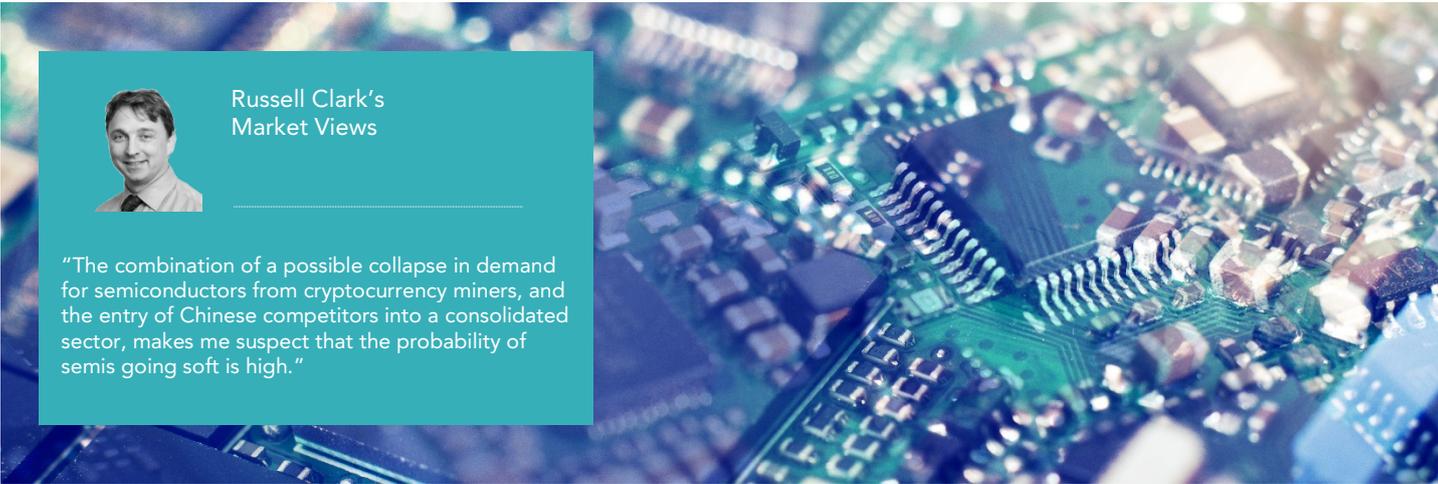


SEMI BAD



Russell Clark's
Market Views

“The combination of a possible collapse in demand for semiconductors from cryptocurrency miners, and the entry of Chinese competitors into a consolidated sector, makes me suspect that the probability of semis going soft is high.”

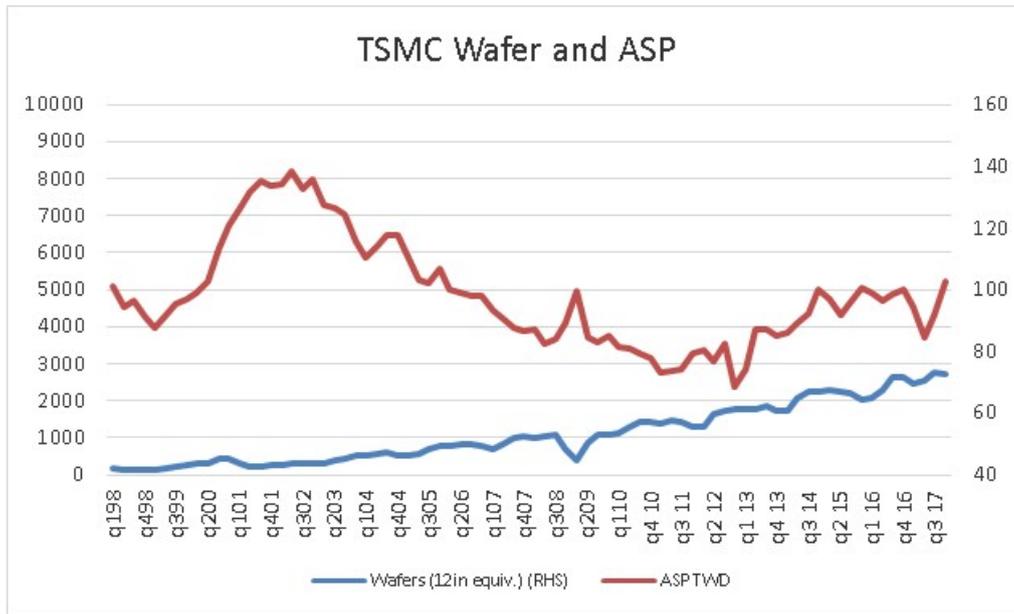
Semiconductors stocks have been moving higher in 2018. The Philadelphia Stock Exchange Semiconductor Index (SOX Index) has recently taken out the dot com high.



