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Embracing a digital future

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Industry 4.0 trends



IoT/5G



Fintech



Cybersecurity



Blockchain
Solutions

Why this theme?

The accelerating pace of technological innovation and velocity of disruption is transforming the world at an exponential pace, blurring the lines between physical, digital and industrial spheres. We believe this transformation will offer attractive multi-year investment opportunities.

Why does it matter?

Improvements in computing power and data availability are fuelling innovations in many areas. Within this, we expect three trends to propel this digital transformation:

- 1) the increase in connectivity
- 2) the exponential rise in data creation
- 3) the increased penetration of automation

What does this mean for investors?

As with previous technological revolutions, we expect there to be winners and losers. We believe that Internet of Things (IoT) and 5G, Cybersecurity, Financial Technology (Fintech) and Blockchain Solutions are the sectors and industries that will disproportionately benefit from these technological innovation trends. We would consider adding exposure to these areas within a diversified asset allocation in order to capture potentially outsized performance over a multi-year horizon.

Embracing a Digital Future

The fourth industrial revolution is fundamentally altering the way we live, work and relate to one another. The accelerating pace of innovation and velocity of disruption is transforming the world at an exponential pace, blurring the lines between physical, digital and industrial spheres.

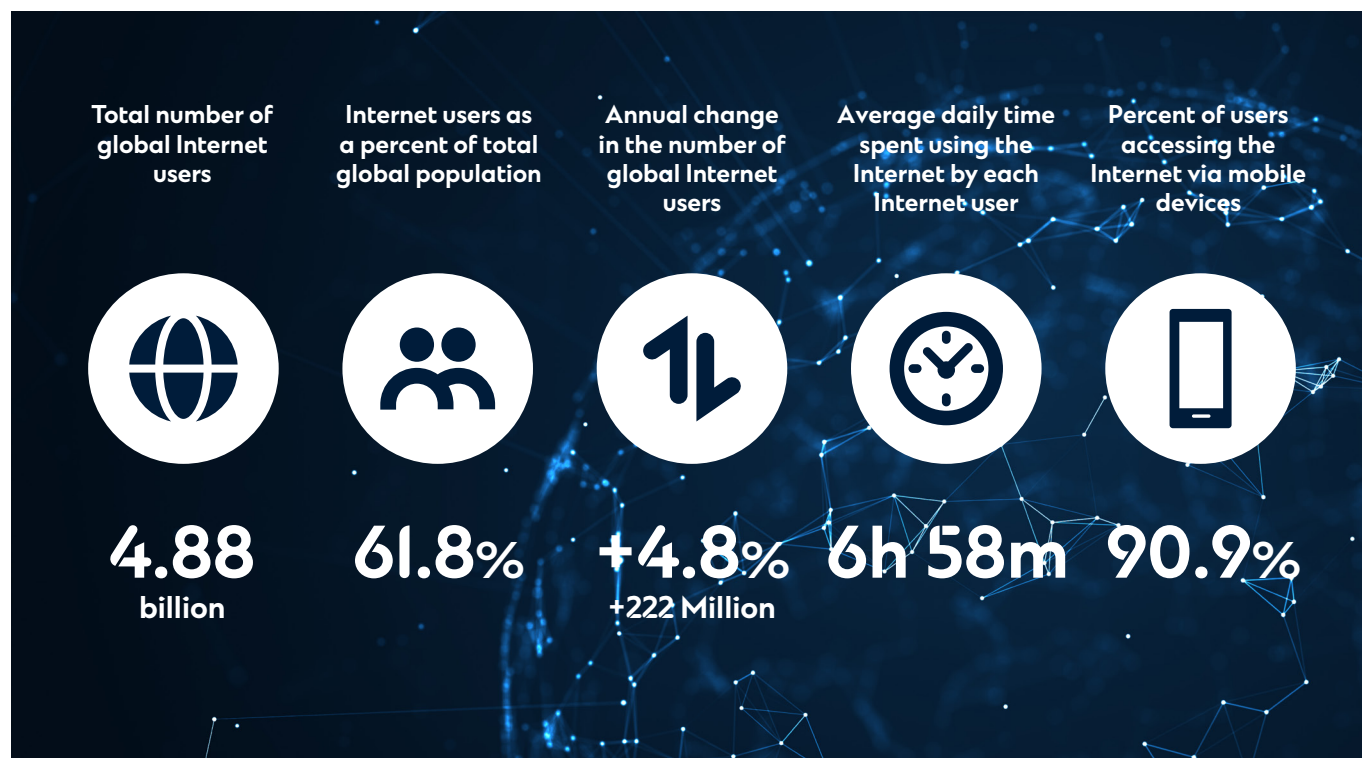
Breakthroughs in processing power and connectivity is allowing billions of people to be connected by mobile devices. Improvements in computing power and data availability is fuelling innovations in many areas such as artificial intelligence, internet of things, energy storage and quantum computing.

