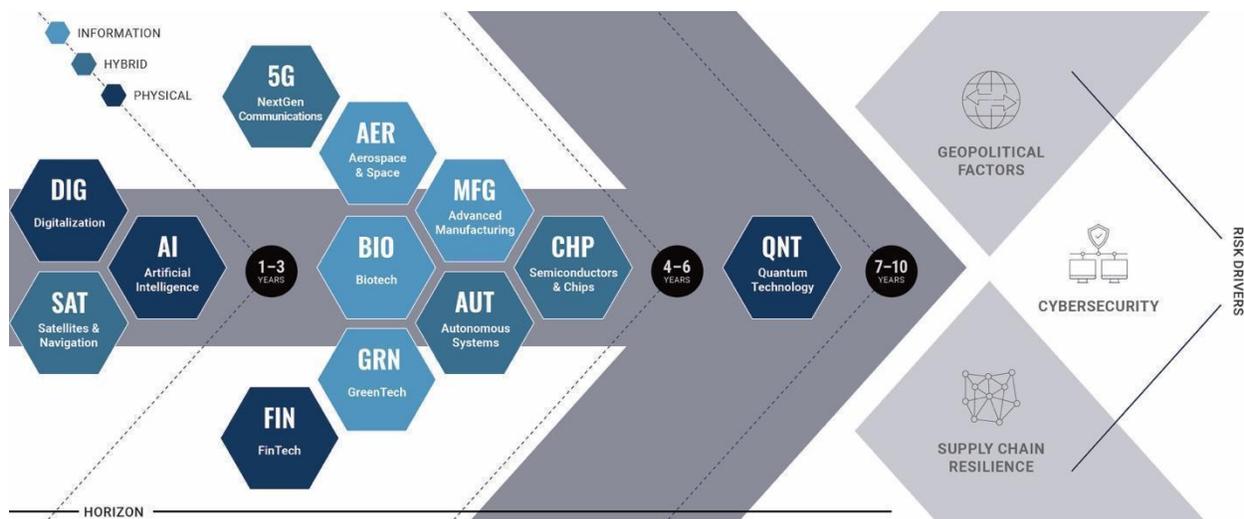




MATRIX MONITOR

Friday December 31, 2021

Welcome to Next5's weekly digest – emerging technology news and analysis to keep you on your game and ready for what's Next



This week's Next5 Matrix Monitor features China's AI prosecutor that can charge people with crimes, an AI-powered human exoskeleton, China's complaint to the U.N. that SpaceX satellites almost collided with its space station, Japan's plans to send astronauts to the moon as part of the U.S.-led Artemis program, breakthroughs in nuclear fusion, Huawei's entrance into China's EV race with Tesla, China's efforts to advance automation in manufacturing, an observation of the first "quantum entangled" animal in history, and China's set of draft rules for companies' overseas listings.

NEXT5 NEWS & AMPLIFICATIONS:

→ **The Cyberspace Solarium Commission (CSC) was officially stood down last week; A CSC 2.0 project was established separate from the federal commission.** The project will:

- Conduct and publish an Annual Assessment of legislative/executive progress on CSC recommendations
- Conduct research and analysis related to outstanding CSC recommendations
- Provide research to policymakers as they implement executive branch CSC recommendations
- Draft op-eds and articles for commissioners on CSC issues
- Represent CSC positions/policy recommendations at conferences, panels, & hearings

Additionally, the project will conduct research and analysis and develop policy proposals in five issue areas identified in the initial report but not fully delved into:

- Cybersecurity in the water/wastewater sector
- Federal cybersecurity work force development
- Continuity of the economy planning
- Cybersecurity in the maritime transport system sector
- Cybersecurity in the healthcare sector

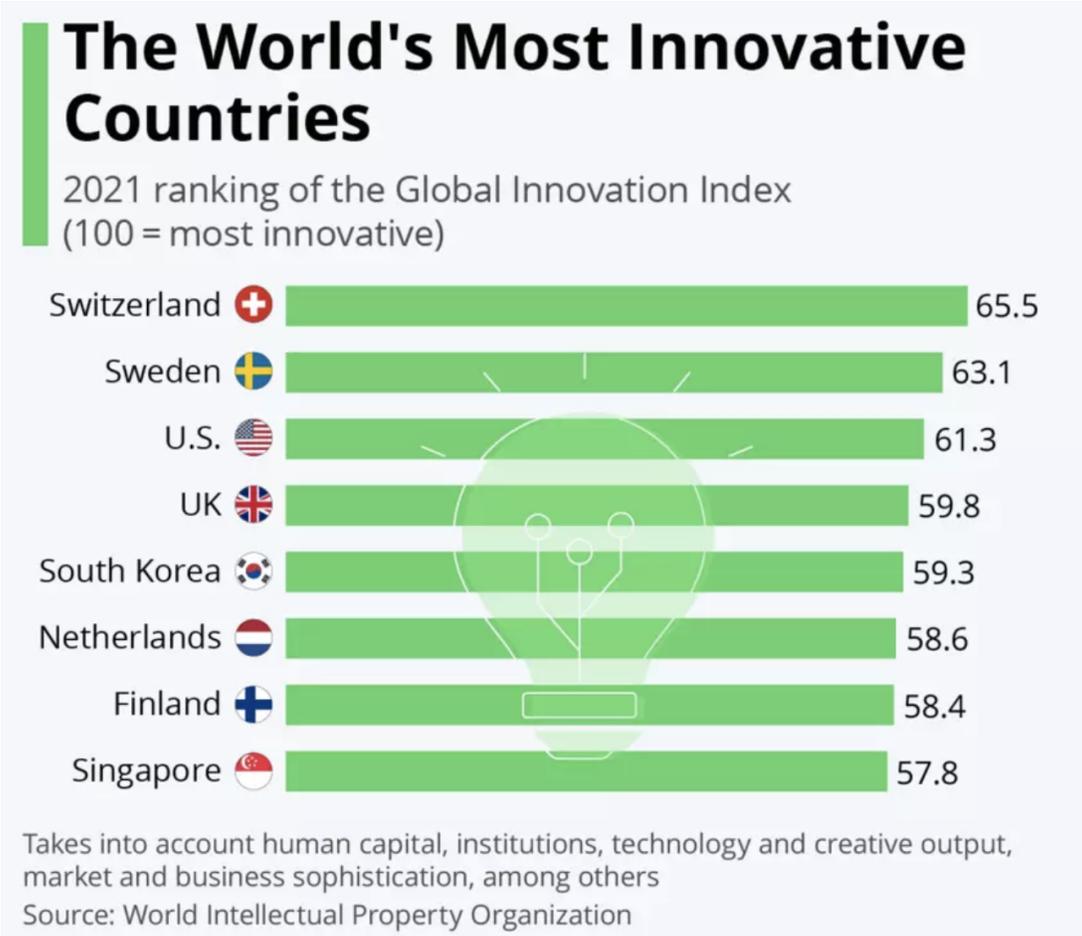
When the CSC's mandate officially ends, the government will no longer maintain public access to the CSC reports and recommendations. A website will be maintained to house and make easily accessible the CSC's work product which will be set up at the beginning of 2022:

