Investment Recipes

by AtonRā Partners

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On the Menu

FEARFLATION

Inflation Is The Topic Of The Day

Unprecedented money flood

Recent aggressive and unparalleled monetary and fiscal policies question the possibility of a sustained period of high inflation.

- To soften the effects of the Great Financial Crisis (GFC), the Central Banks (CB) started a few rounds of Quantitative Easing (QE), totaling more than $7tn.
- To temper the effects of the Covid-induced recession, both CBs and governments unlocked a flood of money and injected several dozen trillions of dollars.

Various measures of inflation

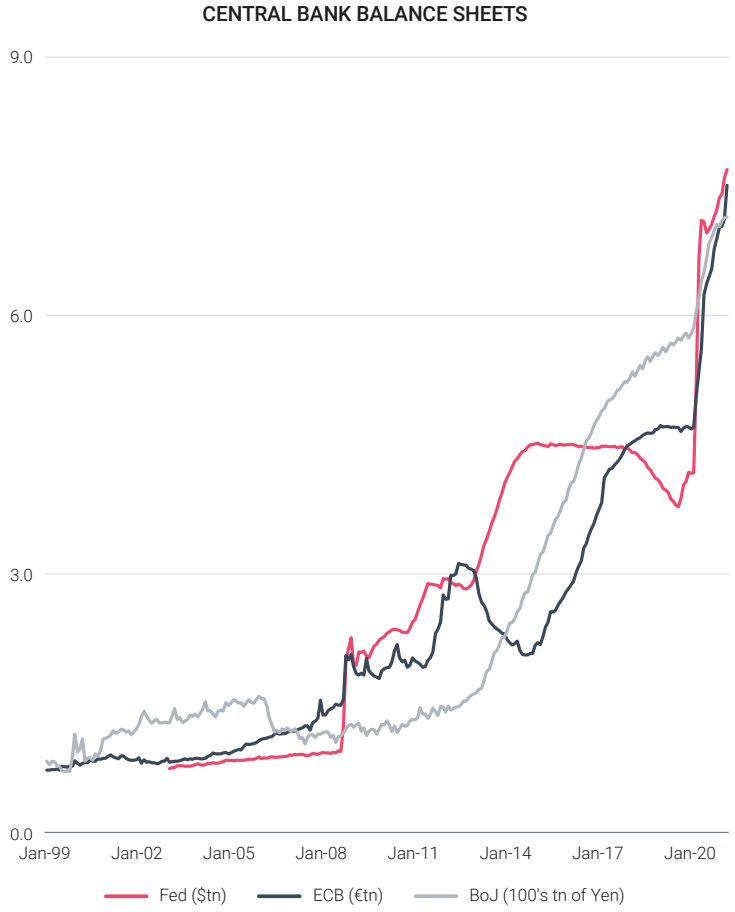
Inflation is difficult to define. Therefore, there are multiple ways to measure it and to anticipate its changes.

- Several government agencies are calculating and publishing various forms of inflation indices, which are backward-looking.
- Numerous surveys or market-based inflation measures help investors interpret inflation expectations.

We are not in a structural high-inflation setup

We believe current conditions are different from the past two inflationary episodes of the U.S. in the '40s and '70s or from emerging markets (EM) hyperinflation.

- Money supply is eventually trapped in the financial system.
- Real growth and demographic pressure are low, while debt is high.
- We are experiencing a supply shock rather than a sustained demand shock.
- The U.S. has its debt denominated in its own currency and is still the world's reserve currency, reducing thus the risk of EM-style currency crisis.



SOURCE:
Reuters Refinitiv Eikon, U.S. Federal Reserve

Money Supply And Velocity

Surge in money supply

The various monetary and fiscal measures to fight the Covid-induced recession caused a surge in money supply, spurring fears of high inflation.

- Fiscal stimulus (direct household payments) and monetary stimulus (mainly QE) contributed to a 25% increase in M2, a broad money classification that includes non-cash highly liquid assets, and its largest rise ever on a YoY basis.

The monetarist approach to inflation

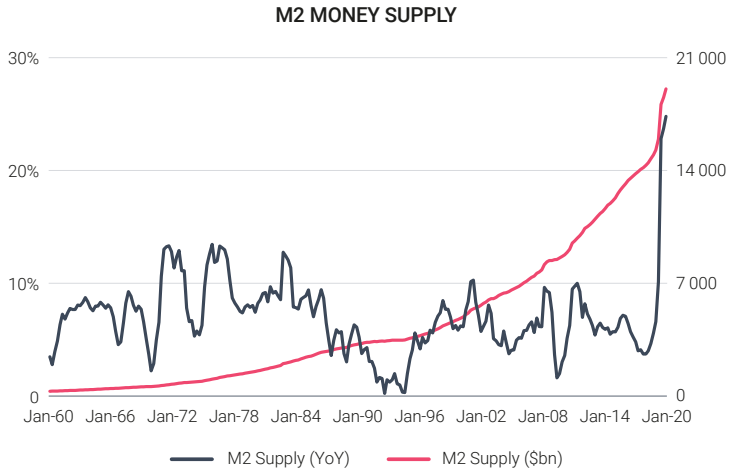
According to classical monetary theory, inflation occurs because there is too much money and credit available to buy the same amount of goods and services produced in an economy.

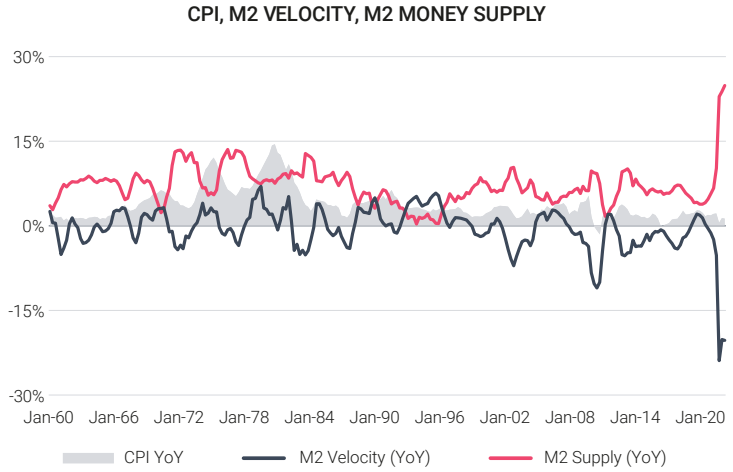
- The "quantity theory of money" formula states that nominal GDP (nGDP), which is price level (P) times the quantity of good and services (Q) equals the money supply (M) times its rate of spending or velocity (V): nGDP = P*Q = M*V.

The role of velocity

In a situation where nGDP is structurally constrained, increasing money supply has a direct and inverse impact on velocity. Velocity of M2 crashed during the pandemic but its decline started decades ago and appears to be related to more structural reasons.

- Growth is structurally constrained by demographics and adding money into the economy does not increase the number of working people nor their productivity.





SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

QE And Money Supply

Mechanics of QE

QE is the process by which the Central Bank buy bonds to lower their yields and supposedly injects money into the economy. But this outcome is not guaranteed.

- In the U.S., the Fed buys bonds from banks or Primary Dealers (PDs) and credits their Fed's reserves accounts. Higher reserves accounts should allow banks to make more loans to the real economy while maintaining their regulatory ratios.
- Banks extend loans based on criteria like strength of the economy, credit scores, and levels of indebtedness. If no loans are granted, this mechanism will not produce the desired effects and no new money will go into the economy.

Impact on money supply

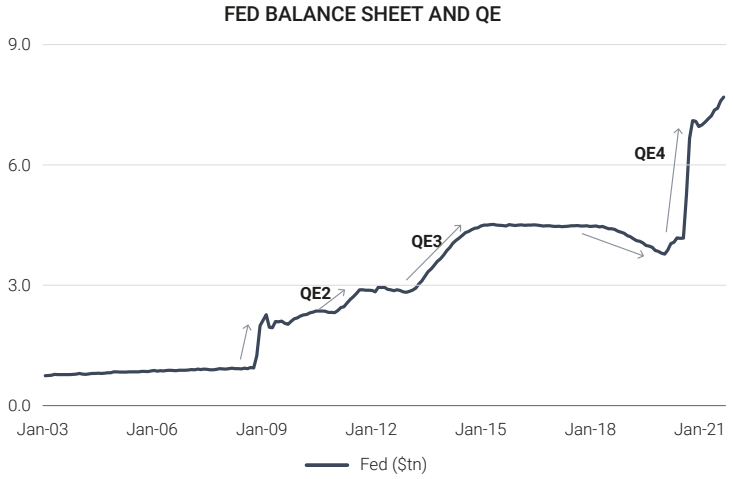
A PD also acts as an intermediary between the Fed and non-bank financial institutions (NBFI), such as pension funds or life insurance, which hold bonds, providing an additional channel to add to or take money from the system.

- The PD buys the bonds from NBFI and sells them back to the Fed.
- NBFIs then receive QE-generated cash, increasing thus the money supply.

QE Inflation

QE is indeed inflationary, but almost only for financial assets as cash received by NBFIs will not necessarily go to the real economy.

- When cash is deployed into the financial markets, it creates inflation of financial assets, with a likely wealth effect for investors but also speculation.
- QE increases money supply, but without higher nGDP, velocity goes down.



SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

Money Multiplier And Inflation

The money multiplier

The Fed controls the monetary base (MB) which is the actual currency in circulation. However, it does not fully control M2, even if, as we have seen, it can influence it via QE or other monetary tools.

- To measure how much money is created per dollar of monetary base, we can use the ratio M2/MB, known as the money multiplier (MM).
- An increase in MM indicates credit creation and potential inflation.

Money multiplier and inflation

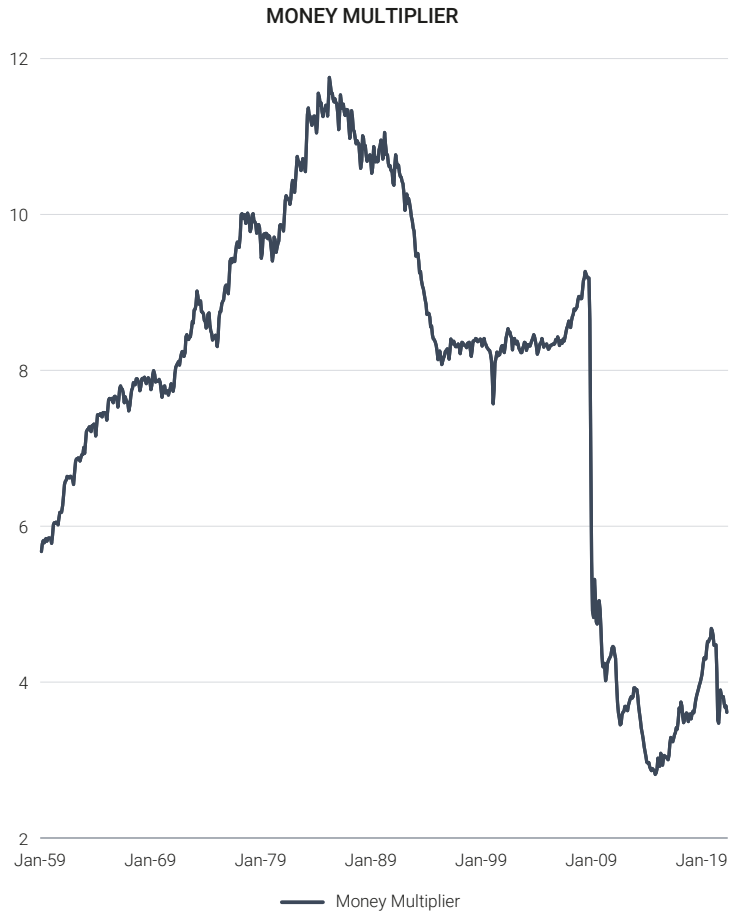
Credit creation is driven by financing demand when growth expectations are rising. Decreasing MM suggests eventual money creation is not transmitted to the real economy through the credit process.

- The MM steadily increased from 1960 to 1985, i.e., before and during a high inflation period, but decreased since then.
- Most of the money creation since GFC has been captured by the financial markets.

Money multiplier and velocity

Having both the velocity and the money multiplier going down signals that money creation is not flowing into purchasing goods and services but remains stuck somewhere else and thus has no inflationary effect on consumer prices.

- Major measures of inflation are not rising because new money is not flowing to the real economy.



SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

Measures Of Inflation (1/2)

The main reference

The Consumer Price Index (CPI) is the most widely-used measure of inflation. It is produced monthly by the U.S. Bureau of Labor Statistics (BLS) and has over a century of data.

- Currently, housing spending accounts for more than 42%, while food and energy account for more than 20%.

