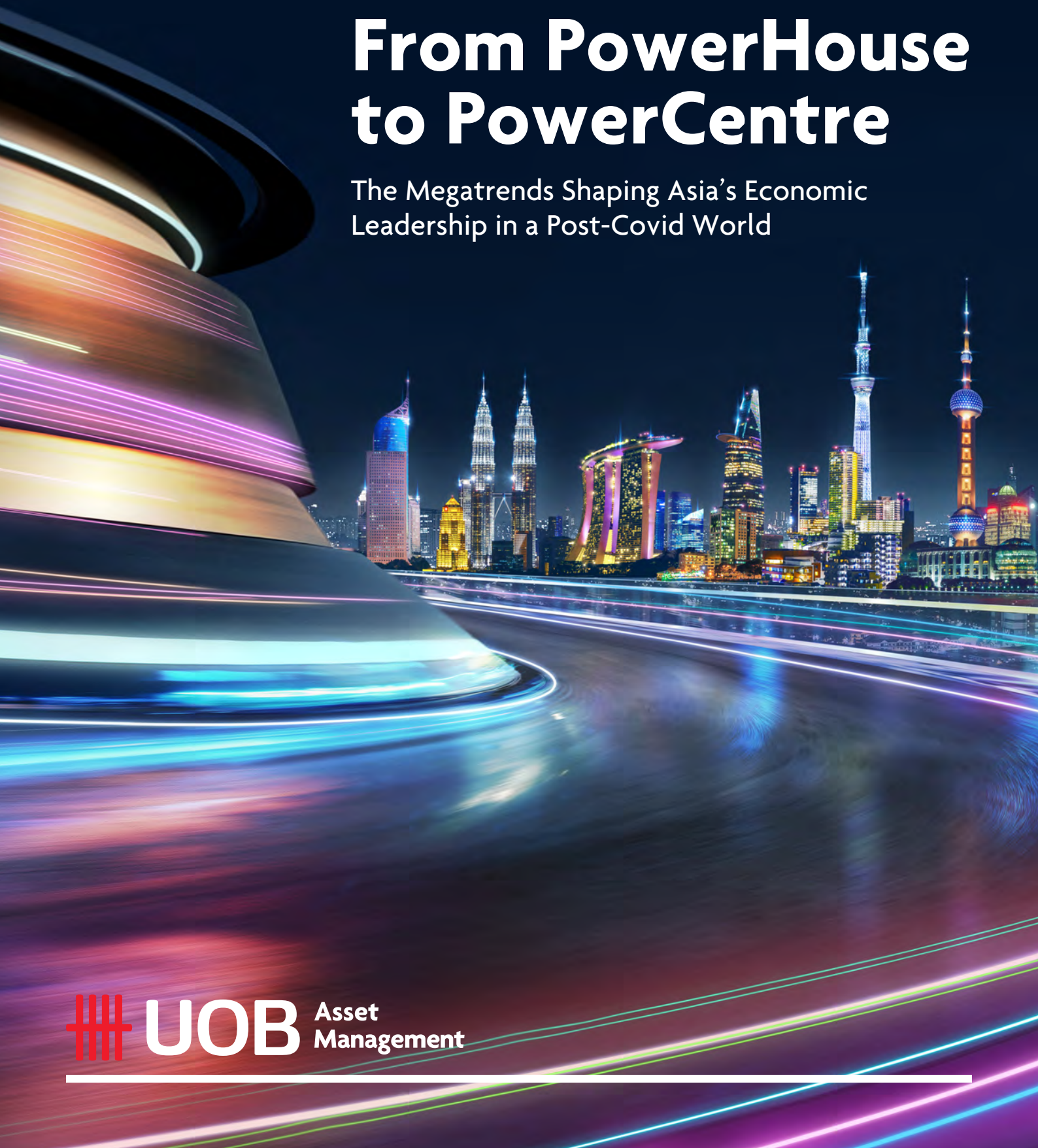
# From PowerHouse to PowerCentre

## The Megatrends Shaping Asia's Economic Leadership in a Post-Covid World



UOB Asset Management

# Asia as a PowerCentre

A number of megatrends prevalent in Asia have increased in potency since the Covid pandemic. Three megatrends stand out as having the potential to put Asia at the helm of future global growth. In a three-part series, we examine each of these megatrends in detail and the investment opportunities that are expected to emerge or strengthen as a result.

- Changing Demographics
- Go Green
- The Digital Economy

## Part One: Changing Demographics

As in the rest of the world, Covid heightened a number of pre-existing population trends. This further accentuated the change in Asian countries' age and income profiles, and will have a significant long term impact on Asian economies.

## Part Two: Go Green

The pandemic brought to the fore a wide variety of ESG (environmental, social and governance) challenges. Asian governments, companies, and individuals have taken bold steps in response, setting the stage for profound regional developments.