www.cybersolarium.org

→ **Upcoming decisions on contracts in the Panama Canal present strategic opportunities to secure new business, counter Chinese influence and preserve free flow of goods through Panama after a year of supply chain crunch and high shipping costs.** On September 7, 2020, the Panama Canal Authority (ACP) launched a tender for a new water management system project to guarantee adequate water supply for the canal and consumption for the next 50 years. And future infrastructure projects are expected to follow. Further, a decades-old Chinese contract owned by Hutchison PPC is set to expire on January 16, which will either be extended for another 25 years or recompleted. With the breakdown of supply chains during COVID-19 and the potential nearshoring of manufacturing away from China, the Panama Canal will likely play an even larger role in shipping goods to and from the United States moving forward. But in the past several years, through several contracts like Hutchison's or Belt & Road Initiative projects, China has exploited the country's need for foreign investment to gain strategic and political influence in the region. Further, China's expansive footprint around the waterway directly threatens Panama's independent control of this critical infrastructure system which the US military has taken responsibility to protect. Without providing any competitors to these Chinese contracts, the US risks not only missing out on significant

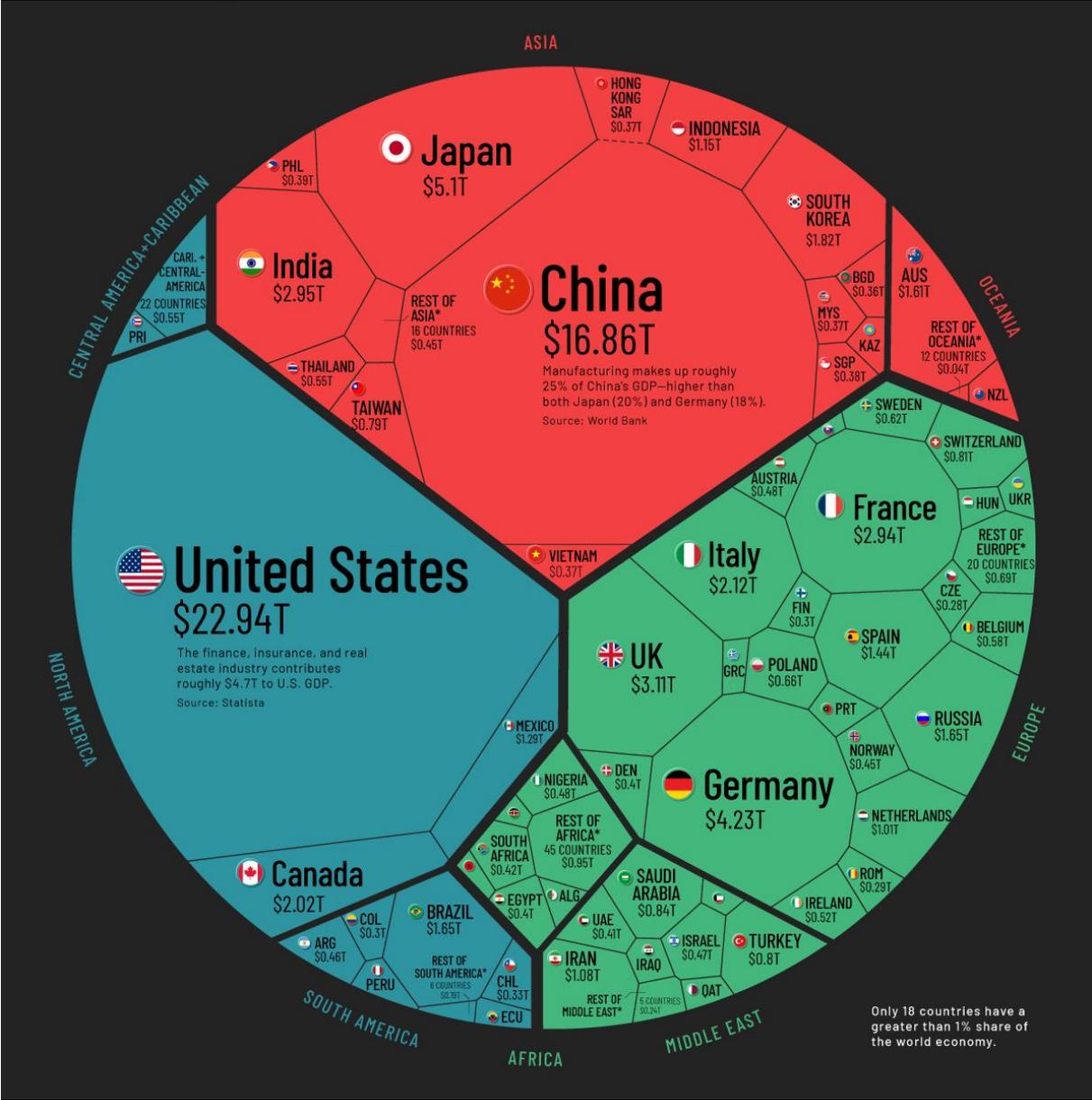
business opportunities but also risks the security of US supply chains that flow through critical ports in the region. [The Hill](#) [CSIS](#)

→ **The World Intellectual Property Organization (WIPO) released its 2021 Global Innovation Index which seeks to rank the world's most innovative countries.** The 2021 index found that innovation is blossoming in some sectors despite the global economic slowdown and pandemic. Switzerland topped the rankings with a score of 65.5 out of 100, the eleventh time it has been named the world leader in innovation. Sweden came in second while the US came in third. China is now the world's 12th most innovative country up from rank 14 in 2020 and 17 in 2018. China was also named the most innovative upper middle-income country ahead of Bulgaria, while Vietnam came first for lower middle-income countries, followed by India. One of the biggest winners of the rankings was South Korea who climbed from rank 10 in 2020 to rank 5 in 2021. [WEF](#)