Other price indices

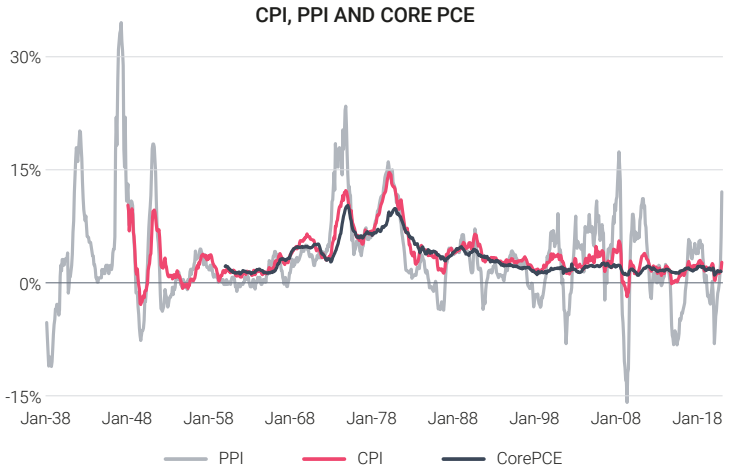
Other measures of inflation that are released by government bodies should also be considered such as core personal consumption expenditures (PCE), the Fed preferred measure of inflation, or the producer price index (PPI).

- Core PCE excludes food and energy which are volatile, making it easier to observe underlying inflation trends.
- PPI measures the input cost inflation, which is then extremely volatile, but also more predictive.

Hourly Earnings

Demand inflation usually starts with wage inflation in the context of a tight labor market. The Average Hourly Earnings (AHE) index is released monthly by the BLS.

- AHE tends to increase when the economy is overheating as workers can ask for an increase and businesses are willing to pay more to keep up with demand.
- Workers will have more money to spend, while the extra cost for the businesses is also likely to be passed into prices.



SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

Measures Of Inflation (2/2)

Inflation Breakevens

Besides government-based survey data, which are backward-looking, there are market-based inflation indicators that are forward-looking.

- Breakeven inflation rates are derived from the yield difference between the Treasury Inflation Protected Securities (TIPS) and the Treasury Bonds.
- It allows having the market view on inflation expectations. However, liquidity issues or the available history are not enough to draw significant conclusions.

Commodities

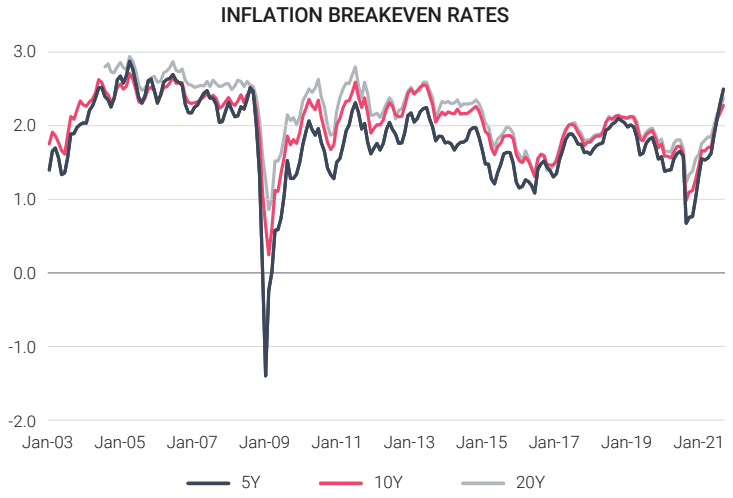
Commodity prices are highly correlated to inflation expectations, as they are a key component of the input costs.

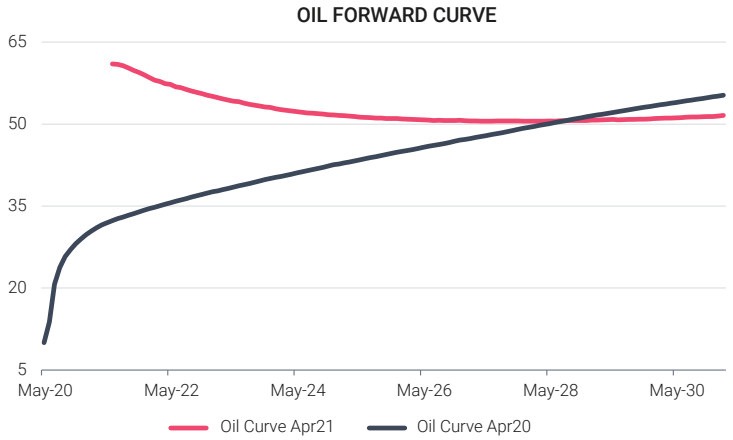
- Commodities also have a forward curve, which allows deriving some inflation expectations.
- The Oil supply shock of the '70s is considered to have been a strong driver of that high inflation period.

Combination of indicators

There is not a single way to observe inflation and we always prefer to look at the combination of various indicators to have a better picture.

- Survey-based, backward-looking data, will surely show higher prints in the coming months due to base effects from the pandemic outbreak period last year.
- Market-based, forward-looking data, are currently not suggesting high sustained level of inflation in the coming years (e.g., the commodity curve is in backwardation, i.e., spot prices are higher than future ones, and breakevens remain tame).





SOURCE:
Reuters Eikon Refinitiv

Past Inflation Episodes (1/2)

Similarities with recent episodes of sustained high inflation

To better assess whether we could experiment high sustained level of inflation we could delve into some of the initial macro conditions that lead this phenomenon in the 1940's and 1970's, even if comparison is not always meaningful due to the structural differences among these periods.

- Real GDP growth, debt, demographics and saving rates are key indicators.

Real GDP growth

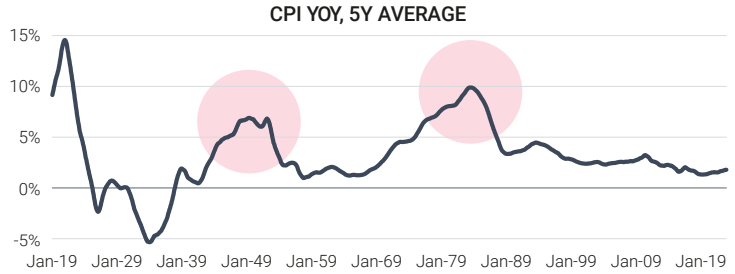
The last 5 years preceding high inflation periods were characterized by high level of real GDP growth, 7% prior to the 40's and 3% prior to the 70's.

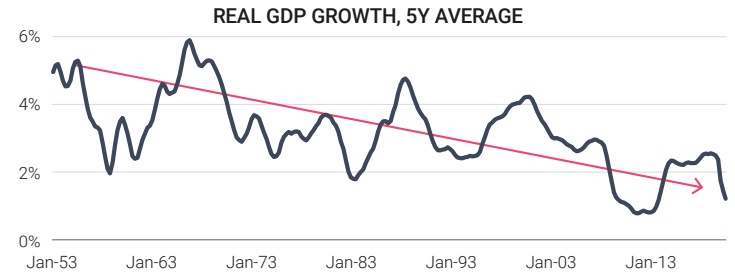
- Since 2016, real growth has been only about 1%.
- Similarly, real GDP per Capita has drifted below its long-term trend.

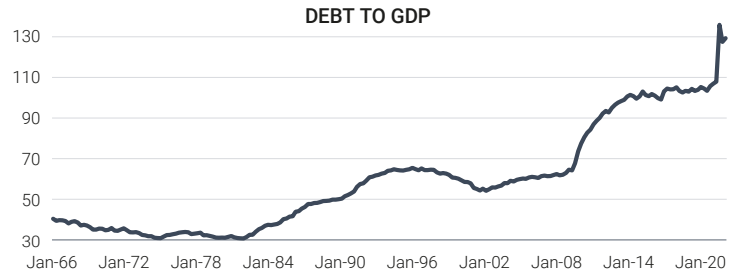
Debt

For the government to massively spend and potentially create inflation, the federal debt level should give room to debt increase. At high levels of debt, any spending has lower marginal effect on GDP growth.

- The debt-to-GDP ratio was 44% in the 40's (before exceeding 100% due to the war) and 35% in the 70's.
- Current ratio is already way above the 100% threshold.







SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

Past Inflation Episodes (2/2)

Demographics

Demographic is one of the strongest force driving both growth and inflation.

- With low demographic growth, demand for goods and services is not increasing fast enough to cause prices to rise.
- In both the 40's and 70's, population was growing fast (ca. 1%), while now growth is ~0,5%. Working age population growth is also dropping fast.
- In Japan, where demographics have been slowing down for the past 30 years, and despite all the monetary and fiscal measures, inflation never picked up.

Savings rate

High savings give spending power. While personal saving rates increased due to lockdowns and governments checks, government saving went negative. Thus, the net national saving rate, aggregating government, corporate and personal savings is a more relevant figure to consider.

- Net national saving rate as a percentage of Gross National Income (GNI) was above 10% in both the 40's and 70's while it is currently below 2.5%.

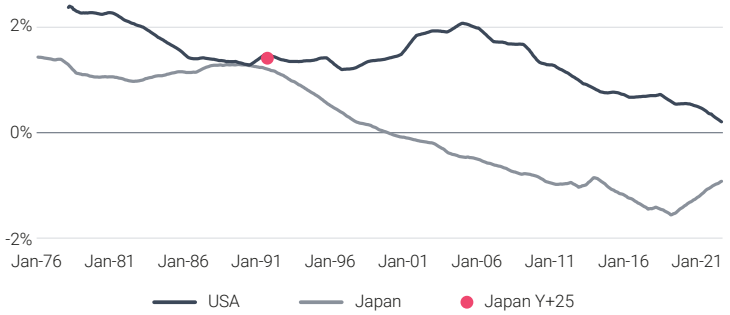
The specter of hyperinflation

Excessive money and credit creation may lead to hyperinflation. Famous examples include Weimar Germany, but various emerging countries suffered episodes of hyperinflation. Conditions today are crucially different.

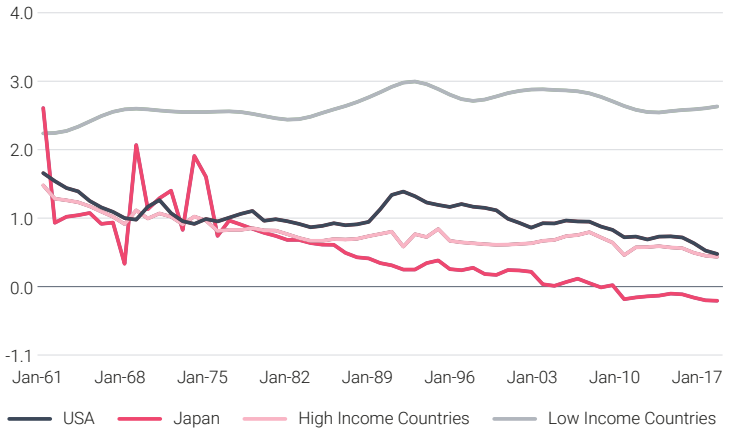
- The USD is the currency on which U.S. debt is denominated; it was not the case for countries enduring hyperinflation.
- The USD is still used as the world reserve currency, and more than half of global trade is denominated in USD.

SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

WORKING AGE POPULATION YOY GROWTH, 5Y AVERAGE



POPULATION GROWTH (YOY %)



NET SAVINGS AS % OF GNI

Spillover Risks?

Acceleration vs. level

The danger in inflation is not necessarily its absolute level, for which the market can adapt, but its rate of change, notably in case of an unexpected acceleration. Monitoring closely any risks of spillover from markets showing inflation is key.

- Besides financial markets, there are some niche markets where inflation is present or may arrive and could quickly spillover to the entire economy.

Commodities and supply chain

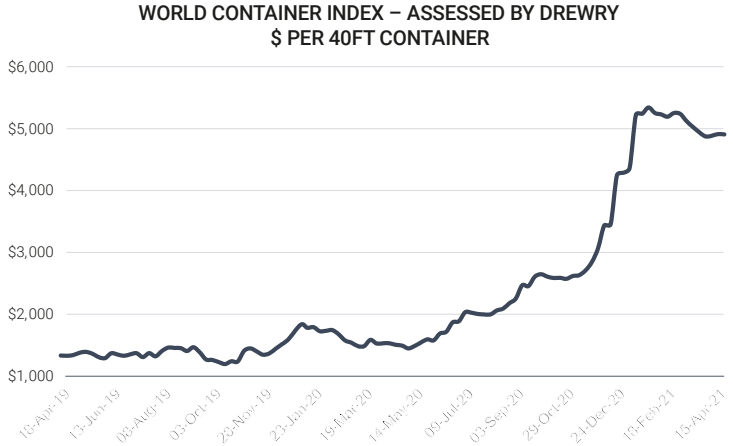
Despite the current energy curve being in backwardation, some commodities' prices have risen significantly.

- Lumber rose by 300% YoY. As it is mainly used in house building, it could lead to much higher prices in CPI's housing component.
- Oil investments dropped massively. A strong reopening combined with supply chain disruption could dramatically drive up the prices and increase input costs.
- Shipping cost also increased by more than 300% YoY.

Relocalization

As we wrote at the beginning of the Covid crisis, many governments are realizing the critical role of the global supply chain. Re-localization of goods manufacturing is on the political agenda as a mainstay.

- Developed economies are not producing goods anymore and the unemployment rate is high.
- The increase in production costs will likely be reflected in sales prices.