## Part Three: The Digital Economy

No other emerging trend has been as powerfully impacted by the Covid pandemic as the shift towards digitalisation. Whether it is home schooling, working from home, or e-commerce, Asia's digital acceleration is yielding unprecedented opportunities.

# Content:

# Introduction Investing In Asian Megatrends

**Equity ownership is one of the most powerful forces of wealth creation.** The process of securitising equity ownership into small shares opens that ownership opportunity to everyone. With equity ownership, one's wealth can grow by more than what one's labour can earn, and the opportunity is not limited to only those with the capital to start businesses. In the modern world, anyone with any amount of savings can participate in wealth creation and this simple process is one of the most egalitarian features of modern society.

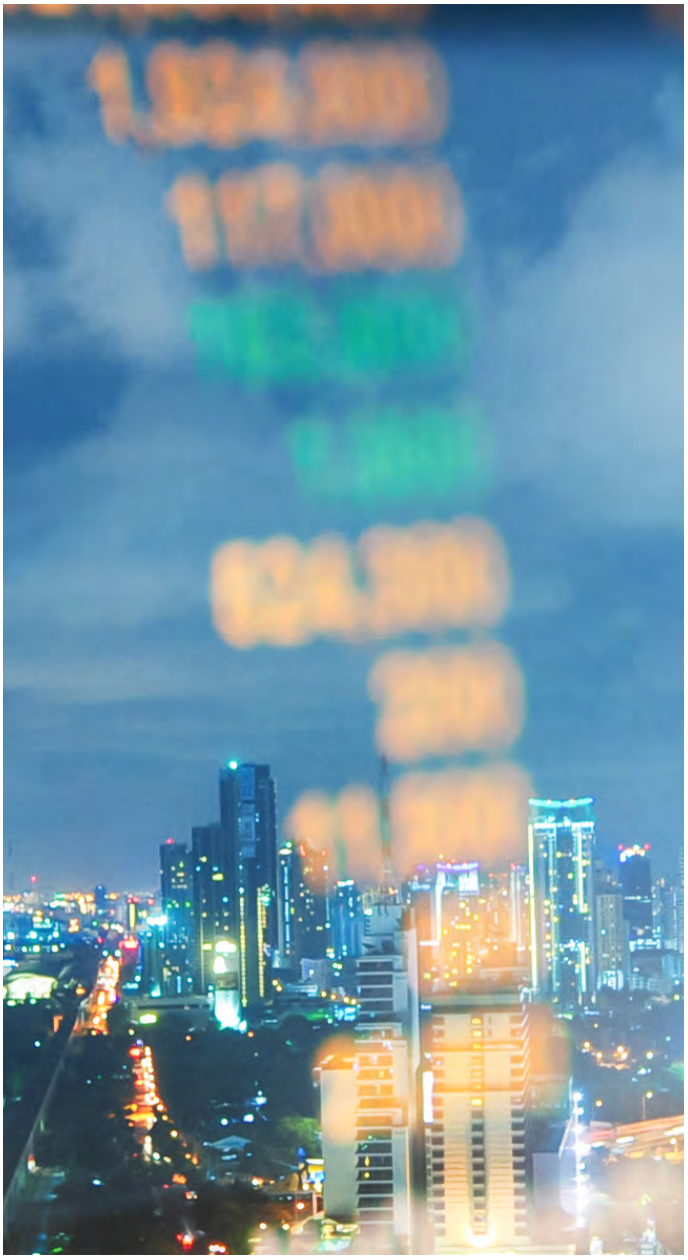
**But within these equity opportunities there are different potential approaches to investing.** In this report, we highlight the opportunities in focusing on megatrends as an investment opportunity. This contrasts with the common practice of leveraging on short-term market events.

Most basically, a broad market diversified fund has usually been able to provide returns in relation to the economic growth of a country or region and the risk premium involved in the market. Megatrend investments, on the other hand, are trying to target the structural trends that go beyond the normal market trends. Over the years there have been strong structural trends that have provided outsized returns beyond normal risk premia associated with the investments. These megatrends have frequently been challenging to analyse but over years can yield returns far beyond what normal markets can provide.

For example, in the late 1990's, investments in internet stocks was a megatrend that captured the imagination of many investors. Henry Blodget, who was an equity analyst with CIBC Oppenheimer in 1998, famously predicted that Amazon stock would soar from the then price of $250 per share to over $400 per share by the end of the year. This seemed an outrageous call at the time, but within three weeks it had surpassed that value.

**This highlights investors' desire to participate in new trends.** By the end of 1998, Amazon had risen to 10 times its price at the start of the year. But then the dotcom bubble burst and by 2002, Amazon shares fell back to levels seen at the start of 1998. Many highlighted the fallacy of investment "fads". But over time and throughout the cyclical ups and downs of markets, strong structural trends can persevere.

