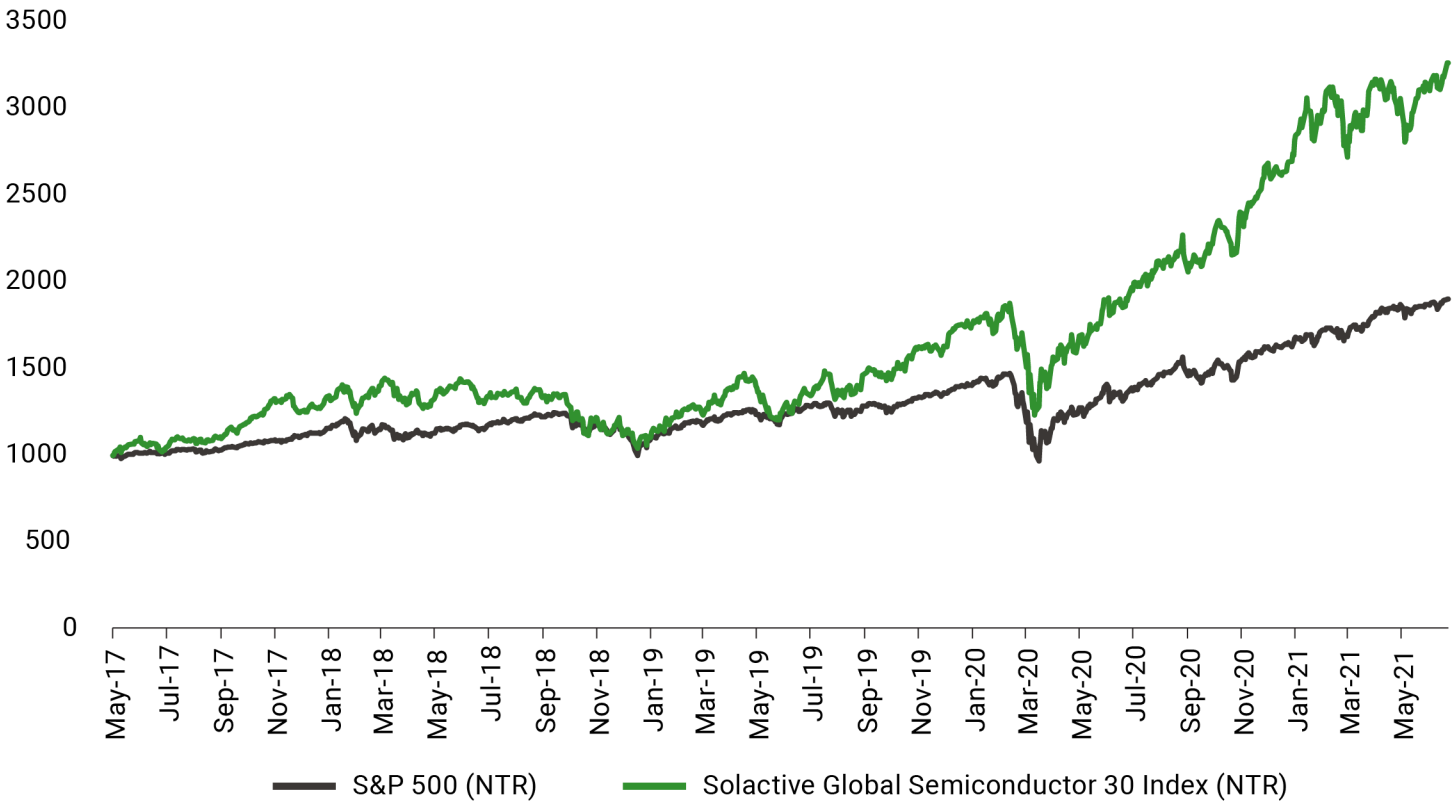
ETFS Semiconductor ETF Investment Case

ASX Code: SEMI

INTRODUCTION

Semiconductors, or microchips, are like the brains that enable electronic devices – from televisions to phones to computers – to function. They are so ubiquitous that, like windows or doors, we can just forget they are there. However, the ongoing semiconductor shortage, which has increased wait times for some semiconductors to 18 weeks as of June 2021 according to Bloomberg[1], has raised the visibility of this crucial sector. The shortage has put a rocket on the share prices of major chip makers and highlighted the investment case for semiconductors.