During the pandemic, consumers shifted dramatically towards online consumption and businesses have responded. Companies have refocused their online offerings, accelerating the development of digital products

and services in response to this shift. We believe these structural trends are just getting started, as business leaders recognize the importance of technology as a key enabler of success, not just a source of cost efficiencies.

According to the latest McKinsey Global Survey of Executives last year, funding for digital initiatives has increased significantly, despite cuts elsewhere, as businesses sped up their adoption of digital technology.

Overview of global Internet use



Source: We are social, Hootsuite, Standard Chartered

Major trends underpinning digital transformation

We believe three powerful trends will propel the ongoing digital transformation:



Connectivity

With the number of connected devices globally set to exceed 11bn, **Internet of Things (IoT)** is likely to remain one of the key focus areas for businesses. However, to fully amplify the transformational impact of IoT, it needs to be combined with key technologies such as **5G connectivity, cloud computing, data analytics, machine learning and cyber security**, amongst others. Large scale industrial automation represents one of the best opportunity sets within IoT, in our view. Case in point: the pandemic exposed key vulnerabilities of the world's existing supply chains, highlighting the need for timely information and swift responses to unplanned changes in demand or supply. Using an IoT inventory system, the supply levels of critical components can be monitored in real time to inform business decisions and help anticipate shortages.

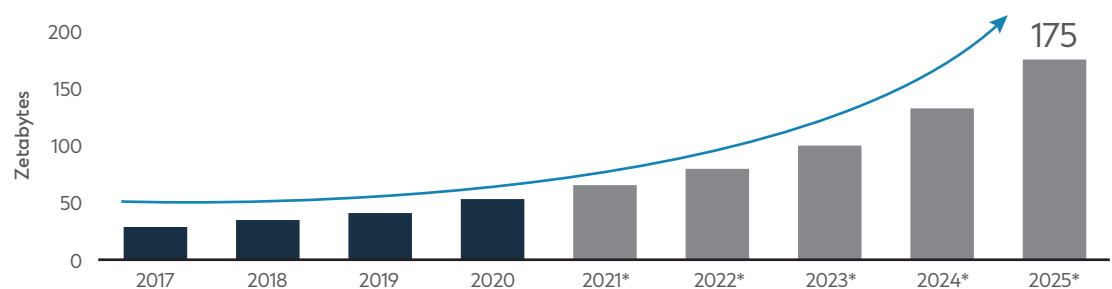


Exponential rise in data

The rapid growth of smart devices, further accelerated by the rollout of 5G networks, augmented/virtual reality and quantum computing, will likely drive an exponential growth in data. Machine processing and artificial intelligence can now be applied to large data sets to generate new insights and enable better decision making. Organisations able to convert this into actionable insights will likely have a competitive advantage in driving business performance, laying the foundation for long-term success.

