



Worlds Apart: The chip industry's reshoring revolution

Kent McClanahan:

Hello, my name is Kent McClanahan and I'm here today with Frédérique Carrier on November 29, 2023, to discuss the latest article in our RBC Wealth Management series, "Worlds Apart." A series of articles which discuss the geopolitical shifts which are happening at the moment, and how they impact economies, financial markets, and client portfolios. Hey, Frédérique.

Frédérique Carrier:

Hi.

Kent McClanahan:

I really enjoyed this piece, and it really shone a light on an issue I didn't know a lot about. I found it really interesting because the Worlds Apart series hadn't really focused so far on a specific industry. It had previously talked about more macro issues, so I'd love to hear why you chose to talk about the semiconductors industry in particular.

Frédérique Carrier:

That's a very good question. Look, there are three reasons. Firstly, the semiconductor industry is absolutely crucial to our economies, to our modern societies. Secondly, it's really one of the few industries whose supply chain is really truly global. Lastly, the supply chain has some choke points, which are particularly vulnerable to the geopolitical shifts that we're seeing at the moment.

Kent McClanahan:

Could you expand on those three points for me a little bit?

Frédérique Carrier:

Let's look at the first reason that the semiconductor industry is crucial to our modern economies. Semiconductors, or chips, and I'll use the term interchangeably, they're everywhere. They power your emails, your mobile phones, cars, increasingly traffic lights. They also enable military systems. So, semiconductors are no less than the critical enablers of our modern lives, and that is why they're now at the forefront of national security.

The second point is that semiconductors is one of the few industries whose supply chain is really, truly global. The semiconductor industry has evolved into a highly efficient supply chain that was driven by a desire to maximize capital efficiency, but to achieve this high capital efficiency, the semiconductor supply chain became very complex, very dispersed, and truly global.

For instance, and I think it's important to illustrate this, a typical chip could be designed with blueprints from a Japanese-owned, UK-based company using design software from the U.S. Once it's complete, the design can be sent to Taiwan for production, which uses ultrapure silicon wafers and specialized gases from Japan. The design can be carved into silicon using precision tools manufactured by a Dutch company, and the chip is then packaged and tested in Southeast Asia before being sent to China for assembly. Really very dispersed, as I mentioned, and truly global.



Kent McClanahan:

That example you just gave to me really was what was super eye opening for me when I read that piece. I had no idea that the semiconductor supply chain had these choke points, which are so particularly vulnerable to geopolitical shifts. Can you talk a little bit more about those choke points and what we're thinking about there?

Frédérique Carrier:

Yes. The biggest concern is probably the outsized role that Taiwan plays in the semiconductor ecosystem, given that it's in the crosshairs of Chinese-U.S. tensions. Many people don't realize, but Taiwan today manufactures 60% of the world's semiconductors under the outsourced foundry model, and 90% of the most technologically advanced ones, the logic chips that perform advanced processing.

Taiwan got to play such a big role over time because of lots of government support, lots of subsidies, and a very big drive to succeed. So, for the many nations and regions such as the U.S., Europe, Japan, and China, whose phones, whose data centers, autos, telecom exchanges, all depends so heavily on semiconductors made in Taiwan, it's a really uncomfortable situation.

Kent McClanahan:

I was reading your piece, you talked about how this has led governments to really focus on technological sovereignty. They want to bolster the semiconductor supply chain resilience in their own countries. You introduced the concept of reshoring, how are they going about that exactly?

Frédérique Carrier:

Well, many governments are focusing on chip security and they're proposing bold new initiatives to fund and to safeguard their domestic semiconductor manufacturing industries. Their aim is to manufacture critical technology closer to home as a hedge against over-reliance on foreign supplies. So, they've been backing this strategy with lots of money and plenty of intervention.

With respect to the subsidies for the chips industry over the period of 2014 to 2030, it will total up to \$400 billion for seven key economies which include the U.S., Europe, and China amongst others. The U.S. has its Chips and Science Act for about \$74 billion.

But beyond subsidies, there are also other forms of intervention. For instance, trade restrictions. And in particular, the U.S. wants to hold back China's efforts at developing its semiconductor industry by restricting U.S. exports of advanced chips; and ironically, that may have increased China's resolve to support its own domestic semiconductor industry to have these restrictions put on them.

Kent McClanahan:

What does that mean for investment portfolios?

Frédérique Carrier:

Well, we see the semiconductor equipment manufacturers—so, that's the companies that build the machines which are used in the production of chips—we see these equipment manufacturers as beneficiaries of the reshoring efforts that we've talked about. Semiconductor equipment manufacturers operate in a cyclical industry, but they enjoy really quite a strong backlog and healthy order books.



Remember, there are lots of new plants which are being built on the back of the reshoring trends. Should geopolitical tensions flare up—over Taiwan, for instance—well, this segment could provide a useful hedge.

Beyond this, semiconductor manufacturing companies should also be considered, but they're facing a tricky time at the moment because the surge in investment is happening at a time when there's already a glut of chips. That's quite typical in the industry. The industry is very cyclical. That's because it takes a few years to build a plant, by which time the demand trends may have changed.

Also, the product lifecycles of chips tend to be quite short because there's constant technological innovation. Gluts in the industry is something that happens often, and the industry is facing a difficult time, but once these challenges are overcome, new applications such as artificial intelligence and greater chip content throughout the economy should really enable the semiconductor industry to grow by mid-single digits through 2030.

To summarize the broad semiconductor sector—so, that's semiconductor equipment manufacturers and chip manufacturers—you really have to wait for a favorable cyclical entry point. That entry point may be delayed, of course, if there's a recession. While there's some cyclical or economically sensitive factors which will influence the sector, the industry should benefit from secular or long-term growth. We really believe that this specialized sector should be considered for global equity portfolios.

Kent McClanahan:

Thanks, Frédérique. That was super informative and I really enjoyed reading this piece, and thanks for sharing all of this information with us on this call. For more detail on this issue, please read the Worlds Apart series article titled *The chip industry's reshoring revolution*, which we published in November. If you're interested in learning more about the Worlds Apart series as a whole, please reach out to your advisor and they can send you additional information on this topic. Thanks for listening.

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