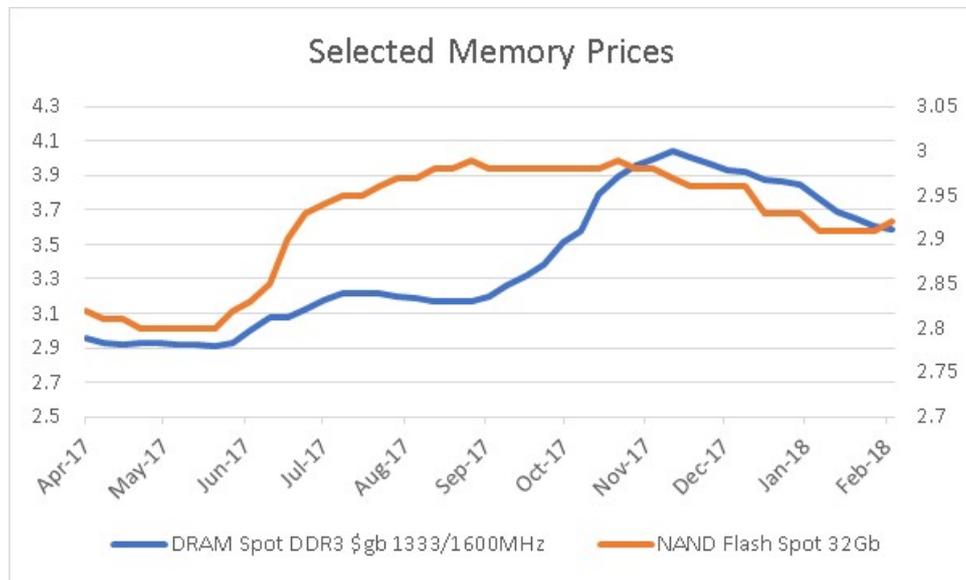
According to the Semiconductor Industry Association Factbook, worldwide semiconductor industry revenue has grown from USD 132bn in 1996 to USD 339bn in 2016. Currently 30% of sales are to China, with another 30% to Asia Pacific, and then America, Europe and Japan combined making the remaining 40%. The big drivers of semiconductor demand are mobile phones, PCs, servers, and automobiles. In mobile phones 50% of volumes are already in Asia, likewise in automobiles, 60% of global volumes are in Asia. The growth in Asia as an end market for semiconductors has matched the growth in volumes for mobile phones, PCs, and automobiles.

The semiconductor industry has benefitted from two trends. The existing providers of semiconductors have consolidated. This has been driven by the ever-rising cost of building a semiconductor fabrication plant (fab). These days a modern fab, usually a 300mm wafer fab, can cost upwards of USD10bn. This has led to massive consolidation in the sector.

Foundries receive orders from chip designers who do not want to build fabrication plants. TSMC has come to dominate the foundry industry. Recent pricing at TSMC had been weakening; but strengthened in Q4 2017.



For DRAM, the top three producers have 80% of the market, Samsung, SK Hynix and Micron. For NAND Flash, Samsung, Toshiba, Western Digital, SK Hynix and Micron are the main producers. Again, pricing here has been very strong, with some weakening in 2018.



