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JUNE

2019

# FINDING ALPHA

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Spring 2019 Editors: Anandini Gupta and Evan Higgins



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# Boeing: The story

By John Li and Samuel Benedict

After reaching an all-time high in March, Boeing's share price has experienced a highly volatile quarter, as many countries have banned their 737-Max aircrafts following a series of crashes. Consequently, Boeing saw two straight months of no orders versus a projected $10 billion worth of orders to Airbus, Boeing's top competitor, at the Paris Air Show.

## What Happened?

The new generation of Boeing 737-Max planes was introduced in August 2011, with improved aerodynamics, redesigned cabin interior, as well as highly fuel-efficient LEAP engines. However, the size of these engines meant that putting them at the base of the wing tilted the plane upwards - a dangerous proposition when in flight. As such, Boeing also added an MCAS sensor, which automatically detected upwards tilting motions and would adjust the plane downwards when necessary. The expectation was that these new planes were similar in controls compared to its predecessors, and such, pilots were not expected to require additional training.

On October 29, 2018, in Indonesia, Lion Air flight JT 610 from Jakarta to Pangkal Pinang crashed into the Java Sea, killing everyone on board. A multi-national group of investigators identified an MCAS error where the MCAS sensor incorrectly detected an upward tilting plane. As a result, it kept pushing the plane downwards and making it crash into the Java Sea [1]. March 10, 2019, in Ethiopia, Ethiopian Air ET 302 from Addis Ababa to Nairobi fatally crashed in the fields of Bishoftu, killing all members on board. Initial reports released by the AAIB Ethiopian Ministry of Transport stated that the crash was also caused by the incorrect detection of the MCAS, leading to the plane's nosedive and downfall [2]. Boeing did offer an optional safety feature on the planes whereby if three sensors on the plane (one of which controlled the MCAS) didn't match, a warning light would go off indicating potential danger. All 737-Max planes in the U.S and Canada had this feature. However, Lion Air and Ethiopian Air decided that they were not necessary, which may have contributed to their crashes.

# Aftermath

The 737-Max had been banned by safety regulators in 43 countries including the USA [3]. effective since March 2019 with no visible intention of authorities to lift the ban anytime soon [4]. Furthermore, Boeing is facing a class-action lawsuit from the families of victims.

Evidently, these major headlines have caused a decline in Boeing's stock value. Following the Ethiopian crash, Boeing's stock was down 16.82%. As some may have expected, orders in May were weaker YoY as a result of customer skepticism following the 737 MAX crashes. Boeing reported 0 new orders over the month combined with numerous cancellations. This puts their net order inflow for the month at -72 units, compared to the three-year average of 60 units and five-year average of 54 units. This impact stretched beyond just the month of May, and as of June Boeing recorded -125 unit sales from continued cancellations. However, in a surprising change of events last month, the International Aviation Group (IAG), owner of top European airlines such as British Airways, Iberia and Vueling, expressed intentions to buy 200 737-Max planes, totalling about $24 billion in value, following the Paris Air Show [5]. This significant order will likely help offset prior cancellations and order weakness. What makes it even more surprising is that IAG had been a loyal customer of Airbus. Not surprisingly, this raised share prices 5.5% as Boeing stocks continue volatile trading [6].


Figure 1: Boeing's historical stock chart, where the yellow arrow is the point of the second B737-Max crash
Source: TradingView

Since the commercial airline industry is largely an oligopoly and planes are often backlogged for up to 5 years, it is difficult to see drastic changes in terms of cancellations. While cancellations may impact the company on a YoY basis, the longer-term impact on Boeing's backlog is still unclear. Furthermore, Boeing still maintains other popular planes like the Boeing 787, along with other industries in their portfolio like defence airplanes and other heavy manufactured parts. Hence, despite the recent hard times, some experts predict that this is an excellent opportunity to buy low in anticipation of stock prices reverting to the mean [7].