Growth of global data to accelerate further

Annual global data produced



Source: Data Age 2025 report, Seagate, IDC Global Datasphere, Standard Chartered. *Denotes estimates

Wide ranging factors are spurring the growth of data

Global Cloud Infrastructure:

expected to grow **25%** annually in 2019-2023 to support growing Internet consumption



5G Connectivity:

more speed and more traffic than 4G connections. Expected to take up **12%** of mobile traffic by 2022



Alternate Reality:

Virtual and Augmented Reality (VR & AR) expected to see further adoption as development of the 'Metaverse' gathers momentum



Mobile Traffic:

expected to grow **31%** annually by 2024, with Emerging Markets leading the charge



Source: GlobalX, Standard Chartered



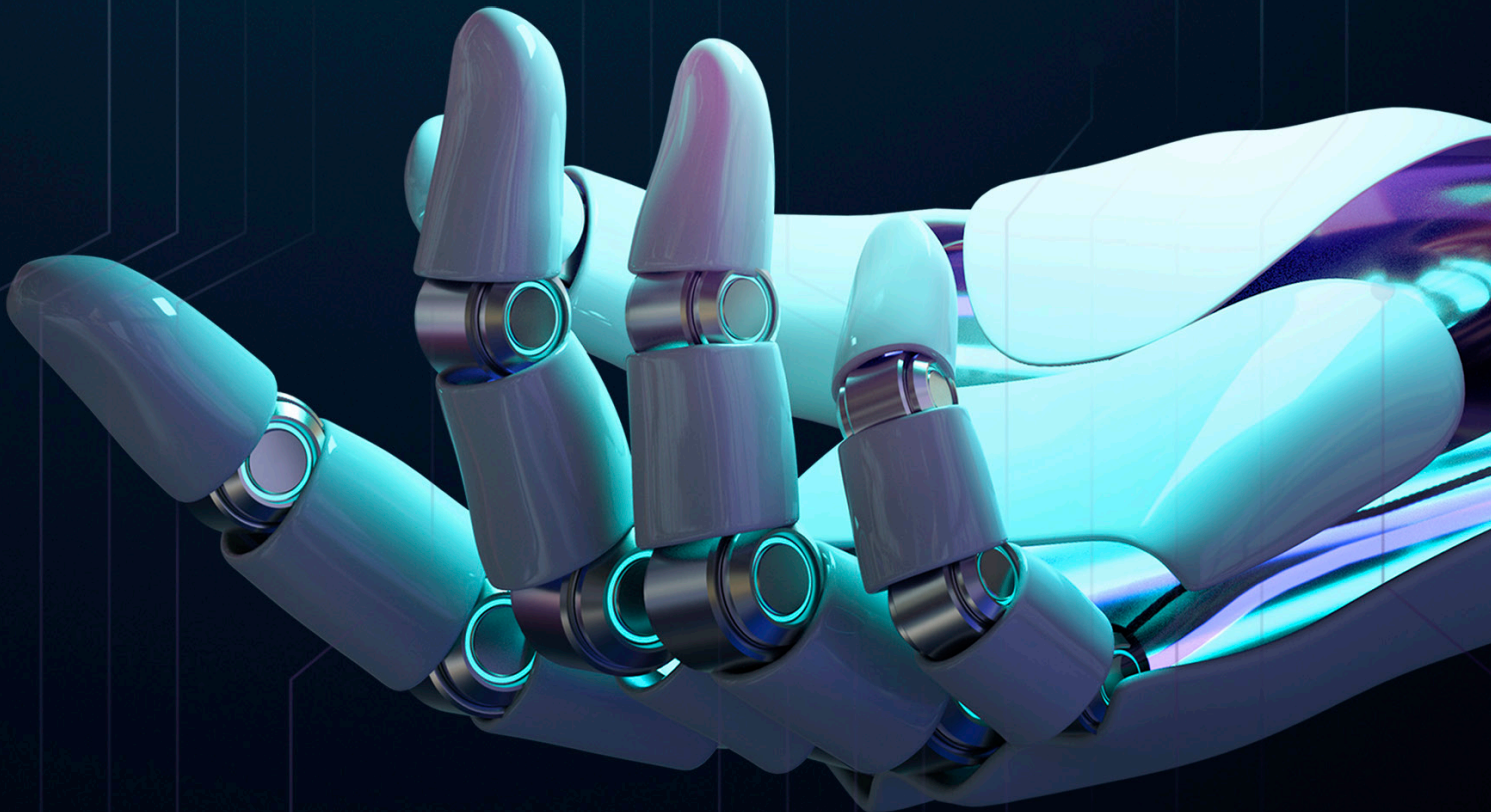
Increased penetration of automation technology

