preparation for the World Cup, Qatar has spent the last decade in aggressive infrastructure building and expects this initial investment to translate into making the country a more attractive investment proposition in the Middle East and bring about FDI.

The nation has awarded projects worth up to $200 billion between 2011–2020, with much of the focus on development of infrastructure related to the World Cup. This makes the 2022 competition the most expensive World Cup in history. Its commitment to its sustainable development goals known as National Vision 2030, and its ambition to host the Asian Games in 2030, are two more ways Qatar is trying to make an imprint on the international scene.

The lists of infrastructure projects include eight stadiums, the Qatar Integrated Railway project ($40 billion), the Ashghal expressway program ($20 billion), Ashghal local roads and drainage program ($14.6 billion), Hamad International Airport expansion, a major port renovation, and several natural resources development projects. Qatar is also looking to boost tourism with the construction of 50 traditional hotels and 16 new floating hotels created specifically to serve World Cup visitors.

Most of the expenses of the World Cup are being undertaken by the government; however, Qatar has recently turned its attention towards the private sector as a potential partner in developing infrastructure. To help achieve the objectives of encouraging wider commercial participation in developing Qatar's economy, the government has adopted a public-private partnership (PPP) program for infrastructure projects. This exercise in nation-building is centered around the adage that money begets money. Qatar hopes that successfully hosting the World Cup will help bring in more FDI into the country to help increase its GDP growth rate.

The current state of FDI into Qatar is abysmal. Following the kingdom's isolation and blockade, FDI plummeted sharply. Inflows fell from $986 million in 2017 to negative $2.8 billion in 2019 — essentially implying massive amounts of divestments from the country. However, Qatari Secretary General Hassan Al Thawadi said he expects the World Cup will bring in over $20 billion to the economy in the short term. This figure is equivalent to 11% of the country's GDP in 2019.

> "The Qatari polity hopes that a successful football World Cup would manifest into enhanced FDI, tourism, and overall prestige for the country."

Rolling Out the Welcome Mat

A key aspect of Qatar's pursuit of soft power is to utilize the World Cup to transform its tourism landscape.

Despite being the smallest country to host the FIFA World Cup, Qatar is gearing up for a big influx of tourists in 2022. More specifically, two hotels have been added into Qatar's tourism leisure offering for the soccer tournament: Hilton Salwa Beach Resort and Villas and Zilla Wellness Resort. Hilton also has partnered with Qatar Airways to bring a more integrated tourism experience for traveling fans. Qatar Tourism plans to add 105 new hotels and serviced apartments in Doha. Additionally, international hotel chains are launching or planning to open their brands in Doha, including Pullman, JW Marriott and Banyan Tree, a five-star luxury property. Qatar Tourism established a partnership with Cruise Lines International Association (CLIA) UK & Ireland to broaden the country's appeal to tourists and achieve its vision to welcome 6 million tourists a year by 2030.

In a precursor to the World Cup, Qatar hosted the FIFA Arab Cup from Nov. 30 to Dec. 18, 2021. The competition was an important event for the tourism department to test its offerings and services and make the necessary adjustments for the World Cup. A statement released by Qatar Tourism's social media account ahead of the Arab Cup stated that they want tourists to explore their "excellent dining, pristine beaches, nature reserves and diverse water sports."

Mistreatment of Migrants

Qatar's aggressive building spree has not only drawn attention to its role as host for the World Cup, it has also caused the world to focus more closely on the country's flagrant abuse of migrant labor, leading to increasing pressure for reforms.

According to the 2021 Human Rights Watch report, Qatar uses the Kafala system to control the more than 2 million migrant workers who make up approximately 95% of the total labor force. Kafala is a controversial legal system in which the government delegates the oversight and responsibility of the migrant workers to private citizens and employers, called "sponsors." For example, without prior permission from the sponsor, workers cannot change jobs, quit jobs, or even leave the country. Additionally, sponsors have the power to cancel the worker's permit anytime, which automatically makes the worker an illegal resident in the country. The legal restrictions are so severe that some nongovernmental organizations, as cited by the *Independent*, have likened the system to modern-day slavery.

Qatar has also received harsh criticism for the working conditions of migrant workers. Statista compiled multiple reports that suggest almost 1,200 workers died in the construction of the new stadiums. The International Trade Union Confederation even concluded that "migrant workers have reported finding themselves in exploitative situations, such as being paid far lower than promised wages, experiencing numerous unspecified deductions from wages, not being paid at all for months, and living in abysmal living conditions with dozens of co-workers crammed into small unventilated shelters without proper plumbing, water, and electricity." These labor issues are not new in the country; however, the World Cup has brought them to light and accentuated the problems.

Since the award of the World Cup, the number of migrants under the Kafala system increased by an estimate half-million to 1 million.

The publicity surrounding the World Cup has created some momentum for labor reforms in Qatar. There are numerous legal actions against the nation to reform its labor laws, Article 26 is one of the most critical legal interventions. In June 2014, delegates from 10 countries submitted a complaint to the International Labor Conference (ILC), arguing that the Qatari government failed to maintain the necessary legal framework to protect the rights of migrant workers consistent with international law. Thus far, the Qatari government has been cooperative and responsive with the ILC to ensure compliance with international standards. For example, in 2017, Qatar identified the immediate objectives as "wage protection, labor inspection and occupational safety and health, and employment contractual system replacing the Kafala system, forced labor, and promotion of workers' voice."

The decision to award Qatar the World Cup has been a controversial one from the onset; nevertheless, the associated humanitarian labor crisis has spurred a reaction from the global community and forced Qatar to institute long overdue reforms, albeit in a limited way. The scrutiny around labor issues is only going to increase as the World Cup inches closer, and Qatar's labor reforms will play a pivotal role in the country's quest for enhancing the national brand.

Culture Clash

In some senses, it seems counterintuitive to award a raucous, global event such as the World Cup to a conservative nation adhering to a stringent, conservative interpretation of Islam.

From that lens, awarding the 2022 World Cup to Qatar, FIFA has shown shockingly progressive thinking regarding the globalization of sports. To Qatar, this has presented an opportunity to challenge the colonial narrative portraying Arabs and Muslims as uncivilized and backwards. It has opened the door to potential ways in which Qatar could defy stereotypes and create a platform that showcases its universal values. Nevertheless, the decision has been met with widespread concern due to allegations regarding the disconnect between FIFA's values and Qatar's image.

One of the main concerns revolves around women's rights. Most of the public's concern surrounds Qatari laws that require women to cover their shoulders and wear modest clothing in public spaces. While Qatar has witnessed some cultural change in the recent years on this aspect, with women now being represented in sport with a women's national football team and a domestic league, it remains to be seen how the kingdom balances the overall "no restraint" environment of the World Cup, enhanced by the thousands pouring in to watch the games, with its continued adherence to a conservative model of social behavior.

Another challenge comes with homosexuality, which remains illegal in Qatar and could lead to the imprisonment of foreigners and expats for up to seven years. Chad Griffin, president of the Human Rights Campaign, wrote in 2014, "This is disturbing news for LGBT people who want to attend the World Cup in 2022, as well as for the coaches and players who would participate in the tournament."

"The publicity surrounding the World Cup has created some momentum for labor reforms in Qatar."

Secretary General Al Thawadi has gone on record to announce that Qatar is prepared to welcome people from all over the globe, regardless of any differences. He said, "The World Cup is an opportunity for celebration and we want everybody who comes to our country to feel comfortable. That's the assurance we want to give people. We are an open society and everybody's welcome."

Yet another challenge is the issue of alcohol consumption, which is forbidden in Islam but part of the FIFA match tradition. Alcoholic beverages are to be banned in public during the tournament, including in the stadium, the streets, and public spaces. Under Qatar's current alcohol policies, those caught breaking the law face fines, imprisonment, and deportation. In 2014, when Brazil attempted to ban alcohol in its World Cup stadiums, then-FIFA General Secretary Jerome Valcke refused to negotiate and said, "Alcoholic drinks are part of the FIFA World Cup, so we're going to have them." As consolation, Qatar plans to heavily expand entertainment alternatives for visitors to consume alcohol in licensed hotel bars and restaurants.

It is evident that as Qatar is approaching the final months before the World Cup, the official position on a number of social aspects remains ambiguous and potentially contradictory. To create synergies between Qatar and the World Cup, Qatar can extend a policy of forbearance on some of the most obvious social challenges during the World Cup, then revert back to its more conservative model of society when the World Cup finishes. Above all, Qatar can introduce changes in its social sphere to allow for the World Cup to act as a pivotal transitional event with a lasting impact on the country.

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The State of Censorship in Kenya, Tanzania, and Nigeria

Technology offers hope for the economic future of many sub-Saharan African nations, but repressive regimes are using that same promising technology to promote censorship. This article looks at the evolution of digital censorship in three key countries.

While censorship has long existed as a cornerstone of authoritarian regimes, a new form of censorship is becoming popular in democracies around the world, including in Africa. This censorship has been propelled by political and technological trends, including the rise of China, surveillance technology, and big tech companies. The impact of these trends in Africa, the youngest and fastest-growing region by population, must be considered. Kenya and Nigeria are known widely as two of sub-Saharan Africa's largest and most dynamic economies. As a socialist-leaning country, Tanzania provides a foil to Kenya, its neighbor in East Africa. Although the three countries and governments have taken different approaches to censorship of their citizens, they share a justification to protect African society from instability as a result of so-called fake news. As events play out with COVID-19 censorship in Tanzania and the Twitter ban in Nigeria, this paper examines the global trends that provide insight into why censorship is becoming increasingly relevant for Africans as well as the types of censorship methods used throughout the continent.

Kenya

As Kenya made its first steps as an independent state, its government's history of censorship fluctuated, becoming particularly prevalent during times of political change. Kenya saw increasingly strict rules on the media industry under the autocratic rule of Daniel arap Moi. During his presidency, which lasted 24 years, Moi exerted significant control over Kenya's media outlets and was granted power to dismiss judges he saw as unfit. Censorship during Moi's presidency was most evident during 1994 and 1995, when the president publicly chastised *The Daily Nation*, a privately owned regional newspaper. In the following months, the publication would go on to terminate the contracts of three reporters who had written stories relating to government corruption. Meanwhile, the news editor of *The Daily Nation*, Mutegi Njau, was arrested and charged with subversion. While the late 1990s marked the beginning of the end of Moi's control over the country, his tenure ensured lasting stability in Kenya at the cost of human rights abuses and the suppression of opposition.

> "Despite the growth that Kenya has experienced post independence, democracy has backslidden under the current regime."

In the wake of Moi's regime, Kenya has seen the rise of several outlets for information sharing, including newspapers. Despite the increasing adoption of digital media, newspapers are still very relevant in the country where the cost of internet access has let the printing world survive. The freedom that the media has enjoyed over the past decades after Moi's tenure was challenged in September 2018, when the current government implemented numerous censorship measures after the Supreme Court of Kenya nullified the election between the country's sitting president, Uhuru Kenyatta, and his opponent, Raila Odinga. Following the announcement of the election results, the current president used old censorship tactics by ordering the shutdown of four TV stations, causing public fear of being punished for speaking out and panic in the community. Despite the growth that Kenya has experienced post independence, democracy has backslidden under the current regime.

With the growth of digital technology and the internet in Kenya, the way information is shared has changed significantly. As a country with one of the highest number of internet users on the continent, Kenya hosts a growing tech-savvy population and a very active social media landscape. It is important to note that despite the contested 2017 presidential elections, the internet remained largely unrestricted during the period following the election, including when the government interfered to block the signals for the three leading television stations planning to air Odinga's unofficial inauguration in January 2018. However, following the contested elections and the alleged misinformation campaign ran by Cambridge Analytica on behalf of Uhuru Kenyatta's campaign in 2017, the Kenyan government introduced the Computer Misuse and Cybercrimes Act, which passed in May 2018, imposing penalties for up to 10 years in prison for the publication of false or fictitious information that results in "panic" or "is likely to discredit a person's reputation." The passage of such an act marked a turning point in censorship in Kenya. Despite this negative development resulting in the decline of the country's freedom of expression, Kenyan civil society has been very active in pushing against such practices. Most recently in April 2018, the High Court of Kenya ruled unconstitutional the Communication Authority's plan to implement a Device Management System that would have provided the Kenyan authority with access to mobile subscriber data, including call data records.

"Unsurprisingly, Tanzania's crackdown on free expression has everything to do with political power."

Tanzania

In Tanzania, government censorship has dramatically expanded since the late President John Magafuli came to power in 2015. Since then, a series of controversial regulations have passed, including the 2015 Statistics Act, which criminalized publishing economic statistics without government approval; the 2018 Electronic and Postal Communications Act, which subjects bloggers to excessive license fees; and the 2016 Media Services Act, which gave government agencies broad power to censor the media by creating stringent rules for journalist accreditation. When media outlets were suspected of violating these laws, the government was quick to act. In 2019, the Ministry of Information, Culture, Arts and Sports suspended Tanzania's major English language newspaper, *The Citizen*, for publishing articles highlighting depreciation of the local currency and a U.S. congressman's opinion on the "disrespect for civil liberties in Tanzania."

Unsurprisingly, Tanzania's crackdown on free expression has everything to do with political power. Despite having become a multiparty democracy in 1992, Chama Cha Mapinduzi (CCM) — the party of independence leader Julius Nyerere — has managed to hold onto executive power, rendering the country a de facto one-party state. While Magafuli was running for reelection in October 2020, citizens were reportedly cut off from social media platforms such as Instagram and Facebook. International media organizations were also barred from covering the elections. In another example, during the global COVID-19 crisis, Magafuli remained in denial that the disease had reached Tanzania. First, he proclaimed that Tanzania had defeated the pandemic through prayer. Then, he banned doctors in public hospitals from wearing face masks and from reporting COVID-19 deaths, which had to be classified as pneumonia, heart disease, or other ailments. Not only did he deprive citizens of access to critical medical care, but he also restricted the testing and reporting of cases. Censorship led to otherwise avoidable losses of life, potentially including the president's own.

Nigeria

Despite constitutional protection, Nigerian media was controlled by the government throughout most of its post-colonial history. Censorship in Nigeria typically targets certain kinds of ideas, such as ethnic discussion, political opposition, and morality incorrectness. The news media outlets in the post-colonial period continued the practice of using news media to serve political interests, but ongoing ethnic tensions shifted their focus from political parties to ethnic groups. This development significantly contributed to the self-censorship among news organizations.