[1] https://qz.com/1477182/lion-air-crash-report-details-pilot-battle-with-boeing-737-max/
[2] https://www.theverge.com/2019/4/4/18294317/boeing-737-max-ethiopian-airlines-crash-report
[3] https://www.nytimes.com/2019/03/13/business/canada-737-max.html
[4] https://www.cnet.com/news/boeings-737-max-8-all-about-the-aircraft-flight-ban-and-investigations/
[5] https://www.timothysykes.com/blog/boeing-stock-price/
[6] https://www.theguardian.com/business/2019/feb/14/a380-airbus-to-end-production-of-superjumbo
[7] https://www.cnbc.com/2019/06/06/once-boeing-does-this-its-stock-will-become-a-cash-cow-again.html

JUNE 2019

# Innovations In Healthcare

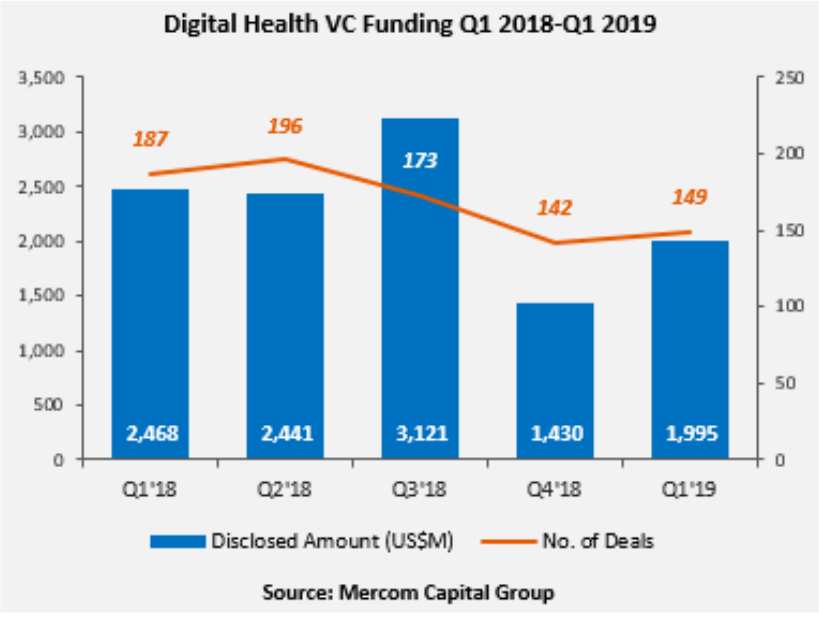
By Shanda Feng

## What is Digital Health?

Digital health is a rising sub-industry of the healthcare sector that is broadly defined as the use of technology to aid in healthcare processes[1]. This encompasses mobile apps to track vitals, the use of robotics in surgery, machine learning algorithms to analyze disease patterns, etc. Recently, developments in digital health are attracting more technology sector investments driving the growth of this sector. As most of the digital health industry is still at a start-up stage, without having released an IPO, analyzing it provides a great opportunity to track potential high growth stocks.

## Industry outlook and 2019 performance

In 2018, venture capital funding was at an all-time high of $14.6 billion USD since the previous high in 2010 as there was increased interest from investors in digital therapeutics, as well as artificial intelligence and machine learning applications in healthcare.[2] In the first quarter of 2019, $2 billion has been invested into digital health startups from private equity, ventures and corporations compared to the $2.5 billion last year during the same period. [3]



While private investments decreased, the performance of the 66% of the digital health companies that are being tracked by the Mercom Capital group have performed above the S&P 500. The positive performance suggests that there might be an increase in investor interest in the industry, leading to more digital health companies going public with IPOs this year. As opposed to last year, the top areas of investor interest lay with data analytics which brought in a total of $557 million and mobile health apps which brought in $392 million for this quarter. Doctolib, a French online and mobile platform to book specialist doctors, lead the venture capital investments at $170 million is one of the startups receiving the most funding.[4]

# M&A Developments

As the digital healthcare sector continues to grow, businesses start looking to expand their operations into healthcare. The subsequent examples are key partnerships, funding stages, and IPOs to follow.