→ **Visualizing the world economy in one chart:** Just four countries - the US, China, Japan, and Germany - make up over half of the world's economic output by GDP. The GDP of the US alone is greater than the combined GDP of 170 countries. At \$22.9T, the US GDP accounts for roughly 25% of the global economy, a share that has actually changed significantly in the past

60 years. The finance, insurance, and real estate industries add the most to the country's economy followed by professional and business services. China's economy is second in nominal terms, hovering at near \$17T in GDP. It remains the largest manufacturer worldwide based on output with extensive production of steel, electronics, and robotics among others. The largest economy in Europe is Germany, which exports roughly 20% of the world's motor vehicles. Among the fastest growing economies in the world in 2021, four of the top ten are located in South or Central America (Guyana, Panama, Chile, and Peru). In 1970, the world economy was only \$3T in GDP - 30x smaller than today's. Over the next 30 years, the global economy is expected to more or less double again. By 2050, global GDP could total close to \$180T. [Visual Capitalist](#)



DIGITALIZATION

→ **China's Baidu launched its metaverse app as more Chinese tech firms join the global race for supremacy in emerging technologies.** Baidu, known for its developments in AI and autonomous driving, unveiled Xirang, meaning "land of hope," at its annual AI developer conference on Monday, December 27. Among other Chinese internet giants developing metaverse technology is Tencent, with its music arm's announcement on Friday to launch TMELAND, the first virtual music carnival in China, that's scheduled to kick off on December 31. E-commerce giant Alibaba has also responded to the metaverse with a wholly-owned subsidiary called "Yuanjing Shengsheng." The new unit, founded on December 6 with registered capital of \$1.57M, purportedly paves the way for Alibaba to expand into metaverse-based gaming. In a sign that the metaverse goes beyond the commercial sphere, Russian President Vladimir Putin said in November that people need to take advantage of meta-universe-enabled opportunities for communication and education, despite distance. Additionally, South Korea and Japan have rolled out government-led initiatives to explore metaverse-generated growth.



A screenshot of Baidu's Xirang platform on December 27, 2021 when China's first metaverse conference is held in the virtual space.
Photo: Li Qiaoyi/GT

#DIG #AI #AUT #CHN #RUS #KPR #JPN [Global Times](#)

→ **As governments adopt new laws to regulate tech giants, an emerging industry helps companies navigate the increasingly fragmented rules of the global internet.** Companies responding to such regulation include data protection firm [OneTrust](#), which has been valued by investors at \$5.3B. [BigID](#), a competitor, raised \$30M in April at a \$1.25B valuation. And,

[TrustArc](#), a company that targets privacy regulations, raised \$70M in 2019. Many of the new companies launched in response to the General Data Protection Regulation, a European Union law passed in 2016 that pushes websites to ask their users if they agree to being tracked online. It also mandates companies to catalog the personal data they hold. Today, OneTrust and its competitors say they can help clients comply with privacy laws in numerous countries, like Brazil, and in U.S. states such as Nevada. OneTrust has also introduced products aimed at helping companies comply with other regulations, including new protections for whistle-blowers in Europe. #DIG #USA #BRA [NYT](#)

SATELLITES & NAVIGATION

→ **China has developed a powerful satellite capable of taking high-resolution images of cities in a matter of seconds.** Beijing-3, a one-ton commercial satellite, can take images clear enough to identify a military vehicle on the street and tell what type of weapon it might be carrying, according to researchers. The satellite was launched by China in June and performed a scan of the central San Francisco Bay area, covering 1,470 square miles, according to the journal Spacecraft Engineering. Most satellites observing the Earth must be stable when taking images because altitude control mechanisms can produce vibrations that blur the images. But the Chinese satellite can change the angle of its camera's line of sight to the ground when passing over the U.S., meaning it can capture a larger area than satellites have been able to previously. According to project lead scientist Yang Fang from the DFH Satellite Company, the Beijing-3 is the most nimble satellite and could be one of the most powerful Earth observation satellites ever built. The Beijing-3's response time is 2-3 times faster than the United States' WorldView-4, currently the most advanced Earth observation satellite, according to Yang. Also, the Chinese satellite can purportedly store one terabyte of images and beam data to the ground at the rate of one gigabyte per second, faster than any U.S. satellite. #SAT #USA #CHN [NY Post](#)

→ **GEOST won two U.S. Space Force contracts worth \$38M to develop an optical sensor payload that could be hosted on government or commercial satellites to scan the geostationary belt.** The contracts awarded to the company – \$6M in November 2020 and \$32M in December 2021 – include the design and development of the sensor, ground infrastructure, technical support, and integration with the host platform and launch vehicle. But the actual payload is less than \$10M, a key price point, which, according to the Space Force, would make it possible to deploy these in large numbers. The objective of the program is to build sensors that could go on almost any U.S. or allied government, or commercial satellite to provide space domain awareness, although the Space Force has not yet identified a host satellite. Hosted payloads would augment the existing Space Surveillance Network that includes a mix of conventional radars, phased-array radars, and telescopes on the ground; as well as two Geosynchronous Space Situational Awareness Program (GSSAP) electro-optical sensor

satellites operating in near-geosynchronous orbit. GEOST's payload is projected to be ready for launch in 2023. #SAT #USA [Space News](#)

→ **An Arianespace Soyuz rocket launched new internet satellites into orbit Monday, December 27 to boost a growing mega constellation by service provider [OneWeb](#).** The Russian-built Soyuz rocket launched 36 OneWeb satellites from Baikonur Cosmodrome in Kazakhstan at 8:10 AM EST on Monday. It was the eighth launch of the year for the company, which now has 394 of its internet satellites in orbit. London-based OneWeb is building a constellation of 648 satellites to provide high-speed internet access to customers around the world, especially in remote and under-connected locations. This year, the company reached the 60% mark of their constellation in space and signed a series of distribution agreements with partners in Australia, Canada, and Europe for their service network. #SAT #GBR #RUS #KAZ #AUS #CAN [Space.com](#)