Unfortunately, there looks to be two negatives coming to the semiconductor industry. One related to short term demand, and the second related to long term supply.

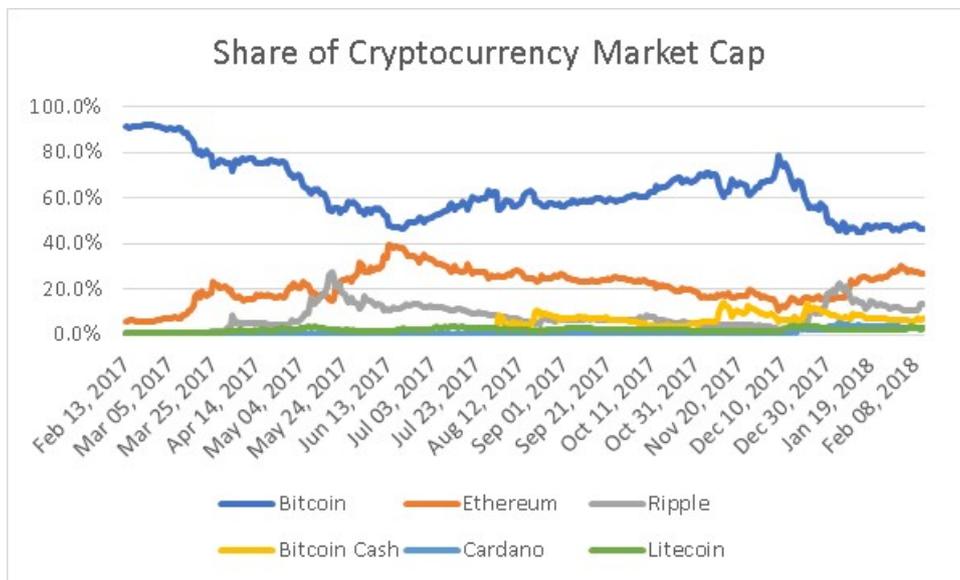
Short term demand for memory chips has been inflated by the surge in crypto currencies in 2017. According to media reports, the world's biggest bitcoin miner and bitcoin mining rig seller, Bitmain, is taking 10% of TSMC wafer output.

<http://digitimes.com:8080/news/a20180130PD208.html>

The revenue share of Bitmain to TSMC could even be higher than 10% wafer output as crypto currency mining typically requires more expensive cutting-edge chips for mining rigs. However, there are a number of reasons to think that Q4 2017 demand for cryptocurrency mining rigs was exceptionally high. Firstly, the market cap of cryptocurrencies soared into year end.