## Amazon and Pillpack

Pillpack is an online platform for retail pharmaceutical distribution offering mail-order medications with 24/7 customer support. It has lower markups and the convenience of delivery compared to traditional competitors.[5] Working directly with US health insurance providers, it has removed pharmacy benefit managers from the picture. Amazon acquired Pillpack for $753 million in June 2018, as a result of which other pharmacy stocks such as Walgreens and CVS, which dominate the prescription medicine market, fell in value. In 2018, Pillpack reaped $299 million in revenue and this number is expected to rise to $635 million in 2019.[6] With bold plans to exceed $1 billion USD in revenue by 2020 after years of acquiring licenses and expanding their logistics system, Pillpack challenges the current status quo of the prescription medication industry through technology. While Pillpack's revenue does not compare to Amazon's holistically, the average Pillpack user is worth around $5000 in revenue compared to $1300 for an Amazon prime member. With a loyal and older demographic, the growing Amazon company can be expected to make a potentially significant impact in the prescription medicine industry.

## Alphabet's Healthcare Partnerships

While Amazon heads straightforward with its endeavours into prescription medication, Google's partnership with Sanofi focuses on the application of AI, machine learning and big data to aid in medicine discovery. This year, Alphabet's healthcare division, Verily, partnered with Sanofi and Onduo to discover new treatment methods for people with type 2 diabetes and earliner. They received $1 billion in funding from private equity groups Silver Lake and Ontario Teachers' Pension Plan. [7] Verily has also partnered with Novartis, Otsuka, and Pfizer to help improve the clinical trial process. Overall, Alphabet has been venturing into partnerships in order to increase its presence within the healthcare industry.

# Upcoming IPOs

Many healthcare startups including Phreesia, Livongo, Change Healthcare, and Health Catalyst that have filed an IPO to the SEC this year.

## Phreesia

The New York based developer of a patient intake platform, Phreesia filed for an IPO on June 25th, 2019 with the goal of raising upwards of 125 million dollars. As a highly anticipated digital health start up, its projected revenue for the fiscal year 2019 was $100 million, a rise from the $79.8 million in fiscal 2018. [8] As of yet, there has been no announcement on the price range or the number of shares that will be released.

## Livongo Health

Another digital healthcare startup looking to go public later this year is Livongo Health which has filed its SEC Form S-1 in anticipation of its IPO in which they are looking to raise $100 million. [9] The company mainly focuses on wireless blood-glucose monitors to help patients keep their diabetes under control while also expanding their services to a general wellness platform. In the past, they have received a total of around $250 million in private funding from General Catalyst, which owns 25% of the company, 7Wire Ventures, which owns 12%, and other PE firms. Livongo's revenue doubled from 2017 to $68.4 million in 2018 and in the first months of 2019, revenue stood at $32.1 million, indicating an upwards trend. [10] Its current growth plans focuses on expanding distribution channels, maintaining its current customers and potentially looking towards international operations.

# The Industry Moving Forward

As more digital healthcare startups are established, become public, enter into partnerships and grow, the global digital health market is expected to surpass $504.4 billion by 2025 according to a report by Global Market Insights.[11] The rise of digital platforms on smartphones and tablets, increased regulatory requirements of providing quality healthcare are some of the key drivers that allow this market to grow rapidly. On the other hand, installation costs and data security concerns impede the development and expansion of digital healthcare products and services. Overall, following the advancements in healthcare, the digital healthcare industry is one to look out for.