ARTIFICIAL INTELLIGENCE

→ **China has developed an AI prosecutor that can charge people with crimes with more than 97% accuracy.** The machine can identify 'dissent' against the state and suggest sentences for supposed criminals, removing humans from the prosecution process. It files a charge based on a verbal description of the case and was built and tested by the Shanghai Pudong People's Procuratorate, the biggest and busiest district prosecution office in China. The system can run on a standard desktop computer and would press charges based on 1,000 'traits' from the human-generated case description text. It was "trained" using 17K real-life cases from 2015 to 2020 and can identify and press charges for the eight most common crimes in Shanghai. These include "provoking trouble" – a term used to stifle dissent in China, credit card fraud, gambling crimes, dangerous driving, theft, fraud, intentional injury, and obstructing official duties. Once the AI prosecutor is upgraded, it will be able to recognize more types of crime and file multiple charges against one suspect. #AI #CHN [Daily Mail](#) [Korea Times](#)

→ **[Germany Bionic](#) released its fifth-generation Cray X AI-enhanced power suit, or exoskeleton, to help people with almost 70 pounds of additional lifting capacity.** The Cray X is already in use at BMW, IKEA, and the French delivery service DPD, and will be launched internationally in January 2022. Powered by a 40-volt battery, the Cray X consists of a carbon-fiber backpack-like unit that connects to the body at the chest, hips, and upper legs. When the AI-enabled unit senses that its user is trying to lift something, it adds power to that effort, allowing them to both lift and carry with less effort. The system anticipates movements and determines when additional force is needed. It learns how each worker moves and where they might need more or less support. 2.7B people have "deskless jobs," many of which require bending, lifting, moving, and carrying, and the smart exoskeleton market has applications in construction, shipping and receiving, healthcare, and the military. It has been estimated to be growing 41.3% a year to a nearly \$2B industry by 2025.



#AI #DEU #SWE #FRA [Forbes](#)

NEXT GENERATION COMMUNICATIONS

→ **Telefonica** has bought 5G network equipment from Swedish manufacturer **Ericsson** to replace some of the Huawei gear it has rolled out in Spain. The replacement of the next-generation mobile network equipment is part of Telefonica's strategy announced in 2019 to diversify suppliers. The 2019 decision came at a time when Huawei, the global market leader in network equipment, had been drawn into the center of political tensions between Washington and Beijing. The U.S. alleged the company's equipment could be used by the Chinese government for espionage. Huawei and Beijing have repeatedly denied the allegations. When Telefonica announced its strategy two years ago, it said its decision to diversify was purely technical and that it had seen no evidence to support the U.S. allegations that Huawei gear posed a security risk. #5G #CHN #SWE #USA [US News](#)

→ **China Telecom** intends to continue most of its U.S. operations despite an order from regulators to stop due to espionage concerns. According to China Telecom, its business-focused telecommunications operations in the U.S. are not common-carrier services as the Federal Communications Commission categorized them so the agency's order doesn't affect those services. The FCC cited espionage concerns as it voted unanimously in October to revoke permission to operate in the U.S. for China Telecom, one of three leading communications providers in China. The order is to take effect 60 days after its November 2 release. The action against China Telecom relates to worries over potentially illicit data flows from the U.S. to China. Separately, the FCC is considering acting against surveillance-camera makers Hangzhou Hikvision Digital Technology and Dahua Technology. And Congress is considering restrictions on drone maker SZ DJI Technology. #5G #USA #CHN [Bloomberg](#)

FINANCIAL TECHNOLOGY

→ **Chinese investors in bitcoin and other cryptocurrencies are circumventing restrictions that have effectively outlawed their preferred assets.** These efforts continue even after Binance and Huobi, two major crypto trading platforms, have vowed to purge mainland users. Huobi and Binance are set to disable transactions in Chinese yuan by the end of December. Huobi has already halted new registrations using phone numbers from mainland China and said it would start charging a 0.2% monthly fee for any Chinese accounts with a balance next year. According to Binance, Chinese users will only be able to make withdrawals from January. Still, some people who already have crypto holdings plan to carry on despite the legal risks and regulatory hostility. Common approaches to continue trading involve using virtual private networks (VPN), registering foreign email addresses, and shifting assets to less centralized exchanges. #FIN #CHN [SCMP](#)

AEROSPACE & SPACE

→ **China filed a complaint to the U.N. stating Chinese astronauts aboard the country's space station had to take emergency action earlier this year to avoid colliding with satellites launched by SpaceX.** The two Starlink satellites came close to the space station in July and October, according to Foreign Ministry spokesman Zhao Lijian. At the time, Chinese astronauts were purportedly conducting missions on the station, which had to adopt emergency measures to avoid collisions. The developments come as competition in space accelerates between the U.S. and China and as traffic in low Earth orbit becomes increasingly cluttered. China has been barred by U.S. law from working with the National Aeronautics and Space Administration for a decade and has since pursued its own increasingly bold space program. Mr. Zhao cited the 1967 Outer Space Treaty (OST), which stipulates that all countries should respect and protect the safety of astronauts. He said the Chinese government notified the U.N. Secretary-General of the near misses on December 3. During a recent space event Next5 hosted, several executive experts noted that the OST is outdated and was written before commercial space companies took off. #AER #SAT #USA #CHN [WSJ Space News](#)

→ **Japan's recently elected prime minister wants to send Japanese astronauts to the moon as part of the U.S.-led Artemis program by the end of the decade.** According to Japanese Prime Minister Fumio Kishida, the goal is part of a revised space policy roadmap he's submitting for cabinet approval. The revised roadmap calls for cooperating with Japan's private sector to develop crewed lunar rovers and other systems essential for human activity on the moon. In addition, the revised roadmap details plans for Japan to land an astronaut on the moon by the late 2020s. Canada is the only Artemis partner that already has secured seats for its astronauts on NASA's planned moon missions. Last December, NASA and the Canadian Space Agency finalized an agreement permitting a Canadian astronaut to join three U.S. astronauts on Artemis 2, a planned 2024 mission to fly the Orion spacecraft around the moon

before returning to Earth. NASA plans to land astronauts on the moon for the first time since 1972 with the two-person Artemis 3 mission, now slated for 2025. Currently, both seats have been assigned to U.S. astronauts. #AER #USA #JPN #CAN [Space News](#)