Since 1961, the Nigerian government has taken an active role in gaining control of the press by seizing various newspaper organizations. The direct and indirect influence on censorship caused Nigeria to be ranked 115 out of 180 countries on the World Press Freedom Index compiled by Reporters without Borders in 2020, despite having a vast number of independent newspapers. The concerns on censorship in Nigeria were amplified in June 2021, when the Nigerian government decided to suspend Twitter services from operating in the country. This announcement came shortly after the company decided to delete President Muhammadu Buhari's tweet for violating the policies of the platform — a tweet that promoted the use of violence against young Nigerians who were protesting.

The Twitter ban occurred in the context of separatist movements in the region of Biafra and raised the debate about how far the government can go to expand its control over the freedom of speech of its citizens. A Brookings Institute article points out the economic impact of this decision, estimating that e-commerce lost $5 million in the first two months of the ban. It also negatively affected the perception of Nigeria as a technology hub for Africa because startups need an active social media presence to grow.

The government itself faced a new paradox, as Twitter had been the official communication platform for institutional decisions. This problem paved the way for a new form of censorship with the partnering of the Nigerian government with the Indian microblogging platform Koo in months after the Twitter ban in June 2021. This partnership is presented as an alternative to Twitter that does not follow the "neo-colonial" ways in which a U.S. company imposes its policies over Nigerian law. However, at the time of the ban, Koo had only 6 million users who were mostly based in India, while Twitter had tens of millions more. The alternative the government has presented clearly would not fill the hole left by Twitter's absence.

In October 2021, the Nigerian government announced its intentions to lift the Twitter ban if the platform agrees to all the government's requests. TechCrunch, a leading technology news site, reported that requests still under negotiation included, "Twitter setting up a local office, paying tax locally and cooperating with the Nigerian government to regulate content and harmful tweets." The implications of such modifications are alarming since agreement could pave the way for governments to exert more power in social media and set a precedent that regulation on freedom of speech is a business problem and not a human rights issue.

Comparative Analysis

As can be seen from the various case studies discussed above, most countries in sub-Saharan Africa have experienced various forms of censorship since gaining their independence from European powers. In Kenya and Tanzania, government censorship has increased significantly in the post-independence period with the enactment of laws aiming to restrict the freedom of speech and freedom of the press. Two examples of such laws are the new Computer Misuse and Cybercrimes Act passed in 2018 in Kenya, and the 2015 Statistics Act in Tanzania. These tactics are the results of the governments' initiatives to take control of the public narratives. The rapid rise in technology has also enabled Africans to access information through the internet via various social media platforms. As a result of the increasing influence that the internet has had in shaping public opinion, governments have applied censorship in all of the countries analyzed. The most notable example is the Twitter ban in Nigeria following the company's decision to remove a tweet from the Nigerian president. This move brought about a massive reaction domestically and internationally. The country is also known as one of the most favorable countries to attract investments in technology-related startups. The move will not only reduce Nigeria's image as a truly democratic nation, but will also decrease productivity, especially when it comes to the country's burgeoning use of e-commerce and fintech platforms.

New Challenges

New trends and challenges have paved the way for the rise in censorship in Africa. China's growing influence globally has led many to view its policies as an alternative path to economic development for low-income countries, including those in Africa. Over the last decade, the Chinese government has vastly expanded domestic surveillance, which has fueled the growth of a new generation of companies that produce surveillance-related tech products at a much lower price than the rest of the world. Coupled with China's global infrastructure initiative, these types of home-grown surveillance technologies have reached many corners of the world.

According to a Freedom House Report, 18 countries adopted Chinese surveillance technology in 2018. African countries on the list include Kenya, Rwanda, Zambia, and Zimbabwe. Thirty-six countries have sent media elites and government officials to China for weeks-long seminars on "new media or information management." Both Kenya and Nigeria are among the 15 African countries that obtained training from China.

The growing influence of China's surveillance model is especially alarming because China has used tools such as facial recognition technology to monitor its own population and thwart any act deemed to be harming public order or national security. This level of surveillance is particularly evident in the Northwestern Xinjiang region. Coupled with the wider adoption of the nationwide Social Credit System, which tracks "trustworthiness" of citizens through their daily routine, in the rest of the country, the level of surveillance in China could be reaching levels unprecedented in human history. Industry leaders in this field include Chinese companies such as Yitu, Hikvision, and CloudWalk. CloudWalk has entered into an agreement with Zimbabwe to build a national facial recognition database and monitor system.

Besides China's growing influence on censorship, the debate on stopping the spread of false information and freedom of expression still rages. Censorship has not become a concern uniquely limited to the media industry; it now expands across the internet, social media, and telecommunications industries. This development could have grave consequences to the future of technology, which is widely seen as a key sector to guide many African nations out of the current economic model based on the exportation of natural resources.

Africa is entering a new era of censorship marked by the inclusion of tools and technologies used by those in power to restriction of information. In the cases of Kenya, Tanzania, and Nigeria, recent efforts to block political upheaval, underreport COVID-19 caseloads, and ban access to major technology companies serve as a timely reminder to the continent's continued embrace of censorship. As China continues to play an outsized role in Africa, the question is not if governments on the continent will continue to censor online but how effective they will become at it. Increased government controls over Africa's digital landscape will play into what those in power hope to preserve: a lack of regime change and an upkeeping of the status quo.

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Nord Stream 2 and Europe's Bumpy Energy Transition

Despite the energy supply shortage in Europe, the completion of the Nord Stream 2 pipeline has been met with muted response from opponents. This article untangles the complex political motivations behind that response. (Editor's note: This was written October 2021.)

Russian state-owned Gazprom announced the completion of its Nord Stream 2 pipeline in early September 2021, on the heels of an energy supply crunch and sky-high prices across Europe, as reported by *The Wall Street Journal*. Operators hoped to start transporting Russian liquified natural gas (LNG) to Germany and the rest of Europe before the year's end, as soon as German regulators and the European Commission grant final approval to the pipeline. In the meantime, Gazprom continued to offer limited capacity, sending gas futures for the coming winter months ever higher.

The current energy supply crisis roiling Europe appears to confirm the prescience of the project's Russian backers. Russia and Gazprom have consistently maintained that LNG is critical to the stability of European energy supply so long as renewable source technologies lag in production output and storage capacity. The Nord Stream 2 pipeline, Russia insists, is essential to the physical security of that LNG supply to Western Europe. Nord Stream 2 and the previously completed Nord Stream 1 run in parallel directly from Russia to Germany under the Baltic Sea, bypassing traditional gas transit countries Poland and Ukraine. Since 1992, Russia has repeatedly reduced or shut down gas transit through Ukraine in response to Ukrainian payment defaults and allegations that the transit country siphoned off gas destined for its western neighbors.

Nonetheless, despite the surge in European demand, existing pipelines through Poland and Ukraine are transporting significantly less Russian LNG to Europe than their capacity. Gazprom sharply reduced gas flows along its Polish transit route beginning in July 2021 to as low as 25% of its average daily amount by mid-August, according to Tom Marzec-Manser, lead European gas analyst at Independent Commodity Intelligence Services. Instead of exporting more gas to meet increased demand, Gazprom is meeting Europe's previously contracted needs by depleting its forward-located reservoir stores, as reported by Deutsche Welle. This raises the question: Can Europe successfully transition to a more sustainable and independent energy policy while avoiding the economic havoc that a frayed relationship with Russia inevitably brings?

Neither Lean Nor Green

The extent to which Western Europe, especially Germany, truly needs the additional energy capacity has been at the forefront of the debate on Nord Stream 2. While the project promises to expand Gazprom's ability to send LNG to the continent by up to 55 billion cubic meters, the economic benefits to ordinary German citizens, and their Western European counterparts, are questionable. A research team at the German Institute of Economic Research led by Claudia Kemfert, head of its Department of Energy, Transportation, Environment, claim that the costs of additional pipeline use will be "passed on to the German consumer at a flat-rate basis," and that the project's economic viability is unclear, especially if the recent ruling from the Court of Justice of the European Union holds that Gazprom must unbundle its operation and let European firms compete for the project.

With Gazprom transporting less gas to Central and Western Europe in recent years, profit-seeking behavior from the Russia-backed firm may indeed pose a real risk to energy stability. *The Financial Times* reported last year that a Kremlin-backed cut to gas exports pushed prices in Europe to a 13-year high. The promise of eventual Russian gas obsolescence softens the long-term picture, with climate advocates arguing that fossil fuel consumption in Western Europe is already shrinking and would only accelerate if the European Union's goals were met on time. Nonetheless, short-term price spikes, impacting real consumers as early as last winter, continue to rise to the fore.

While geopolitical experts cite the possibility of supply manipulation as a concern, a Europe-wide analysis by the European Network of Transmission System Operators for Gas estimates that the European gas transmission system is already resilient to such shocks. The current spike is artificially created, they argue. But is there a diplomatic solution that circumvents the Nord Stream 2 question?

The question may be irrelevant if the next German government cannot decide on a definitive approach to its Energiewende or "energy transition" policy, which currently aims for a renewable energy target of 60% of all energy produced by 2050. While most energy experts and climate scientists agree that LNG generates less CO2 emissions on a per BTU basis than many of Germany's older coal power plants, many consider replacing one fossil fuel with another as a side-step, rather than a step forward. Further still, while most Nord Stream 2 proponents and so-called climate realists have focused on the CO2 impact of fossil fuels, more recent research demonstrates that greenhouse gas emissions from LNG have been underestimated due to their methane content, which has up to 87 times greater global warming potential, a metric provided by the Intergovernmental Panel on Climate Change.

> "If Germany cannot generate less carbon on a per citizen basis, its climate goal will be meaningless."

The political picture for decision-makers remains unclear. Recent election results in Germany suggest a high likelihood of a Green Party presence in government, committed to transforming Germany into a "socio-ecologic market economy," a reference to Germany's post-war social market economy. The party's leader, Annalena Baerbock, has tinged her party's message with an undercurrent of populist rhetoric, claiming "we [Germany] have everything we need to set our own standards...If we do not become more sovereign, others will decide for us."

Whether the go-it-alone approach to energy is feasible is another question. Anna Mikulska, a senior fellow at the University of Pennsylvania's Kleinman Center for Energy Policy, said that "Energiewende has never worked well" and has caused "intermittency of electricity supply." While it's true that Germany has struggled to meet its climate goals on time, an ongoing study by the regulatory agency Bundesnetzagentur shows that intermittency was down 43% from 2006 to 2019, followed by a rocky 2020 in which Germany was forced to reopen several shuttered plants. While the total contribution of renewables increased sharply and emissions dropped, it is unclear how much of this is attributable to the COVID-19 pandemic.

Either way, if Germany cannot generate less carbon on a per citizen basis, its climate goal will be meaningless. Even among those who favor an accelerated Energiewende, there is significant disagreement on how best to achieve this. There are those who argue that LNG is indeed a viable bridge technology that can tide Germany over until it has enough green energy capacity. Others, such as Scientists for Future, a pro-climate movement driven by some of Germany's foremost researchers on climate science, disagree. In February 2021, they argued that the planned expansion of LNG infrastructure would simply delay investment in the energy transition, creating a "lock in" effect for the EU and fossil fuels. The group also takes issue with pro-Nord Stream 2 arguments that there is a supply shortage in the European gas market, arguing "all modeled scenarios show a decrease in total gas consumption...by 2050."

Parallel efforts are still underway that may allow Germany to leverage its well-known industrial strengths and innovate its way out of fossil fuel dependency. Researchers at Germany's Karlsruhe Institute of Technology, for example, are working on P2X Kopernikus, a project that has shown promise in generating fuel from air-captured carbon dioxide. Others, such as Kemfert and her team, favor hydrogen, arguing it will be the future of energy.

Nord Stream's Geopolitical Ramifications

Across the Atlantic, the pipeline's completion on September 10, 2021, elicited little more than acknowledgement as the Biden administration prepared to commemorate the 20th-anniversary of the 9/11 attacks. Until recently, the United States had been the most influential and vocal opponent of the pipeline on geopolitical grounds. In conversation with Reuters, Amos

Hochstein, U.S. State Department Special Envoy and Coordinator for Energy Affairs, recognized both the new "reality" as well as an opportunity for "breathing room" until 2024, when Ukraine's current transit contract with Gazprom expires.

The marked shift in U.S. policy culminated in July 2021 with a U.S. and German joint commitment to ensuring that Russia "will not misuse any pipeline, including Nord Stream 2, to achieve aggressive political ends by using energy as a weapon." Both countries also committed to advocating for the extension of Ukrainian gas transit contracts with Russia beyond 2024 and to providing material support for the energy transitions of emerging Eastern European economies.

The line previously advanced by U.S. opposition centered on the pipeline's geopolitical ramifications for Eastern Europe, but there may have been other motivations. Between the project's 2015 announcement up until last summer's U.S.-German agreement, the U.S. levied various sanctions to thwart the project. The U.S. position is a result of both geography and volume.

Firstly, the new pipeline will avoid the Baltic states, Poland, and Ukraine, weakening these countries' bargaining power with a more belligerent Russia. A direct route to Europe's biggest energy consumer, Germany, would allow Russia to bypass these Eastern European states, eroding their profits from transit fees and robbing them of their bargaining power. Ukraine, especially, has become a sore spot for the U.S., which believes the timing of the pipeline after the annexation of Crimea was not coincidental. The doubling of capacity that the pipeline brings with it, in practice, makes the existing pipeline through Ukraine obsolete, with the WSJ noting that it is "unknown if Russia would be willing to pay for access to a transit corridor it no longer needs." In 2009, Europe was shocked by Russia's decision to temporarily halt gas deliveries through Ukraine, which then accounted for more than 80% of supply to Europe. The shut-off, occurring during January, highlighted to Europeans their vulnerability. However, the Ukrainian government is now perhaps even more concerned with the competition aspects of the new pipeline, with President of Ukraine Volodymyr Zelenskyy noting in June that "Nord Stream 2 will disconnect Ukraine from gas supplies, which means 'disconnecting' us from at least $3 billion a year… We will have nothing to pay for the Ukrainian army." In September, the Ukrainian Energy Minister Herman Halushchenko reiterated the Ukrainian stance to Reuters: "This threatens the energy independence of many Eastern European countries and undermines Ukraine's security."

"Nord Stream 2 is a long-term Gazprom investment, for which the firm will want to see considerable financial returns."