[1]https://www.zdnet.com/article/what-is-digital-health/
[2] https://pharmaphorum.com/views-analysis-digital/the-rise-and-rise-of-digital-health-investment/
[3] https://techcrunch.com/2019/04/18/digital-health-investments-slide-in-the-first-quarter-to-2-billion-according-to-mercom-capital/
[4] https://mercomcapital.com/digital-health-vc-funding-q1-2019/
[5] https://gritdaily.com/amazon-is-taking-on-online-pharmacies-with-its-own-pillpack/
[6] https://www.cnbc.com/2019/05/10/why-amazon-bought-pillpack-for-753-million-and-what-happens-next.html?&qsearchterm=pillpack
[7] https://finance.yahoo.com/news/alphabets-healthcare-push-gains-steam-130701165.html
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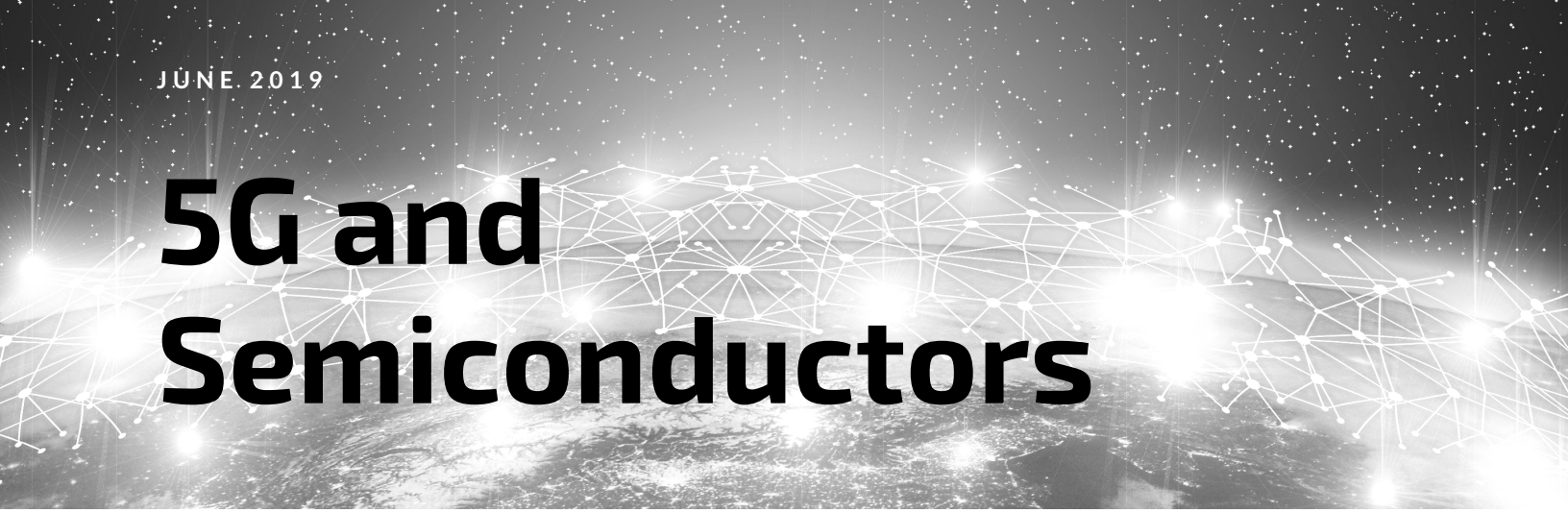
[9] https://www.chicagobusiness.com/john-pletz-technology/livongo-plans-raise-100-million-ipo
[10] https://medcitynews.com/2019/06/five-tidbits-and-takeaways-from-livongos-ipo-fiiling/?rf=1
[11] https://www.prnewswire.com/news-releases/worldwide-digital-health-market-to-hit-504-4-billion-by-2025-global-market-insights-inc-300807027.html



JUNE 2019

# 5G and Semiconductors

By Jack Yao and Michael Li

## Recent Events

The ongoing US-China trade wars have seen massive tariffs being placed on goods being traded between the two nations spanning a variety of industries. Donald Trump stepped up his offense in the battle with China for dominance of 5G technology networks, moving to curb Huawei Technologies Co.'s access to the U.S. market and American suppliers. The semiconductor industry relies heavily upon the cooperative trade relations between these two nations. Top chipmakers in the US including Qualcomm, Broadcom and Micron have large exposure to China. China accounts for 35% of global semiconductor sales, according to Evercore ISI. American companies can derive up to 50% of their revenue from selling components to China. At the same time companies, like Apple, that buy components out of Chinese semiconductor companies are also seeing increased costs. In terms of impact, the global semiconductor industry has been hit hard because of its heavy exposure to China, both in terms of manufacturing and selling. With its heavy exposure to China, the semiconductor industry has seen a higher drawdown compared to the S&P 500.

## Canada's Perspective, Opportunity Costs, and Risks of the Huawei Ban

In December, Canada arrested Huawei's CFO, Meng Wanzhou, at the behest of the U.S. government, who wants her extradited for violating U.S. sanctions on Iran; China responded by jailing two Canadians working in China, and accusing them of spying. Six years ago, Canada allowed a state-owned Chinese oil company to buy Calgary's Nexen Energy for $15.1 billion, despite concerns it would manage the resource in China's best interests rather than Canada's. In response, Canada has tightened foreign ownership restrictions, prohibiting such deals in the future except under "exceptional circumstances." Last year, Canada made good on that promise when it blocked a state-controlled Chinese company from buying Aecon Group Inc., a large infrastructure company, citing national security concerns. The Huawei conundrum is somewhat different.