→ **SpaceX CEO Elon Musk said his company would land humans on Mars in the next 5 to 10 years.** Musk tweeted in March that his aerospace company would land its Starship rockets on Mars well before 2030. Some experts say it could take longer than he's predicting if things don't go exactly to plan during the three remaining launch opportunities before 2026. Musk eventually plans to build 1,000 Starship rockets and launch three of them a day to fly one million people to the red planet. On a recent podcast, Musk said the human settlement on Mars should be a second chance to build a better government. Specifically, he said there should be a direct democracy without representatives on Mars. He said the eventual colony should get rid of 'special interests' and "coercion of politicians." #AER #USA [Business Insider](#) [Yahoo! Finance](#)

BIOTECHNOLOGY

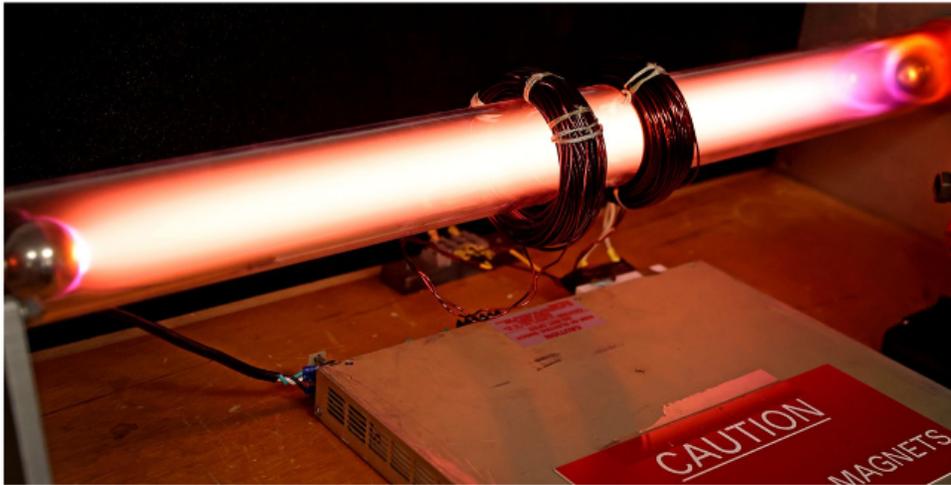
→ **Researchers have developed new approaches to visualize DNA repair in detail, paving the way for new cancer therapies.** With the help of a machine learning analysis method designed by the Spanish National Cancer Research Center (CNIO) Confocal Unit, the researchers used high-throughput microscopy that allowed them to observe thousands of pictures of cells after induction of genetic damage. In the first phase, they introduced more than 300 proteins into the cells and evaluated whether they interfered with DNA repair, allowing them to discover nine new proteins that are involved in DNA repair. Understanding how DNA is damaged and repaired is crucial to learning how cancer develops and how it can be fought. This advancement in DNA repair research can help develop better cancer therapies while protecting healthy cells. #BIO #ESP [GenEng](#)

→ **Roche has secured its first FDA emergency approval for a rapid, over-the-counter COVID-19 test as the U.S. government seeks to boost at-home screenings amidst the spreading Omicron variant.** Roche's test, distributed in collaboration with South Korean manufacturer [SD Biosensor](#), uses a nasal swab sample that allows people to receive results in about 20 minutes for COVID-19 and all its variants, including Omicron. The Big Pharma's antigen diagnostic kit will first be available on pharmacy and retail shelves in January. This comes as the Biden administration announced a plan to purchase 500M self-tests and mail them to people who request them for free. It also plans on pushing private insurers to cover the cost of at-home tests and continuing using the Defense Production Act to deliver federal funds to increase the manufacturing of rapid tests. #BIO #USA [FierceBiotech](#) [Swissinfo](#)

GREEN TECHNOLOGY

→ **After breakthroughs this year, scientists and investors believe that nuclear fusion could start sending power to electricity grids in about a decade.** In September, MIT and

[Commonwealth Fusion Systems](#) demonstrated that, while using relatively low-cost materials that don't require a large amount of space, they could create the most powerful magnetic field of its kind on Earth. This is a critical component of the prototype fusion reactor the company is building in Devens, Massachusetts. With some \$2B raised in recent years — more than any of the other fusion startups — Commonwealth Fusion Systems's goal is to show that their prototype, called SPARC, will produce more energy than it consumes in 2025. If they succeed, the company plans to start building their first power plant several years afterward. The company's goal is to help build 10K 200-megawatt fusion power plants around the world, enough to replace nearly all fossil fuels. #GRN #USA [Boston Globe](#)



Plasma in a glass tube with electric magnets at the MIT Plasma Science and Fusion Center in Cambridge. DAVID L. RYAN/GLOBE STAFF

→ **Earlier this year, China reached its own milestone in its quest for a fusion reactor as its “artificial sun” demonstrated the ability to sustain extreme temperatures (several times hotter than the Sun) for longer than previous benchmarks.** The Experimental Advanced Superconducting Tokamak (EAST) set a new record by achieving a plasma temperature of 120 million degrees Celsius for 101 seconds and realizing a plasma temperature of 160 million degrees Celsius for 20 seconds. EAST, located at the Institute of Plasma Physics of the Chinese Academy of Sciences aims to mimic the nuclear fusion process of the sun, using deuterium found in the sea to provide clean energy. #GRN #CHN [SCMP](#)

