Integrated Circuit Wars

What is the issue?

1. The US announced sanctions to deny China access to the leading-edge chips that China doesn't have the capability to design and manufacture yet.
2. This marks the beginning of a new phase of the integrated circuit or "silicon chip" war.

What are the new US sanctions?

- The US sanctions prohibit the sale of the newest generations of chips to China.
- It also **forbids any US firm** or those dependent on US technology from selling or licensing software, equipment or technologies that China will need to build its capabilities in chips.
- Beyond that, it **restricts US citizens and even those holding green cards** from working for or with any Chinese entities in a large number of technology areas.
- The sanctions also **apply to US allies and their firms**, given that they are dependent on US technology in one way or the other.
- This makes it difficult for companies like TSMC (Taiwan) or Samsung (South Korea) from selling the latest generation of chips to China or even helping it in this area.

What will be the impact of US sanctions on China?

- This is a setback for China that had plans that envisaged it leapfrogging the US in multiple technologies and taking a lead over the West.
- Without access to the latest generation of chips, its ambitions in AI research as well as 5G and Blockchain will suffer a big setback.
- It is not that China did not foresee an event such as this - but it probably thought it had a few more years to prepare and build up its own capabilities and capacities in the area.
- China has been pouring enormous sums of money in directed technology research to make itself less dependent on the West.
- While TSMC is the acknowledged leader in 3-nm processes, Samsung and Intel are building their own capacities. All three firms are also now working on 2nm processes.
- In contrast, Chinese chip fabrication capabilities are several generations behind.

Will this put China permanently behind in chips or can it play catch up?

- Much of China's current tech capabilities were built by people who went to the US, studied in the best engineering colleges and worked with leading Western technology

companies before coming back home.
- Many of these entrepreneurs are Chinese by birth but have since then acquired US citizenship. The sanctions will force them to choose sides.
- Also, many engineers in Chinese technology companies are dependent in critical areas on people with US citizenships or green cards.
- Much of China's current capabilities are based on copying Western designs and technologies.
- China has been pushing technology research in its universities and technology institutes for some time now, but it is still behind the US and European research in many areas.
- This does not mean they cannot catch up - just that the current sanctions will make it harder and increase the time required.

What will be the impact of US sanctions on other countries?

- Most European countries and Australia as well as Japan and Korea are largely backing the US, though they are building their own capabilities.
- Many like Japan and various European countries were content depending on Taiwan for fabrication of chips.
- But now, they are rushing to build their own capacities - just to reduce their dependence on the US, South Korea and Taiwan for chip fabrication.

What is the position of India?

- For a major economy, India is taking baby steps in chip manufacturing.
- The plans unveiled so far by the Vedanta-Foxconn partnership are at the low-end of the chip technology spectrum.
- Our journey will start with 28 nm chipsets. Nor have we managed to get any of the top global chip companies to set up shop in the country.
- Indian Prime Minister has made domestic chip capabilities a priority.
- The government has taken a number of concrete steps ranging from the production-linked incentive scheme to helping firms set up plants in India to license 28-nm fabrication technologies from abroad.
- But while those are good steps, they will not be enough for India's ambitions.

What is next for India?

- Next step may be to look at moving up the chip value chain by either buying fully or taking a significant stake in independent chip design and foundry firms around the world that may be available for sale.
- But that will require **active private sector participation**.
- So far, India's biggest businessmen are focused more on building technology capabilities in green energy rather than in chip-making.
- Unless the government persuades them to bet big on the chip arena, it is unlikely that our vulnerability will come down anytime soon.

Reference

1. Business Standard | The integrated circuit wars

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