Although they are not a state-owned company, few doubt that they wouldn't act on behalf of the Chinese government. (Chinese law, in fact, compels citizens and organizations to assist the government with intelligence work.) Huawei isn't looking to buy Canadian natural resources or companies. Instead, it's looking to supply Canada with technology to power lightning-fast 5G networks. 5G link traditional cell towers and rooftop antennas with multitudes of small cells that are able to transmit huge amounts of data almost instantaneously through higher-frequency radio waves. Some Canadian telecoms already use Huawei radio equipment at the top of cell towers and antennas but are yet to allow them to supply equipment for core networks.

# Drivers of 5G Growth

The rapid growth of interest in 5G in recent years is driven primarily by the anticipation of wider network coverage, more stable internet and faster data transfer speeds. Although promising new opportunities for consumers and telecommunications players, the development of this new generation technology requires advanced and widespread infrastructure investments.An important concept of 5G communication is the idea of significant machine inter-communication, where a large network of interconnected devices embedded in everyday objects share massive amounts of data on a mobile network. This concept is called "internet of things", and is an aspect achievable on a grand scale with 5G networks, which is the main reason that 5G networks seem so appealing to industries and consumers alike. Central to this concept is the ability for everyday devices to connect and share data on a scale never seen before, made possible through the use of mobile 5G capable chipsets. The development of these chips for 5G has become the forefront of semiconductor growth.

# Growth Outlook

The global market for semiconductors is expected to contract by 12.1% to $412 billion this year amid growing economic uncertainties such as the U.S.-China trade war. In its previous report last autumn, World Semiconductor Trade Statistics predicted 2.6% growth for 2019. As a notoriously cyclical industry, the semi conductor market has gone through booms and busts every three to four years on average. The rapid growth of 2017 and 2018 contributed to the drop-off in the new forecast, but this expected contraction exceeds the  2009 drop of 9% in the aftermath of the global financial crisis. The market last contracted by a wider margin when it shrank by 32% in 2001, after the dot-com bubble burst. Toshiba Memory Holdings posted a 28.4 billion yen ($262 million) operating loss for the January-March period after its predecessor reported black ink the previous quarter. "There are no signs yet [that memory chip demand] has hit bottom," said Atsuyoshi Koike, Japan chief of SanDisk, under Toshiba Memory partner Western Digital.