Secondly, Nord Stream 2 will bring a larger volume of Russian gas into the German energy mix. The Trump administration, not known to be frontline advocates for Russian sanctions, was vehemently opposed to the pipeline. Former Energy Secretary Rick Perry underlined in a 2020 interview with CNBC that "Russian gas has strings attached." Germany has resented the somewhat paternalistic implication: that Germans do not know what is good for them (but the US does). Berlin has urged the U.S. to remove its sanctions, which was finally accomplished in June 2021, after the Biden administration weighed that the costs to its relationship with Germany were greater than the geopolitical risks. Moscow has argued that the actions of the U.S. constitute unfair competition and that, contrary to U.S. assertions, Nord Stream 2 will actually strengthen Europe's energy security. Pointing to the growing supply of U.S.-produced gas in the form of sea-borne LNG to European markets, the Russian government has implied that America is willing to go to great lengths to protect its producers of gas, including sanctioning the competition.

Russia's Use of Gazprom to Propagate Soft Power

Russia and Gazprom have leveraged soft power to increase Russia's influence and bolster Gazprom's reputation across Europe. Nord Stream 2 is a long-term Gazprom investment for which the firm will want to see considerable financial returns. With increasing competition for fossil fuels and the drive for more sustainable energy, Russia's state-owned gas company sees the need to influence perception of Russian energy and ensure its brand is well-recognized across Europe.

To that end, Gazprom has gone direct to consumer, so to speak, by sponsoring numerous sporting entities, especially soccer, Europe's favorite sport. Since 2012, Gazprom has been an official sponsor UEFA, European soccer's governing body, and reportedly pays €40 million per year to have its logo seen by European soccer fans.

Unlike UEFA's other main sponsors who sell goods directly to consumers (e.g., Sony, Pepsi, Adidas, Heineken, etc.), Gazprom instead sells Russia's natural gas reserves to foreign governments. By partnering with Europe's premier soccer competitions, Gazprom is looking to subtly alter the firm's public image and make it a recognizable brand worldwide. Indeed, 51% of respondents to a poll associated Gazprom with being a "reliable Russian energy supplier," with an even higher proportion amongst soccer enthusiasts. Gazprom also sponsors several soccer teams, with its sponsorship of historic FC Schalke coinciding with the beginning of the Nord Stream 1 construction. In a parallel move, Gazprom sponsors Serbia's Red Star Belgrade, possibly in anticipation of discussions regarding TurkStream 2, a potential new gas pipeline going through the Balkans.

Will It Matter?

Despite all the reservations and threats, Nord Stream 2 is complete just as Europe finds itself in the throes of an energy crisis. German politicians from the three largest parties (CDU/CSU, SPD, the Greens), whose combined 400-page election manifestos offer only one fleeting reference to the project, are currently negotiating the chancellorship as well as key ministerial positions. Although President Biden's decision to waive sanctions on all the involved parties was met with a sigh of relief in Germany, European politicians from across the spectrum had already reached the conclusion that completing the project was the most pragmatic option. Given the sheer number of variables, the question has always been: What is the alternative?

The world now has front-row seats to watch this $11 billion high-stakes political investment evolve. The reason this project has been on the crosshairs of at least 15 countries is the complexity, with each player only holding only a piece to the unsolvable puzzle. Per Jonathan Hackenbroich and Kadri Liik, policy fellows at the European Council On Foreign Relations, "It is not a clear-cut energy security issue…Instead, the issue is a thorny one because it combines a multitude of considerations — from supply diversification to different countries' business interests; from legal commitments to historical distrust and sanctions against allies' projects — and spices them up with the political passions of the day."

Not completing the project would have sent the message that Europe cannot make independent geopolitical and energy decisions. Approving the project now, while shortcutting regulatory due process, would send the message that the economic needs of a few elite European countries trump those of their European partners and the importance of a cohesive transatlantic partnership. Despite the charm offensive undertaken by Gazprom in Europe in the two decades, there exists a scenario that the reduced demand within the EU's 2030 climate & energy framework and the extant pipeline infrastructure on the supply side could meet Europe's fossil fuel needs. This reality could be one of the limiting factors to the United States' position to step aside and allow the project to progress.

The largest strategic challenges that exist for both Europe and the United States are beyond those of the pipeline. Rather, they include rebuilding frayed transatlantic ties and bolstering collaboration on dicey issues such as terrorism, climate change and a growing, belligerent China.

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Cultural Exports and Soft Power Diplomacy in East Asia

Countries can raise their international status by exporting food, fashion, entertainment, and other cultural consumables to the masses. This article examines the efforts of China, Japan, and South Korea to use cultural exports as soft power.

As the pace of globalization increased during the late 20th century, the cultural exports of China, Japan, and South Korea were generally pushed toward Western audiences with most elements unchanged. However, in the early 21st century, there was a marked shift as cultural exports, particularly in entertainment and media, became more of an exchange between Western and Eastern influences. Not all East Asian countries have been equally successful in exporting their culture. While South Korean media breaks record after record, and Japanese art and cuisine are internationally renowned, Chinese media has had little impact on mainstream Western culture. Why have Japan and South Korea been so successful in exporting their culture while China has had relatively little success?

This question can be examined through specific examples of cultural exports (e.g., ByteDance, K-pop, and anime) across the three countries, along with the subsequent impact on their effectiveness as soft power diplomacy tools. While a strong alignment between public and private programs is necessary to promote Asian cultural exports, it is not sufficient without Western trust in the relevant Asian government. Ultimately, it is not a lack of effort from Chinese government that has caused the failure of China's ability to export its culture, but a lack of trust in the Chinese government itself.

Government Involvement in Japan, South Korea, and China

East Asian governments have had mixed results in their attempts to build soft power through popular culture. Initiatives by China, Korea, and Japan have resulted in differing levels of perception of each country's cultural exports.

Japan introduced the Cool Japan movement and the Cool Japan Fund in order to lead its cultural exports. Although overseas consumers had already been familiar with Japanese food, art, and pop culture, the island country built systematic initiatives to further enhance domestic growth, connect Japan with other countries, and strengthen Japan's offshore presence. Cool Japan was first conceived in 2012 as a national movement encouraging the Japanese people to exercise their creativity in the international community. Specifically, Cool Japan encompassed a wide range of cultural products including games, animation, food, and industrial technologies.

> "It is not a lack of effort from Chinese government that has caused the failure of China's ability to export its culture, but a lack of trust in the Chinese government itself."

By showcasing the "cool" parts of Japan, the government hoped to create an image that attracted tourists, visitors, and talent into Japan across all industries and businesses as a public-private partnership platform. As an offshoot of this movement, the Cool Japan Fund was created in November 2013 to invest in companies that align with the Cool Japan mission. These efforts coincided with the launch of "Abenomics" in 2012. Under Prime Minister Shinzo Abe's concerted economic and cultural efforts to promote Japan to the world, the total number of foreign visitors to Japan tripled from 2013 to 2018 to reach 31 million.

Similarly, South Korea's cultural exports have shined a spotlight on what was once a minnow tucked in between two major Asian powers, dramatically transforming the country's perception and its place in the world since the 1990s. From BTS to kimchi, "Parasite" to Samsung, hallyu or "the Korean wave," has achieved so much in so little time.

Behind South Korea's cultural popularity lies a highly organized and sophisticated state-sponsored effort led by the Ministry of Culture, Sports and Tourism, and private-sector actors. In an interview, Junghoon Kim, who is director of the Korean Cultural Center, an agency within the ministry, suggested there are three key reasons behind the growing prominence of South Korean culture: the spirit of creativity and resilience in the private sector, ongoing government support for the arts and culture industry, and the development of international communications technology.

> "Japan was one of the first countries to start soft-power branding."

In particular, the ministry has been able to leverage the early popularity of K-pop and K-dramas to introduce the world to more traditional aspects of South Korean culture such as food, tradition, and history. For example, through programs such as the English Program in Korea (EPIK) and most recently Teach and Learn in Korea (TALK), the Ministry has targeted students and young professionals from English-speaking countries and sponsored them to teach in South Korea. The Korea Tourism Organization, a government agency that helps facilitate tourism along with many private enterprises, now works with K-pop artists to highlight destinations of particular interest. For example, Gyeongbokgung Palace located in Seoul, where K-pop phenomenon BTS filmed one of their music videos, and Namiseom Island, where the hit K-drama "Winter Sonata" was filmed, have become major tourist attractions for global fans of South Korean culture. The results are obvious: According to a survey of Americans conducted by the Korean Cultural Center in Washington DC, 73.9% of respondents said they wanted to have Korean friends and 74.6% wanted to visit South Korea.

In terms of China's state-led cultural exports, a different story emerges. The Confucius Institute, particularly its rise and subsequent fall in the United States, serves as a prime illustration. Founded in 2004, Confucius Institutes are Chinese government-funded centers that teach and promote the language and culture around the globe. As one of the biggest diplomacy programs in the world, the Confucius Institute boasts over 1,000 locations in 120 countries and is one of the foremost examples of Chinese soft power in the 21st century. Several of the facilities were located on the campuses of major American universities. In 2019, many of these universities very publicly cut ties with the Confucius Institute due to accusations of propaganda, free speech interference, and even espionage. In 2020, the U.S. government designated the Confucius Institute as a foreign propaganda mission.

As seen through the case of the Confucius Institute, China has long promoted Chinese culture from a Chinese perspective. Back on Chinese soil, the government also frequently offers state-sponsored tours of geographic sites that highlight traditional Chinese culture. The Chinese government invites foreigners on these tours in the hopes that the foreigners will spread the merits of Chinese culture back home. However, this method of promoting traditional culture has not been effective in raising the awareness or attitude towards Chinese culture. Japan and South Korea take different approaches when it comes to sharing their culture. Japan and South Korea will borrow elements from Western culture and blend it with domestic culture before sharing it abroad again.

Cultural Export Efforts in the Private Sector

Across Japan, South Korea, and China, these public-sector efforts have also impacted the private sector. Many attempts at using cultural exports to bolster private-sector profits have arisen over the years. In fact, the global perceptions of these three countries come directly from private-sector efforts to export cultural mediums: anime for Japan, K-pop for Korea, and ByteDance for China are examples.

Japan was one of the first countries to start soft-power branding. In the 1920s, Japan started exporting Japanese culture to the West after entering the "Big Five" as the singular Asian nation at the Paris Peace Conference. Jooyeon Hahm, a historian of modern East Asia at Brandeis University, notes that around this time, the Japanese believed that a healthy relationship with the U.S. and the rest of the Western world was critical.

Outreach efforts that originated from the state eventually trickled down to businesses and individuals as overseas consumers started interacting with Japanese cultural artifacts. In fact, Western corporations are now eager not only to distribute but also to create their own Japanese content. In February 2021, Netflix announced plans to partner with WIT Studio to launch an Animator Academy in an effort to foster future animation creators. The Japanese government proactively allows artists to export their talent and exchange ideas with foreign content. Mediums such as manga, anime, and J-pop, help promote Japanese culture and offer ample amount of space to cover broad cultural topics. There are many examples across television and film, such as "Pokemon," "Dragon Ball Z," and Studio Ghibli. In fact, Hayao Miyazaki's film "Spirited Away" grossed $150 million in Japan alone, which is more than what James Cameron's blockbuster "Titanic" grossed in the country.

Japanese food has also become a huge attractor of foreign interest in recent years, particularly sushi as one of the staples of Japanese cuisine. About 31 million tourists visit Japan annually, and indulging in authentic sushi is high on their list of activities. A recent Netflix documentary titled "Jiro Dreams of Sushi" is a prime example of this cultural export. The film follows the lifestyle of an 85-year-old sushi master and restaurateur named Sukibayashi Jiro and his lifelong dedication to sushi. Following the documentary, the reservation waitlist for Jiro's restaurant today spans two to three months. Back in the Western world, omakase has been widely accepted in countries like the U.S. and the U.K. Many fusion-style sushi, such as California rolls and Philadelphia rolls, have also become staple purchases in neighborhood grocery stores.

In South Korea, the entertainment industry has recently found mainstream success abroad and cultivated a global following, thanks in part to the support of domestic government investment. However, some experts have expressed doubt over whether South Korea's private sector undermines government-led efforts. For example, recent South Korean media such as "Parasite" and "Squid Game" have been critically acclaimed around the world. Not only have these productions revealed the depth of South Korean entertainment talent, but they have also placed a bright spotlight on the appeal of South Korean entertainment. More crucially, however, "Parasite" and "Squid Game" have drawn attention to fundamental social problems in South Korea, which undermine the government's efforts to build soft power. In fact, it was reported that the social inequality presented in "Squid Game" was used by North Korean propaganda as a representation of life in South Korea.

This view appears to also be shared, at least in some part, by South Korean government officials. As a counterpoint to the idea that cultural exports serve a political agenda, Kim of the Korean Cultural Center asserted that the measure of cultural exports should not be by the "profits" it produces, but instead as a "shared experience based on diversity and respect." This raises a fundamental question: How effectively is South Korea translating its newfound popularity into soft power? Seung-Youn Oh, a Bryn Mawr College political science professor specializing in East Asia international relations and comparative politics, appears to support this view. In an interview, she suggested that South Korea, compared with China, was not leveraging and perhaps does not have the capability to leverage its cultural products into political capital. According to Oh, South Korea is ultimately a middle power, and no amount of cultural popularity would enable it to supersede the influence of China or the United States.

The attitudes toward private-led cultural exports from China are vastly different from the positive perceptions of private-led Japanese and Korean cultural exports. For example, TikTok, a social media app specializing in short-form videos, surged in popularity in 2020 due in part to the political controversy surrounding its Chinese ownership. This is only the latest incident in a series of institutional confrontations, set against the backdrop of escalating tensions between the U.S. and China.

TikTok, owned by the Chinese company ByteDance, is one of the more compelling and recent cases of both private-led Chinese cultural export and soft power diplomacy. There are three factors that affect China's cultural exports and soft power: state-driven and state-sponsored activities, private activities driven by businesses, and the movement of Chinese people. However, China's cultural exports have largely succeeded in spite of—rather than because of—state-driven support. One of the reasons may be the sheer size of the Chinese diaspora, currently estimated at nearly 50 million overseas Chinese.

Other Factors Contributing to the Spread of Culture

Other than private-sector or state-led promotion, what else contributes to the spread of Asian culture? Especially in the case of China, where neither state-driven nor non-state-driven cultural exports are effective, how has Chinese culture still managed to spread to the West? According to Andrew Methven, chief executive officer of Hampton Group Holdings and co-chair of the Chinese Speakers Association, the answer is simply that a lot of Chinese people live abroad. Chinese pop culture has been brought to the West by more of a pull effect rather than a push. This analysis can be applied to explain cultural import into the West by Japanese and Korean immigrants as well. Korean communities have established their offshore footing through restaurants, retail shops, and entertainment in Korea towns in city centers. Many Japanese immigrants moved to the American West Coast around in the early 1900s (e.g., California, Oregon, and Washington). For example, a paper written by Robert Hegwood discusses how a common Japanese home-cooked dish called sukiyaki, which consists of beef and tofu hot pot, was popularized in the 1930s by Japanese community in the East Coast.