SEMICONDUCTORS HAVE STRONGLY OUTPERFORMED



Source: Solactive, 14 July 2021
Note: Index live as of 26 June 2021. Graph includes back tested data prior to this date.

SEMICONDUCTOR INDUSTRY

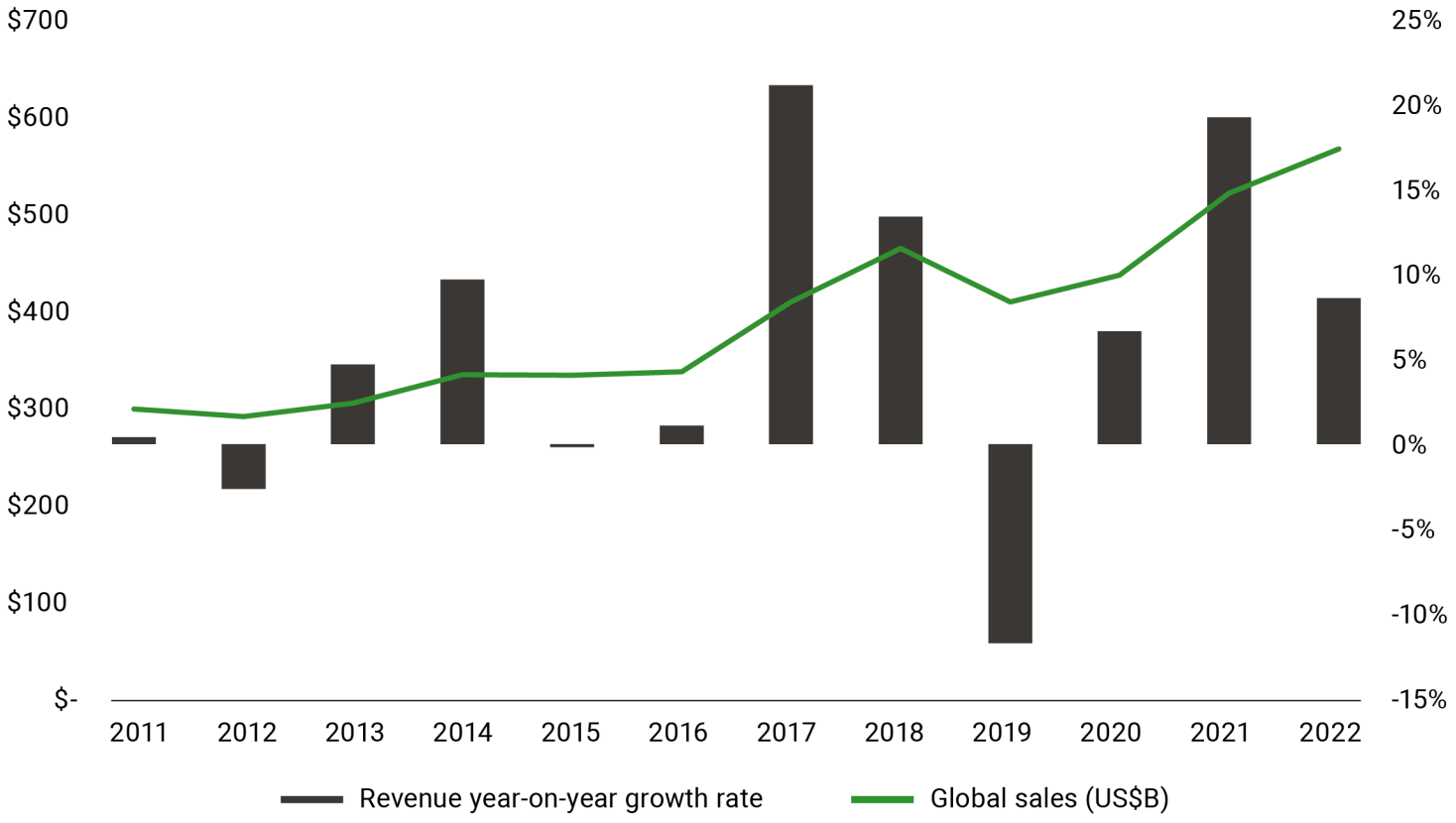
Semiconductor companies can be placed into four categories: foundries; equipment makers; fabless; and integrated device manufacturers (IDMs). **Foundries** are companies, like TSMC, the Taiwanese semiconductor giant, which run the factories that make microchips. **Equipment makers** are companies like ASML that build the specialised and expensive machines used in the foundries to make microchips. **Fabless** companies are chip designers like Nvidia and Qualcomm. These companies do not make microchips themselves, rather they outsource it to the foundries like TSMC. **IDMs**, like Intel, do both: they design microchips, and make them too.

