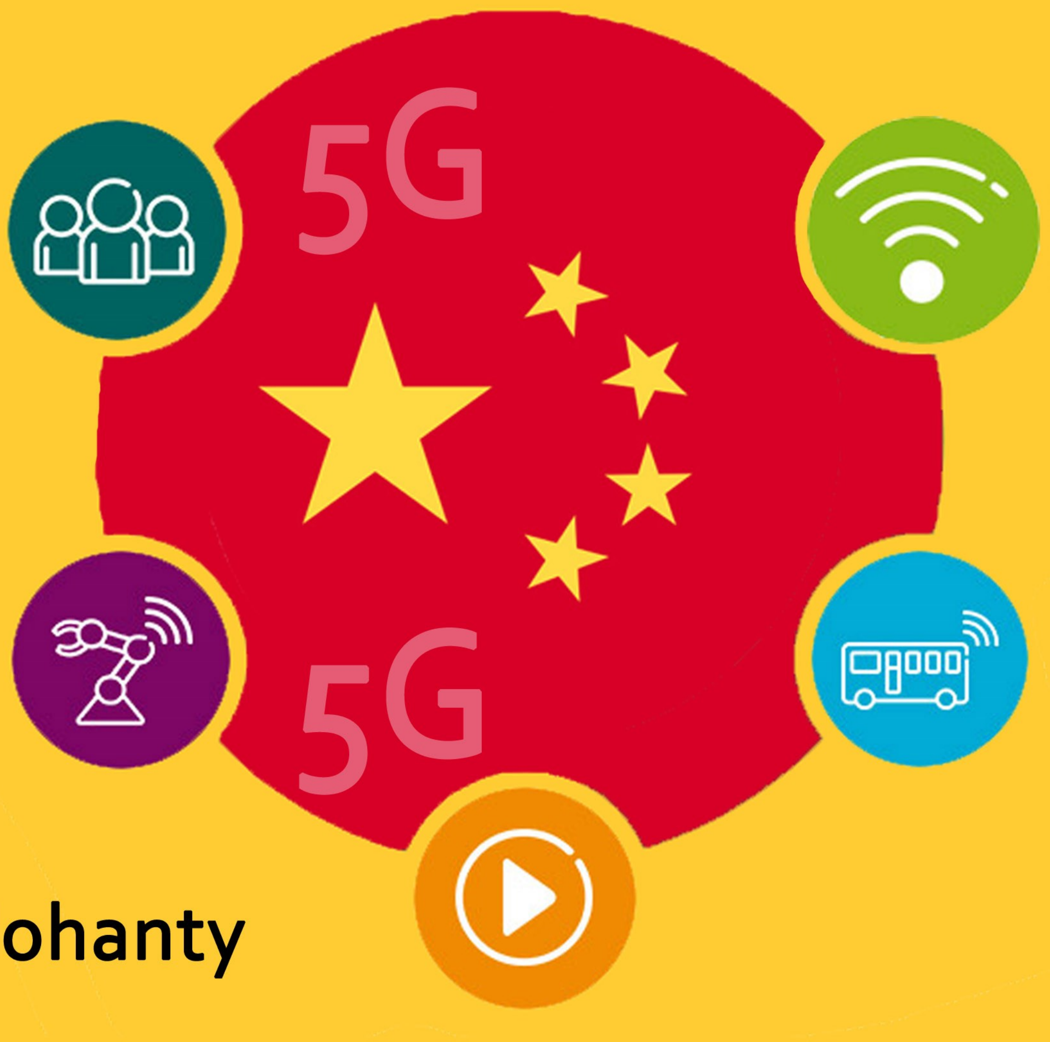
Vivekananda International Foundation

Troubled Times for China Technology

The Huawei Imbroglio



Aayush Mohanty

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3, San Martin Marg | Chanakyapuri | New Delhi - 110021
Tel: 011-24121764 | Fax: 011-66173415
E-mail: info@vifindia.org
Website: www.vifindia.org
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About the Author

Aayush holds a Bachelor's Degree in Political Science from Delhi University and completed his Master's in Conflict Analysis and Peace-building from Jamia Millia Islamia. Previously worked as a Research Consultant at National Commission for Denotified, Nomadic and Semi-Nomadic Tribes. He is a Research Associate at the Vivekananda International Foundation.

Troubled Times for China Technology - The Huawei Imbroglio

Preamble

On the side-lines of the US-China trade war is the question of Huawei's future as it makes rapid progress and has taken orders to build fifth-generation internet infrastructure not just in China but in many countries spanning continents. The Trump administration has clamped down on Huawei in the US, while also telling close allies to stop doing business with them which is suspected of having close links with the People's Liberation Army (PLA).

Huawei has had to face tough challenges from the US administration which seems to have had an impact on its businesses in various countries while also giving its competitors some breathing space to work on the same technology. Incidentally, as the Chinese technology giant deals with its growing problems there is proportional escalation of the US-China trade war.