SOURCE:
Reuters Eikon Refinitiv, Drewry

Post-COVID Inflationary Pressure

Inflation bound to rise temporarily

As mentioned, we expect CPI to significantly but temporarily rise, not because of money supply but rather due to Covid-related shocks on both consumption and supply chain.

- With lockdowns, consumers massively increased demand for goods vs. services.
- Supply chain disruptions imply that the sudden (but transitory) surge in demand cannot be satisfied by inventories, resulting in price inflation.

Transitory demand

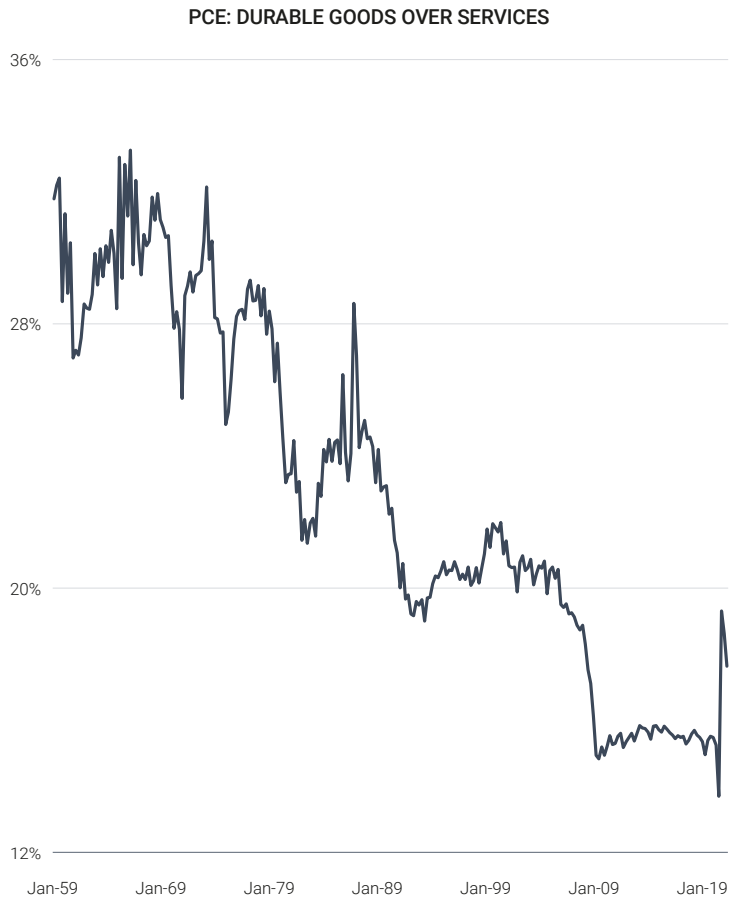
Demand side sustained inflation is possible but unlikely given that conditions for a spike in demand (e.g., real growth and demographic) are currently not present.

- There has been a structural decline in demand-driven inflation which has puzzled the Fed, despite its various policy measures.
- Global demand is likely however to spike transitory as the economy reopens.

Conditions for a sustained high-inflation are not met

Supply side inflation is mainly driven by input costs such as commodities or wages. We currently do not observe sustained and general pressure on the supply side components.

- The commodity futures curve is in backwardation (i.e., longer term prices are lower than shorter term ones) suggesting no supply constraints.
- Unemployment is so high, that a significant and sustained pressure on salaries is currently unlikely, without government intervention.



SOURCE:
Reuters Eikon Refinitiv, U.S. Federal Reserve

Catalysts

- **Different initial conditions.** Initial conditions of the two last high inflation episodes in the U.S. are currently not met allowing Central Bank and Governments to try unprecedented methods to fight the Covid-induced recession.
- **Muted Demand.** Structural conditions such as low demographics and high unemployment suggest demand side inflation, which is the most dangerous, is unlikely in the short term.
- **Central Bank Reaction.** The Central Banks are loaded in potential ammunitions to tighten an overheating economy. If inflation expectations are rising too fast, the Central Bank balance sheet can be worked down rapidly or even increase various short term interest rates.

Risks

- **Central Banks independence.** Abiding to political demands and giving up monetary stability, for example, if they are unwilling to fight rising inflation to avoid killing a nascent economic recovery.
- **Central Bank Digital Currencies (CBDC).** The use of CBDC with an expiry date, such as is suggested in China, can massively increase the velocity of money and thus demand side inflation.
- **Universal Basic Income.** Receiving a bonus is not the same as a base salary increase. The spending habit might change and be distorted.

Bottom Line

- Given the unprecedented size of both fiscal and monetary policy, inflation will be the topic for the years to come. The wise investor will always look at multiple measures of inflation to draw a better picture of the inflation landscape.
- We expect a transitory surge in inflation prints following the reopening of the economies and due to base effects. But initial conditions for sustained high inflation are currently absent. Strong demographics, high real growth and significant velocity are missing. Equity markets are likely to experience turbulences but the overall long-term positive backdrop remains unchanged.

NO SHORTAGE OF OPPORTUNITIES FOR SEMICONDUCTORS

Silicon Shortage Kindles A Healthy Reset

When the ubiquitous becomes hard to find

Semiconductors have become ubiquitous and are the bedrock of modern technology. Therefore, the current shortage is a significant problem for many sectors across the industry, as it hampers and delays the long-awaited post-covid rebound.

- Semiconductors are present in every electric device and are hardly substitutable.
- The automotive industry has been hit the most, with a production deficit of 672k vehicles in the sole 1Q 21.

A transitory yet painful situation

Caused by a covid-induced imbalance, the problem has been tackled by both private and public stakeholders, buoying semiconductor stocks. However, the industry's inertia will lead to turbulences lasting until at least early 2022.

- Semiconductor players have announced substantial CAPEX plans, yet it takes two years to build a semiconductor factory and more to ramp up production.
- E.U., China, and U.S. governments have announced strategic investments, leading to semiconductor stocks outperforming indexes YTD.

A super-cycle in the making

These developments are not the sign of yet another boom-and-bust but the early stage of a semiconductor super-cycle. New transformative technologies, such as the ARMv9 architecture, will sustain demand.

- 2021E CAPEX growth is all but extraordinary vs. historical data. Despite the massive rebound in demand, inventory levels are low.
- 5G, autonomous driving, AI applications, or China have the potential to fuel substantial growth until at least the next decade.

SOURCE:
OMDIA

The Bedrock Of Modern Technology

What are semiconductors?

Semiconductors conveniently designate electronic devices built with transistors, i.e., devices controlling electronic signals and electrical power. Originally replacing vacuum tubes in computational tasks and generally made of silicon, they are today used in a wide range of applications.

- Digital integrated circuits (e.g., processors and memory) compute and store data.
- Analog circuits (e.g., power and RF) adapt and control electric flows.

The building block of every electric and electronic device

Semiconductors control electric power, sense and collect information, transmit and manipulate the corresponding data, and display it by emitting light. This versatility leads them to be present in virtually every device powered by electricity, from pacemakers to planes.

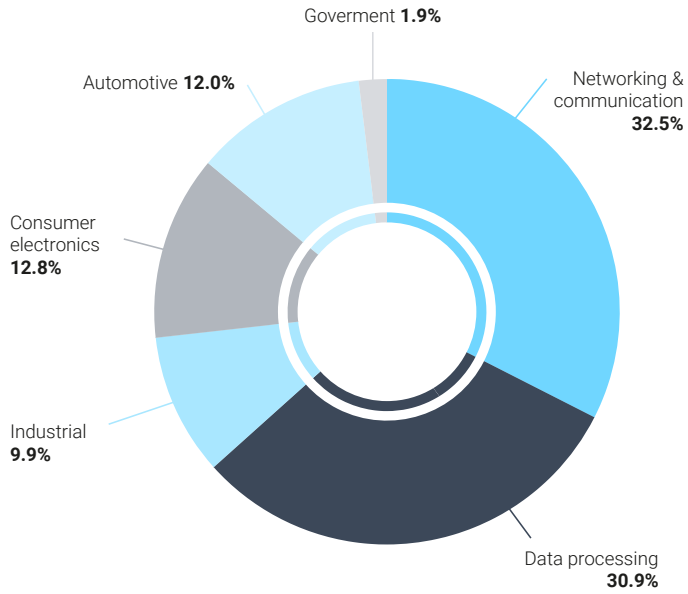
- The global semiconductor market could grow by 16.9% in 2021, reaching $545bn – strongly recovering in a post-pandemic environment.
- The semiconductor industry supplies a massive electronic systems industry nearing $2tn in annual revenues, enabling almost everything electrical.

Harder, better, faster, stronger

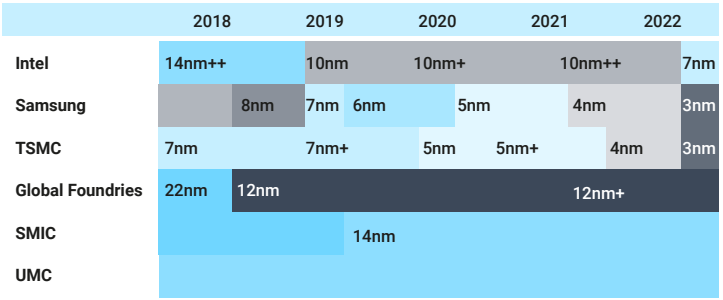
The semiconductor industry's economic engine is "smaller, faster and cheaper" – a surprisingly easy to state and hard to reach creed. Therefore, the industry is in a permanent state of imbalance, transitioning towards the latest innovation.

- Transistors are today 5nm big, with processors packing up to ~40bn of them.
- The technology is now driven by Asian foundries (such as TSMC and Samsung), concentrating the production capacity in the hands of a few players.

SEMICONDUCTORS APPLICATIONS



TECHNOLOGICAL EVOLUTION



SOURCE:
Gartner, IC Insights, Fortune Business Insights

Nano Complexity, Macro Difficulty

Ubiquitous, not generic

The industry's high pace of innovation has led to high specialization over time, giving birth to concentrated silos. High barriers to entry, limited choice, and technology differentiation make it hard, if not sometimes impossible, to substitute products.

- GPUs are a crucial component for AI and Machine Learning (ML), but AMD and Nvidia are the only significant suppliers.
- The DRAM market is owned by Micron, SK Hynix, and Samsung.

An intricate and concentrated supply chain

The exponential complexity of producing integrated circuits has led to a schism between design and manufacturing: most semiconductor players focus on chip designing and are today fabless, outsourcing their production to specialized players, the foundries, which creates blatant bottlenecks along the chain.

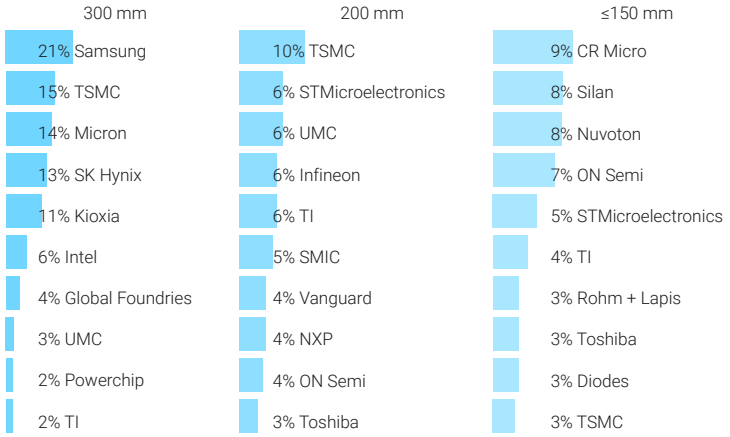
- TSMC and Samsung own 71% of the foundry market, of which 54% for TSMC.
- With the cost of a single manufacturing facility crossing the $10bn mark, top foundries have a *de facto* monopoly on cutting-edge technologies.

More of a cruise ship than a speedboat

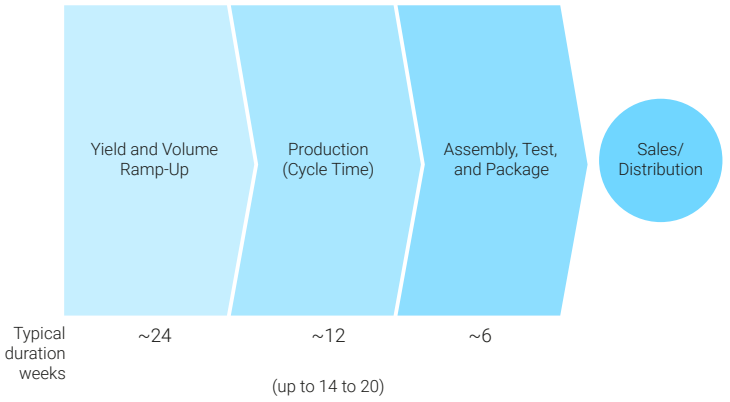
The constraints of an advanced manufacturing process are so tight that the design of chips has to be tailored to it and hence to its supplier. Consequently, switching to another provider is complex and leads to incompressible inertia, an issue compounded by production cycles spanning over several months.

- Designing a complex chip can take several years.
- Manufacturing can take up to 1'400 steps and 20 weeks.
- Retargeting a fab or moving a product is a 6 to 12 months-long process.