STRONG SALES GROWTH, SUPPORTED BY MEGATRENDS

The coronavirus has boosted the demand for electronic goods. With more people working, shopping and entertaining themselves from home, electronic devices that enable a remote existence have never been more in-demand. Thanks partly to the coronavirus, annual sales growth of semiconductors is forecast to hit 20% a year in 2021.

However, the demand for semiconductors extends far beyond the pandemic and the impossibility of buying a PlayStation.

SEMICONDUCTOR INDUSTRY HAS SEEN STRONG SALES GROWTH



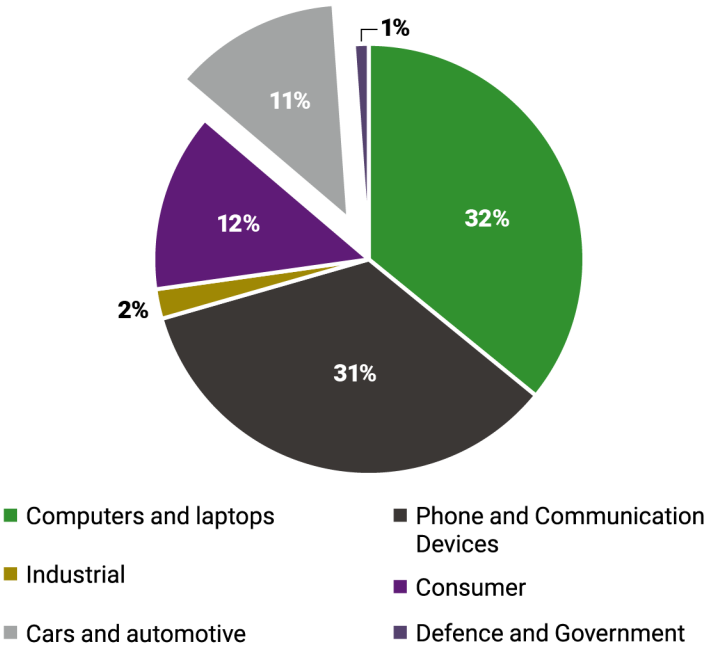
Source: Thomas Alsop, Statista, 12 July 2021

Semiconductors are at the heart of future technology. Megatrends – such as electric vehicles, smart factories, the internet of things – all require semiconductors to operate. In many cases, advancements in technology have only been possible due to improvements in semiconductors. For instance, Graviton2 for Amazon's cloud service AWS, and M1 for Apple's iPhones. Semiconductor's central role in powering the future of technology has meant industry revenue (pictured above) grew at a rate above GDP growth well before the pandemic, despite the dip in 2019 caused by the Trump trade war. And is forecast by PwC to grow at a CAGR of 8.6% right the way to 2028.