US measures against Huawei

The US administration has accused Huawei of various crimes like bank fraud and technology theft (23 indictments in January 2019). By May 2019, the US Department of Commerce's Bureau of Investigation (BIS) added Huawei and its affiliates to the Bureau's Entity List. According to the press release by the US Department of Commerce, this action has been taken on the basis that Huawei has "…engaged in activities that are contrary to US national security or foreign policy interest."[1] Any sale or transfer of American technology to a person or company in the Entity List needs a license issued by BIS, which may be denied if transfer or sale harms US national security or foreign policy interests. Along with the inclusion in the Entity List, President Trump has issued Executive Order 13873 directing the Secretary of Commerce and other federal agencies to implement rules which will prohibit persons subject to US jurisdiction from purchasing communications technology and services from 'foreign adversaries' in transactions that threaten US information and communications technology or services in extension US national security.[2] The order does not specifically identify Huawei, but the Department of Commerce plans to identify it as a "foreign adversary" which will lead to the imposition of restrictions on transactions between US persons and Huawei and its entities.[3]

Right after the punitive actions by the US administration against Huawei and its entities, US companies made radical changes as far as business with Huawei is concerned. Huawei phones, which primarily operate on the Android Operating System (Google's platform for phones) were temporarily removed from getting any new software updates. US chip companies like Intel, Qualcomm are also complying with the order.[4] It was also pushed out of non-profit organisations like SD Association and Wi-Fi Alliance which are based out of California and Texas respectively. SD Association develops the standard SD card along with the license of logo and trademark to other companies while the Wi-Fi Alliance certifies Wi-Fi products while developing new versions of the standard.[5] The blanket ban by the US administration on Huawei temporarily restrained its operations, until the Bureau of Industry and Security gave it a 90-day respite (ending August 19, 2019) by partially restoring the licensing requirements and policies under Export Administration and Regulations (EAR). Which has led to Huawei within a couple of days being brought back under the Android program and the aforementioned non-profit organisations.[6]

The 90 days respite might be good news for Huawei, its non-US based entities and the customers, but 90 days seems less considering that the threat of the blanket ban still looms over the technology giant. This respite does not necessarily mean that US based companies are back to doing business with Huawei, rather, Facebook has decided not to let Huawei's future phones shipped with the apps pre-downloaded (including WhatsApp and Instagram) in them in non-China market. The issue does not seem pressing but delivers a significant blow to Huawei to deliver third-party apps to its customers, which would mean a mammoth task of making its applications store (like the Apple Store or the Google Play Store).[7] Alphabet Inc., which owns Google, has made it clear that after the respite is over, they will not provide the Android operating system to any future Huawei phones. The decision by Google has led to customers contemplating in Europe and Asia as to whether buying a Huawei phone is a safe bet because of the uncertainties which might lead to a significant drop in the smartphone arm of the company.[8]

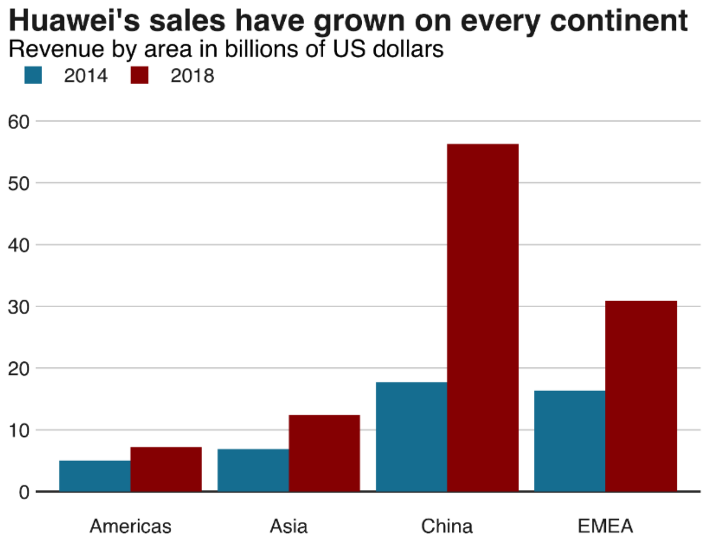
On the side lines of the G-20 Summit in Osaka, Japan, President Trump, after meeting President Xi, decided to relax the ban on Huawei business dealings with US companies. It was later clarified by the White House National Economic Council Director Larry Kudlow that Huawei was still in the Entity List, but temporary licenses will be granted. Observers and domestic critiques think that this proves that President Trump used Huawei as a political target. Huawei Public Relations executives have been insisting on the same for months. President Trump acknowledged that some items had no security implications, and even then they were banned by the executive order signed by him which claimed that selling US technology to China will have a "potentially catastrophic effect." The recent announcement might send a wrong signal to US allies as the Trump administration has been pressuring for ban on Huawei and other Chinese vendors from helping them to set up the 5G infrastructure. That gives Beijing an indication of instability in US' security policy.[9]

Are the US allies responding?