INSTALLED CAPACITY LEADERS – DECEMBER 2020



SEMICONDUCTOR FAB PRODUCTION TIMESCALES
REQUIRED TO INCREASE FAB UTILIZATION



SOURCE:
Foundry market jumps 24 percent in 2020.
Chipmakers Are Ramping Up Production to Address Semiconductor Shortage

Turbulences Ahead

A substantial imbalance

After the Covid-19 winter, the world economy has initiated a rebound which has translated into solid demand across the board. However, this has proven too high for the semiconductor supply chain, translating into unmet needs and a strong overall imbalance, generating undesirable effects.

- The shortage has ripple effects not only in the industry but in all the related supply chains, from cars to gaming consoles and refrigerators.
- The impact on the automotive industry alone is estimated at $61bn.

No easy way-out

Given the size of the imbalance and the impossibility to rapidly roll out new capacity, the situation is likely to somehow persist until 2022 – as automotive products' lead times can be as high as 26 weeks. Some aggravating factors also limit visibility and restrict capacity utilization, increasing the pressure at the worst moment.

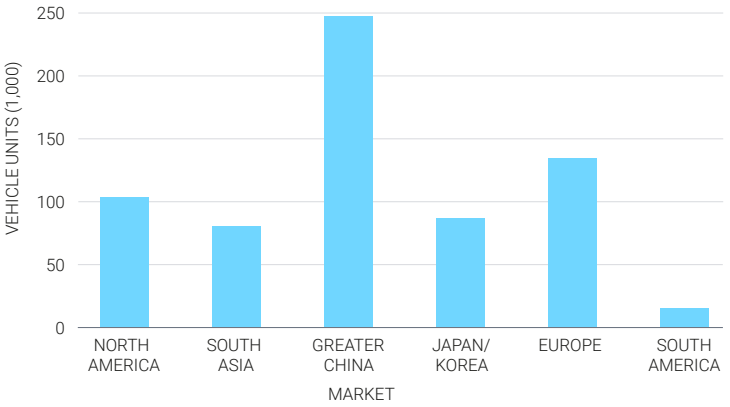
- Substantial chunks of the global production have been durably perturbed by Texas' winter storm and by a fire at a Renesas plant in Japan.
- A severe drought in Taiwan may further impact production, and price increase for processed wafers have already been announced by TSMC and UMC.

Short term volatility amid a robust economic environment

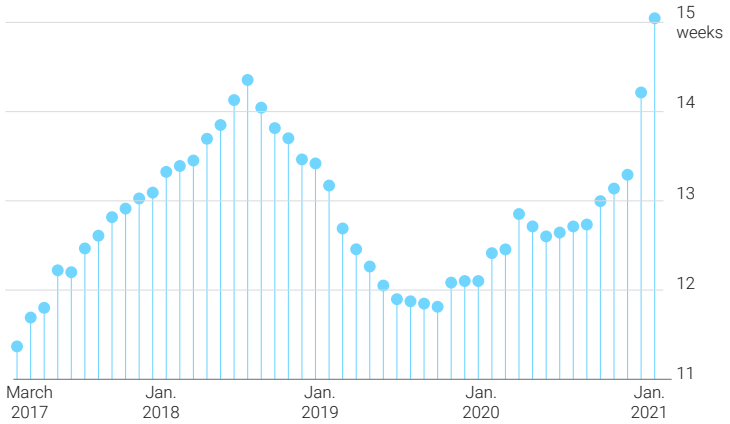
We believe that the demand is structural and will not vanish, hence absorbing price increase. Yet, we recognize that supply limitations impair visibility on chip players' guidance and might have participated in the recent tech stock volatility.

- The global economy is over-heating, stretching the global supply chain beyond semiconductors. Volatility is likely to go on for the next few months.
- Yet, the Year-to-Date performance of the SOXX is twice as good as the S&P 500.

ESTIMATED IMPACT ON LIGHT VEHICLE PRODUCTION VOLUME IN Q1 2021 DUE TO SEMICONDUCTOR SUPPLY ISSUES



GLOBAL CHIP INDUSTRY LEAD TIMES (IN WEEKS)



SOURCE:
How Covid led to a $60 billion global chip shortage for the auto industry

A Big Grain Of Sand

Covid-19 as a trigger

The crisis was triggered by Covid-19, although not instantaneously: after a historic fall in 2019 and a slight increase in 2020, the end demand's 2021 rebound was such that it took many by surprise, depleted insufficient inventory, and therefore saturated production capacities.

- Semiconductor revenues declined by ~12% in 2019 and grew by ~6% in 2020.
- A double-digit growth is expected in 2021 – driving a typical bullwhip effect.

Supply was already constrained before the pandemic

The pre-pandemic supply chain was already unbalanced. Apart from TSMC, the capacity on sub-10nm nodes is almost non-existent outside of Samsung and Intel, which encountered yield or technology problems on their latest processes.

- TSMC's utilization rate has been close to or above 100% in recent quarters, allowing it to cancel its 2022 price discount.
- The problem is compounded by U.S. sanctions on Chinese players – as SMIC is unable to serve the demand and Huawei was stockpiling chips in 2020.

Time is needed to steer the boat

Building capacity cannot be done overnight. A semiconductor fab is a complex machine, requiring advanced clean rooms and specialized machines, for which there is some lead time as well as potential supply constraints already.

- It takes three to four years to ramp up production from greenfield and already announced massive investments will come online in the next two years.
- Some critical components such as lithography machines represent clear bottlenecks, compounded by the ecosystem's shift towards Extreme Ultra-Violet manufacturing, for which ASML has a de-facto monopoly.

SOURCE:
Gartner Says Worldwide Semiconductor Revenue Declined 11.9% in 2019,
Worldwide Semiconductor Revenue Grew 5.4% in 2020 Despite COVID-19 and Further Growth Is Forecast in 2021,
According to IDC, IC Insights Raises Its 2021 IC Market Forecast from 12% to 19% Growth

Strategic Problems Mean Substantial Opportunities

Semiconductors are under the spotlight

The crisis acted as a wake-up call for governments, which realized the strategic importance of semiconductor manufacturing and their increasing reliance on Asian supply chains. Massive investment plans bankrolled by incentive plans have already been announced to relocate or expand supply chains.

- Presidents Biden's infrastructure plan includes $50bn for semiconductors.
- E.U. wants to double its production share to 20% by 2030, investing up to $160bn.
- China has an ambitious strategic plan to become mostly self-sufficient, planning a $118bn public funding over the next five years.

Massive yet disciplined investments announced

The semiconductor industry has long lived boom and bust cycles with muted investment following oversized expenditures. Yet, the trend has been mitigated in the last decade as a result of the fab-lite model generalization and a maturing industry.

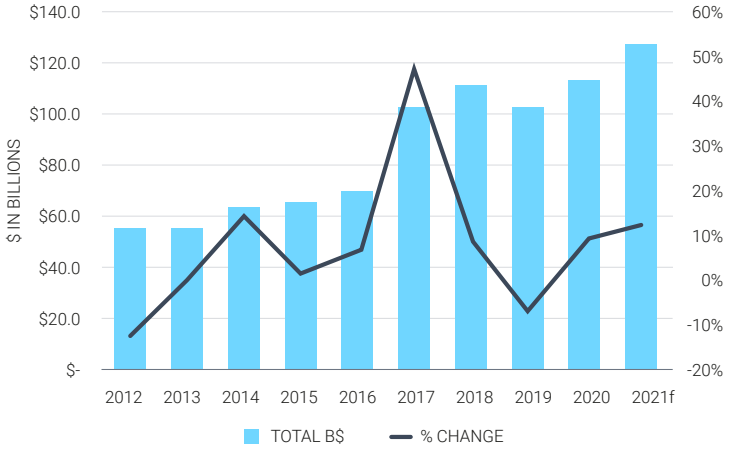
- TSMC and Samsung announced massive investments for the next two years (~50% of the global CAPEX for 2021), and Intel announced revised-up spending of $20bn. Record fab investments in 2021, yet growth remains measured.
- Disciplined CAPEX provides a very positive environment where pricing remains firm, and the demand/supply environment tends to rebalance.

Resulting in industry-wide operational leverage

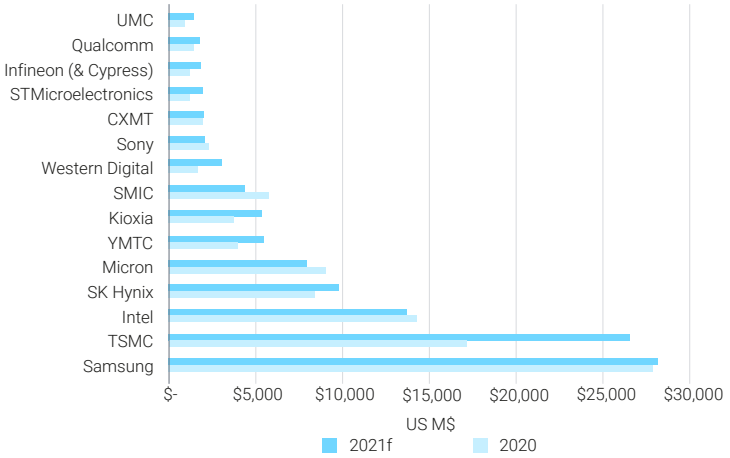
The exogenous Covid19 cycle is causing volatility yet drives a healthy price increase. Disciplined CAPEX will result in a supply rebalance rather than a boom-and-bust process, laying the foundations for a new multi-year cycle.

- We believe the environment will enable leading players to grow their margins while maintaining their competitive edge, ultimately supporting high valuations.

TOTAL ANNUAL SEMICONDUCTOR CAPEX



TOP 15 RANKED BY CAPEX, 2020-2021



SOURCE:
Bloomberg, Center for Strategic and International Studies, Nikkei

When The Stars Align

The world cannot get enough chips

The covid19 pandemic ignited a rise in demand for chips, both on the enterprise and consumer sides. Companies shift to cloud and on-demand services. Individuals work from home and consume more digital entertainment.

- Demand for mobile and PC, once thought in decline, reaccelerated in 2020.
- 2020 was the biggest year on record for consumer tech products such as game consoles, headphones, and smart-home products ($442bn in the U.S. alone).

AI & Robotics accelerate demand

Artificial Intelligence is opening the best opportunities for semiconductor companies in decades. We believe it will drive a significant increase in revenues, favoring market leaders and mergers/acquisitions.

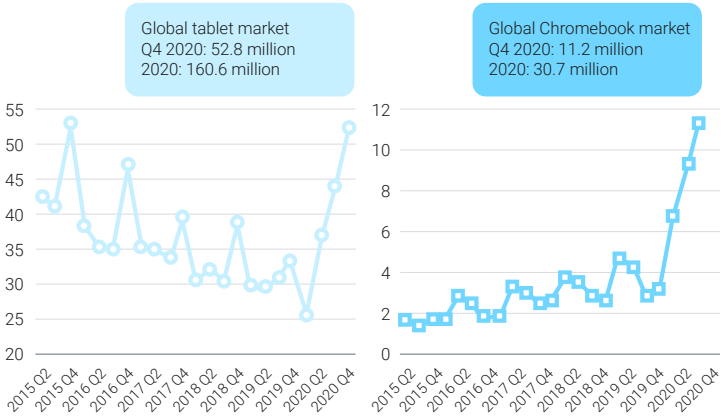
- AI semiconductor market grows 5x faster than non-AI semiconductors, accelerating demand for data-centric processors and memories.
- Global 5G subscription surpassed 400mn in 2020, with adoption rate 3x faster than LTE – resulting in massive demand for mobile and infrastructure products.

Opportunities for all

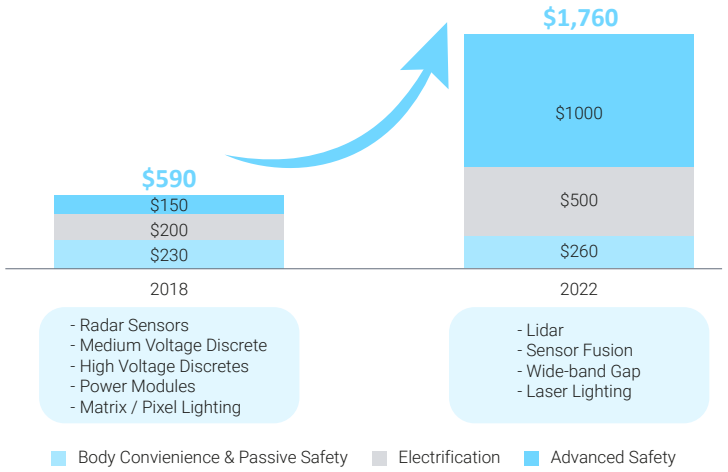
As the U.S., Taiwan, and Korea compete for bleeding-edge products, the current chip shortage is an opportunity for China to capture market share for cheaper products.

- The U.S. sanctions have prevented SMIC from competing in the FinFET space, directing the company's massive CAPEX ($4.3bn) towards less advanced products. SMIC is forecasted to surpass UMC and GlobalFoundries by 2025.
- China is gearing semiconductor investment towards automotive to become a global leader in electric vehicles (EV). Chip shortage imposed temporary fab closures.