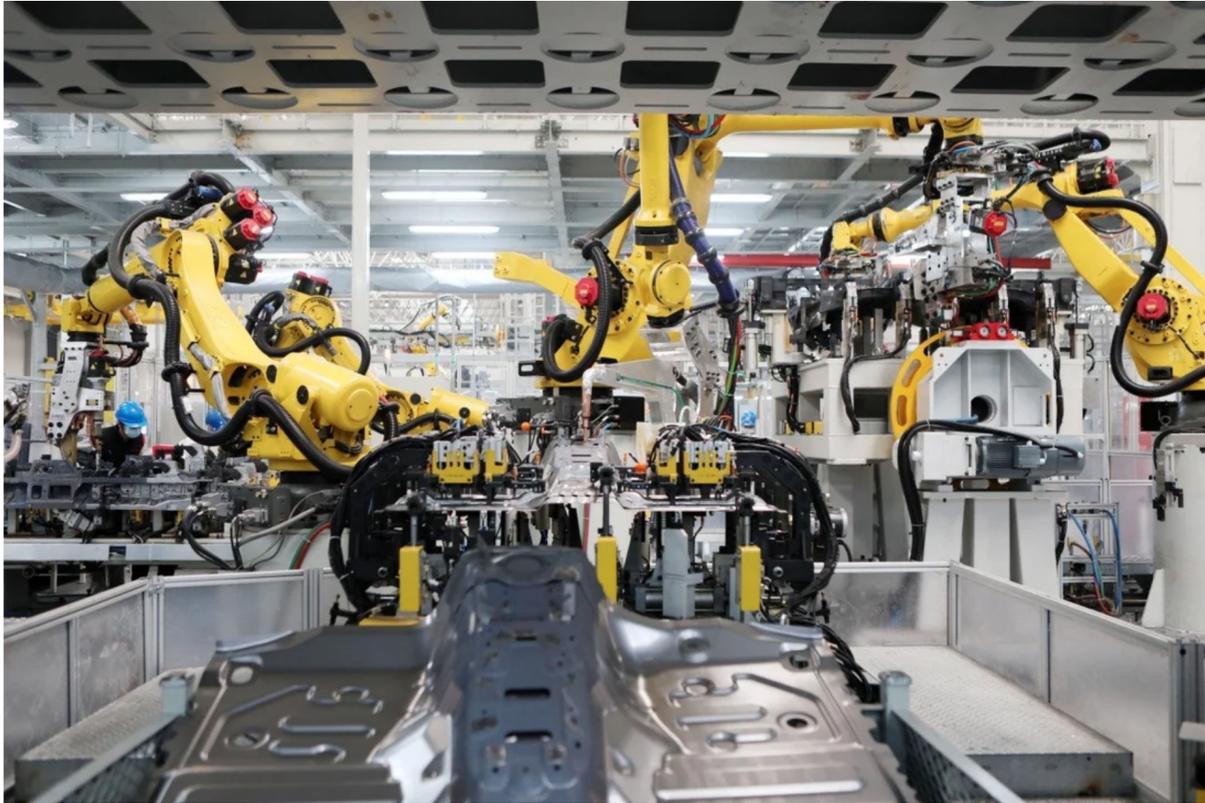
→ **Investors are betting that more EV companies will succeed in manufacturing at scale in 2022.** Investor money this year poured into [Rivian](#) and [Lucid Motors](#), valuing the EV companies at a combined \$150B. Other U.S. EV makers, including [Canoo](#), [Lordstown Motors](#), and [Fisker](#) have entered the public markets in the past year-plus with promises to start delivering vehicles in 2022 or 2023. Moreover, Harley-Davidson is spinning off its nascent electric motorcycle division, Livewire, which will go public through a special purpose acquisition company valued at \$1.8B. For EV companies to manufacture at scale, they will have to contend

with ongoing supply chain disruptions, labor market challenges, inflationary pressures, increasing competition, and the likelihood of higher capital costs. #GRN #USA [CNBC](#)

→ **The first car with Huawei's HarmonyOS operating system, the Aito M5, marks Huawei's entrance into China's EV race with Tesla.** Deliveries of the Chinese vehicle will begin around February 20th. Post-subsidy prices for the Aito M5 start at 250K yuan (\$39,063), a price that's lower than Tesla's Model Y, which starts at 280,752 yuan after subsidies. Richard Yu, executive director and CEO of Huawei's consumer business group claims that the Aito M5 offers peak power and driving range that is better than the Model Y. However, unlike Tesla's cars the Aito M5 is not purely powered by electricity. It has a fuel tank for extending the driving range when the battery has run out of power. #GRN #USA #CHN [CNBC](#)

ADVANCED MANUFACTURING

→ **China has unveiled a set of ambitious goals to enhance automation in manufacturing.** Under a five-year plan jointly published by several government agencies, China aims to achieve a minimum annual growth of 20% in robotics sales and double its "robot density." China has become one of the most aggressive countries in replacing human labor with machines, partly in response to the country's aging and shrinking workforce. According to a report from the International Federation of Robotics this month, China last year ranked 9th in robot density – measured by the number of robot units per 10,000 employees – up from 25th five years earlier. With a robot density of 246 per 10,000 employees, China still lagged behind South Korea, which has a current density of 932 and has ranked first since 2010. China's level was above the global average of 126, and close to the U.S. at 255. As part of its latest plan for smart manufacturing, China aims to digitize 70% of domestic manufacturers by 2025. By that same year, China wants to build at least 500 smart manufacturing model factories to lead the development of smart manufacturing, and cultivate at least 150 smart manufacturing solution providers.



Robotic arms work on a SUV production line of a Great Wall Motors factory in Chongqing, China. Photo: VCG

#MFG #USA #CHN #KOR [SCMP](#)

AUTONOMOUS SYSTEMS

→ **Japanese automakers, including Toyota and Mazda, plan on equipping their main models with level 2 self-driving technology by 2022.** Level 2 allows hands-free driving on highways, but leaves the driver as the vehicle's main operator. With U.S. and Chinese rivals outcompeting Japan in the AV industry, Japanese carmakers see a need to quickly install self-driving capabilities in their products. However, this move is still not sufficient to surpass Japan's foreign competitors. Tesla already has level 2 on its models as standard and Waymo is developing level 4 and above technology, paving the way for full automation. #AUT #JPN #USA #CHN [Nikkei Asia](#)

→ **Waymo, Alphabet's self-driving technology arm, is partnering with Chinese automaker Geely to build an all-electric, self-driving ride-hailing vehicle.** The partnership will integrate Waymo Driver, Waymo's AV system, into Geely Zeekr vehicles for use in U.S. markets, though the timeframe of this project is still unclear. This partnership demonstrates Waymo's multi-platform approach to original equipment manufacturer (OEM) partnerships. Currently, Waymo's ride-hail fleet consists of Jaguar I-Paces and Chrysler Pacificas. It has also expanded its partnership with Stellantis, which owns Fiat Chrysler cars. #AUT #USA #CHN [TechCrunch](#)