While President Trump's administration seems determined to give a black eye to the Chinese through Huawei, its plans to steamroll them worldwide and to stop the company from providing telecom gear for faster internet speeds seem to have no response whatsoever, even from its closest allies in Europe, South America and to an extent Asia (Japan and Taiwan have banned it along with Australia). The reasons for the US banning and encouraging others to ban Huawei equipment ranges from intellectual property theft to risk of espionage. One of Huawei's rotating Chairman in early 2019, in an opinion piece, expressed that while the US cites national security reasons to ban Huawei and other Chinese technology vendors and firms, this onslaught is stopping them from advancing in 5G technology, giving breathing space for western vendors to plays catch up.[10]

In early May 2019, 30 security officials met in Prague to thrash out a common approach on wireless safety. *"The customer -- whether the government, operator, or manufacturer -- must be able to be informed about the origin and pedigree of components and software that affect the security level of the product or service."* The proposal known as 'Prague Proposal' was attested by representatives from the European Union, NATO and Asian countries like Japan and the Republic of Korea. After the proposal was made, The White House Press Secretary announced that the US plans to use this as a guide to "ensure… prosperity and security".[11]

Members of EU and NATO do not seem enthusiastic about US plans for singling out a company, which is why Germany is planning for a more robust and stringent oversight, and the Italians have brushed aside the concerns raised by the US as they aim to increase its trade with China. Dutch Telecom operators, according to a preliminary report by the Dutch Ministry of Justice and Security, do not have to exclude any Chinese vendors from their plans of 5G as telecom providers in The Netherlands are supposed to take additional security measures and one of these is in critical telecom network parts from suppliers of services and products.[12] In Asia, Malaysia's Prime Minister has shown interest in working with the company on Artificial Intelligence, Thai officials hosted Huawei's first 5G facility in Thailand and Indonesia is also not paying heed to US warnings over the use of Huawei's equipment.[13]



(Source: https://www.bbc.com/news/business-46480208)

The US is on a similar warpath in South America, as it is in the rest of the world. Mexico and Argentina have their sights on 2020 to launch the region's first 5G network, with Brazil doing the same in 2021. Huawei has already opened an Internet of Things lab in São Paulo with further plans of an assembly plant in Brazil in late 2019. President Bolsonaro is facing a tough decision as US pressures to veto Huawei and the domestics pressure to let it invest, especially by Vice President Hamilton Mourão who sees China as an important partner rather than a strategic threat. Secretary of State, Mike Pompeo's comments on Huawei were not received well during his visit to Chile, which was apparent through a bitter retaliatory interview by the Chinese Ambassador in Santiago. Soon after the visit, the Chilean President attended the Belt and Road Summit and met executives from Huawei who pitched the idea of opening a plant in Chile, for which even Peru is interested.[14]

How is China (Huawei) responding?

After Google removed Huawei from providing with new and future updates, Huawei released a limited response to a well-known technology-blog wherein it reassured its customers that Huawei and its subsidiary brand handsets would continue to receive security updates and after-sales services that have already been shipped or are in stocks, no update was given on future handsets.[15] The blacklisting has put Huawei in a tough position as it is planning to sell its undersea cable operation, Huawei Marine Systems, which was established in 2009 and laid more than 50,000 km of cable across 90 projects. The sale might have been mitigated due to the spying charges on the Chinese technology giant. Huawei has also reportedly, at the beginning of 2019 reduced its smartphone manufacturing, as reported by Foxconn (the leading production and assembly partner) officials.[16]

Huawei's US Security Chief Officer, Andy Purdy, in response to the total blacklisting believes that sweeping statements about the technology giant comes from the skepticism of China's rise and that the statements against them has no specific backing of proof or evidence. He also mentioned that Huawei was open for a risk-mitigation agreement with the US administration, but the administration has shown no interest whatsoever while other technology companies like Nokia, Ericsson have the agreements in place.[17] Andy Purdy is former White House Staff and later, at Department of Homeland Security served as the co-chair of the National Cyber Response Coordination Group (NCRCG) and the representative to the Committee on National Security System (CNSS).[18] Like Andy Purdy, Huawei, with the help of the Chinese Communist Party and its proxies, has now a wide range of intermediaries who speak or act in its place. That the intermediaries include a well-known World Bank advisor, a minister in the Italian Government, the President of the Czech Republic, and so on, goes on to reflect the party's political warfare doctrine, 'uniting all the forces that can be united." In extension, Huawei has hired former cyber security officials in the Obama administration, former Chief Information Officer of the UK, a former head of British Petroleum and many others. Huawei plans to use these intermediaries as tools of corporate image making, which includes lobbying, advertising, and public relations.[19]

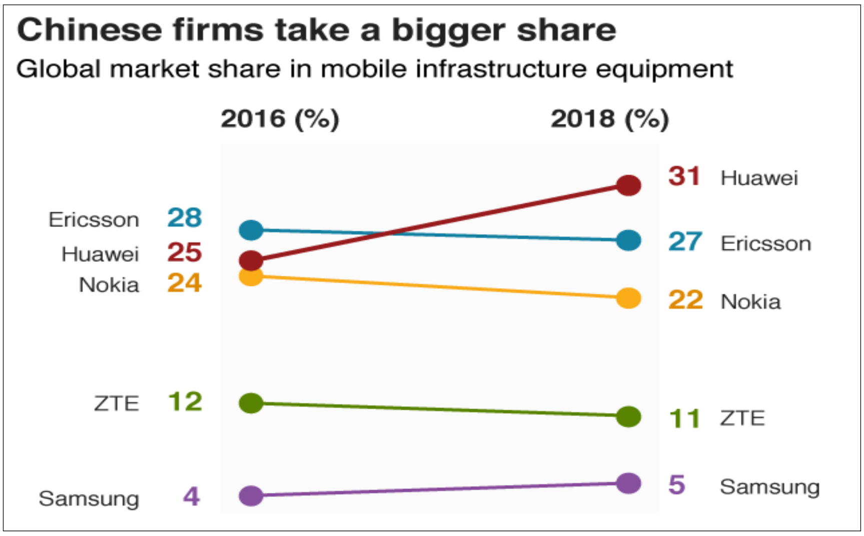
The Chinese Government's mouthpiece Xinhua, in a scathing article against the US administration has accused it of following the 'law of the jungle'. Xinhua's piece suggests that the US government tries to stop the growth of any non-US transnational firms who are trying to make a name for themselves in the global market in cutting edge technologies and products. The US government, according to Xinhua, slaps sanctions on foreign entities under rules and regulations which concern taxation, anti-corruption, investment and arms exports. The same applies to countries which the US deems as competition or rivals, thus exposing it to what