China, unlike Korea or Japan, had to rely primarily on the diaspora of its people as a way of penetrating its culture into the West. Chinese state-driven cultural exports have failed because of political differences between Western countries and China. For example, China, South Korea, and Japan are all equally exotic to the United States. Yet, the United States is generally more receptive to government-backed cultural export programs from South Korea and Japan because both countries are more politically similar and considered U.S. allies. According to Oh, the stark contrast among the three countries' receptions comes down to values. Returning to the Confucius Institute example, it was never about the existence of cultural centers, as Germany and France have similar cultural centers in America. "U.S. politicians are worried about public values being affected," explained Oh, "Many universities severed ties with the Confucius Institute because scholars saw it as China meddling with the spirit of the American education system."

Looking Ahead

Asia's cultural exports have been driven by their states, private sectors, and other factors. These efforts have borne fruit, and the breadth of East Asian influence in the West is poised to expand further. To effectively take advantage of this trend, firms must understand the drivers behind each country's soft power diplomacy ambitions. With the ongoing demand growth for East Asian culture, companies should take note of success cases of soft power diplomacy and formulate distinct strategies to benefit from the trend. When interacting with Korea and Japan, companies should take advantage of programs and ministries within those countries that are actively trying to export Korean and Japanese culture. When considering the Chinese market, perhaps it makes more sense to focus on the Chinese diaspora. It is important to understand that these countries cannot be treated as a monolith. Japan, South Korea, and China's ambitions to export their culture provide huge opportunities for companies that know how to uniquely operate in or engage with each of these countries.

This article was written by Hunter Dong, Angela Huang, George Iwaoka, Yoon Kim, and Joseph Shin, members of the Lauder Class of 2023.

The Digital Payment Revolution: Four Case Studies Across Asia

More societies are moving toward a cashless system of payment, but it takes an investment in digital infrastructure to get there. This article looks at the development of digital payments in China, India, Singapore, and Indonesia.

The evolution of the digital payments industry that has been taking place around the world during the COVID-19 pandemic is irreversible. The use of contactless, real-time payments became a public health measure to reduce the risk of virus transmission, and there is no indication that this will change post-pandemic. This doesn't just apply to traditional or large companies. Across the world, governments are pushing the boundaries of on-the-go transactions, public transport networks are upgrading their systems to accept them, and small businesses are using this agility to their advantage. But how are governments able to create infrastructure for digital payments that allows for healthy competition in the payments landscape?

McKinsey & Company published "The Future of Payments in Asia" report in which its experts state that payments have never been more critical to Asia's financial services ecosystem than they are right now. In terms of payments-revenue growth, Asia has surpassed all other areas in recent years. In 2019, the region generated nearly half of all worldwide payments revenue, at over $900 billion. Payments have also grown in importance in Asia's financial scene, currently accounting for 44% of total banking revenues, up from a third in 2007.

China, India, Indonesia, and Singapore present relevant case studies to understand this development. Differing levels of involvement by governments in setting up the digital payments infrastructure are contributing to differences in the competitive structure of the mobile payments industry.

Background on the Payments Industry in China, India, and Southeast Asia

There were 224 million unbanked adults in China and 191 million in India in 2017, as indicated by the World Economic Forum. According to a June 2021 World Bank report, Asia is on track to exceed 50% of world GDP by 2040 and account for 40% of global consumption, which represents a real shift in the world economy's center of gravity. China and Singapore are among the most digitally advanced countries in the world. China joined this group at an impressive speed. However, when comparing Asian states, there are different dynamics within the continent due to unique demographic and economic factors.

In this context, there are three main incentives to the rise of digital payments: the rapid expansion of mobile internet access, vast data sets available for credit scoring, and developing regulatory frameworks towards providing more certainty and transparency. Southeast Asia is becoming one of the most developed regions for digital payments, according to the World Bank, as a result of several agreements between Southeast Asian countries in integrating their financial systems. Increasing adoption of ISO 20022 (a standardization approach to financial initiatives) can simplify communications between additional payment systems. Another trend points to the proliferation of bilateral agreements among other Asian countries to integrate their payment systems. In terms of the regulatory framework, China had a fairly flexible regulatory regime at the beginning of the digital payment era. In the case of India, minimal requirements allowed quick mass onboarding and more complex cross-sell services to an engaged user base.

> "Even though there are more competitors, as with the case of China, the battle for digital payments in India is a battle of giants..."

China

A defining characteristic of the payment industry in China is the ubiquitous use of QR codes. In contrast to bank card processing, which requires expensive point-of-sale hardware or near-field communication technology devices used by Apple Pay, QR codes are very inexpensive. This has allowed small merchants to accept mobile payments because they simply need to print out a QR code to be scanned by customers at checkout. Protocol, a technology news website, reported that there has been a recent push towards standardizing QR codes so that a merchant can use a single QR code to accept payments through different apps.

Two players with a large and deeply engaged base of customers dominate this landscape. Alipay was a way to facilitate e-commerce transactions on the Taobao online shopping platform, also owned by Alibaba. WeChat, a popular social network, was boosted by the huge success of its "red envelope" service around the Chinese New Year. Since WeChat and Taobao already had millions of active users from their main products, it was relatively easy for them to acquire customers for whom the payment services were a convenient add-on. The apps' closed-loop ecosystem has been pivotal. According to TechCrunch, Alibaba and Tencent together account for an estimated 94% market share in the payments market in China in 2020.

Due to the size of customers' deposits with these payment giants, WeChat Pay and Alipay were in a strong position to push their system across their network of merchants to further promote user adoption. In addition, according to a Chinese payment app expert, the payment platforms also have the ability to "build customer habits" and "access customer behavior as data points to monetize on the lending side." With a strong position in payments, lending, and wealth management within China, these players are pursuing an overseas fintech expansion, through launching localized versions of their apps as well as making strategic investments.

The government has been catching up. The People's Bank of China has been researching and developing a Central Bank Digital Currency (CBDC), filing more than 70 patents to date. According to the officially released plan by the Central Bank, CBDC will play the roles of digital currency and electronic payment, meeting both the needs of portability and anonymity. It remains to be seen how the official launch of the state-sponsored digital currency would disrupt the mobile payments landscape in China and challenge the duopoly of WeChat Pay and Alipay.

India

Compared to the People's Bank of China, the Reserve Bank of India (RBI) plays a more active role in shaping the mobile payment landscape in the country of more than 1 billion. In November 2016, the RBI's decision to withdraw 500-rupee and 1,000-rupee notes from circulation and the resulting shortage of cash played a major role in the increased adoption of cashless payments. Moreover, the National Payments Corporation of India (NPCI) — a nonprofit organization under management by the RBI — launched the United Payments Interface (UPI) in 2016. UPI is an open and interoperable direct bank transfer platform that supports multiple bank accounts in a single mobile application, offering a seamless and more convenient user experience, especially for daily peer-to-peer transactions and transactions with merchants. Coupled with other technologies such as Aadhaar, India's unique digital identity system launched in 2010, the government has set up a level playing field for big techs and startups alike to explore the enormous potential of this payment market.

Based on the number of UPI transactions completed in 2019, the top three players in the market by transaction volume are Google Pay, PhonePe, and Paytm. There are a few differentiations between these payment platforms. They drive user engagement by expanding in-app features (for example, Google Pay allows users to recharge prepaid mobile phone plans or buy gold) and offering cashback rewards or coupons to be redeemed at partner merchants. Late entrants into the market include Amazon Pay (2019) and Facebook's WhatsApp (2020), which have yet to catch up to these three dominating players but are investing heavily to attract new customers.

Even though there are more competitors, as with the case of China, the battle for digital payments in India is a battle of giants, with cash-infused players (Paytm is backed by Ant Group and SoftBank Vision Fund; PhonePe is backed by Walmart) vying for dominance with tech giants like Google, Facebook, and Amazon. However, the market remains under-utilized and there are lots of gains to be made with hundreds of millions of consumers still primarily using cash. According to Yatharth Seth with Boston Consulting Group, in order to capture this lucrative market, both incumbents and new entrants have to find innovative solutions to overcome the remaining challenges, including the high risk of fraud, high failures rate, and high technology adoption barriers for new users.

Singapore

Known for its innovation, Singapore has one of the most advanced payment systems in the world. However, this innovation effort in payments was mostly led by the incumbent banks in collaboration with the Monetary Authority of Singapore (MAS).

Singapore's real-time payments in Southeast Asia by transactions present a 23% five-year compound annual growth rate, achieving 393 million transactions in 2025 as forecasted by ACI Worldwide and establishing itself as a mature market for real-time payments. PayNow is Singapore's leading real-time payment solution. Based on a peer-to-peer (P2P) instant fund transfer service built on the FAST infrastructure, it allows users to transfer funds from one bank account to another using proxy options such as a national ID or a mobile number. PayNow also allows instant B2C transfers and real-time B2B payments.

> "Known for its innovation, Singapore has one of the most advanced payment systems in the world."

PayNow was created by 10 banks and three non-bank financial institutions (NFIs) and is regulated by MAS. Moreover, MAS formulates policies and initiatives focused on leading fintech innovation, such as its Smart Financial Center in Singapore. According to an executive in a fintech company in the region, the banks and the MAS will continue to play a big role in innovation in Singapore.

The tech unicorn Grab is also part of the competitive landscape in payments, but it is still better known as a super app and not as a payment system. Grab added QR codes with GrabWallet, but it still uses the shared infrastructure that all banks use, the Singapore Quick Response Code (SGQR), which is supervised by MAS.

Even though wallets have become more common in Singapore, they are not as prevalent as in other countries in the region. Singapore is an advanced economy, and 98% of the population is banked, according to Statista, which reduces the need for this type of technology. Additionally, merchants already have widespread access to point of sale (POS) systems.

Apart from the increase in cashless payments, COVID-19 has brought another significant trend to Singapore. Buy Now Pay Later solutions, which allow payment in installments, have become more common during the pandemic. According to Bloomberg, this increase is concerning because it is leading to higher debt, particularly among younger consumers. The Monetary Authority of Singapore has crafted media campaigns to warn about the potential consequences of using this payment option.

Indonesia

Digital payment is becoming increasingly popular in Indonesia, Southeast Asia's largest economy. Cash is king in Indonesia, where paper money exchanges still represent 85% of transactions by volume, according to Reuters. But digital payments are gaining ground. The government ushered in the payment revolution by establishing the Indonesia Payment System Blueprint 2025, an instant payment infrastructure that is creating opportunities for fintech companies to grow and innovate.

Digital payment in Indonesia began in the early 2000s and is divided into retail and wholesale. Currently, more than 85% of transactions are processed through SKNBI (retail payment method) because Indonesia's micro and small businesses account for 99% of all businesses and contribute 60% of Indonesia's GDP, according to McKinsey & Company.

The Covid-19 pandemic has accelerated the trend towards digital payments. According to Bank Indonesia and the Asian Banker Research, the value of electronic money transactions reached approximately $14 billion in 2020, representing year-on-year growth of 38.6%.

Two trends are enabling the growth of cashless payment methods: Firstly, smartphone penetration increased from 90 million users in 2015 to more than 180 million users in 2020, accounting for approximately 67% of the population. Secondly, the number of fintech companies grew from 20 e-wallets, mainly banks, in 2015 to more than 55 e-money licensed operators in 2020, according to Bank Indonesia, the central bank of Indonesia. GoPay and OVO are the top two e-wallets with the highest number of active monthly users. Both apps were launched in 2016 and are backed by super-apps. GoPay is the mobile wallet of the nation's largest multi-service platform, GoJek. Meanwhile, OVO has captured more customers driven by its collaboration with Grab, Southeast Asia's regional leading super-app, and Tokopedia, Indonesia's largest e-commerce platform.

Indonesia is currently in the developmental stage of launching its real-time payments system but has all the hallmarks of a country that could see rapid adoption of real-time payments. In August 2021, Bank Indonesia rolled out its real-time retail payment system infrastructure (BI-FAST) that is available 24/7. BI-FAST is an infrastructure for faster interbank transfers as well as card-based payments, similar to India's UPI, Singapore's PayNow, and Thailand's PromptPay. Additionally, Bank Indonesia officially launched the QR code standardization called the QRIS on January 1, 2020. The standardization of the QR code provides an integrated payment system that is efficient, inexpensive, and secure. It also improves interconnectivity in payment systems so that e-wallets from different providers can be used in one QR scanning system. In the meantime, the government is standardizing Open Application Programming Interface-based open banking, an initiative aimed at stimulating the digital transformation of the banking system and facilitating collaboration between banking and fintech players through open banking. The infrastructure provided by the government promotes competition for new market entries and incumbents.

Conclusion

Asian states are creating infrastructure for digital payments by leveraging their specific demographics, technologies, and regulations. Taking India, China, and Southeast Asia countries in the analysis, we verified that state-led payment system infrastructure created a more competitive payment industry landscape in India (UPI) and Indonesia (BI-FAST). On the other hand, China's infrastructure was private-led (WeChat and Alibaba), so only those two players dominate in the country. In Singapore, incumbent banks lead the innovation efforts in collaboration with the government. As a consequence of the new economic exchange platforms, point-of-sale payments and financing platforms will undergo a major transformation to ensure that digital-first options are viable. Additionally, digital coins will become one of the preferred methods for consumers to pay for their purchases, putting Asia on the edge of digital payments trends that will dynamize transactions and foster further economic growth. Regardless of the form of development, the digital payment evolution in Asia will continue in a similar fashion, with more innovation and competition.

In Asia and around the world, the ongoing pandemic accelerated a revolution in the digital payments industry. Players across the ecosystem, including incumbent banks and financial services organizations, emerging fintech players, and established enterprises in adjacent industries like big tech and telecommunications, are expected to be seeking a number of expansion activities, particularly opportunities to cross-sell other financial services such as insurance, loans and wealth management services. While certain aspects of this evolution will happen naturally, actions from government regulators will also play a key role in shaping the outcome. While the future is digital, the cashless revolution has evident ramifications for unbanked communities, posing both societal challenges and opportunities for inventive actors to provide more inclusive solutions.

This article was written by André Rodrigues Ferreira, Grace Yating Guan, Phyo Win, Tam Luong, and Yuri Gomes de Abreu, members of the Lauder Class of 2023.

The Surge of Venture Capital in Latin America

Venture capital is on the rise in Latin America, where startups are tapping new markets as technology spreads. This article examines the growth and explains why VC investors are drawn to the region.