TABLETS AND ULTRA-PORTABLE HIT ALL TIME HIGH IN Q4 2020



AUTOMOTIVE SEMICONDUCTOR CONTENT INCREASES MANYFOLD



SOURCE:
DigiTimes, Nikkei, Omdia, Canalys, ON Semiconductor, CNBC

Catalysts

- **No alternative.** In our digital age, semiconductors have become ubiquitous and are simply irreplaceable. There is simply no alternative apart from fixing current bottlenecks.
- **Underlying demand.** As the economy is rebounding with hopes on the pandemic front, so is end-demand, which adds some more pressure to the capacity extension requirements.
- **Strategic investments.** Governments have finally realized the strategic importance of the semiconductor industry and supply chain, translating into additional investment cycles.

Risks

- **Return of boom-and-bust.** Although this pattern appears to be a thing of the past, the scale of the current investments and the unusual demand variations may lead to further discrepancies in supply and demand.
- **Geopolitical tensions.** Tensions between the U.S. and China could lead to artificial demand crunches in specific areas and destabilize parts of the semiconductor ecosystem.
- **Durable impact of the pandemic.** Although the world economy appears to rebound, it is not protected from a potential cyclicality of the pandemic, which would durably impact demand.

Bottom Line

- The current silicon shortage is expected to last for the best part of 2021, with a negative impact on the global economic recovery. Nevertheless, the solid underlying demand is here to stay and will fuel an already healthy environment for semiconductor players.
- As supply constraints start easing, we believe that semiconductor companies will benefit from a perfect storm of increased prices, operational leverage, and sustained demand acceleration driven by artificial intelligence and robotics. We thus confirm our strong conviction and exposure to the sector, which is poised to remain more than ever the bedrock of the global economy.

Companies mentioned in this article:

AMD (AMD US), ASML (ASML NA), GlobalFoundries (Not listed), Huawei (Not listed), Intel (INTC US), Micron (MU US), Nvidia (NVDA US), Renesas (6723 JP), Samsung (005930 KS), SK Hynix (000660 KS), SMIC (981 HK), TSMC (2330 TT), UMC (2303 TT), WingTech (600745 CH)

WHEN ANTIBODY PRECISION MEETS EFFICACY

A New Powerful Drug Class

A new winning combination

Antibody Oligonucleotide Conjugates (AOCs) are a new class of therapies built on implementing a precision medicine approach that combines two validated mechanisms into one single drug. Although still in the early development stages, this approach already has some validation and could unlock a substantial market opportunity.

- Oligonucleotides, short DNA or RNA molecules, are an emerging class of drugs designed to treat genetic diseases. In AOCs, oligos are attached to monoclonal antibodies, the most common biological drugs.

Targeting an urgent need for patients and families

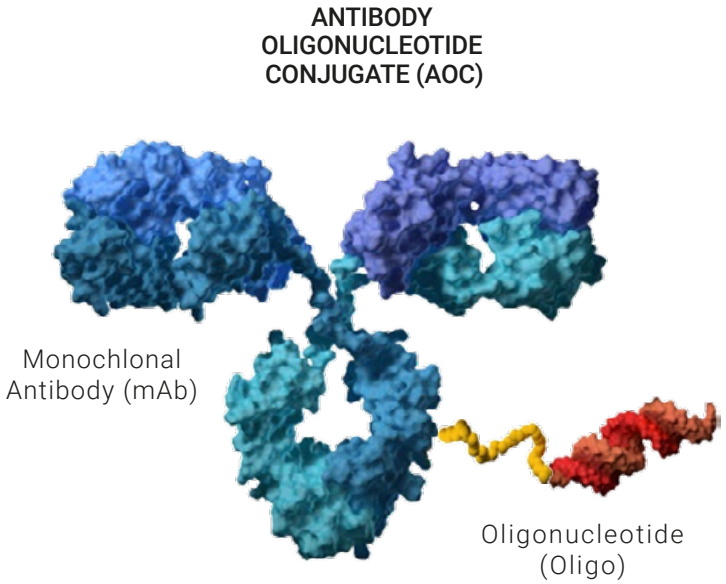
AOC's first indications are genetic muscular dystrophy disorders, a class of diseases causing degenerative loss of muscle function and leading to terrible disabilities and mortality risk. Current therapeutic options in these indications are either designed to treat only the symptoms or show marginal and doubtfully meaningful efficacy.

- Duchenne Muscular Dystrophy (DMD), one of the most known and prevalent disorders in this class, is causing paralysis for boys at young age and death by early adulthood.

A two-horse race for technological leadership

The AOC landscape is currently a tight two-horse race. Dyne and Avidity, which did their IPOs last year, take a slightly different approach to design their AOC platforms.

- Both show solid preclinical validation, and human testing for mild forms of muscular dystrophy is to commence soon.



Two Proven Technologies

A promising traditional oligonucleotide approach…

Oligonucleotides act by interfering with the messenger RNA (mRNA) during the translation of the genetic code into protein production. They are designed as a complementary DNA/RNA sequence that silences or modifies mRNA expression, thereby stopping or limiting disease-causing proteins' production.

- The attractiveness of these drugs is in their versatility; they can essentially target any disease-related gene in a selective approach dependent on the genetic sequence selected.

…is hitting its limits

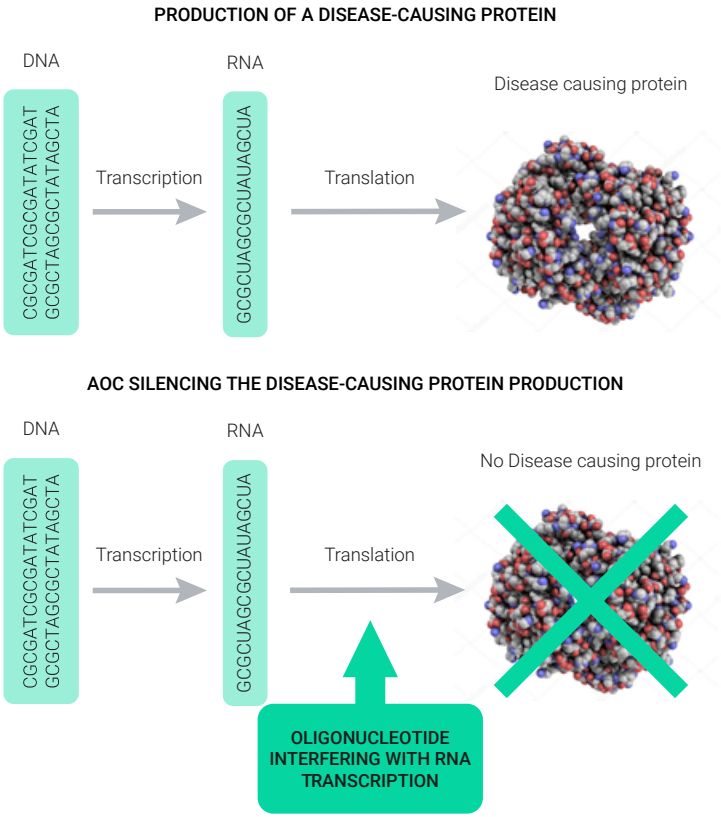
Approved first-generation oligonucleotides therapies (siRNA), including several breakthrough drugs, are very efficacious in liver-mediated diseases but require very high and thus unsafe dosing to reach other tissues.

- Companies such as Alnylam (discussed in detail here) and Ionis have been active in the field, developing treatments primarily for cardiovascular and rare liver diseases.

Using monoclonal antibodies to reach the target

Monoclonal antibodies (mAbs) are by large the most common class of biological drugs. Lab-made and genetically engineered to target any tissue, they generally work by mimicking the immune system's ability to fight off pathogens.

- The most significant advantage of mAbs is their ability to target a specific tissue in a selective manner.



mAbs	Oligonucleotides (e.g. siRNA)
Over 100 approved drugs	Approved method with approximatively 15 drugs on the market
Well-established safety profile	Highly potent
High level of specificity and selective binding ability	High efficacy of gene knockdown
Homogenous and consistent.	Ability to easily target the gene of interest

The Best Of Both World

1+1=3

The promise behind AOC is the potential ability to combine the best of two worlds, the efficacy of an oligonucleotide with an antibody's selectivity. The mAbs play the oligonucleotide's taxi, delivering it to the precise tissue of choice associated with the underlying disease.

- The ability to deliver oligonucleotide therapies beyond the liver opens the door to treating a far larger array of genetic conditions.

An extension of ADC technology

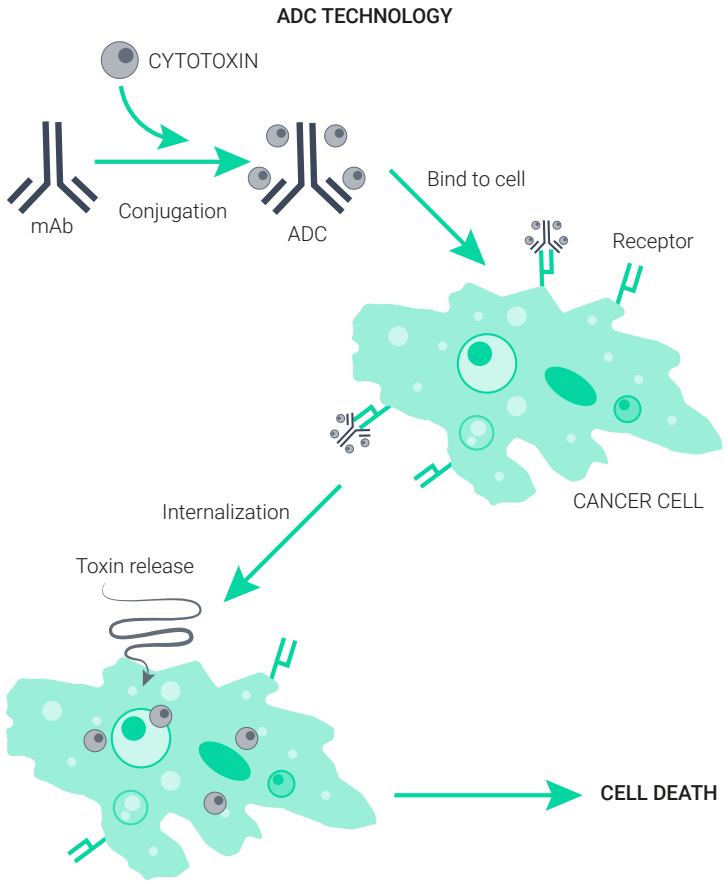
The idea of conjugating a drug material to an antibody comes from oncology, where Antibody Drug Conjugates (ADCs) is a leading therapeutic option in several cancers. In ADCs, a chemotherapy drug is being conjugated to mAbs, delivering anti-cancer treatment to a specific tissue while avoiding the systemic toxicity associated with traditional chemotherapy.

- Immunomedics, a player in this space that was part of our portfolio, was bought by Gilead for $21bn.
- The ADC market is expected to reach $9.9bn by 2025, growing at a 25.9% CAGR over the period.

AOCs have a massive potential

Given the huge unmet need that would be addressed by AOCs, the resulting broad adoption could translate into a substantial market opportunity. Moreover, with a primary focus on rare and underserved diseases, pricing should be resilient.

- Despite substantial research efforts spanning over several decades, there are still very few treatment options for muscle dystrophy disorders.
- Different AOCs are expected to be priced at ~$400k annually, representing a multi-billion revenue opportunity.



Science Breakthroughs Where It Matters Most

Muscular Dystrophy

Muscle dystrophy disorders are the first indications targeted by AOC developers. The expected profound effect on muscle tissue and a severe lack of treatment options make this a sensible strategy.

- Muscular dystrophy is a group of inherited diseases characterized by weakness and wasting away of muscles, often leading to paralysis and death at later stages.
- Genetically originated, most of these disorders manifest themselves usually at infancy, burdening entire families.

Duchenne Muscular Dystrophy (DMD)

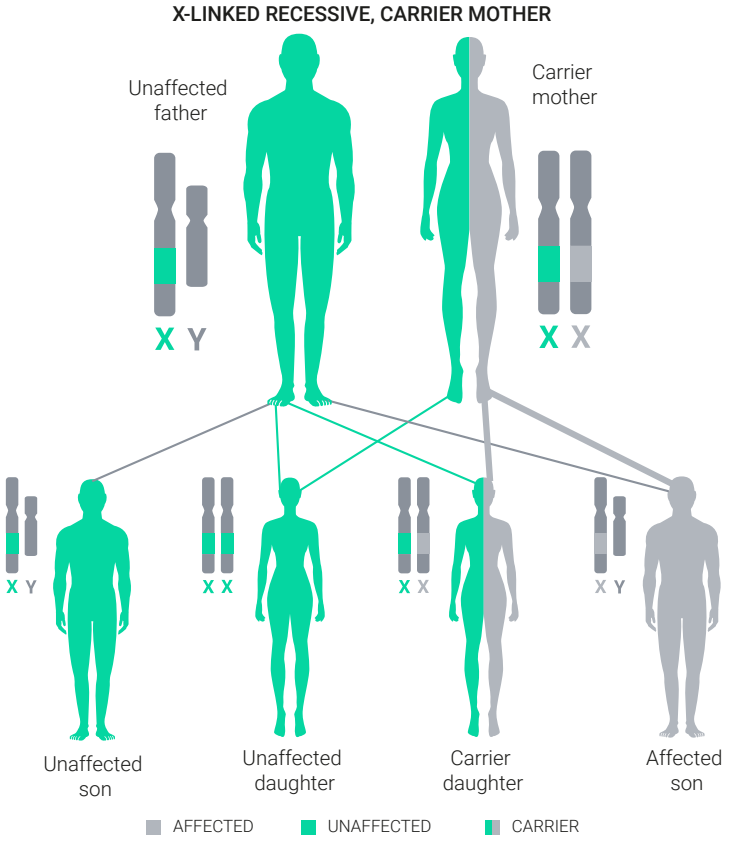
One of the most debilitating muscular dystrophy disorders, both for severity and relatively high prevalence, is DMD. It is an X-linked recessive (and therefore prevalent only in boys) genetic disorder caused by a mutation in one of the genes modulating proper muscle function.