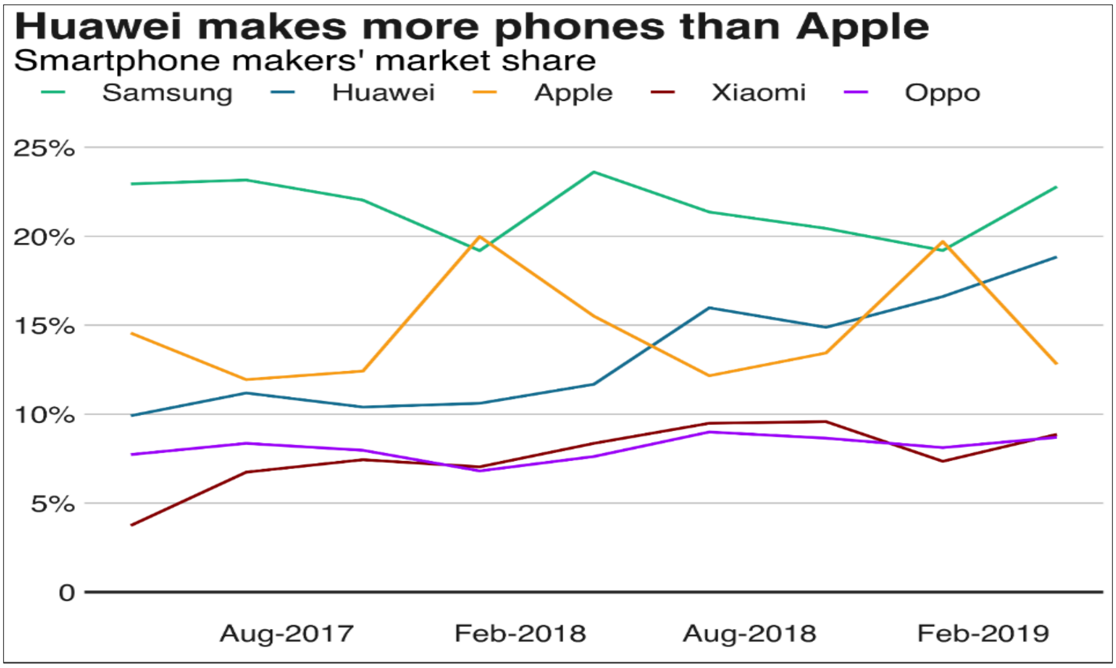
Xinhua calls abuse of Washington's jurisdictional power. The same jurisdictional power has not spared the firms from countries allied to the US and have found themselves under fire.[20]

The ban on Huawei on this scale has led to the Chinese government threatening retaliatory blacklist of 'unreliable entities'. In a series of meetings called by the members of the Ministry of Commerce, Ministry of Industry and Information Technology and members of China's National Development and Reform Commission with several of well-known semi-conductor firms, as well as other technology giants were warned against relocation of production lines. The Chinese state representatives in the meeting threatened dire consequences if the semi-conductor firms and technology giants do not do business with Chinese companies listed by the US Department of Commerce. The non-US companies were told that they would not face any consequence if they continue to do business with Chinese companies, but it might be a tough sell to US companies as they would not risk breaking US laws.[21]

Meanwhile, Huawei reportedly is 'intensively testing' its own operating systems named "HongMeng OS" for the Chinese Market and 'Oak OS' for international markets which would be installed in the new phones in place of Google's Android operating system.[22] However, Google has expressed a different concern as far as the US government ban is concerned. Along with losing revenue, Google also fears that Huawei would develop its own version of Android from the open source project (not having official security updates and without the Google Play store) which would make the new handsets susceptible to hacking, not the least from China. Senior executives from Google are pushing the US officials to exempt it from the ban of doing any business with Huawei.[23]

Huawei smartphone market sales are ballooning while its major competitors Apple and Samsung are facing decline as shipments have shrunk. This is keeping in mind that Huawei phones have had no access to the most lucrative and developed US market while making progress in the Chinese and European markets. Huawei has invested heavily at making devices which compared to its major competitors (who have made slight improvements in the last two years to their devices) are robust as far as general phone performance and the camera is concerned.[24]





