

OPINION PIECE

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Semiconductors and pandemic resilience

One unsung pandemic-era hero was the mighty semiconductor. Millions of us were lucky to suddenly be able to work, school, or get healthcare from home. All of those new laptops, smartphones, medical devices and data servers needed chips. People could not travel, but open trade meant semiconductors could. As a result, parents continued to work, kids continued to receive education, and many were able to stay safe. Semiconductors helped make many of us more resilient to the crisis.

Things could have gone very differently for the tiny chip. About 10 per cent of all semiconductors are sold to car-makers, with some cars needing upwards of 3,000 different chips. Orders from car companies dried up when commuters disappeared. But for that new stay-at-home generated demand, the semiconductor industry could have suffered the same bankruptcies, layoffs and need for government assistance that impacted so many others.

Semiconductors are made all over the world. Their “inputs”, too, are often from far-flung places – the final chip that emerges is from a highly fragmented and global production process. Some companies just design semiconductors. Others only produce them. Some make the

equipment for the manufacturers. Others develop software for the designers. Some firms package them up. But each step is essential. If its supply chain weren’t diversified and resilient, semiconductor flows could easily seize up.

The industry was hardly in peak form heading into the pandemic. Governments had suddenly discovered how to weaponize chips for other uses. Starting in 2019, the sector found itself caught in a row between Japan and the Republic of Korea, hit with United States-China trade war tariffs, and subject to export controls over cyber-security worries for the telecom sector.

Finally – and more than one year into the pandemic – the world ran short of semiconductors. But even that had less to do with a vulnerable supply chain. Demand just grew too big, too fast. The once-departed car companies returned to the chip market with big orders in hand... only to find an industry running at full tilt.

Overcapacity is the opposite of a shortage. It takes time – and tens of billions of dollars of investment – but the semiconductor companies are building new plants, often with generous financial “help” from policymakers (Busvine and Rosemain, 2021).

Unfortunately, governments have also been known to show chips too much love.

Historically, the semiconductor industry has known booms, busts, and trade not being open. Chips were a major battleground in the 1980s United States-Japan trade war. Through the early 2000s, governments often imposed trade remedies, segmenting markets. The relative policy calm of the last 15 years may come to be known as the industry’s period of peak resilience.

Today’s semiconductor supply chains also wind through a *Who’s Who* of trade protagonists. This interdependence may, in fact, have helped keep the peace during a period of escalating geopolitical tensions. But changing supply chain geography to reduce that interdependence could provoke new vulnerabilities. Freak winter storms, droughts, floods and fires happen. Pandemics happen. Don’t forget the pace of technological change. (There are few other industries where a government bet on one firm poses a bigger risk.)

The resilience of the semiconductor industry and supply chain made millions of us better able to manage the crises brought on by COVID-19. Next time might be different.