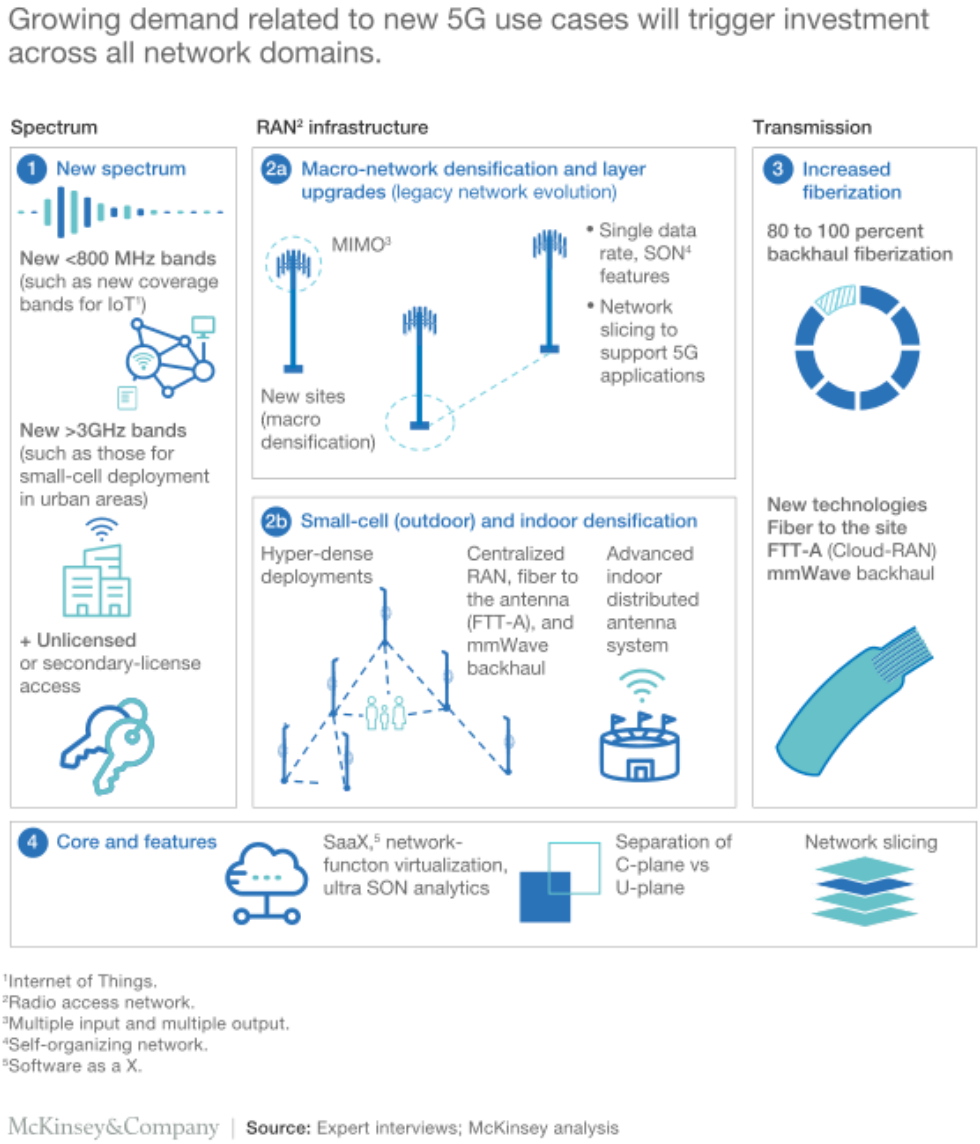
Builders of semiconductor-manufacturing equipment are also affected. In late May, Tokyo Electron revised a three-year business plan released in 2018, extending the time frame for meeting the targets to within five years. The market "will bottom out in the second half of 2019, but considering manufacturers have become cautious about investment due to U.S.-China trade frictions, the pace of recovery will likely be slow," said Akira Minamikawa, a principal analyst at IHS Markit.

# G20 Summit alleviates tension on 5G

Trump surprised most at the G20 with his announcement of concessions on Huawei. "A lot of people are surprised, we sell to Huawei a tremendous amount of product that goes into the various things they make," Trump said. "I've agreed to allow them to continue selling that product." Trump also says the US will hold off raising tariffs on more than $300bn worth of Chinese goods while negotiations to end the trade war between the two countries continue.
"We will be continuing to negotiate. And I promised that for at least the time being, we are not going to be lifting tariffs on China, and we won't be adding an additional, I guess we have $350bn left which could be taxed, or could be tariffed. And we're not doing that. We're going to work with China on where we left off to see if we can make a deal," Trump said at a news conference at the end of the two-day G20 Summit.


However, the rift between China and the United States over 5G technology exports to India sharpened when the Chinese President, Xi Jinping, pitched for a partnership with New Delhi and Moscow for expanding a joint footprint in the cyberspace. In his remarks at the Russia-India-China (RIC) trilateral on the sidelines of the G20 summit in Osaka, President Xi urged the three countries to expand cooperation in 5G network, technology, connectivity and energy among others.