When Sebastian Kanovich co-founded Uruguayan fintech startup dLocal in 2016, he struggled to get international investors to demonstrate interest.

"It took us a lot of no's before getting the first yes," he said in an interview with Reuters. "We were not only from Latin America, but from Uruguay, not known for technology."

Six years later, the story has shifted.

In June 2021, the company went public on the Nasdaq exchange and raised $617.65 million in its IPO. The valuation has risen to $5 billion since then, and the company has formed partnerships with tech giants such as Amazon and Google in 30 countries across Africa, Asia, Latin America, and the Middle East. Other Latin American tech firms, such as Brazil's mobile-only Nubank and Colombia's food delivery startup, Rappi, are also riding this wave of increased investment.

> "As Latin America's economies continue to grow, so does its middle class, which means that the population will have higher levels of disposable income."

The international venture capital sector has been growing steadily over the last few years, and Latin America has been cashing in. While the region has ways to go before it reaches the level of Asia, Europe, and the United States in terms of the volume of VC investment, the widespread and increasing use of smartphones, payment cards, and internet penetration has paved a boom in demand for digital services. Latin America's rising middle class and consumption habits have also been a catalyst for private-sector investment and growth.

The economic potential of the region is undeniable. It is one of the largest economies internationally, with 660 million people and $6 trillion in GDP. To put it into context, the population is twice the size of the United States (roughly 330 million people), and its economy is three times that of Africa's. What's more, the region is urbanizing at a rapid rate coupled with increased digitization and internet penetration. Despite the social and economic costs of the COVID-19 pandemic, the economic outlook for Latin America is also bright. The International Monetary Fund projects that the 2021 regional growth forecast will be at 4.1 percent. And as Latin America's economies continue to grow, so does its middle class, which means that the population will have higher levels of disposable income.

Though Latin America has grown considerably since the beginning of the 2000s, its most notable increases have been made over the past few years. According to a report from the Latin America Venture Capital Association (LAVCA), VCs invested $11.5 billion across over 400 deals in Latin America through the third quarter of 2021. Interestingly, this figure is greater than the capital invested in 2019 and 2020 combined, and greater than what was released between 2012 and 2018.

Venture capital has taken off for a myriad of reasons, most notably increased international interest in the region. In 2019, SoftBank, a Japanese conglomerate holding company, launched its first-ever Latin America-focused fund of $5 billion, focused exclusively on investing in technology startups in the region. According to Miguel Armaza, co-founder and managing partner of Gilgamesh Ventures and a Wharton/Lauder graduate, Softbank's investment kickstarted a wave of international venture capital investment. Capitalizing on this momentum, in September 2021, Softbank committed another $3 billion for Softbank Latin America Fund II to further drive technology adoption in the region.

The region has become attractive to investors who see the young, underserved population, growing internet infrastructure, and rising middle class as a blue ocean opportunity. Latin American startups receive international support from funds in major tech hubs such as Silicon Valley, Tokyo, and New York. Sonya Huang and Deone Leone of Sequoia Capital, one of Silicon Valley's most prominent VC funds, describe Latin America as the "ideal setting for the internet economy to disrupt the real economy." Financial services, e-commerce, health care, and edtech are seen as burgeoning industries. In 2020, for example, fintech startups providing digital financial services entered a multi-year streak as the top sector with the highest amount of capital invested in the region at $1.6 million or 40% of all total capital invested, according to LAVCA.

There is also heightened interest in investing in health and ed-tech startups. Findings released by LAVCA showed that out of 36 health tech and 32 edtech surveyed startups, more than half reported an over 50% increase in product/services utilization during the pandemic.

As VC investment has increased, governments in Latin America have also been approving regulatory changes to enable a more favorable environment for business growth. In 2020 in Brazil, for example, the Senate ratified a legal framework to foster development and boost investments for technology-based businesses. Similarly, in Colombia, a law promoting entrepreneurship was also passed to improve social welfare and equity. It is important to note that six of the region's 33 countries receive the majority of VC deals. The region's biggest startup economies are Brazil, Chile, Colombia, Mexico, Argentina, and Peru. Each of these countries has governments that have created programs to foster entrepreneurship and business development.

Inclusive Technology Opportunity

In contrast with developed markets where disruptive technologies dominate startup ecosystems, Latin American markets and their historic structural inequities present an opportunity for inclusive technology to drive growth. Latin American nations have widespread internet access, yet large shares of their populations are underserved, creating an opportunity for technology-driven, inclusive startups.

Banking is a prime example of this market opportunity, with the World Bank estimating that around half of Latin Americans are unbanked. In 2017, World Bank data showed that this ranged from just under a third of Brazilians to nearly 60% of Peruvians. Major drivers included cost, with 60% of unbanked Brazilians, Peruvians, and Colombians citing it as a barrier, and distance from financial institutions, with 33% of unbanked Brazilians citing it as a barrier. This gap has begun to close with the growth of fintech startups, particularly during the pandemic. But as of 2021 in Brazil, for example, the Locomotiva Institute estimated that approximately 34 million Brazilians are still unbanked or underbanked.

However, robust internet access presents an opportunity in Latin America. World Bank figures from 2019 estimated that over two-thirds of Latin Americans have internet access, above the world average of around 57%. This, combined with Latin America's high urbanization rate — the second most urbanized region in the world at 81%, according to United Nations figures — brings underserved populations in Latin America within reach of tech startups throughout the region.

Thomas Baldwin, a Wharton/Lauder graduate who is senior advisor at Discovery Americas and co-CEO of Kocomo, affirmed that fintech startups can have an outsized impact in the region due to the presence of these inequities alongside strong internet access. The rise of low-cost smartphones alongside a lower cost of serving customers digitally rather than in brick-and-mortar stores enables startups to extend services to previously unreachable or unprofitable consumers. This strengthens the opportunities for investors as fintech startups acquire new customers with less regular competition relative to typical disruptive startups.

International Venture Investors Are Noticing

While local investors were the primary source of capital in the Latin American venture market in the past, since 2017, international investors have turned their eye to the region and have been deploying capital at an exponential pace. Besides Softbank, some other international investors that have been particularly active over 2020 and 1H21, according to LAVCA, include FJ Labs (20 investments), QED Investors (16 investments), Clocktower Technology Ventures (nine investments), Tiger Global (seven investments), and Andreessen Horowitz (three investments).

Latin America has become the destination of choice for many. The U.S. and other developed markets have become increasingly expensive and competitive in venture capital, driving investors to look for other attractive investment geographies. Armaza of Gilgamesh Ventures also attributes the international interest to the success of startups in the region, and the resulting creation of the "unicorn mafia." According to Crunchbase data analyzing companies over the past five years, at least 23 private Latin American companies have crossed the $1 billion valuation threshold (coined "unicorns"). The unicorn companies were from Brazil, Colombia, Mexico, Chile, and Argentina.

> "Venture opportunities will likely continue to grow in Latin America even as international private equity investors withdraw from the region."

The success of these companies has created a unicorn mafia, which, according to Armaza, is the formation of new startups by former founders and early employees of marquee startups like Nubank and Rappi — the 2018 unicorns that helped bring international attention to Latin America. More importantly, the unicorn mafia has enabled the dissemination of startup know-how across the region, leading to a surge in interest and new talent. Further influenced by fervent local media coverage, young Latin Americans have been encouraged to pursue their own entrepreneurial ventures and join growing startups, fueling the startup and venture capital ecosystem. The influx of talent in product development, engineering, marketing, and other specialties has bolstered international investor perception of the talent pool in the region, increasing confidence in the Latin America growth opportunity.

International investor interest in Latin American venture capital has also translated into investment exits, allowing investors to make meaningful returns. Previously, liquidity had been a key concern for international investors given the long investment period (venture capital investors can expect to stay in an investment for seven to 10 years) and limited exit paths. According to LAVCA, Latin America experienced strong momentum for liquidity events in Q12021, with about $6.9 billion represented in two disclosed transactions. Furthermore, exits have been more diversified over the past five years, with some companies choosing to IPO on American stock exchanges (NYSE, NASDAQ), and others acquired by Latin American, American, or Asian companies. Interestingly, a secondary market for Latin America venture capital deals has also emerged, allowing current investors to sell their interest in a company to another party during the investment period at a predetermined price based on company performance. According to Baldwin, while common in private equity, secondaries were not a Latin America venture market feature and have only emerged due to the burgeoning demand for highly sought-after startups in the region.

Venture Avoids Private Equity Concerns

Venture capital activity continues to be strong globally, breaking previous record investment and fundraising levels. Venture opportunities will likely continue to grow in Latin America even as international private equity investors withdraw from the region. Private equity investment requires a strong local presence and requires most, if not all, investments to succeed due to the lower return targets. Venture capital models, however, rely on a few investments providing outsized returns, which shelter them from challenges in Latin America. The reasoning behind the relative attractiveness of venture capital over private equity in the region can also be attributed to the following: 1) differing approaches to operational involvement and due diligence that enable Latin American VC investment, 2) vulnerabilities to foreign exchange shocks for Latin American PE investments, and 3) greater exit opportunities for VC investments in the region.

To begin with, the venture capital models' typical hands-off approach toward day-to-day operations insulates them from the challenges private equity investors have faced in Latin America. Baldwin articulates the heavy operational involvement that private equity investment requires as a primary challenge for foreign investments in Latin America. Baldwin describes private equity as "a hyper-local business" requiring hands-on involvement with operational decisions to achieve the returns set out in investment theses. In contrast, venture capital firms can more easily invest from abroad. In investing in a long tail of startups hoping for one or two major successes, venture capital firms do not require a strong local presence to involve themselves in the operations of each of their investments.

Further, this long-tail model reduces the level of diligence and, therefore, nuanced local knowledge required for venture capital investment. Foreign private equity investors often struggle to achieve the level of rigor in local diligence needed, for example, to achieve two to three times MOIC (multiple on invested capital) and 20% IRR (internal rate of return) on each investment over three to five years, the standard benchmark for private equity deals. However, this level of rigor is not required for venture capital firms, and the investment period is longer at seven to 10 years. As venture capital firms cast a wide net searching for potential unicorn startups, they do not need to achieve a high return on each deal. A venture capital fund can be successful having various deals going to zero, but a few returning 20 times or greater MOIC.

Foreign exchange rates compound the challenges faced by foreign private equity without significantly impacting venture capital. Baldwin cites the Mexican peso's loss of about a third of its value from 2015 to 2020 as a particular challenge faced by foreign private equity investors in the country over that period. Even if an investment doubled in value in terms of local currency, the drop in value, relative to the dollar, wiped out much of the returns for foreign investors. Venture capital, however, is more shielded from foreign exchange risk. Baldwin said that because venture capital investors target 20 times or greater return on a small share of their investments, they are less sensitive to foreign exchange fluctuations.

Finally, these opportunities for venture capital investors and challenges for private equity investors self-perpetuate. As foreign private equity firms pull out of Latin America, private equity firms face fewer and predominantly local exit opportunities. In contrast, venture capital investors will continue to find greater foreign and domestic buyers. Additionally, since venture capital deals are more technology focused than private equity deals, they can more easily pursue U.S. stock markets as a form of exit.

Is VC Growth Sustainable?

Investors in the region believe that venture capital investment will prove more sustainable than many prior investment trends in Latin America. For starters, there is a significant runway for untapped growth that does not rely upon foreign trade or monetary policies. With fintech, for example, greater shares of the population can continue to be served by emerging fintech startups, regardless of overall economic performance in the region. Further, the nature of venture capital will better insulate them from foreign exchange shocks triggered by monetary policy challenges previously seen in the region.

Baldwin said he believes that venture capital has "more potential for long-term durability" during a cyclical downturn than other investment types. Venture capital's insulation from potential poor returns from individual investments will better enable firms to weather cyclical downturns. This, in Baldwin's view, will be particularly important in Latin American markets, which, along with other emerging markets, historically are "first to get hit" when downturns begin.

Additionally, the region is well-positioned to continue to innovate due to attractive tailwinds of increased internet and smartphone penetration, growing middle class, deepening local talent pool, startup-friendly regulation, and other government initiatives. All of these developments should support ongoing entrepreneurial and investment activity.

Like any type of investment, venture capital in Latin America still holds risks, particularly geopolitical in many countries in the region. However, the region is prime to be transformed by inclusive technologies at potentially attractive returns, leading to a bright future outlook for this investment class.

This article was written by Stephanie Michael Silva, Mariam Badi, and Billy Thomas, members of the Lauder Class of 2023.

Private Equity in Latin America: Past, Present, and Future

Latin American countries were once the darling of private equity investors, but those markets have fallen out of favor because of a myriad of factors. This article examines the decline and what's ahead.

In 1595, with Queen Elizabeth's blessing, English explorer Sir Walter Raleigh embarked on an expedition to find El Dorado, the mythical city of gold. He promised the queen he would find a "gold-rich empire," but the men on his expedition to the Orinoco River basin never found the fabled city. Like dozens of other expeditions for El Dorado conducted by conquistadors throughout the 16th century, the quest for easy riches in Latin America proved to be a mirage for Raleigh, and he returned to England with tall tales but no gold.

> "Latin America's challenging investment environment has been defined by slower macroeconomic growth and political instability."

Modern-day private investors may not be chasing legends of golden cities, but after a decade of heavy investment, international private equity funds are divesting from Latin America. Following the global financial crisis in 2008, international investors looked to emerging markets such as Latin America for potential opportunity and returns, according to Bloomberg. The region was in the middle of a commodities boom and seemed poised for strong economic growth. "In the 2000s, more than 80% of [emerging markets] enjoyed faster growth in output per person than the United States, up from 34% in the 1980s," according to *The Economist*.

Major international private equity firms, such as Carlyle, TPG Capital, KKR, and Ajax Partners, quickly opened offices in Latin America between 2008 and 2013 to capitalize on the attractive investment environment, according to Bloomberg. In September 2010, Blackstone acquired its inaugural Latin American transaction through its acquisition of a 40% stake in Patria, a leading asset management firm in Brazil.

However, by the late 2010s, the commodity boom had come to an end and economic tides began to turn for these institutional investors looking for strong growth potential in the region. Blackstone, TPG, KKR, and Ajax Partners have all since closed their Latin American offices. Blackstone reduced its stake in Patria to 14% through its IPO in January 2021, according to Reuters, and Carlyle announced it would no longer raise exclusive Latin America funds, according to Bloomberg. With 2021 fundraising at a fraction of prior years and large-scale divestitures reaching a five-year peak, according to Bloomberg, the future does not look bright for institutional private equity investment in Latin America.

