



#### Telecom

# THE 5G BATTLE HINTS AT COLD WAR 2

What's the battle over Huawei and 5G really telling us? Compared to China, the U.S. has underinvested in developing 5G technology, and now finds itself behind. Meanwhile, within the U.S., the Pentagon has been granted sole access to the low-frequency spectrum at which 5G is fastest and most effective, forcing companies offering U.S. commercial 5G to use a different and more technically challenged spectrum, with special equipment unique to the U.S. market. Meanwhile, the remainder of the world, including China and Huawei, has made the low-frequency spectrum available for commercial exploitation. Additionally, although the U.S. government is aggressively finger-wagging at other countries as an admonition not to buy 5G equipment from Huawei, the world is thus far largely ignoring these protestations. Washington is responding, in turn, with a broader "Cold War" to separate technology and brainpower so that it doesn't get surpassed in other technology areas. Are America's tactics sufficient or sustainable to continue to beat China in aviation, biotech, AI and microchip manufacturing down the road?

## TAKE AWAYS

- The U.S. finds itself trailing China in the development of 5G technologies due to the current lack of business ROI and minimal investment by government.
- While the U.S. has cited Huawei's 5G equipment as a spying risk, America's allies have responded by saying that Washington has provided no evidence of such risk, and these allies are mostly going forward with their Huawei deals.
- The focus on Huawei belies larger concerns within Washington: "dual use" military/civilian technologies and the specter of tech arenas where China is achieving parity, if not outright supremacy, in the coming years.
- A "Cold War 2" focused on technology and brainpower is brewing between Washington and Beijing.

## IMPLICATIONS

- 5G in the U.S. (true 5G) rolls out slowly and on a limited basis until more "killer apps" create demand – perhaps from autonomous cars and 8K video.
- The rest of the world consummates deals with Huawei despite coercion from the U.S. not to do so.
- U.S. credibility and leadership become reduced, accelerating the Global Realignment we have written about.
- The U.S. puts up more protectionist barriers around institutions of higher learning, R&D and commercial trade secrets, further reducing international collaboration.
- U.S. institutions of higher education suffer from dropping enrollments because of fewer matriculations from China, just as America's own pool of college-aged students is shrinking.
- While centered on 5G today, new fears will emerge regarding Chinese capabilities in aerospace, AI, military equipment and eventually microchip manufacturing.

## Dual Use Is the New Risk and 5G Is the First Battlefront

In the 1970s and 1980s, roughly 70 percent of America's military technology was proprietary, whereas another 30 percent was "off the shelf" commercial equipment also available to the civilian sector, known as "dual use." Today, 70 percent of military materiel is dual-use technology, while only 30 percent is proprietary. Such a shift has augmented concerns about commercial equipment that could contain malware or nefariously designed hardware, as more and more electronic components are manufactured outside the U.S. In response to such fears, Pentagon officials have created a new Office of Commercial and Economic Analysis to check the supply chain of Defense Department equipment, down to thirdtier-level suppliers, looking for possible schemes to infiltrate military security, particularly from China. The dual-use nature of equipment raises the stakes for who controls

the components of technology and digital equipment. (*Economist*, 5/18/19)

The stakes further raised are because, in some technological arenas over the last few years, China has advanced to the forefront and become а major equipment supplier, while America has lagged. 5G technology is a marguee example of this shift. Together,

Chinese government institutions and Chinese companies hold 36 percent of the global patents on 5G technologies, while U.S. companies hold just 14 percent. The difference may result in part from differences between the Washington and Beijing models of managment. Washington has left 5G development largely up to the private sector, as it does with the development of most technologies today. Its deployment rests on investments from private-sector companies such as Verizon and AT&T, which are still paying off their privately funded investments in the rollout of 4G earlier this decade. Meanwhile, Beijing has invested \$180 billion in research and development for its 5G technology and plans to spend another \$180 billion to deploy 5G networks over the next five years. China Mobile alone, one of the three big Chinese telecom providers, plans to install 50,000 5G transmitters in 50 cities this year. Its 5G handset will cost just \$145 by the end of 2020, according to company plans, whereas U.S. carriers are planning 5G handsets that will cost in excess of \$1000. Beijing's strategy is to "own" the latest mobile communications technology and sell it to the world, as it continues its shift away from selling toys, clothes and furniture, and moves toward selling airplanes, biotech and digital equipment. This is the "China Dream" central to President Xi's philosophy. (*Economist*, 5/18/19; *Financial Times*, 6/19/19; *China Daily*, 6/29/19)

### Stymied by the U.S. Way of Operating

In contrast, the U.S. private sector is not being subsidized by government, nor does it appear very selfmotivated to roll out true 5G quickly, considering the

> large outlays made for 4G. Both AT&T and Verizon have some markets set up for what they are calling "5G," but the companies are just using 5G as a marketing term, because they are actually offering only a sped-up version of existing 4G networks that don't actually meet the global 5G mobile standards. The rollout of 5G in the U.S. is likely to be slow, until there are some "killer apps" for which American companies can charge more and recoup their investments. (CNBC, 5/22/19)