- DMD affects 10k–15k people in the U.S. and 26k people in the E.U.
- The DMD drugs market is expected to grow at a 42.1% CAGR, from $935mn in 2020 to 7.7bn by 2026.

We need better options!

The disease is characterized by progressive muscle degeneration, leading to paralysis already in childhood. The mainstay treatment for these patients is steroids, targeting the inflammation associated with the disease, with a marginal benefit only on symptoms.

- Most DMD boys die within the 3rd decade of their life as heart muscles stop working.
- Several first-gen oligonucleotides have been conditionally approved in recent years, but the actual benefit is incremental at best.



Current Therapeutic Options Suboptimal

First-generation oligonucleotide treatment approved in 2019

In one of the most controversial decisions in the agency's history, the FDA disregarded its advisory committee and approved Exondys (Sarepta's oligonucleotide drug) to treat one subtype of DMD patients. The shortfall of the treatment is that very little drug material reaches the muscles, despite exceptionally high doses.

- In clinical studies, Exondys and parallel treatments achieved normal gene function with a meagre success rate of <1%.

An attractive market opportunity

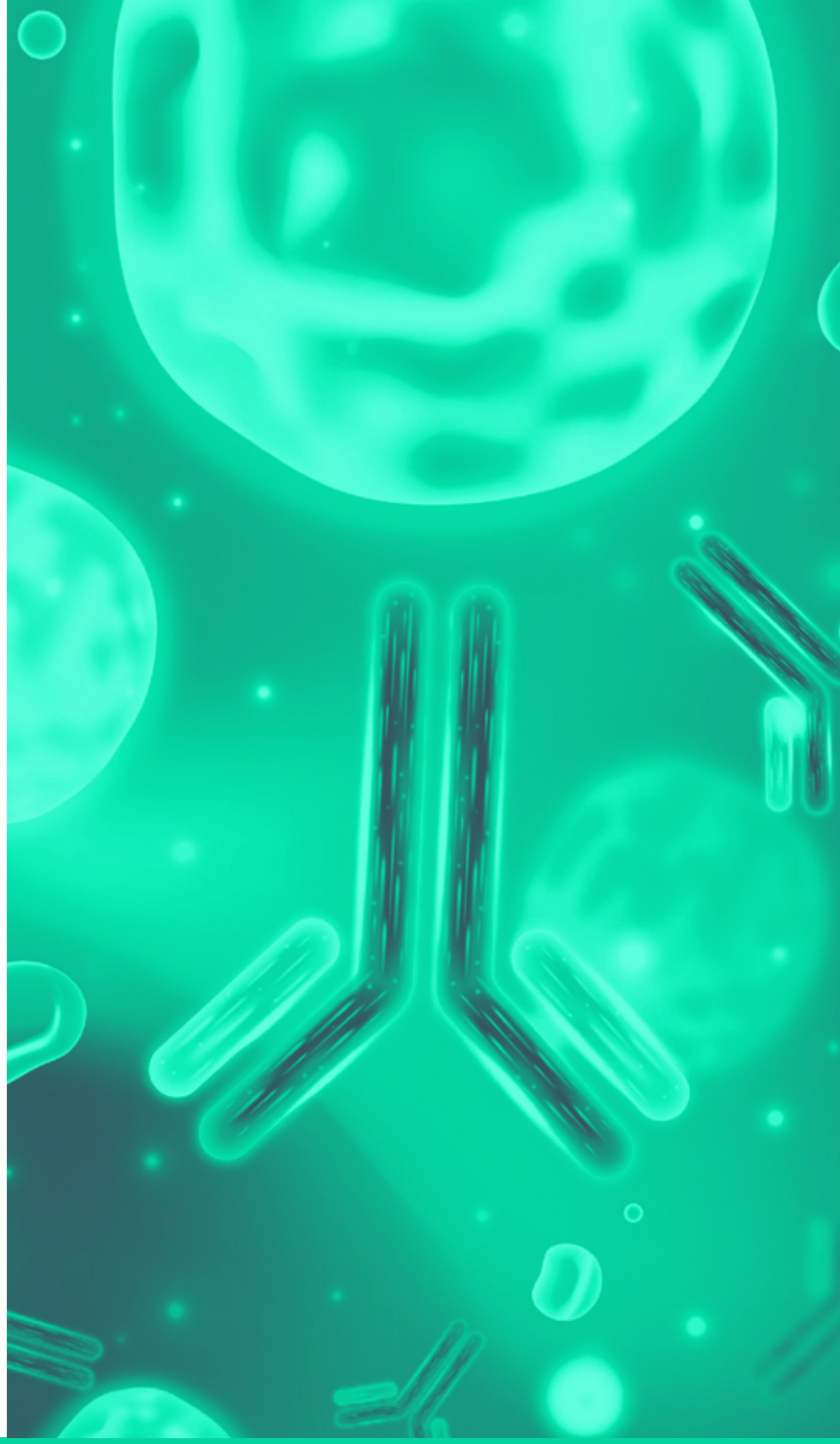
The FDA granted only conditional approval to Exondys and subject to further functional evidence in a larger trial. But that did not compromise a robust commercial success.

- In FY20, Sarepta recorded $450mn in revenue from its portfolio of oligonucleotides and received in February FDA's approval for its third drug on DMD.
- The DMD market is expected to reach $4.1 bn by 2023, growing at a CAGR of 41.3%.

The gene therapy front

DMD is a monogenic (mutation of a single gene) disease and is a straightforward choice for a gene therapy strategy. Nevertheless, clinical experience to date still fails to demonstrate the promises behind the approach.

- The DMD-relevant gene is one of the longest in our genome, which poses a delivery challenge for the currently utilized gene therapy techniques.
- While most programs are still in clinical studies, results to date demonstrate difficulty in inducing actual clinical benefits to DMD patients.



Emerging AOC Players

A tight two-horse race

While still preclinical, the AOC approach is being driven forward (with slightly different methods) by Avidity and Dyne. Laboratory and animal data show similar and profound efficacy, but the debate in the scientific community remains heated.

- Both companies are perusing DM1, a milder form of muscular dystrophy, as the first indication, with DMD right behind.
- The models in preclinical studies for muscle dystrophy are historically not predictive for success in humans.

Avidity opting for a bold approach

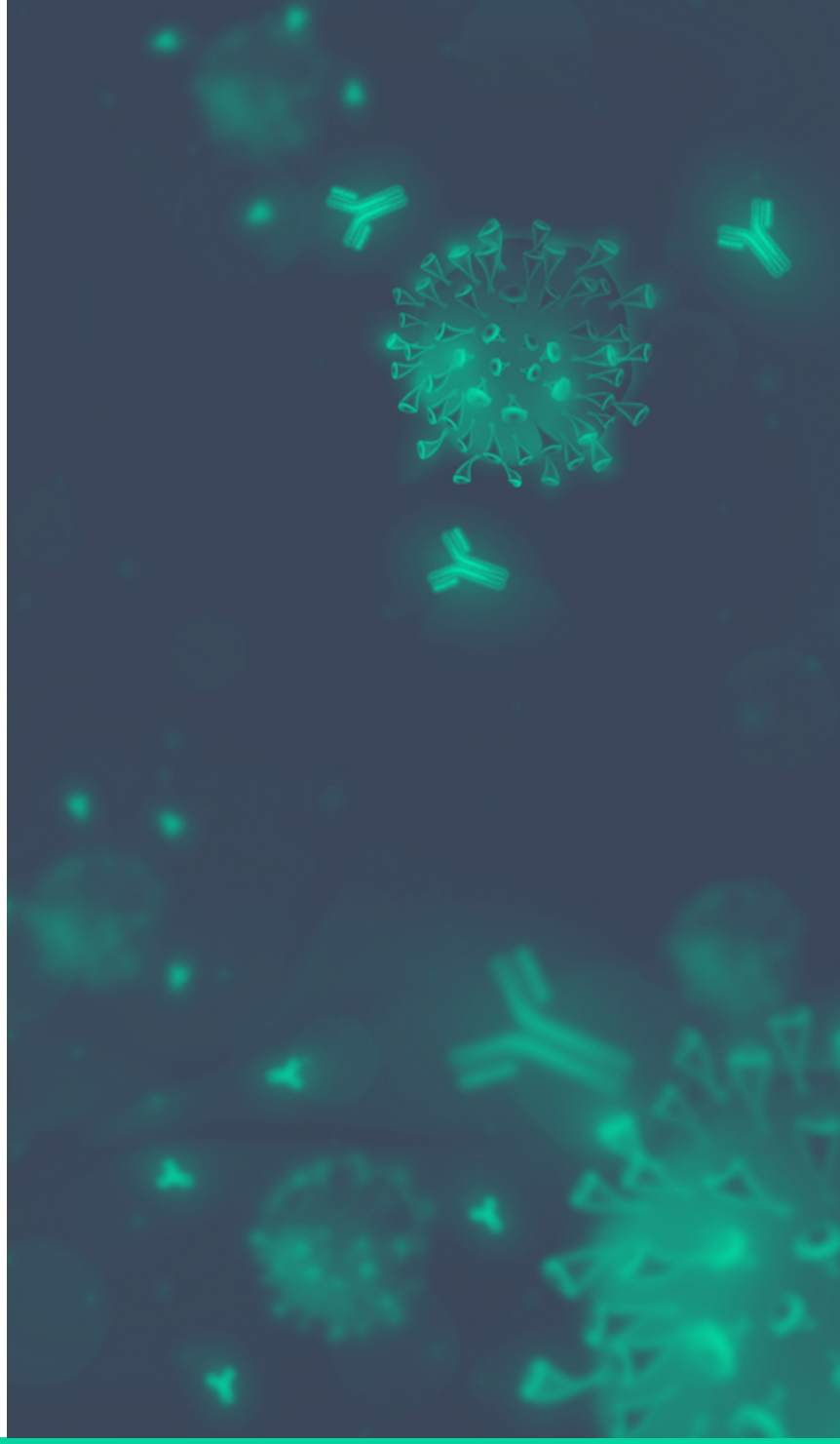
Led by a team of accomplished scientists in the oligonucleotides space, Avidity opted for an approach with less pre-existing validation, but that would be best in class.

- Avidity uses a siRNA payload, a method that can theoretically have better gene silencing, but whose application in this setting is still not obvious.
- For the carrier, the decision to opt for mAbs is quite straightforward.

Dyne combats muscle diseases with FORCE

Dyne is the other front runner in the space, having taken a slightly different approach than Avidy for oligonucleotide (antisense vs. RNAi) and hoping to demonstrate better penetration inside cells.

- Results to date, however, demonstrate incrementally lower knockdown (gene deactivation) than Avidity in preclinical testing.
- For the carrier, Dyne opted to use a fragment of an antibody (Fab), which should also promote better penetration inside muscles, but has, however, much less clinical validation than mAbs.



Who Is On Track For Clinical Validation?

Avidity moving towards clinical this year…

Avidity remains on track to begin initial clinical studies this year, following preclinical data on DM1. The first data updates could be available as early as late-2022.

- The first human study for the lead program in DM1 is expected to enter Phase 1/2 in the second half of 2021.
- Two other muscle disease programs (FSHD and DMD) will enter the clinic in 2022.

…and going beyond muscular disorders

Once Avidity obtains initial clinical validation in muscular dystrophy disorders, its approach could be deployed beyond these indications. Preclinical data demonstrated the ability of AOC to induce robust mRNA knockdown, e.g., in cardiac muscle.