These international private equity firms are scaling back on their Latin America strategy as the region continues to present challenges including slowing macroeconomic growth and political volatility, smaller transaction sizes limiting overall deal flow, and currency devaluations. However, prudent local investors continue to pick their spots to identify mid-market opportunities for growth and drive strong risk-adjusted returns in the seemingly perpetually volatile region.

Slow Growth and Political Instability

Latin America's challenging investment environment has been defined by slower macroeconomic growth and political instability. While the region is not monolithically protectionist, leftist political trends and anti-business policies contribute to increased uncertainty and risk for investors. During the 20th century, most of Latin America had protectionist economic policies restricting international trade to drive growth of domestic industry. During the 1980s and 1990s, a wave of deregulation across the region opened capital markets to investors, but market liberalization was followed by a leftist backlash against open market policies. These trends continue to give investors pause, with political leaders who support anti-business policies gaining traction across the region, according to *The Economist*.

Much of the political volatility stems from perennial discontent about macroeconomic growth. Since 2010, Latin America's three largest economies (Mexico, Brazil, and Argentina), have been largely in decline, according to the World Bank. Real GDP per capita also decreased over the decade, according to the World Bank, contributing to a widening perceived gap in standards of living between citizens of Latin America and other countries such as the United States. Discontent over the status quo has resulted in the emergence of populist leaders, such as Andres Manual Lopez Obrador in Mexico, Jair Bolsonaro in Brazil, and a return to power of the Kirchner coalition in Argentina, bringing challenging policies for business. Slower economic growth continues to put pressure on the governments to increase revenues to pay for social services, exacerbating the environment for business as they bear the burden of these tax policies that cut into their profits.

Dynamic populist leaders raise the chance of aggressive action against companies on the wrong side of the ruling coalition. The risk of increased taxes and reduced trade creates risk for investors, who are nervous to park their money in countries with uncertain futures. In addition to the political risk, the lack of macroeconomic growth itself limits the returns investors will likely receive as companies fight for market share of a shrinking pie. Investments in Latin America present higher risk with less upside relative to larger, developed economies. Within this framework, it makes sense that large funds and international investors would take their money elsewhere, leaving Latin America to smaller or country-specific funds that have deep insight into macroeconomic and political trends within their respective countries.

Too Big Not to Fail

In many ways, the success of private equity funds in raising capital in the 2010s contributed to later difficulties. The cornerstone of many of these large institutional firms is their differentiated ability to efficiently deploy massive amounts of capital in large, complex transactions. Like most emerging markets, however, transaction size is limited in Latin America due to the muted size and growth of its economies. The result is a much thinner pipeline of sizable deals that meet minimum ticket size requirements. Larger firms thus have less optionality and need to make significant trade-offs when evaluating deals in the region. Met with pressure to deploy capital within their investment period, funds may invest in companies they might otherwise avoid, taking on additional risk that predictably leads to disappointing returns. For example, Southern Cross Group, an Argentina-based fund with a historically strong track record, faced this challenge after raising a $1.7 billion fund in 2010, according to Private Equity International, which created incentives to quickly deploy capital into larger, less attractive deals that ultimately yielded poor results.

Because the largest firms get the most headlines, the reporting on the shift away from Latin America hides the fact that some regional and middle-market funds continue to do well. Middle market funds focus on transactions in the $50 to $150 million range, which offers a larger pool of deals to evaluate. With a strong pipeline and more optionality, these firms can be more selective and prudent in their investment process. To hedge against the volatility of the region, successful funds are also more conservative in their financing and place a premium on improving the core operations of their companies rather than boosting returns through leverage.

Given the size of Latin American economies and resulting dealflow, firms are also limited in their ability to specialize by industry despite investor preferences in some cases. Limited dealflow within any given sector suggests that firms cannot justify completely specialized funds and must maintain generalist knowledge of the region as a whole. Thus, private equity investors in Latin America face a peculiar challenge to maintain a breadth of knowledge across sectors while developing expertise to evaluate these transactions. This incentivizes funds to opportunistically pursue deals across a wide variety of industries, which can make it harder to effectively evaluate the quality of a company in an industry they are less familiar with. As a result, local knowledge and strong industry relationships have become critical differentiators for successful firms to generate strong returns in the region.

This has significant implications for a different segment of the market: venture capital. The speed and scale of venture capital growth in the region mirrors the dynamics of private equity growth in the early 2010s. But if these venture capital firms are to be successful, they should look to the lessons learned by the Carlyle Group, Blackstone, TPG, KKR, and Ajax Partners. Bigger is not always better.

Currency Kills

Currency volatility is another headwind for private equity funds in Latin America. Throughout the 20th and early 21st centuries, Latin American currencies have been subjected to speculative attacks and sharp devaluations, and the past decade has been no exception. To give a few recent examples, the Brazilian real, the currency of Latin America's largest market, has depreciated against the dollar every year since 2011, falling 22% in 2020 as the government initiated several stimulus programs, according to Bloomberg, while the Argentinian peso has experienced a 96% devaluation against the dollar since 2010, according to data on XE.com.

> "The speed and scale of venture capital growth in the region mirrors the dynamics of private equity growth in the early 2010s."

While economic theory suggests that over the long run companies could raise prices to adjust for inflation and ultimately mitigate currency impact on returns, in reality, private equity funds must deliver returns within their five-year investment horizons, making it virtually impossible to perfectly align exit strategies with currency upswings. Therefore, currency fluctuations and inflation create additional risk and potentially reduce returns, requiring larger capital investment to drive alpha and compensate for losses.

Conclusion

While anemic macroeconomic conditions, political volatility, market size, and currency fluctuations continue to present challenges in the region, savvy mid-market funds focused on Latin America continue to find attractive growth opportunities. In some instances, currency devaluations benefit investors that are able to capitalize deals at an attractive basis. According to Tim Purcell, founder and managing partner of Latin America-focused fund Linzor Capital, when "currencies are devalued, and macroeconomic growth decreases, the entry point into the market is lower, leading to more upside potential." Business owners, Purcell also noted, are more likely to sell during currency devaluations due to liquidity constraints, which increases dealflow.

Additionally, certain industries in the region seem particularly promising. For example, Purcell shared that non-banked financials are attractive given Latin America's large unbanked population, and the education sector is enticing due to the opportunity to invest in educational institutions that provide value-for-money to first-generation university students. With the appropriate industry focus and opportune investments decisions, there are still plenty of growth opportunities for private equity firms in the region, and it will only be a matter of time before Western investors return, again in search of the metaphorical Latin America city of gold.

This article was written by Adriel Barrett-Johnson, Brandon Rollins, Camille de Ry, and Tim Jacobs, members of the Lauder Class of 2023.

Digital Integration of the MENA Economy

This article explores the effort to integrate the economies of the Middle East through digital startups, which are growing in both number and relevance. While these startups offer the best hope for a strong, regional economy, they still face institutional and regulatory barriers.

The Arabic word *qawmiyya* connotes a feeling of connectedness that is unbound by borders. For the Middle East and North Africa (MENA), the later 20th century has been a failed experiment in forming its *qawmiyya*. The Arab League's vision of a prosperous pan-Arab identity post-World War II that attempted to unite 22 different MENA nations and over 400 million people via a common culture has instead left a region that *The Economist* notes is more nationalized and brittle than ever in modern history. Indeed, economic and cultural development has been driven via state-based institutions that are often inward-looking rather than regionally active. With limited common ideological or economic links to stitch together the region, institutions like the Arab League have now become symbols of the failure in achieving the goals of free cross-border movement of culture, talent, trade, and investment. Apart from the United Arab Emirates, no Arab nation has a shared know-how of how to build a diversified post-oil economy. And excluding Tunisia, the region is less democratic and more fragmented across distinct dictatorial lines than a decade ago.

Nevertheless, a nascent attempt at modern pan-Arabism is emerging today. This attempt lies not in archaic cross-border institutions or governmental bureaucracies, but rather in a digitally driven commercial movement, with emerging Arab businesses and investors taking advantage of an untapped digitally savvy consumer *qawmiyya* across the region. Tech startups are growing fast within the region, with multiple funds focusing on cross-regional communities. Much of this recent growth has been initiated by venture capital as well as sovereign wealth funds, both of which are looking to the MENA startup economy to secure a stake in the region's long-term growth, generate returns across nations, and in the process contribute to an economically prosperous pan-Arab movement. This trend demonstrates that the scalability of the MENA digital startup economy will be a key driver in developing a sustainable pan-Arab identity in the coming decade.

For this movement to reach its full potential, continuing reform of existing governmental interference is required to both reduce and harmonize cross-border commercial regulations. With that reform, the ease of doing business across MENA will improve, and the organic movement to grow commerce across the region will further push the cause of an integrated pan-MENA identity.

Historically, MENA economic integration has been a core pillar of pan-Arab movement, with multiple institutional attempts to facilitate the movement. The Arab League, formed in 1945, proposed the PAFTA (Pan-Arab Free Trade Agreement) in 1997 to eliminate local tariffs and enable increased trade amongst the MENA nations. There have also been other sub-regional pacts including the Agadir Agreement in 2007, Maghreb Arab Union in 1989, and the most successful one — The Gulf Cooperation Council in 1981.

These integration efforts haven't borne substantial results due to embedded economic and geopolitical challenges that include repeated regional conflicts, tariffs and non-tariff protectionist safeguards, and institutional corruption. Yet the concept of MENA integration has remained alive within the region, with the belief that it has the potential to bring about improved economic outcomes.

Regional Integration through Startups: A Digital Oasis in the Desert

Careem, one of MENA's most successful startups, draws on the Arabic word for "generous," which it has been for regional economic cohesion. Co-founders Mudassir Sheikha and Magnus Olsson reflected in a recent interview with Entreprenuer.com that they launched the eponymous ride-hailing company in 2012 with 20 drivers and the aim of transforming the transportation industry in the United

Arab Emirates. In 2019, the company was acquired by Uber for $3.1 billion, making it the largest exit for a Middle Eastern startup and paving the way for a new generation of founders in the region.

According to World Bank data, the MENA region has a vast population with approximately 400 million residents and $2.6 trillion of combined GDP. With strong elements of shared transnational identities, the region is conducive for integration through the technology startup ecosystem. As technology companies are scalable across geographies in theory, the region represents a fertile ground for cross-border entrepreneurs to grow their businesses by targeting consumers with a shared set of cultural and socioeconomic attributes.

After achieving unicorn status in 2016, Careem stated that it created "over 1 million employment opportunities" and generated "over $2 billion in earnings across 15 markets."

> "Venture-backed technology startups that have the potential to scale beyond their countries can attract more capital and have been more successful in MENA."

Their service proposition was targeted at a pan-MENA consumer, leveraging a marketing and growth model that appealed to similar demographics and cultural attributes, connecting populations across nations and in turn driving cross-regional economic cohesion.

From an investors' standpoint, startups like Careem attempting to extend cross-regionally also access a larger market size, both in terms of population and GDP. Individual nations in MENA have either small or economically unattractive markets in isolation. Thus, venture-backed technology startups that have the potential to scale beyond their countries can attract more capital and traditionally have been more successful in MENA.

The trend of cross-border operations of digital startups, however, brings about a set of contradictions with it. The first challenge from a digital integration standpoint is that investment distribution is not spread evenly across nations. The second challenge is around regulatory issues that inhibit the speed of digital integration and bring about memories of roadblocks faced in the pre-digital era.

Uneven Investment Distribution in MENA

According to Magnitt Research, 88% of the capital invested in 2020 was concentrated in three countries: UAE, Saudi Arabia, and Egypt. In fact, while the UAE holds 2.5% of the region's population and 16% of the GDP, it received over 50% of the investment capital. The rest of the MENA nations received less than 12% of the capital.

Cross-border investments have been on the rise since January 2016, but they represent a very small portion of the overall technology investments in the region. For instance, Morocco, with 9.3% of the region's population and 4.3% of GDP, received less than 1% of the startup investments.

The low proportion of cross-border investments and concentration of investments and startups in the three largest economies can be attributed to three major reasons: strong leverage of rich countries, limited capital markets, and corruption or lack of transparency.

The strong capital base advantage in UAE and Saudi Arabia has led to the concentration of startups in those nations. It has also led to strategic decisions such as attracting strong talent pools and consolidating resources from other MENA nations within their own nation-state boundaries.

An investor from Abu Dhabi who requested anonymity explained, "When investors from UAE or Saudi invest in startups in Egypt or Jordan, the startups are expected to move their base and employees to cities from the investee countries. This helps in increasing the educated pool of engineers and scientists, and also in the nations reaping the benefits of an integrated and imported technology ecosystem. UAE has less than 10 million population of its own and is increasingly looking to get talent from elsewhere to improve their future movement towards a knowledge economy. The city of Masdar's transformation into a tech hub is one such instance where startups from all across the Middle East and the world are moving."

In an Atlantic Council talk, Ayman Soliman, the CEO of the Sovereign Fund of Egypt and Tariq Abdulqader I, discussed how the lack of exit opportunities poses another threat when it comes to investments in smaller regions. Not all countries in MENA have capital markets that can support companies going public, which limits exit opportunities. Some companies are listed on local exchanges and are traded below their value. Other companies operate in countries without exchanges altogether. With no guaranteed way to exit on an investment in a foreign company, this increases the risk of investing across borders.

The quantum of historical cross-border investments showcases the large variations in ecosystem maturity within the region's nations. These friction points are exacerbated through the regulatory challenges and lack of a common framework to bring the nations together economically.

Institutional and Regulatory Hurdles

The policies surrounding digital services are useful to measure the extent to which digital startups are driving economic integration in MENA. A 2020 World Bank report on digital trade in MENA concluded that the region is "falling behind in establishing a modern governance framework for the digital economy." Among the many policy features that affect economic integration, a few are particularly endemic and restrictive to early-stage startups seeking to expand in the region: non-transparent regulations, the high cost of entering new markets due to a lack of regulatory consistency and coordination, and nationalistic policies.

Founders need to be able to access the regulatory requirements necessary to move into a new market. Often, this isn't readily available and founders are blindsided by fines or regulatory interference. Mohammad Albattikhi, the founder of Bilforon, an app for home-based kitchens, notes that all MENA countries do not have regulations that are clearly defined and easily accessible to founders. In Albattikhi's experience, regulatory complexity is a result of governments struggling to keep up with the changing business environment, and these issues are exacerbated by the lack of interregional coordination.

As Albattikhi observes, "Unlike the U.S. or Europe where standard rules exist, every country [in MENA] has different regulations that are not in sync with each other," making entering new markets costly.

