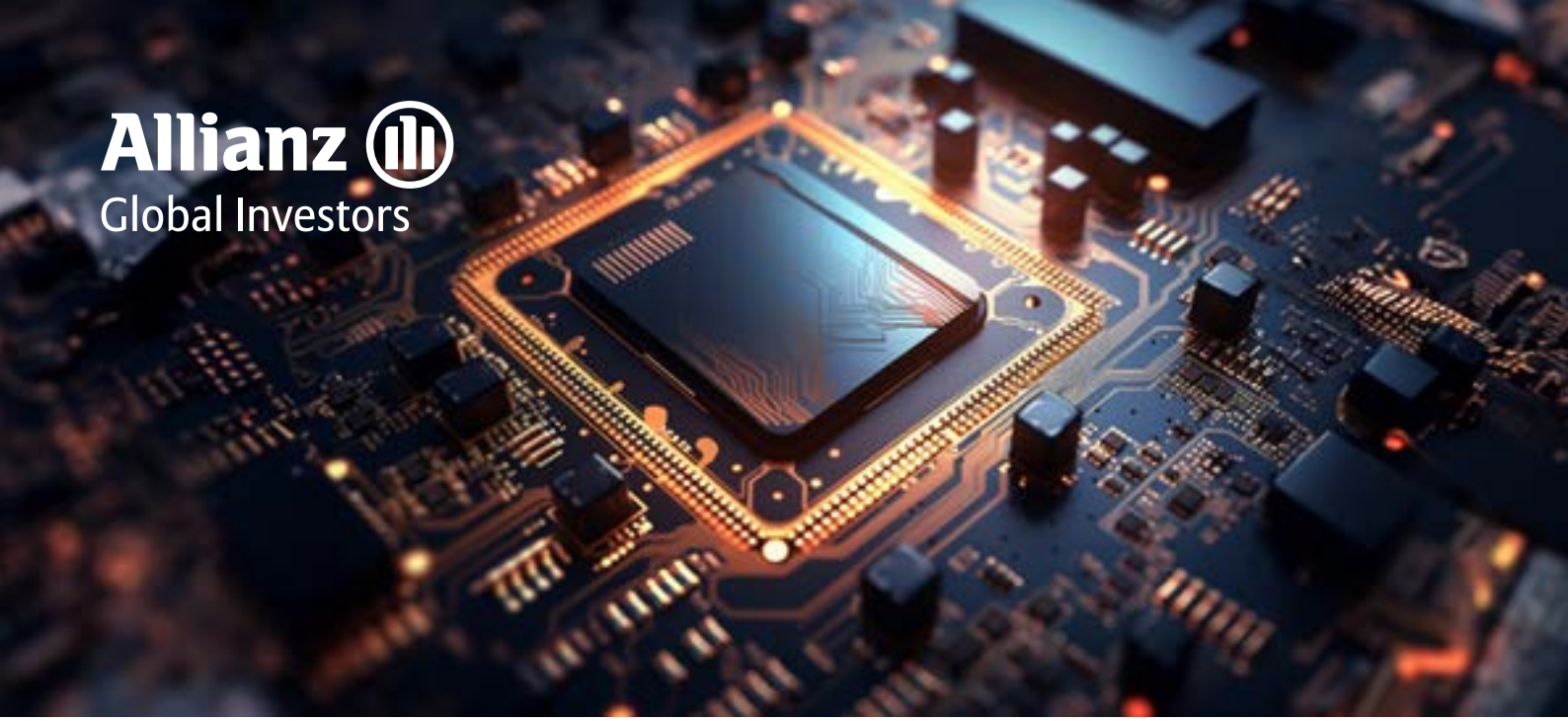

Allianz Global Investors

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Are semiconductors the new utilities?

Due to both escalating trade tensions – most notably between the US and China – and its growing importance for the rapid development and implementation of artificial intelligence (AI), the semiconductor industry is currently top of the list of talking points for many market participants. And the recent election results in the US have certainly added a greater degree of uncertainty to the future trajectory of this sector.

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Historically, semiconductors have exhibited volatility driven by supply cycles, with the associated gluts and dearths of the product at various times, while demand has been heavily dependent on product innovation and the economic cycle.