SEMICONDUCTORS & CHIPS

→ **India has allocated \$10B to incentivize domestic semiconductor manufacturing in a move that has already attracted Intel to build a plant in the country.** Currently, India relies on overseas manufacturers for most of its semiconductor requirements. Because of the global chip shortage, the Indian government wants to expand the domestic semiconductor industry and become more independent in chip production. The \$10B scheme will help develop a complete semiconductor ecosystem in India, ranging from design, fabrication, packaging, and testing. Under the plan, the government will extend fiscal support of up to 50% of a project's cost to eligible fabricators. India expects its plan to create 35,000 high-quality jobs, 100,000 indirect jobs, and attract \$8.8B worth of investment. #CHP #IND [TechWire Asia](#)

→ **The chip shortage has wreaked havoc on many companies in 2021 and is expected to last well into 2022; however, companies can redesign their products to combat chip shortages.** The first way to redesign products is to design for resilience, which refers to building products with interchangeable parts that can be swapped out if supplies develop in the future. This allows companies to weather supply shocks with more flexibility and minimize their exposure to supply shocks altogether. The second approach to product redesign is designing for availability, which involves redesigning a product when a shortage occurs, making use of whatever material might be used to fill the gap. Companies can achieve this by using agile engineering teams that can quickly achieve redesign, focusing only on addressing areas affected by the supply shortage. The most effective agile teams rapidly modify software to accommodate new parts, adjust the current product to free up resources for more important features, and use rapid prototyping and testing to validate new designs. Tesla has been cited as a prime example as they survived this year's chip shortage by continuing to outsource hardware semiconductors, but designing chip software inhouse. #CHP #SCRM [HBR](#)

QUANTUM TECHNOLOGY

→ **Scientists have identified the first “quantum entangled” animal in history.** Called tardigrades, they are microscopic multicellular organisms known to withstand extreme living conditions through a latent state of life known as cryptobiosis. In a study, researchers coupled a tardigrade with a superconducting qubit and then created a highly entangled state with another qubit. This experiment is a big advancement because it combines present-day technology with biological matter and quantum matter, two things that are seldom



discussed together. If it continues, this experiment could be a key step in creating technology built at the intersection of quantum and biological matter. #QNT #BIO [Quantum Insider](#) [WION](#)

→ **Rigetti Computing, a pioneer in hybrid quantum-classical computing, introduced its next-generation “Aspen-M” 80-qubit quantum computer into private beta.** Assembled from two 40-qubit chips, Aspen-M is the world’s first commercial multi-chip quantum processor. Separately, a new Aspen system based on a single-chip 40-qubit processor was released publicly. Rigetti’s new processors have improvements in scale, speed, and fidelity – metrics critical to unlocking commercial value. In addition to doubling the processor size over its previous generation, the systems powered by these processors deliver a 2.5x speedup in quantum processing times and reduce readout errors by up to 50%, improving the reliability of quantum program results. #QNT #USA [Quantum Insider](#)

GEOPOLITICS

→ **China’s securities regulator laid out draft rules for Chinese companies listing overseas.** The draft rules were released last Friday after a nearly six-month pause in Chinese listings in the US after China said it would crackdown on its companies listing overseas following Didi’s debut on the NYSE. The China Securities Regulatory Commission (CSRC) said the draft rules aren’t meant to tighten policies for overseas listings though it also stressed that companies listed overseas can’t leak state secrets and that they must follow domestic regulations such as foreign investment, cybersecurity, and data security laws. It is seeking public consultation until January 23. The rules also blessed the structure known as [variable interest entity \(VIE\)](#) which has been used by virtually every Chinese internet company to get around China’s restrictions on foreign investments in domestic businesses since the early 2000s. The rules also require companies to get CSRC approval before cooperating with investigations by overseas regulators. CSRC also requires companies seeking to list overseas to divest all their domestic assets or operations as a way to mitigate national security concerns. #Geopolitics #CHN #USA #HKG [WSJ](#) [Bloomberg](#)

→ **A recent spat between Senator Marco Rubio and consulting giant McKinsey over its work for the Chinese government highlights the increasing pressure on some companies to choose sides between Washington and Beijing when making business decisions.** In a December 16th letter to McKinsey, Senator Rubio wrote, “It has come to my attention that McKinsey & Company appears to have lied to me and my staff on multiple occasions regarding McKinsey’s relationship with the Chinese Communist Party and the Chinese government.” Rubio contends that the firm told him the CCP nor the PRC was a client of McKinsey, but later disclosed its work for the Chinese government. Rubio’s letter said “These previously undisclosed relationships between McKinsey & Company and the CCP, the Chinese government, and CCP-related entities pose serious institutional conflicts of interest... It is increasingly clear that McKinsey & Company cannot be trusted to continue working on behalf of the US Government, including our Intelligence Community.” As we previously reported,

McKinsey has historically done classified work for both the US IC and Chinese government, putting US national secrets at risk. McKinsey has worked for CIA, FBI, NSA, and DoD. And at the same time, the firm represents, or has represented, 22 of the 100 largest Chinese state-owned enterprises and 9 of the top 20 Belt & Road Initiative (BRI) contracts. #Geopolitics #CHN #USA [Newsweek](#)

→ **The US Department of Labor awarded \$5M focused on improving the working conditions in Peru and Ecuador by combating illegal, unreported, and unregulated fishing in coastal communities.** Illegal fishing operations yield an estimated 26M tons of fish per year - valued at approximately \$23B - roughly equal to 15% of world fisheries' annual production. And China bears much responsibility. In 2020 a PRC fishing fleet numbering hundreds of vessels fished waters outside of the Galapagos Islands and many large PRC-flagged fishing fleets have repeatedly fished the area in recent years. In 2017, Ecuador seized a PRC vessel in the Galapagos carrying 300 tons of wildlife. The US Coast Guard has been working with countries in the area for years to train them for combating illegal fishing. #Geopolitics #SCRM #USA #CHN #PER #ECU [US Department of Labor](#) [US Department of State](#)

→ **President Joe Biden signed a defense spending bill including sections calling on Taiwan's participation in a 2022 joint Naval exercise and recommending that Taiwan's asymmetric defense capabilities be strengthened.** On Monday, December 27, President Biden [signed](#) the National Defense Authorization Act for fiscal year 2022 into law. The \$768.2B law includes \$740B for the defense department, \$25B more than the \$715B Biden had requested. Section 1246 of the act calls for continued support for Taiwan's military to enable it to maintain a self-defense capability. This section of the act also states that "Taiwan's naval forces should be invited to participate in the Rim of the Pacific exercise in 2022. First started in 1971 and held every two years, the U.S.-led RIMPAC is the largest international maritime warfare exercise. Section 1247 obligates the U.S. to resist an effort by China to invade and seize Taiwan. Section 1248 recommends building up Taiwan's asymmetric defenses, including "coastal defense missiles, naval mines, anti-aircraft capabilities, cyber defenses, and special operations forces." #Geopolitics #USA #CHN #TWN [Taiwan News](#)