Tamer Al-Salah, managing director of Jordan-based Beyond Capital, said, "Entering each market takes a license that costs an arm and a leg, and you probably need to go through a sandbox to have the regulations defined, and then you can get the license." He recalled that when Liwwa, a Beyond Capital-supported micro-lending startup, tried to sell direct-to-consumer in Egypt, the cost of acquiring a license to perform its services was around $2 million. Such a fee is nonviable for most early-stage companies.

> "The strong capital base advantage in UAE and Saudi Arabia has led to the concentration of startups in those nations."

Another important issue in the integration of markets is that the richer, larger markets exert power to advance their own economies at the expense of regional integration. Workforce mandates represent one potent example of restrictive nationalist policies. For example, when Liwwa tried to register in Egypt, the employment law there required 90% of the total number of employees in an entity to be Egyptian. To comply, Liwwa would have to hire a new Egyptian team, which was simply not feasible, Al-Salah said.

It's important to note that there has been much easing of regulation in recent years in order to remove barriers for digital services operating across borders. While the digital economy has catalyzed policy reform, small companies and those operating in certain industries like fintech continue to struggle to scale regionally. While investments and regulations still present a huge barrier to the integration of digital startups across the MENA region, the growth of the digital economy is forcing governments to introduce new initiatives on both fronts.

On the regulatory front, governments across the Middle East recognize that reducing the barriers to digital startup investment and expansion is within the best interest of their citizenry. In its 2020 edition of the Doing Business Report, the World Bank singled out four MENA nations — Saudi Arabia, Jordan, Bahrain, and Kuwait — for their efforts to reduce the hurdles to starting and expanding businesses via regulatory reforms.

The Road Ahead

In the last few years, many of the essential reforms MENA nations undertook were in response to the emergence and growth of digital startups and their expanding digital economy. Since 2016, eight regulatory sandboxes have been introduced in the MENA region specifically to propagate startups. The Abu Dhabi Global Market (ADGM) pioneered this movement by introducing ADGM Reglab in 2016. Per ADGM, ADGM Reglab is the second most active regulatory sandbox globally and has successfully contributed to the development of the UAE's financial sector. Regulatory sandboxes serve an important function of increasing transparency across and within fintech industries and reducing the investment costs of starting up these businesses.

Governments have also taken steps to reduce the costs to register and introduce foreign startups within their nations. MENA governments have implemented specific reforms to make starting a business or entering their economies easier. The World Bank reported that the UAE improved its online registration process in 2019, and a year later reduced the fees for business incorporation. Similarly, the Saudi Arabia General Investment Authority (SAGIA) has undertaken several reforms since 2016 to streamline the business registration process, eventually creating a one-stop-shop for doing so. It has also made it easier for women to register companies and reduced registration fees. Creating one-stop-shops has become increasingly popular across the region, with Kuwait and Egypt joining in. Additionally, Kuwait, Bahrain, Algeria, and Qatar have each reduced capital requirements for starting a business. As the startup economy grows throughout the region, governments are supporting the change by reducing hurdles and increasingly fostering them.

Governments are also recognizing the benefit of allowing foreign ownership and thus reforming nationalistic policies. While defense and other security-related industries remain tightly controlled, the desire to integrate the growing digital startup economy has prompted reforms in consumer-facing sectors like financial services. Reuters reported in June 2021 that the UAE decided to allow full foreign ownership of companies in specific industries. Similarly, complete foreign ownership is now possible in Saudi Arabia, Oman, and Kuwait under specific circumstances.

On the investment front, there are increasing instances of institutionalized cross-border investment funds from the richer nations that could lead to improved digital and economic integration. In 2019, Mubadala, Abu Dhabi's state investor, announced the launch of MENA tech funds that planned to invest over $250 million in startups in the region. This initiative was part of a broader move to reduce the dependence on oil and transition to a tech-based economy. Another example is the Saudi Jordan Investment Fund, which aims to increase investments from Saudi Arabia to Jordan in various industries and segments. The fund made its maiden tech investment of $15 million in the Jordanian tech startup Opensooq in June 2021.

Conclusion

The MENA story has the potential to be one of modern-day success. Following a long history of individual nation-building, it is the organic proliferation of digital commerce that seems to be succeeding in economically integrating the region where numerous political and diplomatic attempts from history failed. The story is not perfect yet; challenges on equitable investment distribution and regulatory barriers exist. Yet with the continued success of startups like Careem and those following its footsteps, optimism exists. Indeed, we have already witnessed a series of course-correcting strategic steps from both enterprise and governments that will go some way toward harnessing the full digital potential of the region. There's a famous Arabic proverb that translates to, "What is coming is better than what has gone." The region's vision of *qawmiyya* remains both alive and digitally charged in its days ahead.

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Health Care 2.0 in Africa

This article profiles three companies that are driving innovation in health care in Africa, where national spending on physical and mental health ranks remains stubbornly low.

Access to quality health care is one of the most important humanitarian and developmental issues across sub-Saharan Africa. A recent McKinsey & Company report asserts that Africa faces a twin health crisis that will be exacerbated by COVID-19: a high existing disease burden and fragile health systems. Despite the compounding effects of the pandemic and extensive underinvestment in health care systems across the continent, entrepreneurs across the continent are leveraging local innovative solutions to upend this trend. Zipline, a drone medicine delivery company, is reducing the costs and time of logistics in underserved rural Africa. MANI, a mental health awareness company, is harnessing technology to help local communities address mental health problems. 54 gene, an enterprise cataloguing the African genome, aims to facilitate medical research tailored to the African people. These companies are at the forefront of innovation, laying the foundations for health care 2.0 in Africa through data and community infrastructure. In this article, we explore their stories.

Background and Context

Africa is currently the home of approximately 1.3 billion people. With a population growth rate of approximately 2.6% — the highest of any continent — it is projected to reach 2.5 billion by 2050, according to United Nations estimates. Africa is experiencing an unprecedented population boom. Currently, 60% of its population is under the age of 25, making Africa the youngest continent in the world. Over the past 20 years, this trend has been accompanied by rising economic growth exemplified by a threefold increase in the average GDP per capita, according to the World Bank.

A *Stanford Business Review* report states that fewer than 50% of Africans have access to modern health facilities. In addition, many African countries spend less than 10% of their GDP on health care despite the dearth of services. Life expectancy in the region has grown steadily since the turn of the century; the average life expectancy grew by 10 years in only the past two decades. A study by the World Health Organization found that the average life expectancy at birth in Africa (60 years) is the lowest in the world compared to the Americas (76.9), Europe (76.8), and South-East Asia (69). Neonatal mortality, malaria, diarrhea, and lower respiratory diseases and infections still represent a vast percentage of total deaths, in comparison to other parts of the world.

In an attempt to defy these infrastructural challenges, young people across Africa, making up the *youth bond* — a term coined by economists to describe the availability of young workers as a share of total population — are creatively building the foundations of a modern health care system and driving innovative African solutions to strengthen African health care systems.

Flying Medicine

Leveraging the latest robotics technology, the drone-logistics company Zipline has enabled Rwanda to turn its health care supply distribution and cold chain storage challenges into a 21st century on-demand model for shipments of life saving supplies. Using autonomous fixed wing aircraft drones, which can carry cargo of five pounds as far as 100 miles, Zipline has partnered with the Rwandan government to leapfrog newer and better equipped health logistics in Western countries in terms of cost, delivery efficiency, and geographic reach. Since launching its health logistics services in Rwanda in 2016, it has made over 190,000 deliveries of vital medical supplies, ranging from blood used for lifesaving transfusions during childbirth to vaccines, insulin, and personal protective equipment.

> "Across Africa, the need for mental health care services cannot be overstated."

According to the World Bank, 83% of Rwanda's population lives in rural areas and relies on over 500 small community clinics, rather than hospitals located in urban areas, for access to health care. Through its on-demand drone delivery system, Zipline significantly enhances the reach and timely delivery of vaccines and blood from its 22 distribution centers located near the country's limited number of cold chain storage facilities. Given the challenge of predicting the need for supplies across the country, particularly during community vaccine campaigns and crises, health care officials were often forced to make trade-offs between expanding access or limiting waste. Today, doctors are able to place blood delivery and vaccine orders in real time and receive the products within 15-30 minutes across all corners of the country, significantly reducing delays due to traditional health logistics infrastructure challenges and almost eliminating the wastage of medical supplies, which according to *Forbes* magazine has not been achieved by any health care system globally. In a recent TED Talk, the company's founder and CEO, Keller Rinaundo, stated that Africa is on the cusp of a major paradigm shift in that it "can be the disruptor. Small, agile economies can out-innovate large richer ones. They can leapfrog over the absence of outdated legacy infrastructure to go straight to newer and better systems."

Building off of its successes in Rwanda, Zipline recently expanded to serve 12 million people in Ghana and over 10 million across Tanzania. The company's successes in Africa have not only improved health outcomes, particularly in rural areas, but have led to replication in the United States. Noviant Health in North Carolina launched America's first emergency drone operation to deliver personal protective equipment and medical supplies to health facilities to combat COVID-19. Learning from Zipline's growth in Africa, Walmart established a similar partnership focused on consumer health products with the ultimate aim of offering an on-demand service for delivering lifesaving prescriptions directly to patients' homes.

Building Communities to Address Mental Health

Across Africa, the need for mental health care services cannot be overstated. The COVID-19 pandemic has exacerbated the problem and highlighted the persistent mental health infrastructure gap across the African continent. According to the WHO, 15 African countries are among the top 30 globally for suicide per 100,000 people. While there are nine mental health workers per 100,000 people globally, that number falls to 0.9 in Africa. In addition, the median mental health hospital beds per 100,000 was 1.6 in Africa, compared with 11.14 in the U.S. These figures indicate a severe shortage of psychiatrists and psychologists.

In September 2015, the United Nations General Assembly recognized mental health and substance abuse as key priorities of the Sustainable Development Goals (SDGs), urging countries to propose mental health solutions in their national budgets. Yet, according to the World Economic Forum, most African governments devote less than 1% of their national health spending to mental health services.

In Nigeria, Mentally Aware Nigeria Initiative (MANI) is working innovatively to close the mental health gap using technology-driven, community-based solutions. According to its website, MANI, founded by Victor Ugo in 2016, is West Africa's biggest youth-run nonprofit. Using digital and social media campaigns to drive mental health promotion and prevention, it democratizes access to mental health professionals and advocates for better mental health policies across Africa.

In an interview with WHO, Ugo described how his experience seeking mental health care in Nigeria led him to create the community-led organization:

"My passion for mental health has always been there from my time in medical school, but what amplified that passion was my personal experience and my diagnosis of major depressive disorder in my final year in medical school, which opened my eyes to the shocking inadequacy of mental health care in Nigeria. I was lucky and privileged to have friends who were doctors and some also had mental health issues themselves...but I am aware how different the reality is for millions of other young persons in Nigeria who go through these issues without support. That formed the foundation of what MANI is today — a community of young persons who will be there to support each other, build knowledge about mental health basics and fight for better mental health in the country."

To address the issue of limited resources and infrastructure for mental health care, Ugo and his team leveraged the power and popularity of digital and social media among Nigerian youth to provide access to mental health services to a large share of the Nigerian population that would otherwise have been underserved. In a Guardian interview, Ugo described leveraging social media's cool factor. They launched online campaigns in which youth spoke candidly about their experiences dealing with mental health issues. They also shared catchy educational content about mental health issues such as depression and anxiety and practical ways to cope. Noticing the level of interest among Nigerian youth, in 2017, MANI launched a 24-hour mental health support/suicide hotline led by professionally trained volunteers. Using this service, any Nigerian can reach out using Twitter or Whatsapp for advice and counselling. One year after its launch, MANI had trained over 1,500 volunteers and was providing mental health care to Nigerians in 13 of the country's 36 states.

To supplement its digital community, MANI also hosts in-person events to further create connections among Nigerian youth and provide a platform for people to share their mental health experiences more openly. MANI is an example of innovative models that leverage communal involvement to solve mental health through networks of support, leapfrogging challenges in Africa's health sector. During the COVID-19 pandemic, MANI provided specific mental health services through its project-COVID website and partnered with companies such as Twitter to amplify its reach. MANI is currently expanding its community and platforms in its mission to provide mental health support to every Nigerian that needs it.

> "Due to historic and socioeconomic reasons, Africa has long been excluded from the global health care industry."

Deciphering the African Gene

Are traditional medicines, vaccines, and studies suitable for every race? Are they built for all in an equal manner? Genetic bank data and clinical trials representation prove otherwise.

Due to historic and socioeconomic reasons, Africa has long been excluded from the global health care industry. Despite representing approximately 15% of the total world population, only 3% of current gene data is from African people or people of African descent. Following this trend, Africa as a whole has conducted 12 times fewer studies than have been conducted in the United States, according to BioMedical Central. Historically, Africans have composed less than 5% of the total sampling size for clinical trials, especially in cancer research. The problem has been exacerbated by the fact that Africa has one of the most genetically diverse populations in the world. Thus, it should be receiving both a larger percentage of gene pooling and a larger representation in clinical trials, not dismally less.

These two factors clearly establish that medicine is not being researched for nor by Africans. Consequently, Africans and people of African descent are more likely to suffer unpredictable outcomes from newly launched medicines and may not be receiving the most efficient treatment suited to their genetic composition. The lack of African participation in medicine discovery can be directly attributed to a lack of research network effects, knowledge spilling, poor infrastructure, and minimal funding. 54gene is a company trying to solve this.

The company is building a robust data set of African genomic samples, which it aims to share with drug manufacturers to incentivize its use for drug development. Beyond collecting and processing the data, the company also strives to enhance African representation in the drug discovery process. The intention is to help facilitate the expansion of African owned and published research around genomics.

To collect samples, the company is administering non-invasive, ethically run diagnostic tests for patients currently in the hospital. When patients visit the hospital for a diagnosis, they're given the option to share their sample with 54gene. Without the need for additional sampling, the test results are highly cost effective. Once a patient gives authorization, the company proceeds to sequence genetic data using the first privately owned NovaSeq 6000 on the continent, and subsequently stores the patient's sample in a centralized biobank.

To date, 54gene has successfully collected over 100,000 samples. The company plans to expand its database and share the captured biobank sequencing and genotyping samples with pharmaceutical companies. The resulting partnership will enable the development of drugs tailored to African populations and facilitate the identification of pathogenic variations or vulnerabilities in the African races.