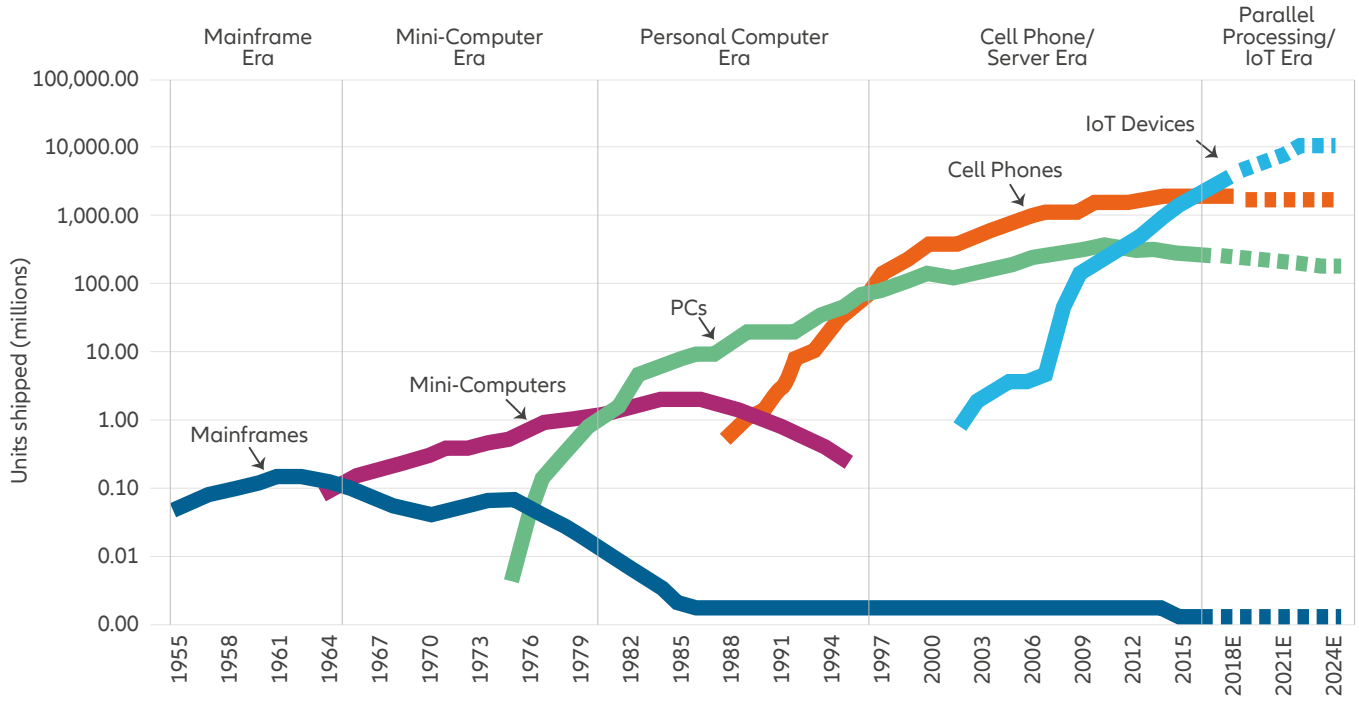
Given the strategic importance of semiconductors today in a world of digital Darwinism and shifting world order, the question for investors is: have semiconductors, which used to self regulate via those wild cycles of supply and demand, now become a more critical resource, enabling global competitiveness and potential defense edge to such a level that they will be seen by leaders as a critical "utility"? If this is the case, how would pricing and capacity build out be affected?

Geopolitics at a nano scale

The case for the new character of the semiconductor sector persisting is a strong one. The usage of complex semiconductors has expanded, and is no longer focused on pure computing applications. While the 1990s and early 2000s saw personal computing dominate

Waves of new technology adoption is a feature of the sector

Tectonic shifts in the computing paradigm over the past 60 years



Source: Jefferies Equity Research, Mainframe computer data sourced from IBM Company Filings. "The Early Computer Industry: Limitations of Scale and Scope", A. Gandy; Minicomputer "History of Research Computer Communications", J. Pelkey; Personal Computer data sourced from "Total Share: Personal Computer Market Share 1975-2010", J. Reimer, Gartner, Mobile devices sourced from Counterpoint Research, Canalys Research, "Smartphones" Research Report, M. Ilyas, S Ahson; IoT devices sourced from Gartner.

semiconductor demand, this first broadened to mobile phones and consumer electronics such as smart television and game consoles, and then to industrial automation, automotive, and the internet of things (IoT).

A related development is that some chips have become less standardised, meaning switching suppliers at short notice is less of an option for many customers, something that has also diminished the utility-like aspects of this sector.

However, this burgeoning importance of the semiconductor industry across sectors – not to mention the growing national security implications of reliable supply – is seeing greater government intervention in the market, across all regions. Indeed, while the semiconductor industry has largely been in a healthy state since the end of the dotcom era excesses, we are now seeing increasing political involvement in capital expenditure decisions, such as where and when new manufacturing facilities are built. The US and European "Chips Acts" provide perhaps the most notable examples of this, while subsidies for this sector have also come from the governments in Japan, Korea, and China. This, of course, may lead to new supply being added in a more irrational and unpredictable way.

Building semiconductor fabrication facilities is itself a complex task, and the new capacity described above will take some time to come online, meaning it is currently having little effect on pricing. However, such growing intervention in the market, specifically in terms of supply, lends credence to utility-like descriptions of this sector – and the future impacts on pricing are currently hard to predict.

Taking a global look at the sector, Taiwanese firms are still very much the leaders in terms of know-how, while America is certainly writing the biggest cheques in terms of encouraging domestic capacity and seeking to restrict where semiconductor manufacturing equipment can be sold and shipped. China is, of course, a significant player and views itself as having the potential to provide a counterbalance to the dominance of Taiwan and the US, as it seeks to become self-sufficient in this area. However, the country still lags in terms of leading-edge manufacturer, and restrictions on the supply of equipment from the US, EU, and Japan is hampering them. Export restrictions will also stymie their ability to scale in the same way some of their non-Chinese competitors have managed to do.

CONCLUSION

The increased weaponization of the semiconductor industry as a tool in geopolitical conflict is certain to impact supply and pricing, even if we are not yet seeing much impact from the increased capacity being driven by governments across the world. Given the growing importance of semiconductors across industries, these developments should be keenly observed by all investors – not just those focused on tech and adjacent sectors.

Yet while increasing interference in and manipulation of supply will certainly lend utility-like aspects to semiconductors, this industry still exhibits significant differences. Utilities often enjoy close to monopoly status, and are stable and non-cyclical, while semiconductors are a cyclical industry with segments such a memory chips that do not enjoy any pricing power. Indeed, perhaps a better way to conceive of this sector, in its current state, is as a necessary enabler of growth, efficiency, and innovation. In this respect, semiconductors do share some traits with utilities, but the sector retains its own distinct characteristics and will continue to do so despite growing interest and interference in the sector from government.

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