Driven by the rapid adoption of the IoT, a shortage of labour and a shift in consumer preferences, businesses are increasingly looking towards digitisation to help drive revenue growth and productivity.

Capital expenditures in smart automation in the manufacturing sector (Industry 4.0) are projected to grow at a CAGR of 20% between 2021 to 2026 to USD 165bn, according to Markets & Markets.

Increased penetration of Artificial Intelligence (AI) and IoT technologies is expected to allow greater optimisation of manufacturing processes, helping scale productivity and profits margins.

This should drive the use of such technologies over the coming years across industries. This dynamic is also reflected in asset owners' preference for firms to increase capital investments, as indicated by Bank of America's fund managers' survey.



How to invest

As with any transformation, we expect there will be winners and losers in this journey. We would consider exposure to key enabling digital infrastructure in the following areas: 5G/Internet of Things (IoT), Cybersecurity, Financial Technology (Fintech) and Blockchain Solutions.

5G & Internet of Things (IoT)

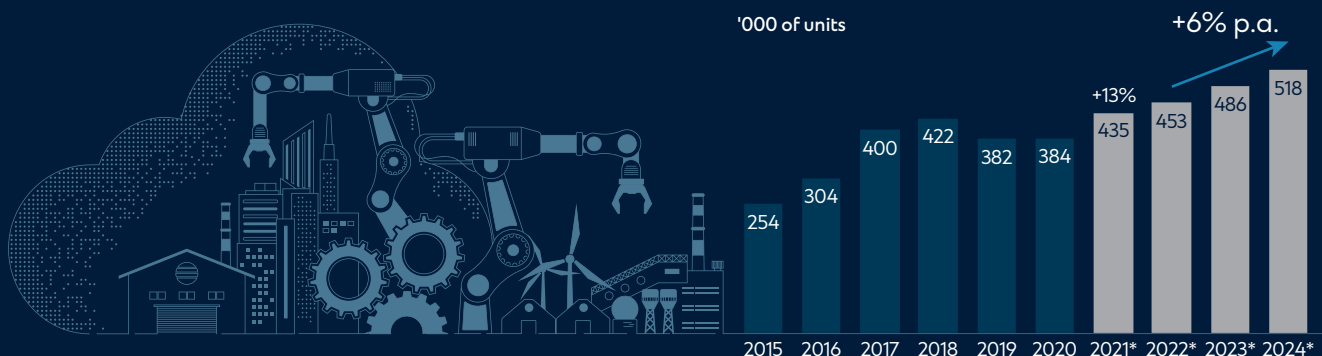


5G represents the fifth generation of wireless connectivity that enables faster, more stable and secure connectivity underpinning the potential of technologies around the Internet of Things (IoT), from self-driving vehicles and smart grids to AI-enabled robots on factory floors. The push for greater connectivity continues across the three largest economic blocks (US, Europe and China) which are targeting higher investments in broadband and network connectivity. The US recently signed into law the bipartisan USD 1.2tn infrastructure bill, which includes USD 65bn towards improving digital infrastructure; Europe launched its own Global Gateway infrastructure plan, which also focuses on 5G and improving connectivity; China is on track to invest USD 1.4tn in digital infrastructure over the coming five years.