The work of 54gene and similar companies present unique challenges in terms of data privacy. Nikki Tiffin, a computational biologist from the University of Cape Town in South Africa, said that issues of data privacy are paramount when dealing with people's genomic data. Despite the risk, she said she is in favor of projects such as 54gene, according to an article on genomeweb. To this point, 54gene has stated that they only accept and biobank specimens for which they have explicit consent. In addition, the samples are devoid of information that link them back to the original donor. A final measure of protection is in the form of choice offered to donors. Donors have the option to request that their samples be withdrawn from the gene bank and destroyed.

Closing Thoughts

There is still plenty of ground to cover over the next few decades to address the complexity of health care challenges across Africa. African youth and innovative companies are forging the future health care landscape by harnessing the power of the most modern technologies and a bold approach to problem solving.

Flying drones, massive volunteering communities, and gene decoding represent cutting-edge solutions developed and deployed across the continent and which are enabling cost-effective mechanisms to meet the challenges posed by Africa's health care crisis. Zipline, MANI and 54Gene epitomize the thesis that locally launched solutions can overcome legacy infrastructure, as well as deeply entrenched political and demographic challenges.

This article was written by Olaotan Awoyomi, Roman Balin, Sebastian Read, Alejandro Safdie, and Ugo Udeogu, members of the Lauder Class of 2023.

Pandemics in Africa: Does Experience Mean Preparation?

As the COVID-19 pandemic batters every corner of the globe, some nations are using what they've learned from prior outbreaks to push back against the deadly virus. This article analyzes the effect of protocols in Rwanda, Zimbabwe, Mali, Guinea, and Liberia.

Sub-Saharan Africa has a history of battling pandemics: cholera, Ebola, HIV/AIDS, measles, yellow fever, and most recently COVID-19. In a September 2021 interview conducted by this research team, Dr. Ibrahima Socé Fall, assistant director-general for Emergencies Response for the World Health Organization, stated that West Africa has dealt with over 1,000 outbreaks every year, wreaking havoc on citizens, economies, and health systems.

From its onset, health experts were keenly focused on how COVID-19 would play out across the continent. Speculation about the emergent virus and how it would behave was rampant. As Dr. Sam Okuonzi, head of hospital management at Arua Regional Referral Hospital in Uganda, suggested during a WHO health conference in October 2020: "Factors for a lower transmission and disease severity rate in the continent may include, for example, a youthful population, possibly an inherent immunity, possibly something to do with temperature and altitude, possibly something to do with better population response because we have a lot of experience from Ebola and other diseases, and people are prepared for some of these diseases."

While sub-Saharan Africa has experienced numerous viral and bacterial disease outbreaks, three have stood out due to their severity and impact: cholera, Ebola and HIV/AIDS. Has the region's previous pandemic experience strengthened its COVID-19 response? We examined the histories of these three diseases across Rwanda, Zimbabwe, Mali, Guinea, and Liberia to understand whether prior outbreaks bolster a country's COVID-19 response. We found that having prior pandemic experience alone did not strengthen a country's COVID-19 response. Rather, the learnings and resources gained from prior pandemics and, more importantly, how they are applied affect the strength of a country's COVID-19 response.

For instance, although Mali and Guinea both experienced Ebola epidemics, Mali leveraged existing laboratories and significantly expanded testing capacity for COVID-19, while Guinea's overall underinvestment in health infrastructure limited its testing capabilities.

Among the five countries, four factors illustrate how prior pandemic experiences can be leveraged to strengthen the COVID-19 response. The first is recycled and adapted health infrastructure and IT systems, including refitting laboratories used to test for HIV/AIDS cases. The second is sustained investment in health infrastructure to aid the rapid deployment of resources to fight new outbreaks. The third is clear public health dissemination via multiple channels to ensure that as many people as possible have the knowledge to stop the spread in their local communities. The fourth is collaboration among the public, private, and social sectors, as each sector brings additional capacity and specific capabilities to fight COVID-19. We'll now examine how these factors emerged through our five case studies.

Rwanda: Not Reinventing the Wheel

Rwanda has been on the front lines of public health crises and epidemics ranging from HIV/AIDS to Ebola. The country's medical and technological ecosystem has taken lessons from these crises to heart and quickly learned to use the resources they have to stop the spread of COVID-19 in its tracks. Early in the COVID-19 outbreak, Rwanda made the critical decision not to reinvent the wheel, but to redeploy its Weltel infrastructure and technology that had been used to manage the spread of HIV/AIDS. Initially developed as an SMS-integrated system used to increase patients' adherence to the treatment plan for HIV/AIDS, Weltel technology was redeployed for COVID-19 contact tracing to better understand the spread of the disease.

"We are using the same structure, same people, same infrastructure and laboratory diagnostics, but applying it to COVID testing," Sabin Nsanzimana, director general of the Rwanda Biomedical Center, said to NPR in June 2020.

Rwanda's success does not stop at tracking and tracing. The country's network of laboratories and molecular testing facilities were already effectively running to monitor people with chronic conditions such as HIV and hepatitis B and C. These labs were well-equipped with molecular instruments and an experienced staff with technical know-how to support widescale COVID-19 testing. This enabled Rwanda to effectively ramp up its already significant capacity, opening 12 new PCR testing centers in April 2021 that can conduct up to 10,000 tests daily.

The results are notable. Compared with neighboring countries, Rwanda has tested more frequently per population and maintained a low positivity rate. Coupled with extensive data science and data collection linking testing, doctors, contact tracers, and the government, Rwanda's IT solutions in the health care space have paid dividends in the country's ability to safely manage the initial wave of COVID-19.

"Compared with neighboring countries, Rwanda has tested more frequently per population and maintained a low positivity rate."

Zimbabwe: Leveraging Public-private Partnerships from Cholera

Cholera was an equally educational experience for Zimbabwe, albeit with far more disastrous consequences. From August 2008 to July 2009, the country reported over 4,000 deaths from cholera, impacting 90% of the country's districts. With a crumbling health system, Zimbabwe also faced inadequate water and sanitation infrastructure in urban and rural areas, overcrowded settlements, and an economic crisis. According to Simukai Chigudu, associate professor of African politics at Oxford University, Zimbabwe's response addressed both institutional and communal challenges. Data was not readily available, so developing a process to gather and transmit data was the initial step.

The country created a centralized approach to review the information, take action, and communicate updates to prevent misaligned messaging. Guidelines around case management were updated, standardized, and rolled out across health facilities. Zimbabwe used this approach to address a key driver of the outbreak: limited access to clean water and sanitation facilities in the rural areas. Zimbabwe established a centralized task force that mobilized resources from many sources, supplemented by interventions in health education campaigns and media messaging. Although the cholera outbreak was officially declared over in July 2009, the country has observed and effectively contained sporadic outbreaks due to the measures put in place.

By September 14, 2021, as stated by the World Health Organization, Zimbabwe had reported 126,399 confirmed cases of COVID-19, 4,543 deaths, and 4,552,455 vaccine doses administered. With about 16% of its population vaccinated, according to the Reuters COVID-19 tracker, these statistics make Zimbabwe a relative success story in Africa where less than 2% of the continent's total population is fully vaccinated.

The structures put in place to address the cholera outbreak became key facilitators in the Zimbabwean government's response to the COVID-19 pandemic. The National Task Force on Epidemic-Prone Diseases, which was established at the start of the cholera outbreak, has become a standing committee that supports any outbreak. According to Dr. Rugare Kangwende, director of monitoring and evaluation at the Ministry of Health and Child Care, "a robust weekly routine monitoring system that rides on an existing system" was critical in getting reliable and timely data and making lifesaving decisions. Ultimately, harmonizing across both government and nongovernmental agencies was critical in both strengthening the health system and in conducting social mobilization interventions to sensitize communities on COVID-19.

Mali: Being Proactive and Leveraging Existing Infrastructure

Despite demonstrating some of the most proactive measures on the continent to halt the spread of COVID-19, Mali saw the virus spread faster than in neighboring countries Algeria and Niger. Mali reported its first domestic COVID-19 case on March 25, 2020, much later than many adjacent countries. However, even prior to the disease's arrival, Mali instituted various precautions following the onset of the outbreak in China. For instance, two weeks prior to the declaration of the first case, Mali instituted temperature screenings at Modibo Keita International Airport. In the days before the first case, Mali halted all air traffic, banned public gatherings, and instituted a national curfew.

In preparation for the pandemic, Mali was also able to leverage various learnings from the Ebola outbreak of 2014 to assist with preparation. Dr. Fall described the nature of the Malian Health Ministry's proactive task force, established before the first detected case, that led to successful containment of the first Ebola case. He said the country quickly adapted a "culture of evidence-based preparedness," which was critical. Furthermore, Mali leveraged the expertise it acquired from combating Ebola less than a decade prior to efficiently operate its university clinical research center of the Faculty of Medicine and Odontostomatology. In addition, the Ministry of Health strengthened the capacity of the health system by increasing capacity at four laboratories for PCR diagnostics.

Despite these proactive measures, the on-the-ground resources and decision-making to address COVID-19 cases led to a rapid spread. Though Mali instituted COVID-19 precautions ahead of its peers, these measures were lifted as of July 25, 2020, following indication from the Economic Community of Western African States that cases had been declining. Meanwhile, although the Ministry of Health learned to invest heavily in pandemic testing and research resources, the health system remained underfunded. Upon the onset of its first COVID case, the country only had 49 hospital beds available and a short supply of personal protective equipment and hospital equipment. Mali's actions did not prove successful, as they would reach 45 confirmed cases and five deaths a mere month into the pandemic, a number that would cumulatively approach 15,000 over the next 18 months.

Guinea: Underinvestment in Resources for Two Pandemics

The Republic of Guinea demonstrates that prior exposure to Ebola does not necessarily guarantee successful deployment of resources to fight other pandemics such as COVID-19. Despite the Ministry of Health and Public Hygiene of Guinea leveraging the strengths acquired from the Ebola outbreak in 2014, such as maintaining P3-level laboratories to adequately address the COVID-19 pandemic, Guinea experienced the unthinkable: another onset of the Ebola outbreak simultaneously with the COVID-19 pandemic. On February 14, 2021, the government of the Republic of Guinea declared a resurgence of Ebola following a report of seven cases, less than a year after declaring its first COVID-19 case in the country. Thus, Guinea was far from prepared for the COVID-19 virus, let alone simultaneous pandemics.

> "The structures put in place to address the cholera outbreak became key facilitators in the Zimbabwean government's response to the COVID-19 pandemic."

Repurposing Guinea's standard operating procedures for the COVID-19 outbreak was unsuccessful because the country underinvested in its health care resources and information-sharing. Guinea has one of the lowest health care expenditures per capita in the world ($38) and a low medical workforce density of less than 1.5 people per 10,000, according to the World Bank. As a result, when 160 of the country's 2,000 health care workers were infected with the virus in June 2020, the hospital system was overrun and ill-prepared.

In addition, Guinea's treacherous terrain limits access to vaccines in remote areas and hampers widespread dissemination of information. A distrust of the Guinea medical system in prior outbreaks plagued the country with declines in hospital admissions. Lastly, while state laboratories were available for both COVID and Ebola testing, no other testing was available for other diseases, leading to inevitable delays in the detection of other viruses. The combination of factors ultimately contributed to more than 30,000 COVID-19 cases through December 2021. Thankfully, the Ebola outbreak was declared over in June 2021.

Liberia: Information-sharing and Strong Political Will

Like Guinea, Liberia initially responded poorly to the Ebola epidemic between 2014 and 2015. The WHO recorded a total of 10,678 cases leading to 4,810 deaths. In 2014, Liberia was beset by generally unprepared and undeveloped health care systems (e.g., 50 doctors to serve a population of 4.3 million) and was still recovering from a lengthy civil war. In a 2019 analysis, Dr. Fall describes how the unprepared health system not only led to far-reaching impacts on the Liberian health system but also a "deceleration of progress" across overall health outcomes, ranging from access to care, increases in mortalities from nonfatal diseases, and several others.

Despite the major negative impacts from Liberia's Ebola epidemic to the country's health outcomes, the country learned from its earlier handling and was able to successfully contain subsequent epidemics. WHO Liberia Emergency Preparedness and Response Officer April Baller wrote in the *PanAfrican Medical Journal* that Liberia's successful health care training, implemented as a response to Ebola, led to zero infections among the 20,000 health care workers who received this training. Dr. Fall detailed later health events in his 2019 analysis, noting how effective application of communication and containment measures led to reduced response times for minor measles and meningococcal disease outbreaks. These were lessons Liberia continued to apply when COVID-19 first hit the country in early 2020.

In a *Nature* interview, Mosoka Fallah, director of Liberia's National Public Health Institute, said that "the political will was there from the start" of COVID-19. This political will led to proactive measures implemented early by the Liberian health department. Dr. Impouma Benido, a WHO Africa director, described how Liberia enacted an Integrated Disease Surveillance and Response strategy on February 3, 2020, based on lessons from the Ebola epidemic. By February 21, about 90% of Liberia's health facilities had staff trained in COVID-19 surveillance. Within 35 days, testing capacity became available nationwide. Furthermore, Liberia launched a mass public information campaign in early March and supplemented it with public health regulations to reduce COVID-19's spread.

As a result, Liberia was successful for much of 2020 in containing the disease, with rates 22 times less than in the United States. However, like in other African countries, resource scarcity limited the impact of these preparatory measures. For example, COVID tests took a median of five days to return results, particularly problematic as initial symptom onset is when viral load is largest. While Liberia had early success, "persistent health systems' weaknesses and the unique nature of COVID-19" will continue to challenge Liberian COVID-19 outcomes, according to a 2021 WHO report.

Preparing for the Next Pandemic

The rapid global onset of COVID-19, coupled with its numerous and prolonged waves as the virus evolves, requires countries to have quick, adaptive, and sustained responses. There is simply no time to reinvent the wheel.

Africa has experienced over 10.7 million COVID-19 infections and more than 236,000 deaths on the continent as of January 2022, according to Reuters. According to USAID's COVID-19 Fact Sheet, more transmissible variants such as Delta and omicron, limited vaccine access and challenges with roll-out, fragile health care systems, and the beginning of winter in southern Africa have driven up cases and deaths. These issues will continue to prolong the COVID-19 pandemic in the region. Leveraging the lessons from prior pandemics and COVID-19 will continue to be critically important.

As seen from the cases of Rwanda, Zimbabwe, Mali, Guinea, and Liberia, adapting existing health infrastructure and IT systems, making sustained investments, reaching the public across channels and partnering across private, public, and social sectors will be essential to minimize COVID-19's effects on the region's people and economy as much as possible.

This article was written by Ginny Maceda, Chad Payne, Georgia Stylianides, Burake Taye, and Sai Yeluru, members of the Lauder Class of 2023.

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