# Future Predictions




While many things on the road to 5G are uncertain, it is easy to envision the emergence of new and innovative use cases. The changes in infrastructure requirements can be understood by looking at developments as three distinct categories viz enhanced mobile broadband, IoT, and mission-critical applications. These use cases will require network performance to increase 10-fold over current levels across all network parameters, as measured by latency, throughput, reliability, and scale. To get there, mobile operators must invest in all network domains, including spectrum, radio access network (RAN) infrastructure, transmission, and core networks.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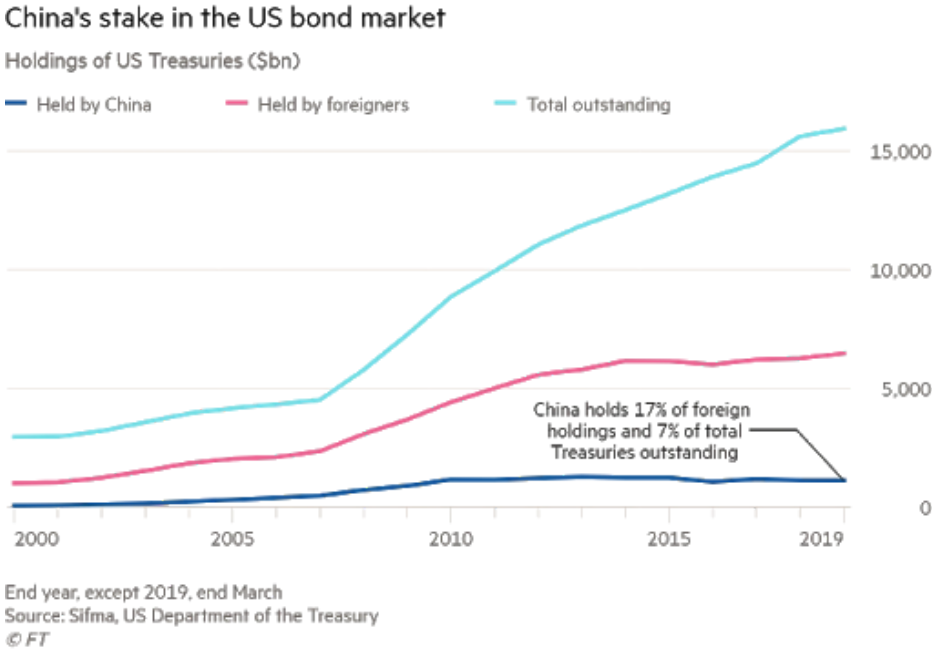
# China Dumping U.S. Treasurys

By Jonathan Zaionz and Jordan Ng

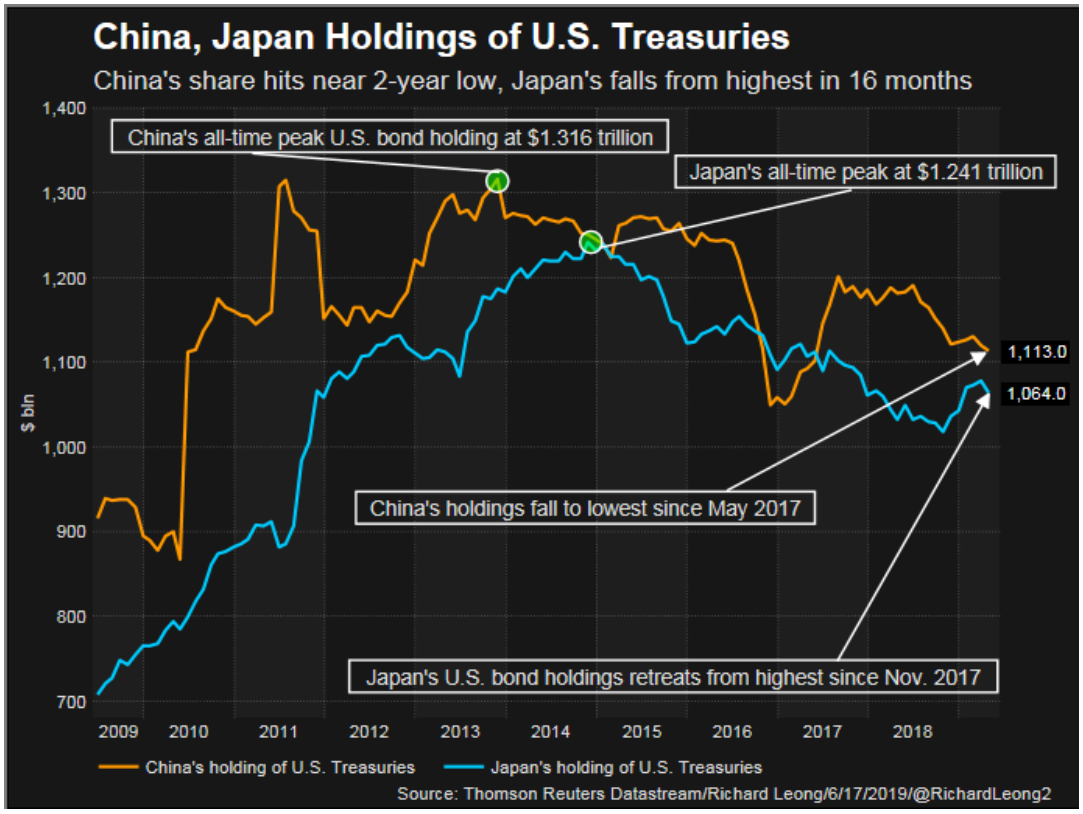
The biggest purchaser of US Treasurys, China, is considering lowering their position significantly or even eliminating their reserves completely, amidst the very influential trade war. Tariffs on Chinese imports to the US totaled approximately $540 billion in 2018 and China could need additional leverage to fight the tariff and trade war.