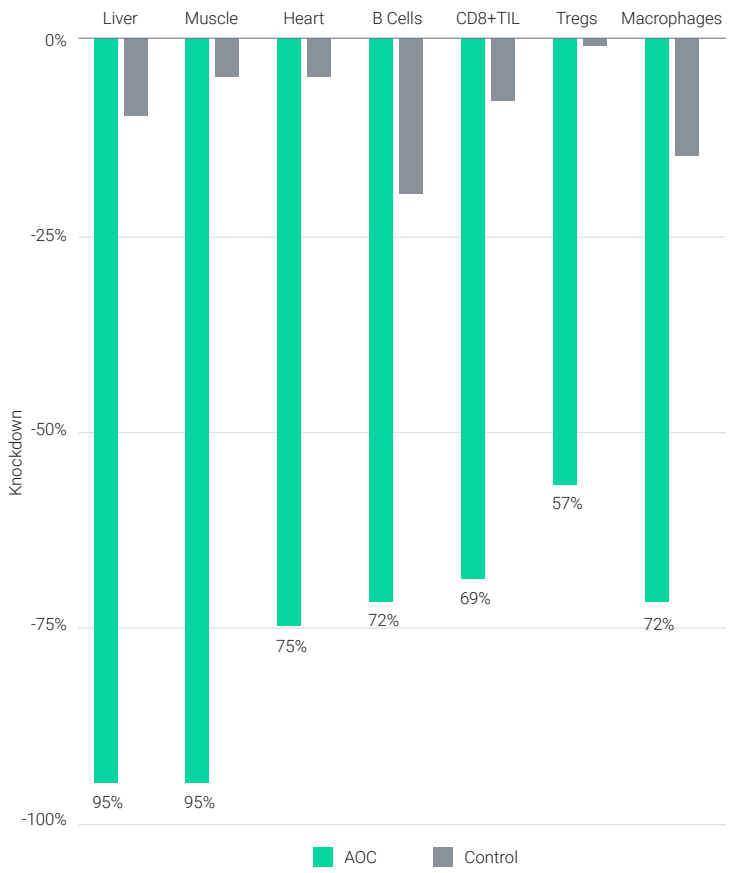
- The company collaborates with Eli Lilly on up to 6 immunology programs, getting upfront payment of $35mn and milestone payments of up to $405mn per target.
- Avidity also has a partnership with MyoKardia (acquired by Bristol Myers Squibb) to assess the potential utility of AOCs in cardiac tissue.

Dyne playing the challenger

Dyne and Avidity are targeting the first indications and have a similar timeline. Dyne's pipeline is still focused on muscles, has no other preclinical programs, and does not benefit yet from pharma collaborations. However, they have discovery programs on rare skeletal, cardiac and metabolic muscle diseases.

- Dyne will initiate IND filings for three programs (DM1, DMD, and FSHD) between Q4 2021 and Q4 2022, with DM1 likely to be the first.

PERCENT KNOCKDOWN OF TARGET GENE EXPRESSION



Therapeutic Approaches To DMD

THERAPEUTIC APPROACHES TO DMD

	1st generation Oligos	Gene Therapy	AOC's
WORKS BY	Silencing mutated gene	Replacing mutated DMD gene with a shorter, modified version of the full sequence.	Silencing mutated gene in the muscle
CHALLENGES	High dose needed, safety concerns	New gene version not replacing real function	Potentially delivering optimal dose to target tissue
RESULTS TO DATE	Efficacy minimal and doubtfully clinically meaningful	To date biological data didn't translate to functional benefit	In preclinical models' good evidence of gene silencing
STATUS	Marketed under conditional approval, additional trials ongoing	Late-stage studies commencing	First programs entering human studies later in the year
	SAREPTA THERAPEUTICS BIOMARIN	SAREPTA THERAPEUTICS SOLID BIOSCIENCES Pfizer	AVIDITY BIOSCIENCES Dyne THERAPEUTICS

Catalysts

- **Entering human trials.** Leading players in the space are expected to start their preliminary in-human clinical studies. First data will indicate the safety of this method and its ability to silence the mutated genes.
- **Expansion to additional indications.** Genetically "simple", the companies' go-to indication is DM1. However, a positive outcome will accelerate expansion to other indications such as DMD and FSHD.
- **Pharma collaboration.** Like the partnership between Avidity and BMS or Lilly, other collaborations would reinforce the attractiveness of this emerging sector.

Risks

- **Efficacy risk.** AOC is a new treatment method with no supportive data to date, and in these debilitating conditions, preclinical testing provides only limited evidence to eventual human benefit.
- **Safety.** An antibody is essentially part of the immune system, and even if genetically modified to avoid systemic activation, it could still induce an undesired immune response. (unlike in cancer, the antibody component in AOC needs to be benign).
- **Competing approaches.** Muscle dystrophy is an active research area, and other methods such as gene therapy or gene editing are expected to present competing datasets.

Bottom Line

- Muscle dystrophy disorders such as Duchenne Muscular Dystrophy are debilitating and life-threatening. Current therapies show marginal efficacy, leaving ample room for better solutions. Antibody Oligonucleotide Conjugates result from rational drug design and precision medicine advances in genetic medicine and aim to provide an efficacious solution, potentially unlocking a multi-billion market opportunity.
- Despite its strong potential, the combined approach does not yet benefit from clinical validation. We are closely monitoring this new class of drugs and the two emerging players in AOCs are potential candidates for our biotech 360° portfolio.

Companies mentioned in this article:

Alnylam (ALNY US), Avidity (RNA US), Biomarin (BMRN US), Brystol Myers Squibb (BMS US), Dyne (DYN US), Ely Lilly (LLY US), Gilead (GILD US), Pfizer (PFE US), Sarepta (SRPT US), Solid Biosciences (SLDB US)

YOU CAN'T TRUST A CLOUD NOT TO RAIN

When Cybersecurity Meets Darwin

The cloud revolution

Cloud has become a must-have for businesses given its power and flexibility, a trend accelerated by the pandemic and the subsequent work-from-home. The direct consequence is an exponential generation of data, some of which rather sensitive, that have become an attractive target for criminals.

- 94% of businesses use a cloud service.
- Half of the global data will be stored in the cloud by 2025.

Do not bring a knife to a gunfight

Traditional cybersecurity approaches have become obsolete in the cloud context: insulating a perimeter makes no sense when workloads are executed outside of it, and firewalls cannot protect from new oversized attack vectors.

- Traditional rule-based firewalls cannot efficiently keep up with the dynamic nature of cloud workloads.
- Attacks such as new forms of distributed denial of service (DDoS), i.e., saturating a server with requests, are too massive for traditional defense mechanisms.

Major business opportunities materializing

The need to rethink cybersecurity creates opportunities for new types of approaches, such as zero-trust security. New players with native cloud solutions have the lead, but old players are not necessarily out of the game.

- The cloud cybersecurity market represented a $34.5bn market in 2020, with an expected CAGR of ~15% until 2025.
- New players such as Zscaler or Cloudflare already benefit from >30% revenue CAGRs.

SOURCE:
Cloud Security Market by Security Type, Application, Service Model, Organization Size, Vertical, and Region – Global Forecast to 2025,
Cloud Adoption Statistics for 2021

Cloud Is A Useful Servant But A Dangerous Master

Mega, Giga, Tera… Zettabyte!

As the Internet is welcoming more users, applications generate more data, and devices are entering the Internet of Things dimension, data growth is exponential. In the meantime, cloud environments are getting more complex, exacerbating already complicated security frameworks.

- Data stored in the cloud is projected to reach 100 zettabytes by 2025.
- More than 80% of firms operate in multi-cloud, (SaaS) relying on two or more providers, i.e., infrastructure- (IaaS), platform- (PaaS), or software-as-a-service

Data is becoming the most thought-after asset to steal

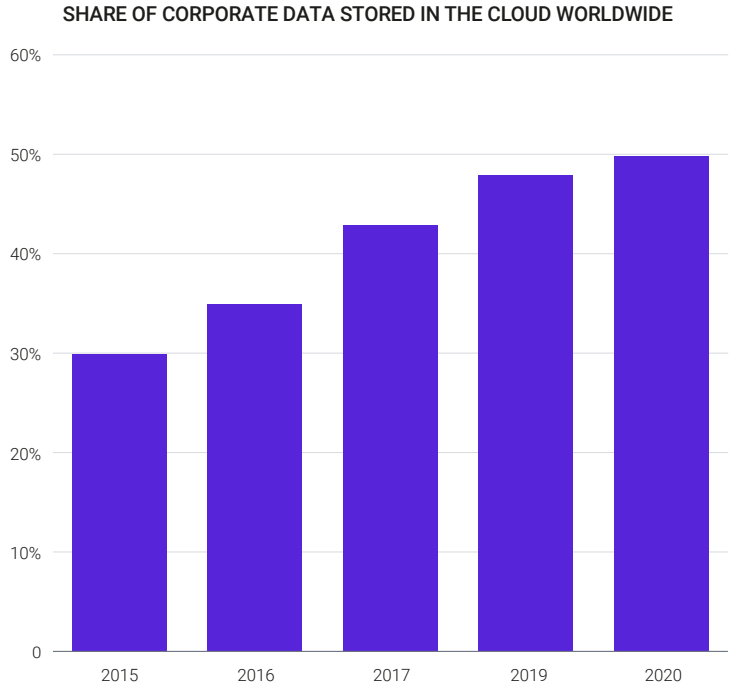
Larger amounts of data, especially of susceptible records, stored in the cloud inevitably attract more cybercriminals. As healthcare systems digitize worldwide, personal health data is the most desired type of data and the least protected one.

- Already, half of the world's corporate data was stored in the cloud in 2020.
- In 2020, healthcare and retail industries saw a 10% increase in data breach costs.
- The Healthcare sector has the highest time of 329 days (versus the average time of 280 days) to identify and contain a breach.

Sharing responsibility and not avoiding it

Contracting a cloud supplier is not a jack-of-all-trades solution. Customers are still entirely responsible for cloud security, while cloud suppliers are only responsible for protecting the infrastructure, i.e., hardware, software, networks.

- Incomplete understanding of the cloud and an ensuing false sense of security has resulted in 75% of firms experiencing breaches.
- As explained on the next slide, cloud customers often fail to understand and therefore identify their share and areas of responsibility when securing the cloud.



SOURCE:
The World Will Store 200 Zettabytes Of Data By 2025,
Cloud computing overload: How many apps is too many?

Untangling Cloud Services

		On-Premises	Cloud		
	Security provider	**IT-department exclusive**	**Infrastructure-as-a-Service (IaaS)**	**Platform-as-a-Service (PaaS)**	**Software-as-a-Service (SaaS)**
	Summary	Network and servers are managed on-premises: flexible but expensive and hardly scalable solution.	Cloud infrastructure services: computing resources are offered on-demand. This highly scalable solution needs no additional hardware.	Cloud platform services: cloud components are provided via a platform to be used mainly by developers to build applications.	Cloud application services: applications are delivered via the internet, run through web browsers, and are managed by 3rd party vendors.
	Delivery, characteristics, and utilization	Network is maintained and secured entirely in-house. While very flexible, scalability is limited by the physical space, network throughput.	Cloud resources are delivered via virtualization technology. Clients have complete control over the infrastructure, data, and security. Providers guarantee only physical server security.	While the platform sits on the web, infrastructure may be managed by the client or the 3rd party provider, and developers control applications (and their security).	Delivered via the web, SaaS requires no installations with vendors managing everything. This further reduces costs and frees up time, but also a possibility of a vendor lock-in and weaker data security.
	Players	IT employees and cybersecurity experts	Amazon Web Services, Microsoft Azure	Apache Stratos, Force.com	Google Workspace, Dropbox, Cisco
Type of security & responsibility-sharing	Data classification & accountability	○	○	○	○
	End-point protection	○	○	○	●
	Identity & access management	○	○	●	●
	Application security	○	○	●	●
	Network security	○	●	●	●
	Host infrastructure	○	●	●	●
	Physical security	○	●	●	●

○ Consumer is responsible ● Shared responsibility ● Provider is responsible

SOURCE:
How providers and user companies protect the cloud,
SaaS vs PaaS vs IaaS: What's The Difference & How To Choose

Cloud Has Opened A Wide Hole In Defenses

Swiss-cheese walls cannot keep up

Traditional cybersecurity defenses rely on insulating the internal network from the internet and filtering inter-communications. Today, this architecture is obsolete: its very structure is inadequate, as the cloud requires a permanent connection.

- Firewalls are either bypassed or cannot deal with the exponential number of connections and data.
- Multi-cloud (explained here) and work-from-home increase the surface of attack.

Novelty and complexity require time to adjust

Cloud is not a novelty but increasingly replaces on-premise infrastructure for various workloads. This ongoing technological shift increases the risk of misconfiguration due to user inexperience and increasing environment complexity.

- 80% of U.S. companies have experienced a data breach related to cloud misconfiguration, primarily due to human error.
- 33bn of records were exposed over 2018-19, for a theoretical cost of ~$5tn (a stolen record sells at an average of $150 onto the black market).

No place for nice things

The rise of the cloud has given birth to specific weaknesses and attacks tailored for this new environment, such as distributed denial of service (DDoS), account hijacking, or insecure APIs. Traditional cyber defenses are mechanically completely unprepared to face these new threats.

- The number of attacks against cloud systems surged by 250% YoY in June 2020.
- 95% of these attacks were aimed at cryptocurrency mining.

SOURCE:
Security Misconfigurations a Leading Cause of Cloud Data Breaches,
Cloud misconfigurations cost companies nearly $5 trillion,
Vast majority of cyber-attacks on cloud servers aim to mine cryptocurrency

Improving Current Infrastructures

Protecting the entry point

Breached endpoint devices such as laptops compromise the whole network, including the cloud. To secure endpoints, they must be integrated into the broader network and have policy-based access controls with automated security responses.