There are several exciting trends driving semiconductors. Cryptocurrency is one, as semiconductors have been used extensively for crypto mining. Artificial intelligence is another, as it requires graphic processing units or the newer AI chips that can run many computations simultaneously. Video games and cloud computing are others, given their use in consoles and servers. All of these areas – AI, cloud computing, eSports – are experiencing strong growth, and taking semiconductors with them.

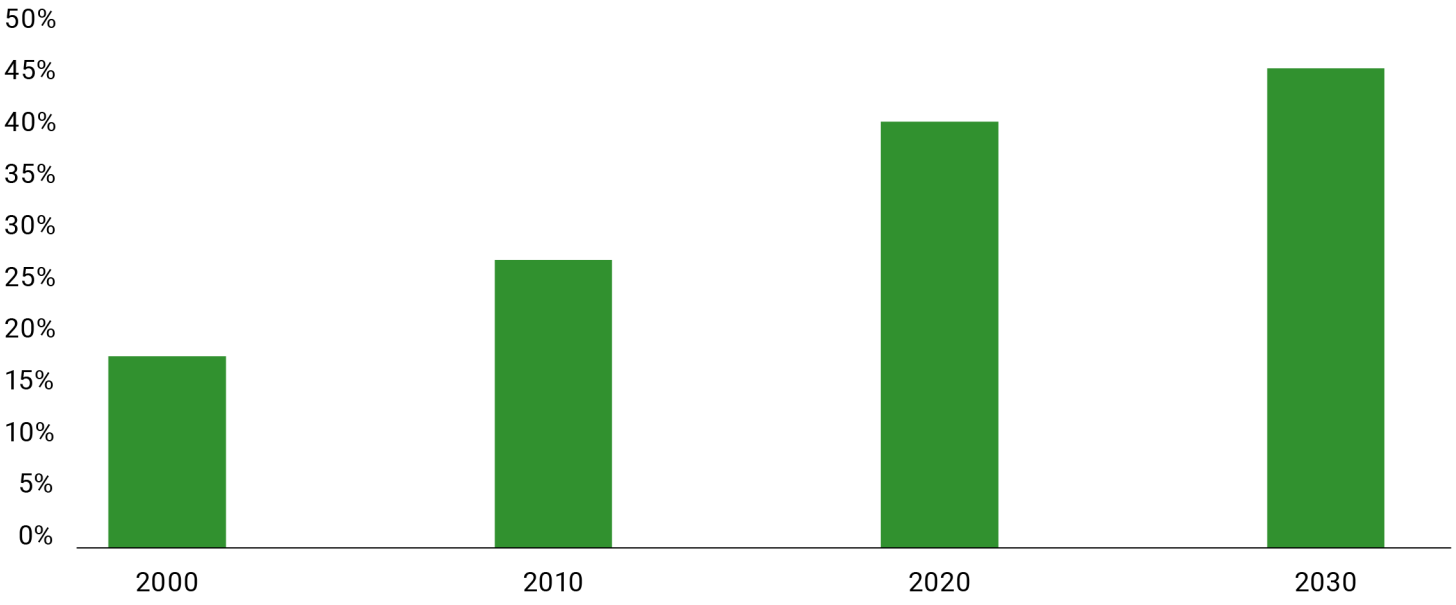
But perhaps the most exciting is electric and self-driving cars. Cars currently make up 10% of overall demand for semiconductors, data from World Semiconductor Trade Statistics (2020) indicates. While substantive, this is still small. But the electric vehicle market is forecast to grow at an impressive 25-40% a year this decade, as the world rides out to meet the challenges of global warming. And electric vehicles need far more semiconductors than petrol guzzling cars. This is reflected by the rising cost of electronics as a percentage of total car cost (below), which is projected to rise to almost 50% by 2030.