Meanwhile, manufacturing and industrial sectors are facing record high labour shortages, which should increase demand for automation and robotics, a direct use case for more widespread 5G/IoT adoption. Specifically, we expect rising demand for tools such as AI surveillance, smart controls, digital sensors and industrial robots. This is part of a structural decrease in manufacturing and industrial jobs worldwide, in our view. Companies will continue to invest in capital and machinery to replace labour, increase productivity and protect profit margins.

Industrial and manufacturing firms looking to fill labour shortages with robots

Annual installations of industrial robots; 2015-2020 and 2021-2024 estimated volumes



Source: International Federation of Robotics, Standard Chartered. *Denotes forecast values



Cyber-security



With the proliferation of connected devices and digital infrastructure, ensuring the security of data and digital networks is vital. Cybercrime cost the world USD 6tn in 2021 and will increase to USD 10.5tn annually by 2025 (Cybersecurity Magazine, BCA).

The average total cost of a typical data breach hovers around USD 4.2mn, up from USD 3.9mn in 2020 (IBM). The most common cyberattacks fall under three major categories: 1) Physical Network Infrastructure (e.g. communication appliances such as routers, network hardware), 2) Digital Network Infrastructure (e.g. broad server and network security, including firewalls), and 3) cloud and data security. The cost and reputational damage of cyberattacks underpins why cybersecurity is a 'must-have' for companies' survival.

The global cybersecurity market is expected to grow to USD 175bn by 2024 (from USD 125bn in 2020), an 8.8% compounded annual growth rate (CAGR) according to IHS Markit. Governments are also expected to increase their spending in this space to improve national security levels, thus supporting the growth of this space.

Financial Technology



Financial Technology (or Fintech) encompasses companies that aim to leverage the use of technology to deliver financial services such as online banking, mobile payments and more complex services to consumers and businesses. The rapid penetration of smartphones (particularly in Emerging Markets), the shift in consumer preferences and the convenience provided by embedded finance solutions (e.g. non-financial firms offering financial products and services on their platforms) continues to drive strong growth in digital payment flows. Several surveys indicate that Gen Z loves seamless connectivity, online banking, and digital wallets. They are also more likely to be the early adopters of semi-autonomous digital and non-traditional banking and insurance providers.

Blockchain Solutions



The rise of digital assets and blockchain technology will further spur Fintech's growth, in our view. Technological leaps in distributed ledger technology (DLT) have supported the expansion of the digital asset ecosystem and fuelled interest by various types of investors. DLT allows firms to reduce overhead costs and it promises to be more secure against cyber threats. Global Venture Capital firms have poured USD 15 billion in blockchain start-ups in the first nine months of 2021 (a 380+% increase compared to full-year 2020) according to CB insights. This record funding suggests growing legitimacy for blockchain solutions and will likely spur growth over a multi-year period. While regulatory concerns regarding cryptocurrencies will likely remain, an upgrade in the financial system's infrastructure thanks to DLT technologies should help boost financial inclusion and bring down costs for users, thus supporting wider adoption.

Lastly, semiconductors deserve a special mention. Semiconductor chips are the one key technology that underpins most, if not all, the current technological innovations. Demand drivers such as 5G smartphones, PC upgrades, cloud infrastructure build out and automotive demand continue to drive strong demand for chips, widening the demand/supply gap. Supply shortages could extend till H2 2022, according to sector CEOs' recent earnings calls, with some flagging the risk they could extend even to 2023. This sets the sector up well for sustained pricing power and profit margins, supporting positive revenue and earnings revisions into 2022.



Valuations

The rapid acceleration in, and urgency for, digital transformation across all industries has helped sustain fast revenue growth across our Disruptive Innovation themes in 2021 (between 20-40%, based on the indices we track). Going forward, consensus annual revenue growth for this segment is set to remain elevated at over 20%+ for 2022, higher than revenue growth in global equities.