Since 1985, China has been running a vast trade surplus with the United States. As such, since China is primarily a manufacturing hub and export-driven economy they are heavily dependent on the US. China wants to maintain export-led growth, so RMB value must be lower in value than the US dollar. China's central bank buys excess US dollars from exporters and gives them RMB to keep the dollar rate higher. If this did not occur the US dollar would depreciate with respect to the RMB, making China's exports pricier. Higher priced exports could slow international demand and, in turn, the country's manufacturing-led economy. By keeping the RMB low, the dollar piles high among China's foreign exchange reserves. China puts its trillions of dollars into one of the safest investments, US Treasury securities. China is making loans to the US so it can keep buying China's goods. Both nations benefit, as China gets a huge market for its products and the US pays economical prices for their goods.



As of Q1 2019, the US debt to China totalled $1.12 trillion, 17% of the total outstanding Treasury bills to foreign countries. China holds most of the United States foreign debt, narrowly ahead of Japan ($1.08 trillion as of Q1 2019). In November 2013, China held $1.3 trillion of US Treasury bonds, and since has significantly reduced its holdings. China's position as America's largest banker gives it political leverage and by selling part of its massive holdings of US debt, decrease the prices the market will pay for these securities, potentially raising US interest rates. On the other hand, the US Federal Reserve insists that the offloading of Treasury bonds will not cause a rise in interest rates since the US 10-year bond yield rates have been trending downward over the last year despite the offloading of all of these Treasury bonds.


If China were to exercise their threats of unloading all of its US Treasury bond holdings, the value of the US dollar could plummet. This may not be a smart thing for China to do however, since if the USD were to fall, US goods would be relatively cheap compared to Chinese goods and China would need to export to other countries to replace all its exports to the United States.




In April 2019, China's holdings of US Treasury bonds declined for the second straight month. This was a reaction to President Trump's initiative of charging tariffs on Chinese imports which sparked what is now known as the 'trade war'. China is looking to threaten the US by dumping all their reserves of US Treasurys at once, which could destabilize US financial markets and cause interest rates to rise even further - potentially harming US economic growth. Treasury yields are a benchmark for US consumer and business credit and a majority of interest rates, eroding global confidence in US dollars as the world's reserve currency. Despite all the threats, it is unlikely for China to offload a large portion of their US Treasury bonds as this would negatively affect the value of their remaining holdings. Expert opinions from CNBC say that this could be a useful bargaining chip for the Chinese government, but actually following through with these threats would just "endanger the value of something they are deeply involved in".

If China does choose to dump all of its holdings of US Treasury bills it could cause the United States to implement counter-measures, heightening volatility. China could also make enemies with other large US bond holders such as Japan and the European Union, as they do not want their assets to fall in value. For now however, it seems to be just a threat that is unlikely to materialize.

https://www.cnbc.com/2019/05/13/chinas-self-destructive-nuclear-option-in-trade-war-selling-us-treasury-bonds.html?fbclid=IwAR3AOKXiIZFr9dD7gKTLnP6LSZoyWLe8UHOyvJi0d31lrlJdpclJ1UI7b-I
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