SEMICONDUCTORS HAVE BROAD SOURCES OF DEMAND



Source: World Semiconductor Trade Statistics, 12 July 2021

ALL ELECTRONICS AS % OF TOTAL CAR COST



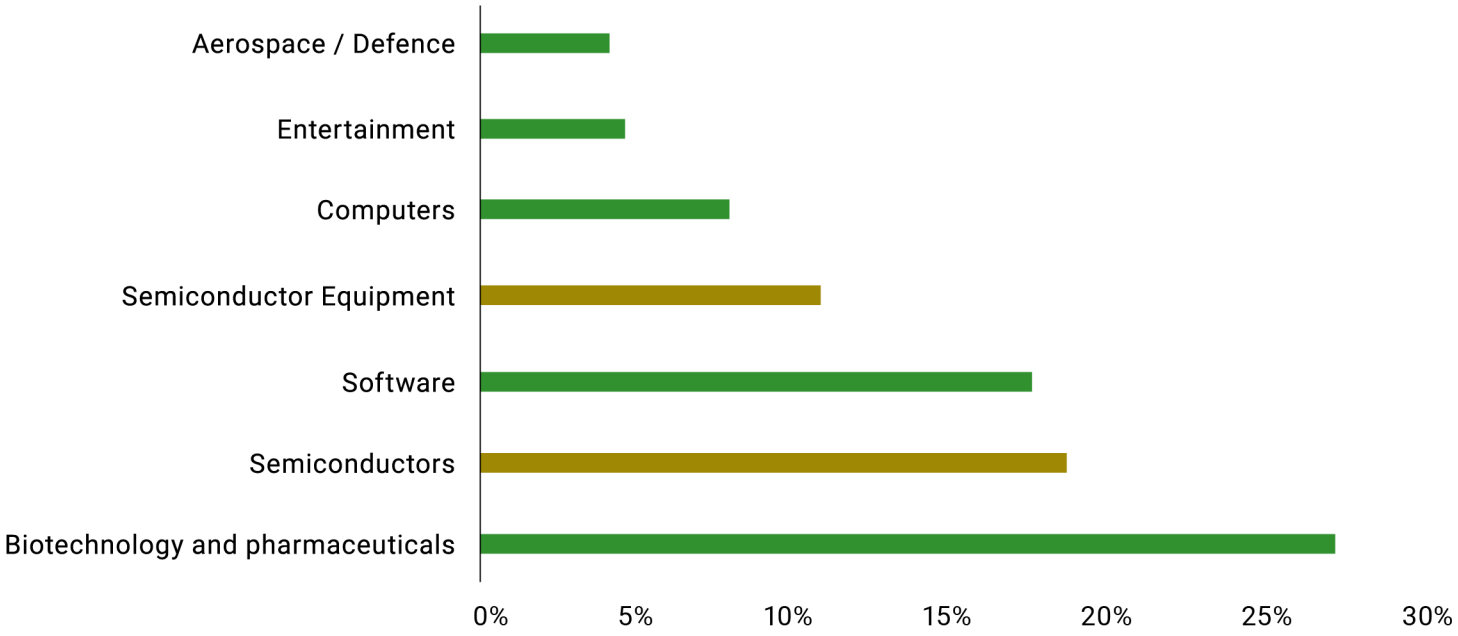
Source: IHS, Deloitte analysis, 1 July 2021

HIGH BARRIERS TO ENTRY AND R&D SPEND

Semiconductor businesses are protected by high barriers to entry. The industry is extremely capital intensive, with foundries usually costing billions of dollars to build, often taking several years to complete. Upgrading foundries is not cheap either. For example, TSMC and Samsung, the two largest foundries, have committed to spend over US$100 billion this decade to make their foundries larger and more efficient. Very few businesses globally can afford this kind of capital expenditure.