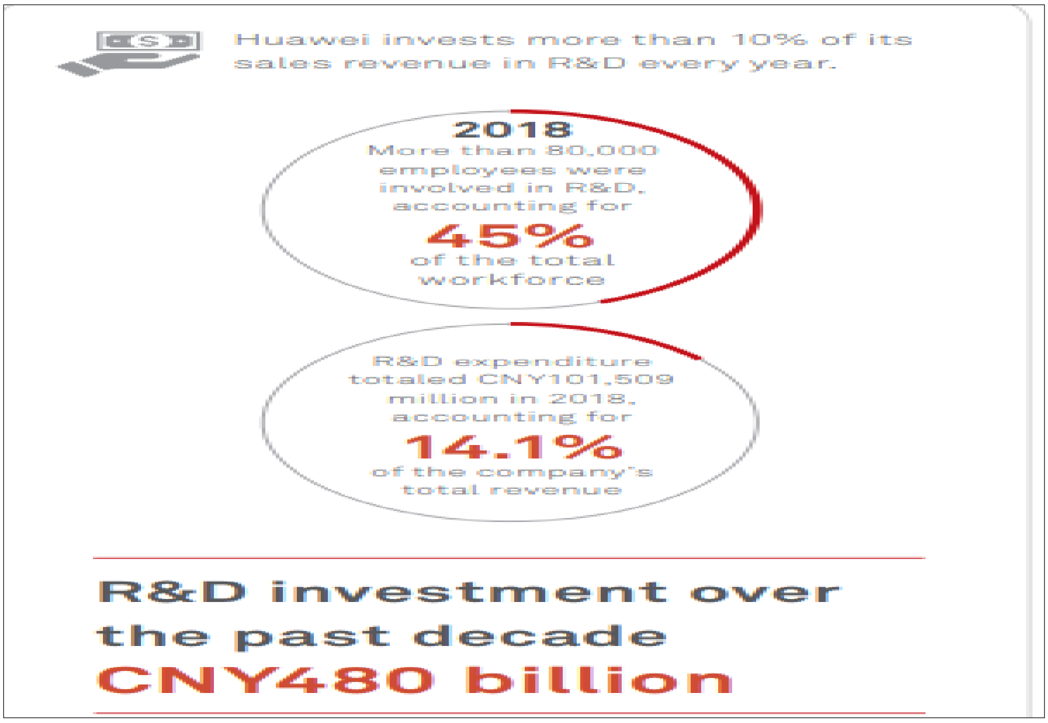
(Source: https://www.bbc.com/news/business-46480208)

Five-Year Financial Highlights

	2018		2017	2016	2015	2014
	(USD Million)	(CNY Million)	(CNY Million)			
Revenue	105,191	721,202	603,621	521,574	395,009	288,197
Operating profit	10,689	73,287	56,384	47,515	45,786	34,205
Operating margin	10.2%	10.2%	9.3%	9.1%	11.6%	11.9%
Net profit	8,656	59,345	47,455	37,052	36,910	27,866
Cash flow from operating activities	10,889	74,659	96,336	49,218	52,300	41,755
Cash and short-term investments	38,777	265,857	199,943	145,653	125,208	106,036
Working capital	24,921	170,864	118,503	116,231	89,019	78,566
Total assets	97,109	665,792	505,225	443,634	372,155	309,773
Total borrowings	10,201	69,941	39,925	44,799	28,986	28,108
Equity	33,994	233,065	175,616	140,133	119,069	99,985
Liability ratio	65.0%	65.0%	65.2%	68.4%	68.0%	67.7%

Notes: 1. Converted into United States dollars ("USD") using the closing rate at the end of 2018 of USD1.00 = CNY6.8561

2. Starting from January 1, 2018, the Group applied IFRS 15 and IFRS 9 and related amendments in preparation of its financial statements. Details about the changes to related accounting policies are discussed in notes 3, 4, and 5 of the consolidated financial statements summary. As permitted by the standards, the cumulative effect caused by the adoption of new standards was recognized as an adjustment to the balance of equity at January 1, 2018. Comparative information has not been restated.



(Source : Annual Report Huawei 2018,

https://www-file.huawei.com/-/media/corporate/pdf/annual-report/annual_report2018)

Huawei's stride towards dominating the 5G and the smartphone market might be facing trouble from the US sanctions and putting in jeopardy its operations in 170 countries, and it does not seem to stop it anytime soon. Huawei's Modus Operandi (MO) for almost a decade is to give quality products at competitive prices be it 5G telecom gear or smartphones, but this does not mean that it makes Huawei a safe bet for initiating 5G in any country. The Huawei oversight body in the UK which is chaired by the head of the Government Communications Headquarters' (GCHQ) National Cyber Security Centre, in its latest report, has mentioned that Huawei hasn't made any progress in dealing with the concerns raised in the last report released in 2018. This year's as well as as last year's report raised technological issues about Huawei's engineering processes which are leading to new risks in the UK's telecommunication networks. The oversight body was established in 2014, and since then its reports have indicated various issues with Huawei's way of working. But UK is still not following US's lead on banning the Chinese technology giant even after growing pressure, as banning them would mean losing millions of pounds for telecom operators and a slow the process of 5G rollout in the UK. Further, it will also put an additional burden of replacing Huawei's existing equipment, with the dilemma whether the new equipment from rival firms would be compatible with the existing setup.[25]