CYBERSECURITY

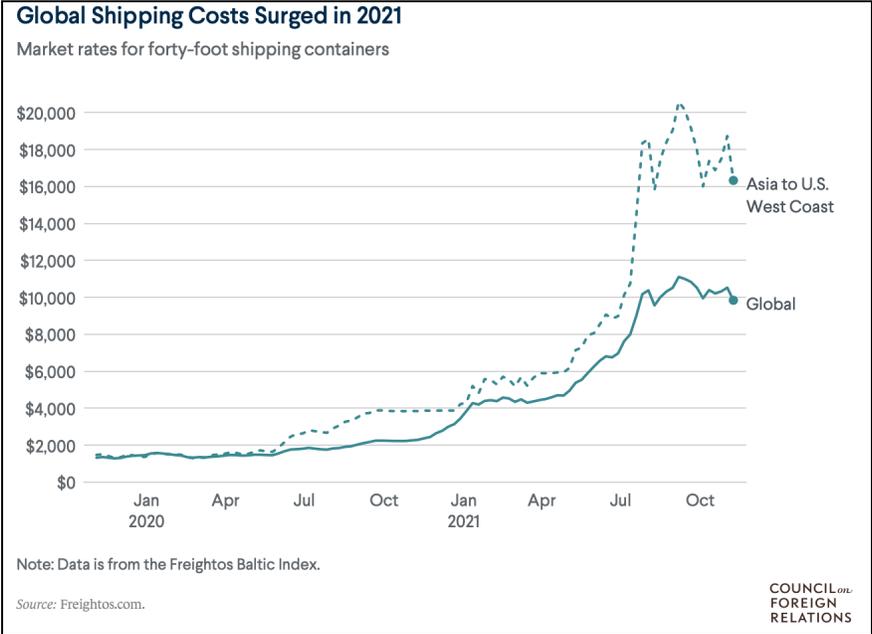
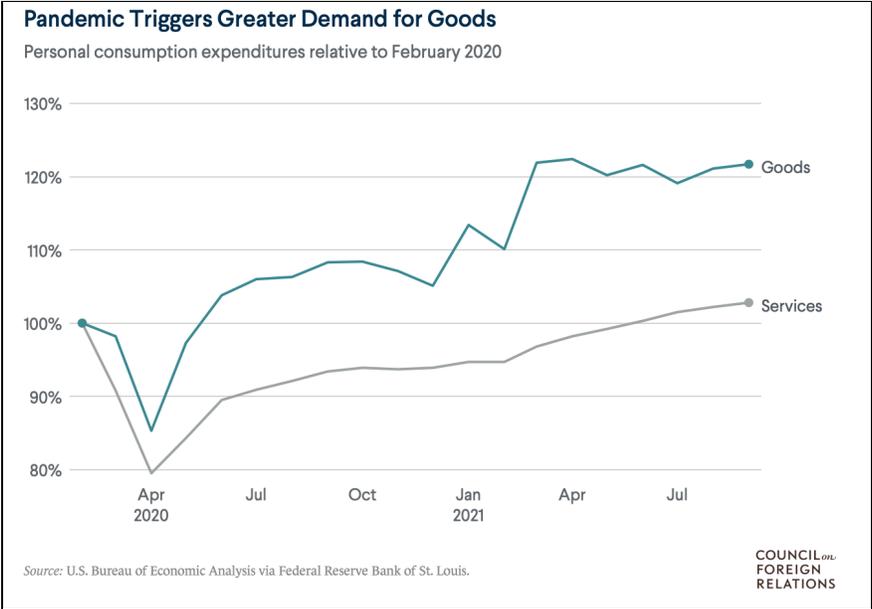
→ **Microsoft said it won't fix or is delaying patches for several security flaws impacting Microsoft Teams' link preview feature reported since March 2021.** German firm Positive Security discovered (and reported to Microsoft) four vulnerabilities leading to server-side request forgery, URL spoofing, IP address leak, and denial of service. Out of the four vulnerabilities Microsoft addressed only the one that attackers could use to gain access to targets' IP addresses if they use Android devices. Regarding the other bugs, Microsoft said they wouldn't fix the SSRF in the current version while a fix for the DoS will be considered in a future release.

Microsoft said the reported bugs do not present an immediate threat to users. #Cybersecurity #USA #DEU [Bleeping Computer Threatpost](#)

→ **Meta has filed a lawsuit in a California court against the operators of more than 39K phishing sites that have been hosted through the Ngrok service.** The company is seeking to obtain a court injunction and damages of at least \$500K from the operators of these sites, even before they are identified, according to [court documents](#). The lawsuit alleges that the group created phishing sites on their local systems and then used [Ngrok](#), a localhost-to-internet relay service that allows developers to expose their local sites on the ngrok.io domain. The group then spread links to these ngrok.io domains to victims and collected their account credentials. **According to Meta, since 2019, the operators of this scheme—listed in court documents as 100 unnamed John Does—are believed to have created and hosted more than 39K phishing sites impersonating the login pages of Facebook, Messenger, Instagram, and WhatsApp.** #Cybersecurity #USA [The Record](#)

SUPPLY CHAINS

→ **The Council on Foreign Relations provides an overview of the origin of the 2021 global supply chain disruption.** As COVID-19 vaccines became widely available in the U.S. and the economy reopened, consumer demand recovered strongly. Significantly, the pandemic-induced increase in demand for goods persisted even as demand for services (such as dining out, entertainment, and travel) largely returned to pre-pandemic levels. Companies—which for decades had been disciplined by the market into creating “just-in-time” supply chains and holding little inventory—scrambled to keep up. At the same time, companies in critical sectors such as warehousing struggled to attract and retain workers. These factors, combined with years of underinvestment in U.S. infrastructure, saw goods-laden containers piling up at major ports and ships waiting for weeks to dock. As a result, shoppers around the country saw sparse shelves and higher prices.



#SCRM [Council on Foreign Relations](#)