And once complete, not every foundry can make semiconductors for the latest iPhones or Teslas. On the contrary: the lion's share of profits go to a handful of foundry companies that produce the smallest transistors. Transistors are the devices that control the flow of electricity through a microchip's circuits and ultimately make computation possible. Smaller transistors mean more of them can go onto a single chip. This makes the chips better performing and reduces heat output and power consumption. Chip makers that fall behind and only produce larger transistors quickly lose customers and pricing power, as consumers do not want large, hot and power-draining electronics.

SEMICONDUCTORS HAVE SOME OF THE HIGHEST R&D SPEND OF ANY HIGH TECH INDUSTRY



Source: Aswath Damodaran, NYU, 12 July 2021

The capital intensity means oligopolies or monopolies dominate every point in the supply chain, and not just foundries. ASML, the Dutch giant, monopolises lithography machines, which put the transistors onto the microchips. Nvidia, Intel and AMD have close to 100% market share for graphics processing units in personal computers. Two Korean companies, Samsung and SK Hynix combined control two-thirds of the memory chip market globally[2]. These monopoly and oligopoly positions then help shore up profits.

Reinforcing these barriers to entry are high research and development costs, which also help ensure that the industry continues evolving. According to NYU professor, Aswath Damodaran, semiconductor designers like Nvidia, AMD and Broadcom, have the second highest level of R&D spending of any of the high-tech industries, behind only biotech and pharmaceuticals. While semiconductor equipment companies, which create the machines used to build semiconductors, like Lam Research and Applied Materials come in fourth. This ensures capital discipline, as only companies with low debt and strong cash flow can maintain high levels of R&D spend.

VALUATION: ARE SEMICONDUCTORS EXPENSIVE?

With the strong rally that semiconductors have enjoyed the past few years, the question obviously arises whether semiconductors are expensive or overvalued. Questions of valuation are particularly acute with semiconductors as they were some of the worst offenders during the dotcom bubble. Industry powerhouse Intel has never seen its share price recover. Meanwhile Qualcomm and Xilinx took 20-years to exceed their dotcom peaks.

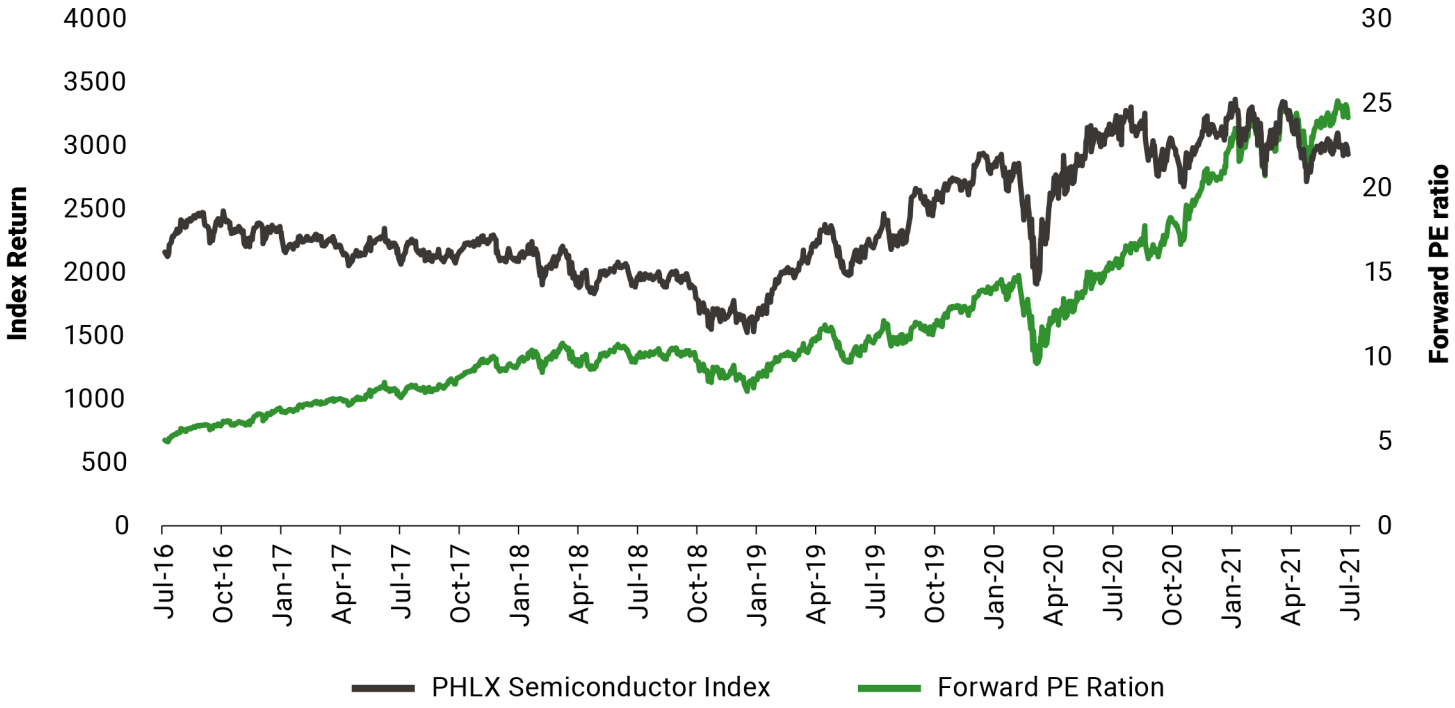
	MARCH 2000 PE RATIO	JULY 2021 PE RATIO
Qualcomm	350	20
Nvidia	138	95
Texas Instruments	107	29
Applied Materials	88	28
Intel	67	13
TSMC	58	34