The growing market share of Huawei and its technology advancements highlight the Chinese government's alleged monetary and political backing. US allies, most of them, have ruled out any ban on Huawei probably paving the path for it to dominate the next generation technology. 5G will be the central nervous system of the 21st Century economy and ensure Artificial Intelligence working without any lag, machines in automated factories being able to communicate with each other in real time, and connecting every device on earth. Huawei's rise has been facilitated by the Chinese state and protected from foreign competition by the Ministry of Industry and Information Technology. There is not much evidence to back the claim of Chinese state's support of Huawei, as it has no obligation to show its financial records or issue reports, although the European Union, back in 2011, had found some evidence that Huawei got a line of credit from the China Development Bank amounting in billions of dollars. From a technological perspective, Huawei's strength lies in its Research and Development, where it employs half of its 80,000 strong workforce and puts 15-20 billion USD per year, with the research organisation integrated into the development process. The company dominates 29 per cent of global telecom equipment market with 43 per cent market share in the Asia Pacific and 34 per cent in Latin America. Huawei's efficiency can be credited to the way the company has been set up as it is vertically integrated unlike its rivals Ericsson and Nokia. It designs most of its components of the 5G technology and is the world's largest smartphone maker, which is the most important component of internet economy.[26]

Indian response

Huawei in India has to now look forward to the decision to be taken by Ravi Shankar Prasad, the newly appointed telecom minister, on whether to allow the technology giant to participate in developing India's 5G infrastructure. Huawei seems to be optimistic about getting a confirmation for the same. The clarity on 5G is much needed from the Indian Government as Huawei is looking to expand its market presence in the country in response to the blacklisting and the volatility of US-China trade tensions. The Department of Telecommunications (DoT) is divided on the issue as telecom is a critical infrastructure sector. One side of DoT believes that not allowing Huawei reduces India's options and it does not mean that the other vendors will not come with risks. This section also believes that allowing Huawei will help India scrutinise security vulnerabilities.[27] The other section of DoT suggests a blanket ban on Chinese vendors as they pose a security challenge because of the National Intelligence Law which compels organisations to work with the Chinese state and also promises to protect the organisation that will support, assist or cooperates in China's intelligence work.[28]

Due to the suspicion that Huawei works closely with the Chinese state, the Principal Scientific Advisor to the Prime Minister of India has suggested that India should go ahead with the 5G trials barring Huawei. The suggestion came during the meeting of the sub-committee on 5G and technology trials which consists of members from Department of Science and Technology, Ministries of Home Affairs, External Affairs, Telecom and Information Technology along with Intelligence Bureau (IB). The members of the sub-committee have divergent views as follows:-

- **Ministry of External Affairs (MEA)** believes that all vendors should be allowed to participate in the 5G trials, including Chinese vendors. The reason behind this line of argument is that India is the second largest market after China, allowing all vendors would help leverage India's position.**Intelligence Bureau (IB)** has made it clear that security related issues should take precedence over commercial decisions. The issues related to security have to be dealt without, specifically focusing on a country or a company. Whether to allow Huawei to be a part of the trials is a political decision. IB proposed an indigenous software which would be uploaded on the 5G open source hardware which would provide 'air-gap' security. The proposal was backed by the representatives of the Ministry of Home Affairs.

- **Department of Telecom** representatives led by the Telecom Secretary was of the view that stakes were high for India due to the humongous size of the market and the rapid digitisation efforts. However, the telecom operators need to build security expertise. Meanwhile, the Telecom Ministry wants the trials to start as soon as possible with adequate safeguards with or without the involvement of Chinese vendors. If Chinese vendors do become a part of the trials, the decision for the same has to be taken by the Prime Minister's Office (PMO).

- **Ministry of Information and Technology** wants India to manufacture 5G equipment and have indigenous stacks while the **Department of Science and Technology** representative indicated that India should have the capability to test new 5G equipment in indigenous test beds and laying special emphasis on 'biological effects' of the trials.[29]

Huawei has now offered Indian Government a 'no-backdoor' agreement as the Department of Telecommunications in consultation with other stakeholders of India's national security takes a call on inclusion of Huawei. On face value the agreement looks lucrative as it seems to alleviate the threat of espionage but if one looks closely the security issues still persist for three reasons:-

1. The allegations against Huawei is rooted in the amendment of the National Intelligence Law as mentioned above which compels the organisations and individuals to cooperate with intelligence agencies and by extension, the Chinese state.

2. The Chinese Communist Party is now pushing to set up party cells in privately owned enterprises, joint ventures and in foreign firms which would blur the lines between the party and private enterprises. This begs the question as to whether a 'no-backdoor'' agreement holds any weight.

3. Huawei might also push for making an oversight body. If India does consider that route it would mean delaying the rollout of 5G as setting up an oversight body will take time and might also have senior executives from Huawei. However, an oversight body can only recommend and wait for the Government to take action. An example of the same would be the UK oversight body which since 2014 has been pointing out that there are significant issues with Huawei's equipment but no action has been taken.[30]

The 5G battle in India is about to start between the top telecom companies in India as they look forward to raising 84 billion USD above the 59 billion USD debt that has piled on for the last decade. Any company which misses the 5G wagon is expected to see an erosion of subscribers, and if companies do invest in 5G, it would mean more borrowing but it stands a chance to gain revenue at an unprecedented rate. India's digital economy has the potential to reach 1 trillion USD by 2025. The Telecom Regulatory Authority of India estimates that investment needed for 5G in India would be around 70 billion USD. The Indian Government, which for years has been running successive budget deficits, depends on the auction of the airwaves. The competition is so tight that while operating in India which has more than 1.1 billion subscribers, internet data tariffs are the cheapest in the world.[31]

