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Policy | brief

The global 5G race: South Korea speeds ahead

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South Korea has become the first country in the world to launch commercial 5G services on 3 April. 5G economic benefits are estimated to include worldwide revenues of €225 billion by 2025 and a wealth of job creation. The US, China, South Korea and the EU are economic powerhouses vying to lead the unfolding global 5G market. US and China are strongly positioned in the current telecom market, but their growing 5G competition is spilling over into geopolitical competition. Wary of being swept up in US-China rivalry, the Moon government is banking on building strong 5G market competitiveness and doubling down on the IT sector which represents a critical economic growth engine domestically.

South Korea has become the first country in the world to launch commercial 5G services on 3 April. The fifth generation of wireless information technology enables ten times more devices to connect to a network with ten times faster maximum speed, i.e. 1 Gbps to 4G's 100 Mbps. Worldwide commercial revenues are estimated at €225 billion by 2025, and industrial applications will generate an additional €114 billion, along with a wealth of job creation.

5G networks can support the machine-to-machine communication necessary to operate autonomous vehicles, smart hospitals and smart factories, revolutionising these key industries. On the flipside of the coin, 5G presents considerable challenges to network security due to the higher levels of inter-connectivity. The US has warned against using Chinese telecom equipment – and particularly Huawei gear - in wireless networks, pointing to potential risks of espionage.

The US, China, South Korea and the EU are economic powerhouses vying to set standards and lead the global 5G market. Setting industry standards brings the privilege of dictating the rules to other market players. In the hope of becoming the torchbearer, countries are scrambling to be prepared for the 5G roll-out. US and China are strongly positioned in the current telecom market, but their growing 5G competition is spilling over into geopolitical competition. South Korea and Europe are also well-positioned to lead and are conducting key policy reforms and industry investments to foster their own competitiveness.

Several European countries, along with the US, China and South Korea, have held radio spectrum auctions which have revealed two 5G standards. While most countries have chosen the sub 6 Ghz frequency band, the US opted to build its 5G network above 24 Ghz (or mmWave). The practical reason is that much of the sub-6 spectrum in the US is reserved for use by the Department of Defense and other federal agencies. US telecom operators, Verizon and AT&T, have started to develop mmWave networks

and run the risk of having poor compatibility with the rest of the world's developing 5G markets.

On the other hand, China has opted to develop its 5G network on sub-6 spectrum. Chinese tech giant Huawei takes the market leader position in the global equipment market with a share of 28%, ahead of Finland's Nokia (17%), Sweden's Ericsson (13%) and US' Cisco (8%). Having started its 5G research back in 2009, Huawei claims to be at least twelve months ahead of any contender. Already supplying 30% of the European equipment market, Huawei is currently shipping its 5G base stations to several European countries and, also, a growing list of Southeast Asian countries such as Singapore, Malaysia, Philippines and Thailand.

Against the backdrop of a trade war, the Trump administration has taken on a hard-line stance towards Huawei. A few months after the arrest of Huawei's chief financial officer, President Trump issued an executive order on May 16 barring US telecom companies from selling parts to any foreign adversaries who pose a risk to national security. China's chipmaking industry is known to be reliant on foreign suppliers. However, the Chinese government has been working on building a competitive semiconductor sector, in line with its Belt and Road Initiative to foster competitiveness in global key sectors, which includes establishing a self-reliant supply chain. Thus, this move will likely result in nothing but a speedier disengagement from American suppliers.

Prefaced by 5G trial services at the PyeongChang Winter Olympics last year, South Korea's three big carriers rushed the launch of the world's first 5G commercial services. The launch was complete with 5G-capable phones by Samsung Electronics and LG, and about half a million South Koreans subscribed to the services. Bracing for the lowest projected GDP growth of 2.6 per cent in the last six years, the Moon administration is searching for new growth engines to revitalise its economy. The nation's key sectors, ship-building and steel, have been taking hits due to low demand and increased Chinese competition. In contrast, the IT sector has been expanding its economic presence and registered a job growth of almost 7 per cent compared to last year.

The Moon government is doubling down on the IT sector and plans to transform the country to an innovation-led economy less dependent on manufacturing. A few days after South Korea's launch of 5G commercial services, on 8 April, the Moon government announced its "5G Plus Strategic Business" plan which intends to faciliate investments, including giving tax breaks to telecom companies. The government and private sector plan to invest $27 billion to establish a nationwide 5G network by 2022. The aim is to secure 15 per cent of the global 5G market by 2026, create 600 thousand jobs and reach $73 billion in exports.

South Korea already dominates the global memory market, with the world's biggest smartphone vendor Samsung Electronics and chipmaker SK Hynix holding a share of 60 per cent. Samsung Electronics also devotes a share of its portfolio to network equipment, but lags behind European and Chinese gear companies in sales. Only one of South Korea's three biggest telecom companies, LG Uplus, is working with Huawei for supply of 5G base stations, likely in continuation of a previous 4G network partnership. Other carriers, SK Telecom and KT, are working with Samsung Electronics' and European gear, supposedly due to cost and technical advantages. South Korean firms are developing 5G devices which can run on both sub-6 and mmWave networks, and US telecom companies are working with Nokia, Ericsson and Samsung to supply 5G equipment for its network. In other words, a trilateral 5G ecosystem is appearing between the US, South Korea and EU.

South Korea is banking on building strong competitiveness on the global market and is reluctant to be swept up in US-China geopolitical competition. The repercussions of the 2017 THAAD spat, in which China opposed the instalment of US missile systems on South Korean territory, were felt deeply with related economic losses of $6.8 billion. With

China as its biggest trade partner, South Korea is wary of undergoing another economic retaliation.

5G is a high stakes global competition with implications to both national security and economic sustainability. The US is running considerable risks by building on a different standard and by shutting the most technologically advanced player, Huawei, out of its 5G ecosystem. Presidents Donald Trump and Xi Jinping will meet at the G20 in Osaka on 28-29 June. Many are keeping a close watch on how they will set or bend the rules of competition. The Moon government is determined to cement South Korea as an important player in the Fourth Industrial Revolution, including 5G which represents a critical economic growth engine domestically. With a clear government-backed roadmap and strong market players, South Korea beat competitors to the punch with its speedy 5G commercial roll-out. This allows South Korea to showcase know-how and capture early sales, and they are likely to benefit further from the US-China rivalry if the US succeeds in containing Chinese competition.

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