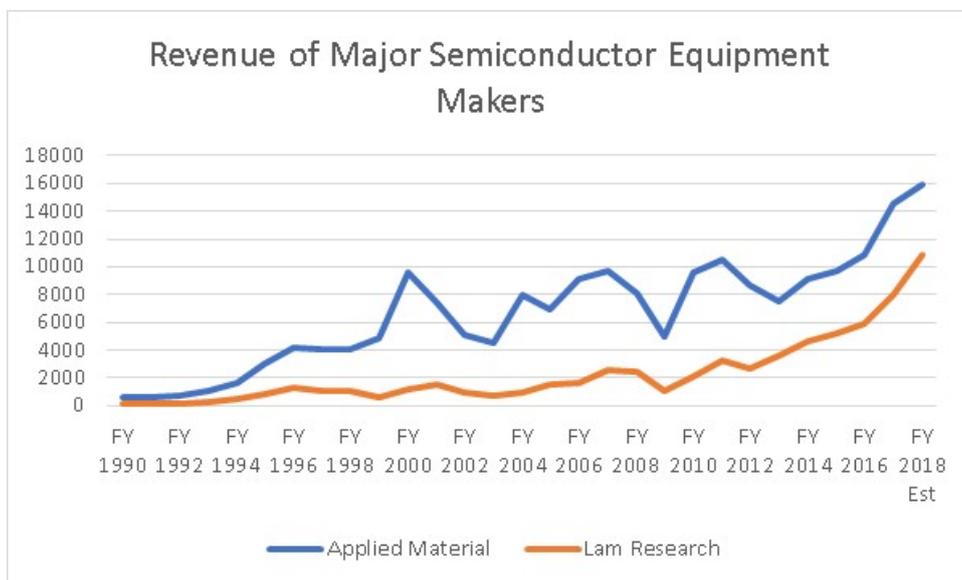


Secondly, the share of cryptocurrency market cap taken up by bitcoin dropped dramatically over the course of 2017 (data from coinmarketcap.com). This means that demand for rigs to mine other currencies would have increased significantly.

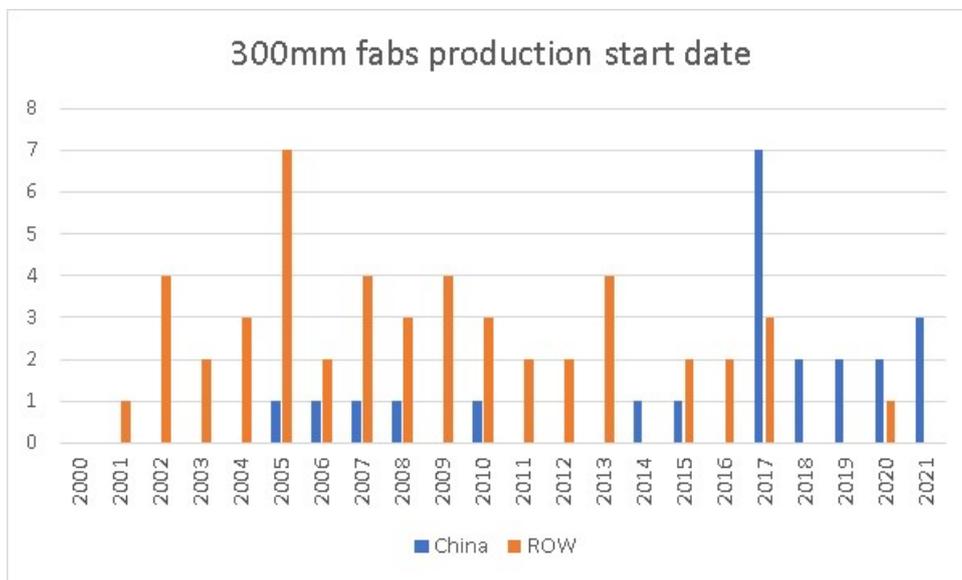


Given the significant decline in the market cap of crypto currencies this year, it is possible super strong demand for mining rigs is declining. There is some strong evidence for this. Bitmain, the largest producer of cryptocurrency mining rigs list new prices for rigs on its website (<https://shop.bitmain.com/>). The top of the line mining rigs is Bitmain Antminer A3, with a list price of USD 2375, but due to high demand was unavailable. On Amazon, this was for sale at USD7,293 on 22 January 2018. The most recent price we can find as at 12 February 2018 on Amazon is USD 2,130. With mining rigs available online below new mining rig prices, it is likely that Bitmain has seen a significant drop in demand.

The other longer-term problem with the semiconductor industry is the significant increase in capital expenditure by current players and the significant investment being made by China in the semiconductor industry. Much of the Chinese semiconductor sector is government controlled or unlisted, but we can see from the sales of major semiconductor equipment manufacturers that there has been an industry wide increase in capital expenditure.



That much of this is going to China, either by foreign companies opening fabs in China or Chinese companies can be seen by the location of the newest 300mm fabs. Data taken from Wikipedia.



The combination of a possible collapsing demand from the cryptocurrency mining sector and the entry of Chinese competitors into a consolidated sector makes me suspect that the probability of semis going soft is quite high.

INFORMATION

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