Source: Ycharts, 10 July 2021

Investors are certainly wise to be cautious—fool me once shame on you, fool me twice shame on me. The experience of the dotcom era doubtlessly created bad muscle memory. And the 10 years following the dotcom bubble bursting were a lost decade of stock growth for semiconductors. Nonetheless, in our view there are some crucial differences between the semiconductor businesses of today, and in the late 1990s.

SEMICONDUCTORS HAVE STRONGER FUNDAMENTALS AND JUSTIFIABLE VALUATIONS. Industry revenue and earnings are far larger in 2021 than in 1999. The valuations that the major players are trading on, such as price to earnings and price to sales, are much lower.

SEMICONDUCTOR VALUATIONS HAVE NOT BUBBLED UP



Source: Bloomberg, 16 July 2021

MORE GOVERNMENT SUPPORT AND BETTER REGULATION. Much of the irrational exuberance in the dotcom bubble of 2000 and mortgage bubble of 2007 owed to the way financial products were sold. Brokers and advisers would put client money in funds or encourage them to buy small cap shares that paid them the largest commissions. This type of poorly incentivised selling ended with global regulations.

Meanwhile, semiconductor companies are enjoying more government subsidy than ever before. The US senate recently approved a $250 billion tech stimulus package, which included substantial subsidies for chip makers.

INTEREST RATES ARE LOWER. Interest rates today are lower than in the late 1990s. Furthermore, they seem set to remain low. These lower rates put a higher premium on growing businesses, due to the way that discount rates compound.

INVEST IN SEMICONDUCTORS: DIP INTO CHIPS

For investors wanting to access this promising sector, the ETFS Semiconductor ETF (ASX Code: SEMI) provides one solution. SEMI buys the world's 30 largest semiconductor businesses, spanning from foundries to designers to equipment makers. It is the first global semiconductor ETF to list in Australia. It takes a market capitalisation weighted approach, ensuring that the top innovators are well represented. While capping the biggest stocks at 10%. The fund charges a low 0.57% management fee.

For more information on the ETFS Semiconductor ETF (ASX Code: **SEMI**), please speak to ETF Securities.

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[1] https://www.bloomberg.com/news/articles/2021-06-22/wait-times-for-chips-stretch-further-deepening-shortage

[2] https://www.statista.com/statistics/271726/global-market-share-held-by-dram-chip-vendors-since-2010/

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