The Government of India is in a tight spot to take a call on providing 5G technology which will help in transforming a wide range of services and industries and will lead to an impact in India exceeding 1 trillion USD by 2035. India's decision seems to be the important one from a global perspective because of the vast market and the magnitude of the same. The decision on 5G might be a landmark decision as it will have a significant impact on the economy's high and still rising level of dependency on modern infrastructure which comes with risks which are imperative to national security. The policy makers, while taking a call on the future of telecommunications in India, can establish a risk mitigation programme and National Critical Information Infrastructure Centre (NCIIPC) can supervise which can be supported by a technology-diplomatic alliance with countries who have expressed their apprehensions regarding Huawei and other Chinese vendors in the telecom sector in light of the revelations by the US administration.[32]

The rollout of 5G in India by next year will be a great boost for NITI Aayog's plan of making India a circular economy. The manufacturing sector contributes 16-17 per cent of the GDP, and with the rollout of the services, there is more scope for the sector to contribute more.[33] India seems not to miss the opportunity of launching 5G services in the country as the technology has reached global peaks. 3G and 4G services were deployed later compared to other nations which is why the Government of India has allocated 224 crore to make the 5G test bed fully operational by 2021; the first version of the 'test-bed' will be ready by the end of 2019. The 5G test bed project is being conducted in various eminent institutions in India which would help in creating an ecosystem. This would resemble real deployment of the services in India. It would also set up an open test bed for academia and companies which will help enhance India's capability in telecom technology in manufacturing and creation of intellectual property.[34] The test beds will help India by:-

- Providing an open test bed to validate products, prototypes, and algorithms;
- Boost Product Design and Manufacturing in India for 5G technologies;
- Encourage telecom product start ups in India;
- Multiply R&D capability to develop 5G based solutions for Indian markets;
- Demonstrate solutions for India:-

- LMLC (Low Mobility Large Cell) for rural network deployments;
- Smart city applications Dense Urban broadband, “wireless fiber” for spurs;
- Increase India’s participation in global forums (3rd Generation Partnership Project, International Telecommunication Union, Institute of Electrical and Electronics Engineers) - present test results for Indian use with due testing security and privacy aspects;
- Hugely enhance capacity in 5G technology skills.
- Moreover, the users of the test beds in India will be:-
- Academic Institutes for research and validation of algorithms and experiential learning tool for 5G;
- Mobile network operators for an early understanding of 5G and demos based on 5G;
- Equipment companies for R&D of their product and stack developments;
- Application/Solution Developers for an end to end test bed to demonstrate applications and understand integration issues with 5G Network;
- Telecom start ups for having experience on end to end perspectives for starting point for product/solution development.[35]

As India is poised to be the fastest growing economy in the coming years, the foreign direct investments in India will depend a lot not just on giving basic infrastructure like roads and continuous electricity supply at high voltage but also on creating a robust digital eco-system. Private industries in India need to have risk capitals and not just look after their survival. They should collaborate with national laboratories which have an enormous pool of talent. Joint partnerships would help India from being in high dependence on international vendors who come with security risks and end-use clauses and do not take into consideration India’s security, socio-cultural complexities. The Government of India is now taking these issues seriously and realises that India’s growth cannot anymore be dependent on international support or investment but through a self-sustaining eco-system. India should also comply with the World Trade Organisation (WTO) rules and regulations and free market principles, unlike China whose non-compliance with WTO have left the state, the enterprises owned by the state and its private corporations at a precarious position.

Conclusion

In February 2019, the United States Trade Representative submitted a report to the US Congress on China's WTO compliance. China has not opened the market in the telecommunication services throughout 2017 although it accepted key principles laid down in the WTO reference paper on regulatory principles wherein it was obligated to separate regulatory and operating functions of its telecom regulatory agency, Ministry of Industry and Information Technology (MIIT). Difficulties faced by foreign companies in the telecom sector can be attributed to MIIT's decisions and actions. While MIIT on paper does not hold any sway over China's telecommunication firms but it has extensive control over their operations, which leads it to use its regulatory authority to put foreign firms at disadvantageous position. The US has raised its concerns in bilateral and WTO meetings with China. The issue has also been raised in the annual transitional reviews in Council of Trade in the Services where the US has support from other WTO members, but no progress has been achieved.[36] China has vehemently denied the accusation of following 'mercantilist' trade practices and said that the report lacks factual basi, and is based more on US law rather than WTO agreements and multilateral rules.[37] The report, irrespective of whether China accepts the accusations leveled against it, is strongly worded and gives a view of all of the rules China breaks, not just in the telecom industry or industry-based services but in a host of other sectors.

While Huawei is in the center of the news cycle, but the important aspect of trade war between the US and China is the semi-conductors. The Department of Commerce has put five Chinese companies on the entity list which includes a company which is closely related to the People's Liberation Army and is focused on supporting China's military modernisation.[38] The respite might not help much as Huawei's revenues are bound to take a 30 billion USD hit, as estimated by founder Ren Zhengfei, in the next two years.[39] However, Huawei is also expecting a revival by 2021 and will invest around 100 billion USD on a more efficient network. Zhengfie is assuring countries that Huawaei is willing to sign no backdoor agreements and expectes the issues of network security and information security to be treated separately.[40] Huawei does not seem to be bothered much by the US Department of Commerce's ban as it plans to invest 100 billion USD over the next five years to improve the quality of network infrastructure, making them reliable and efficient.[41]

There is no doubt that the US government is making an example out of Chinese technology vendors by imposing fines on them. The larger issue lies with the MIIT and the Chinese state which for 17 years now has not been complying with the WTO and has been reaping benefits of the lack of opposition to these transgressions and not adhering to free-market principles. It is instead trying to create a new economic order which mainly benefits China. The clampdown on China's private vendors on future technology is focused on stopping Made in China 2025 blueprint from taking off while pushing China to come up with a better Intellectual Property Regime that would enable foreign companies to compete in the Chinese market. The Chinese state has also been supporting its private corporations to succeed in the international market and make laws which compel organisations or persons to share data with them under the pretext of intelligence work and promising to protect them. Self-serving laws, non-compliance with market principles, arbitrary political and economic policies are the basis for the growing lack of trust as far as Chinese vendors like Huawei in setting up 5G infrastructure not just in India but around the world.