The U.S. has further stymied its own position in terms of commercial 5G by limiting itself to a higher frequency of 5G spectrum than that of the rest of the world. The Pentagon has a monopoly on the lower frequency spectrum that the rest of the world is planning to use for 5G, and this spectrum is desirable because it allows communications to penetrate walls and go around buildings, much as 4G already does. However, the Pentagon does not want to share this spectrum with consumer/civilian applications, forcing American 5G up into a higher frequency range, which a foggy day, blowing leaves or building walls can easily disrupt, raising the question how this spectrum could even ultimately be used



for, say, communication between autonomous cars when there are minor changes in the weather. The Pentagon's own Defense Innovation Board, which brings together technology industry executives and researchers to advise the Department of Defense, has chastised the military for not opening up this spectrum, saying the failure to do so will cost the U.S. billions of dollars in potential business. A test done by Google demonstrated that, by limiting the civilian use of lower-frequency spectrum in the U.S., the deployment of 5G will require five times as many base stations to cover the same area as the equivalent area elsewhere in the world. (*New York Times*, 7/2/19; *Financial Times*, 6/19/19; *Economist*, 5/18/19)

In other words, the U.S. has had very little centralized support of, or planning toward, its development of 5G, and has fallen behind. This has resulted in Washington leading a global finger-wagging campaign in

an attempt to stop other countries from using equipment from the global leader, Huawei. So far this tactic has largely failed globally, notably with nationalsecurity advisors in both Germany and Britain admitting they cannot see what the security risk is that the U.S. has warned about and claiming the U.S. has not provided any evidence of it. The UK has made a preliminary decision

to allow the use of Huawei 5G. Germany's Siemens is going so far as to set up a 5G-research lab of its own in China. Meanwhile, Italy has done a deal in which Huawei will invest \$3.1 billion in Italy over the next three years to develop 5G, including setting up a laboratory with the University of Pavia. It is not surprising that the deal in Italy came shortly after Italy formally joined China's Belt and Road Initiative. This is the Global Realignment in action. (*Bloomberg Businessweek*, 6/17/19; *Associated Press*, 5/21/19; *China Daily*, 7/23/19 and 7/25/19)

Explanations from the White House regarding the Huawei security risk have also been inconsistent, something President Xi has complained about to foreign diplomats. President Trump has at times said that the world cannot accept the spying risk of 5G equipment from Huawei. But on occasion, in his trade negotiations he has suggested that perhaps Huawei's equipment could be given a blessing from Washington – that is, under a new trade deal – if one ever comes. So is Huawei a real security risk? Is it a bargaining chip in a trade dispute? Is it a long-term risk to American economic competitiveness? (*New York Times*, 7/2/19; *Economist*, 5/18/19)

#### The Bright Shiny Object, Huawei, Obscures a Brewing New Cold War

While President Trump appears to be somewhat mixed up about the long-term security concerns of using foreign technology, the rest of the federal government remains more focused on such risks, albeit a broader array of areas than just 5G. Between March and November 2018, the U.S. Department of Justice indicted a dozen individuals

> and entities it says were directed by Beijing to steal secrets from 15 companies, predominantly in high-tech areas. Moreover, last November, the Department of Justice established the China Threat Initiative, whose staff monitors attempts by Chinese agents to steal trade secrets or to influence domestic opinions, particularly on U.S. university campuses. An effort is also slowly emerging to separate Chinese nationals from sensitive technology and teaching areas in the American higher education system. In April, FBI chief

Christopher Wray urged academic institutions to be wary of how others may exploit America's open and collaborative research environment. Some visas for Chinese academics have been pulled, and some U.S. universities have dismissed both Chinese and American academics for not fully disclosing their ties to Chinese institutions. Both foreign and American academics have been arrested for stealing trade secrets. On a broader undergraduate level, the number of Chinese students enrolling at U.S. schools has been dropping, falling a full 39 percent since 2015. The growth of such enrollments from 2007 to 2015 had helped keep many U.S. colleges funded. (*Chronicle of Higher Education*, 6/7/19; *Economist*, 5/18/19)

Washington is seeking to separate China and the U.S. in other areas. CFIUS, the Committee on Foreign



Investment in the United States, for example, forced the Chinese owners of Grindr, the dating app for gay men, to divest the company, out of fears that Beijing would use data culled from the app to blackmail American gay men, including potentially those working for the U.S. government. CFIUS also expanded its purview into new areas, such as Chinese or other foreign nationals purchasing property near sensitive sites or taking stakes in various "critical technologies." (*Economist*, 5/18/19)

Such efforts have triggered retaliations from Beijing. The Middle Kingdom is warning its citizens not

to travel to the U.S., is dissuading more of its students from studying here, versus in Europe, and has harassed employees in a series of American Cultural Centers in China run by the U.S. State Department, which has opted to defund them. (*Economist*, 5/18/19)

Yet the fact remains that the U.S. and Chinese economies are highly intertwined, with companies on either side of the Pacific relying on the customers or components of those on the other. A new technology Cold War, if it were to develop further, could impact both countries negatively, as well as all the other countries depending on them for growth.