- Real-time information and visibility will allow IT experts to monitor endpoints and associated risks, deploy solutions across all devices, and ensure security hygiene.
- Endpoints exposed to the Internet face, on average, 1.5 attacks per minute.

Refining the firewall-based security

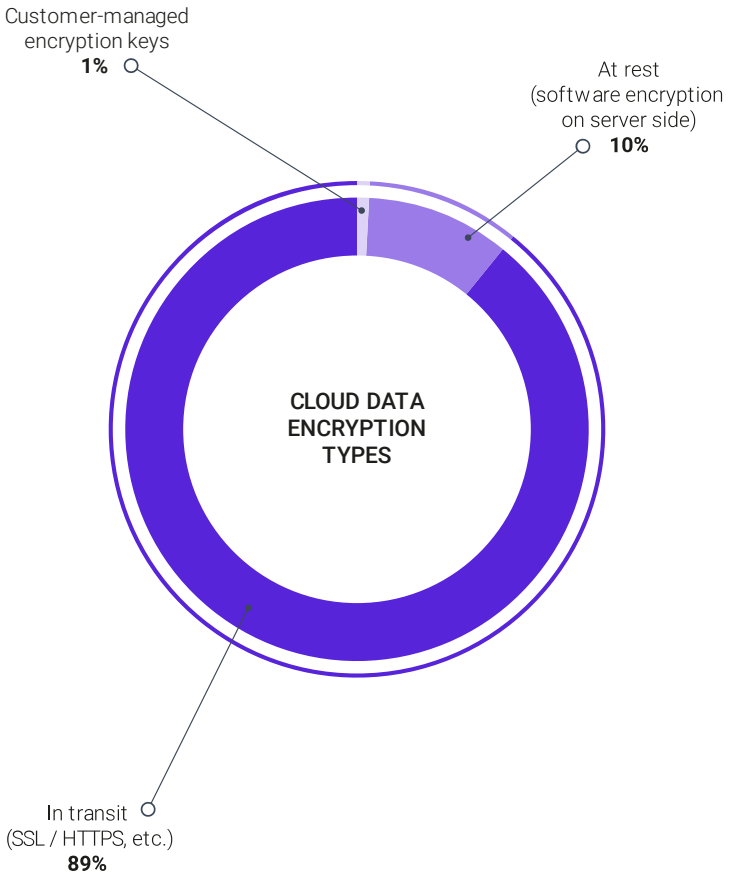
Cloud applications open as many ports in the on-premises firewall as required. Such a firewall policy is dangerous and challenging to improve. Firms need to dynamically check for breaches and use the Next Gen Firewalls (NGF).

- NGFs are cloud-based applications deployed on a virtual server that secure all traffic between cloud applications and data storage.
- A downside for NGFs is reliance on network availability – any downtime leaves the firm vulnerable. Therefore, enterprises need to have a better on-premises firewall.

Improving software encryption efficiency

Within two available forms of encrypting data in the cloud, secure tunnel and client-side encryption – one doesn't provide sufficient security, while the client's IT resources limit the other. The ideal solution would efficiently encrypt and decrypt data on the client's side and transfer it encrypted to and from the cloud.

- Across industries, the average organization uploads 13.9 TB of data to the cloud each month, but less than 10% are encrypted "at rest".
- An average cost of a data breach via cloud rose by 15% to $4.4mn. Encrypting data is an essential element for data security to limit the damage of breaches.



SOURCE:
Four ways to improve endpoint security: moving beyond traditional approaches, What are Cloud Firewalls, Safer than "Safe": Client-side encryption for Zero-knowledge cloud service, How Does Cloud Encryption Work?, Recent Endpoint Security Statistics for Cybersecurity Professionals: Q3 2020, IBM Security Cost of a Data Breach Report 2020

Inventing A New Cybersecurity

Controlling access, a tale of cyber-Cerberus

The first step is to control access to workloads, which new system architectures do by combining a Content Delivery Network (CDN), a Cloud Access Security Broker (CASB), and a Web Application Firewall (WAF).

- CDNs prevent DDoS attacks from blocking access to servers.
- CASBs and WAFs monitor and filter access to the servers.
- WAFs are next generation firewalls using new advanced filtering techniques.

Segmenting the environment

The cloud environment is dynamically segmented into individual zones insulated from each other, an approach called micro-segmentation, which relies on containerization to protect ever-changing workloads.

- Separating applications and workloads create additional obstacles to attackers.
- Players such as Zscaler propose cloud-native sandboxes (isolated segments) that offer real-time holistic surveillance and protection.

Managing identity

Identity management precisely maps users to grant them access to only strictly necessary resources and establish connections between network nodes needed to execute the tasks. The extension of this approach is the base for so-called Zero-Trust (ZT) security.

- ZT is based on a concept of least privilege, where every user is considered a potential threat, even if it is already inside the network.
- It combines next-gen firewalls, identity control with other technologies and puts them in segments to control who, where, when, and why can connect.
- This contrasts with the traditional approach, where insiders are trusted by default.

SOURCE:
Zero Trust architecture: a paradigm shift in cybersecurity and privacy

The Ball Is Already Rolling

When there is a cloud, there is a way

While the world is embracing cloud and corporate networks move beyond firewalls, many players are offering cloud security solutions and enjoying >30% 5Y CAGRs.

- Cloudflare is designed to work natively and in real-time on the cloud, offering security that blocks DDoS attacks and vulnerability exploits.
- CrowdStrike's endpoint protection was designed to run natively on the cloud. Its scalability allowed the firm to gain market share swiftly and rank #4 globally.

Old dogs learn new tricks

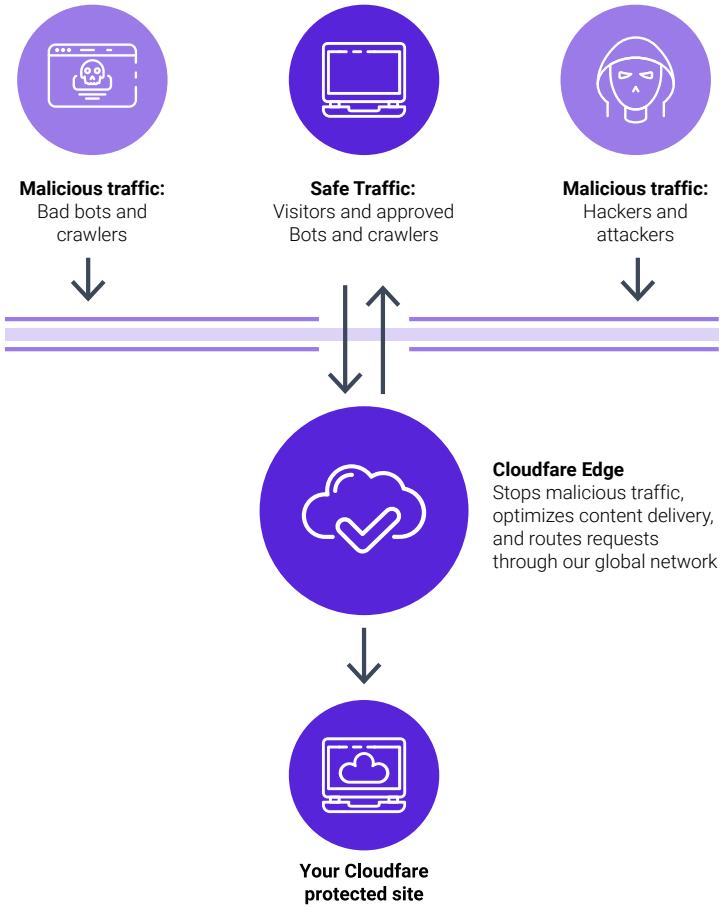
Legacy security players such as Palo Alto Networks are extending their offering to cover the cloud as well. Their Prisma suite offers cloud infrastructure together with endpoint protection, visibility, security, compliance, and virtual firewalls.

- In 2018, 13 years after its creation, Palo Alto finally announced a cloud-based ecosystem and completed its first cloud security-related acquisition of RedLock.
- After acquiring CloudGenix in 2020, the leader of WAN Edge infrastructure is now offering a first SD-WAN with ML and AI and a cloud-delivered branch.

Friend or foe, I have zero trust for you

The zero-trust (ZT) concept was developed in 2010. However, as it is a process and not just a technology that may be thrown into the existing architecture, no company has yet achieved a proper implementation of zero-trust.

- ZT combines next-gen firewalls, identity control with other technologies and puts them in segments to control who, where, when, and why can connect.
- Some companies are using pieces of ZT, such as identity control, but only a few companies are genuinely building or transitioning legacy architectures to ZT.
- Akamai, the cloud provider, has been exploring and integrating ZT since 2010.



SOURCE:
Palo Alto Networks, Cloudflare, Crowdstrike corporate websites,
How to implement zero-trust security with real-life examples

Catalysts

- **Rising cloud adoption.** Increasing cloud penetration will mechanically translate into higher cloud security adoption, primarily through bundles with cloud offerings.
- **Growing threat pressure.** The growing number of hacks is benefiting awareness. These hacks are increasingly recurrent and incapacitant, as operations are more and more relying on IT systems.
- **The rising cost of data breaches.** It is only a matter of time when average losses from a data breach will topple costs of implementing a new security architecture. This will significantly boost the adoption of cloud and security.

Risks

- **Inertia.** CIOs may succumb to inertia and keep with old systems either due to insufficient budgets, undue confidence in old systems, or to already recent upgrades and lack of will go all over it again.
- **Unfavorably perceived risk-reward.** Investments in new systems or disruptions to current ones may be considered too important than the perceived risks, especially considering the early stage of ZT frameworks.
- **Major vulnerability.** A significant vulnerability discovered in a system, or a defense failure, may lower the confidence and, therefore, the adoption of cloud and cloud security.

Bottom Line

- Cloudification means a total redefinition of traditional cybersecurity: the ancient "moat-and-castle" approach is more than ever obsolete due to the fusion of internal and external networks, compounded by the exponential growth of connected terminals. This has significant implications, such as updating current infrastructures, creating dedicated ones from scratch, and implementing a longer-term vision: zero-trust cybersecurity.
- This fundamental shift creates major opportunities for both native new players and adapting old ones. Our portfolios are increasingly exposed to the new players while keeping selective exposure to those legacy cybersecurity players that have demonstrated understanding of the new reality and willingness to adapt.

Companies mentioned in this article:

Akamai (AKAM US), Alphabet (GOOG US), Amazon (AMZN US), Apache Software Foundation (private), Cisco (CSCO US), Cloudflare (NET US), CrowdStrike (CRWD US), Dropbox (DBX US), Microsoft (MSFT US), Palo Alto Networks (PANW US), Zscaler (ZS US)

CHARTS FOR THOUGHTS

A New Healthcare Sector?

Healthcare cycles

The charts show the Purchase Only House Price index (a broad measure of the movement of single-family house prices) along with the Average Hourly Earnings index (a classical measure of income from labor).

- Financing and investments in R&D along scientific discoveries, technological breakthroughs and regulation drive these boom-and-bust cycles.
- The underlying upward trend, however, is driven by more structural components of socio-demographics nature such as aging population or nutrition habits.

A paradigm shift

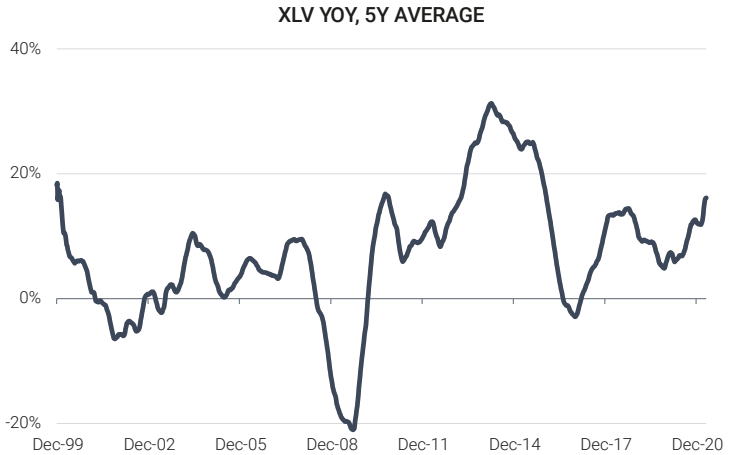
The healthcare sector is undergoing a generational transformation, emerging from the Biotech and Bionics industries: while the 20th century was about general chemical drugs, the 21st century will be about biologicals and targeted therapies.

- High technology is decreasing the inherent randomness of scientific discoveries.
- A clear industry specialization across the entire supply chain is already happening.

Surfing the new wave

The juncture of both the cycle and the paradigm shift could mark an upside inflection point that is likely to drive a sectorial outperformance. At the same time, the transformation of the industry may bring new leaders to the forefront.

- At AtonRâ Partners, we already redefined our Healthcare products to catch the new wave emphasizing the entire supply chain of new drug developments.



SOURCE:
Reuters Eikon Refinitiv

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