Banning Huawei might also give China a chance to enforce a different digital ecosystem. It already has created a wall around the internet services in the country, and the seriousness could be seen through the establishment of what is known as the ‘Greater Bay Area’ which is bigger than Silicon Valley. China’s determination to get rid of the image of a country of assembly plans it is heavily investing in making cutting edge technology, artificial intelligence, drones.[42] The Huawei ban and the subsequent pull out by Google has led to Huawei testing its operating system. Reportedly, other Chinese smartphone makers like Tencent, Oppo, and Xiaomi are also testing Huawei’s operating system with the Chinese mouthpiece Global Times claiming that it is 60 per cent faster than Android.[43] Although Huawei and other smartphone manufacturers from China have to take into consideration that a new operating system is not a guarantee of business flourishing - Microsoft with its enormous wealth took a heavy beating with their version of operating systems for phones and Amazon tried it once. Android and Apple’s operating system, iOS have survived the test of time, and the consumers might take their time to warm up to an alternative which is safe and gives them the same features as the aforementioned operating systems.

India today stands at a better position as far as technology is concerned, which is why US and China have separately asked the Government of India to collaborate with them on 5G technology. Now, because of the threat of digital eco-system split, India has to take a call on collaboration. Due to the massive market and pool of resources it would enable India to be a political stakeholder who would influence the rules of the digital order. Collaborating with the US would mean siding with a traditional technologcal superpower which puts mechanisms and rules which controls access to dual-use technology, which is necessary for the evolution of any technology program.[44] If India goes ahead with the Chinese vendors, then telecom operators would be the first to rejoice as competitive tariff plans have made them burn through their cash, while with Chinese vendors selling equipment at competitive prices it would be possible to continue and maintain the cheapest tariffs in the world and still attract customers. Chinese vendors, along with competitive pricing, provide payment plans which are spread over the years and would help the already debt-ridden telecom companies in India to reduce capital expenditure.[45]

India is in this position of a dilemma because it is not pulling the right levers due to the belief that investing in science and technology is not yielding financial results. The other side of the story is that India is a premier space power, and one of the few who possess the prowess to protect its interest along with exploration. Scaling up of centers of excellence is a must as the resources and the people India depends on are overworked, and the limitation of one center of excellence across the country is not helping matters, either. This is not to say that India is lagging and will continue to do so. The government has taken initiatives which include sanctioning cyber-physical systems, artificial intelligence or e-mobility. These are examples of innovation that has been upgraded through the process of setting up of research parks, especially in centers of excellence like IIT's. These have yielded results and have led to Indian industrialists taking notice of this progress.[46]

The Government has to increase the spending as far as R&D is concerned. This has been stagnant for the last two decades at 0.7 per cent of the Indian GDP, and which is considerably less than what South Korea, Israel, China, UK or US are spending. What is also worrying is that the private industry in these countries put their weight behind R&D, but in India, the Central Government is not just the only one funding the projects but also it is the primary user of the such funds.[47] If this continues, and if the blacklisting continues creating different ecosystems, then the Government of India and telecom operators will have to take sides. It will make it difficult for them to choose between the western vendors and the Chinese ones as devices produced in one market will not be compatible to the other.[48]

The US has been pressuring India to not go ahead with Chinese vendors, but it has threatened its European partners of curbing intelligence sharing in case they still go ahead with Huawei. While the European vendors might come with their risks but stringent privacy laws and effective and open judicial system of the EU can reduce doubts about their vendors operating in India. In India's case, the debate needs to change from West vs. China to make India a technology hub not just for software but for designing hardware for future technologies, and maybe compete with its American, European or Chinese counterparts by using the huge pool of talent available in India.

The dilemma surrounding the Indian policy-makers and playing the catch up with the world is not helping either. Telecom companies want the government to take a decision as soon as possible as they want to roll out the technology for its customers at competitive prices. They do not take into consideration that widespread usage of the technology can only be fully utilised if there is digitisation at a massive level, which includes digital healthcare, building smart cities and homes and a host of other functions – steps which would help in manufacturing through autonomous factories which 5G enablement in India can do. The push for 5G is commendable, but unless there is an overhaul of R&D in India, the security dilemma will always persist. With China's orientation towards creating future technology, the risks will not just persist on India's borders but in the digital and cyberspace too.

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VIVEKANANDA INTERNATIONAL FOUNDATION
3, San Martin Marg, Chanakyapuri, New Delhi – 110021
Phone: +91-11-24121764, 24106698
Email: info@vifindia.org,
Website: https://www.vifindia.org
Follow us on twitter@vifindia