Valuation

5G/IoT

Cybersecurity

17.6x 35.2x

VS

Global equities

18.0x

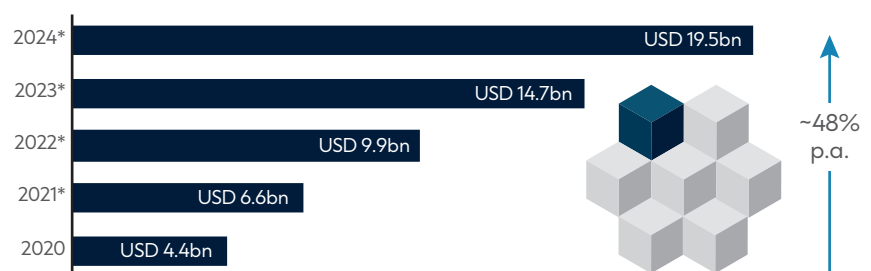
Current 12-month forward looking valuations for IoT and Cybersecurity are 17.6x and 35.2x. Consensus earnings growth for the coming year is higher than that of global equities (9-13% vs 6%), while analysts continue to revise expected earnings growth estimates. On balance, considering long- and near-term drivers, we remain bullish on these themes.

Fintech trades at a valuation premium to global equities (30.3x vs 18.0x). However, we remain bullish on this theme as earnings growth continues to significantly outpace that of global equities. We also take comfort from a faster pace of analysts' upgrades to earnings, as well as the positive correlation of this theme to the re-opening of economies (as increased spending will likely benefit payment flows, in particular).

See page 10 for a full listing of indices we track.

Going beyond digital assets

Estimated global spending on blockchain solutions



Source: IDC, Global X, Standard Chartered. *Denotes estimated values

Looking to next year and beyond

We believe that the acceleration of technological innovation underpinning these themes will persist in 2022 and beyond. Public spending and private sector competition is expected to continue supporting growth in technology-related fields. Improved digital infrastructure will likely help accelerate momentum further, thus continuing to reinforce the technological disruption feedback loop.

While valuations across these themes are not cheap, they reflect a higher earnings growth premium relative to global equities and are also areas of key policy focus. We are likely still at the early stages of the fourth industrial revolution and believe that investors will benefit from exposure to these themes for years to come.

Themes monitor

Name	2021 YTD (%)	Annualised 3-year perf. (%)	12m forward P/E
The winds of climate change			
Circular Economy	24.4	25.1	N/A
Clean Tech	-17.5	42.2	31.0
Electric Vehicles (EVs)*	27.7	38.6	18.7
Water*	28.7	28.4	27.4
Infrastructure/Green CAPEX*	7.4	8.1	19.4
Embracing a digital future			
Robotics & AI	20.0	32.1	29.4
Internet of Things & 5G*	20.0	26.9	17.6
Medical Technology	-8.4	16.3	1,489.7
Online Gaming	-6.0	N/A	23.6
Fintech*	-5.7	26.3	30.3
Cybersecurity*	5.5	22.6	35.2
Blockchain*	29.1	47.8	16.0
China's 'Common Prosperity'			
Hard Tech/Semiconductors*	24.9	57.1	28.0
Renewables*	5.1	38.8	16.2
China Internet*	-44.2	5.1	31.6

Source: Standard Chartered

*Denotes our preferred themes for 2022 and are represented by the following indices: **Electric Vehicles (EVs)** - Solactive Autonomous & Electric Vehicles Index; **Water** - ISE Clean Edge Water Index; **Infrastructure/Green CAPEX** - S&P Global Infrastructure Index; **Internet of Things & 5G** - Indxx 5G & NextG Thematic Index; **Fintech** - Indxx Global FinTech Thematic Index; **Cybersecurity** - Prime Cyber Defense Index; **Blockchain** - CoinShares Blockchain Global Equity Index; **Hard Tech/Semiconductors** - FactSet China Semiconductor Index; **Renewables** - MSCI China IMI Environment 10/40 Index; **China internet** - CSI Overseas China Internet Index

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