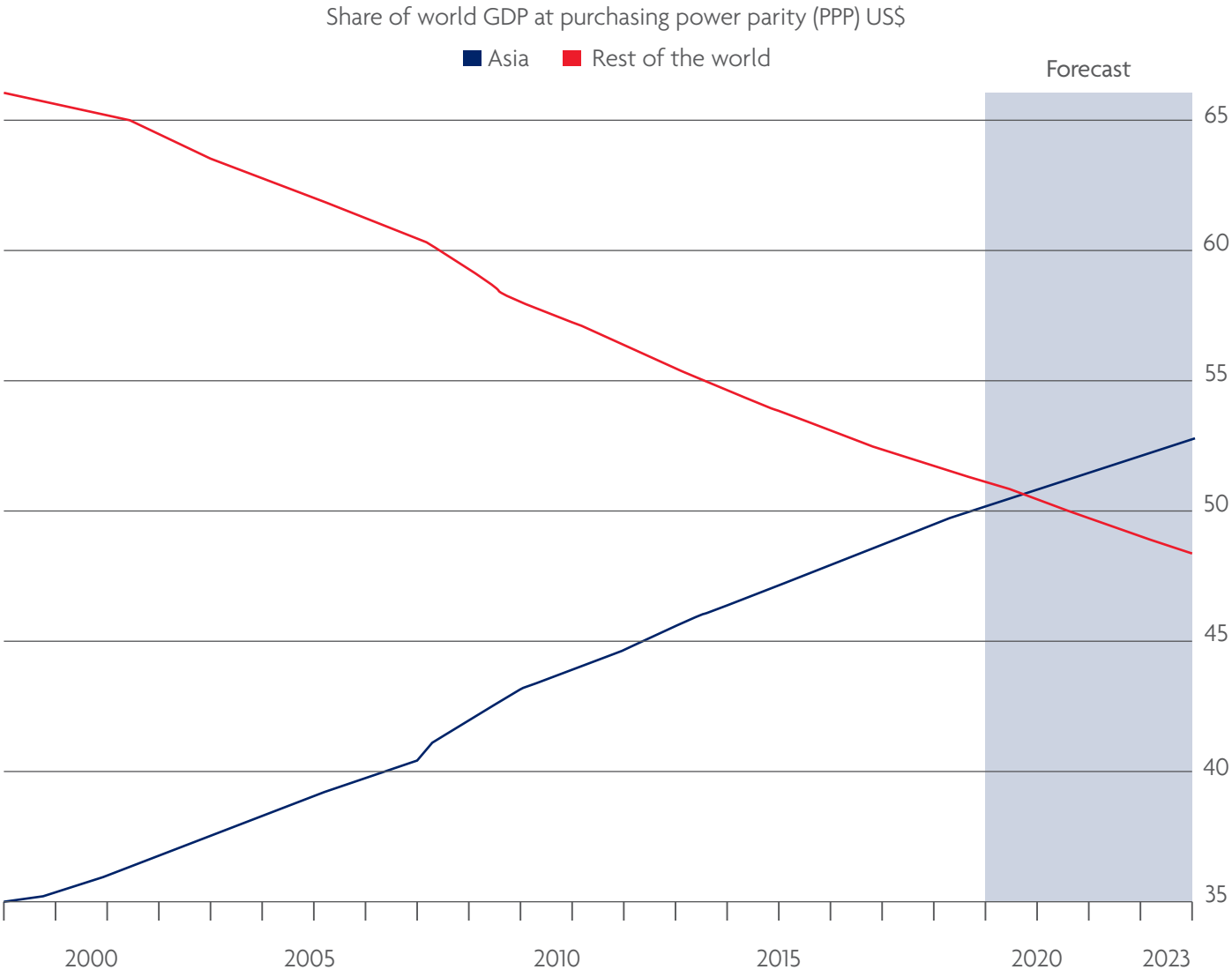
Today, Amazon stock is worth 650 times what it was worth in early 1998. With the benefit of hindsight, it is clear that megatrends can and do prevail. However, not all megatrends do as well as the Amazon example. Normal broad market investments already give investors a strong way to participate in the wealth creation that come with growing economies. Megatrend investing, although potentially powerful, must prove to be a strong structural trend outside the normal directional benefit of economic growth. Plus, the benefits can take years to bear out.



**At UOB Asset Management, we seek to give investors access to both.** We aim to offer our clients the traditional participation of broad market wealth creation and potentially steady average market returns. In addition, we look to uncover exciting megatrends and investment themes that have the potential for stronger long-term returns.

While identifying impactful megatrends can be challenging, our analysts and portfolio managers see several of these and are starting to employ them into the funds that they manage. We acknowledge that there are a number of important trends and sub-trends – and therefore investible opportunities – in the world today, including those that have been boosted by the Covid pandemic. However, we believe that many of these are subsumed within the broad megatrends that we are examining in this report.

## Figure 1: The Asian century has begun




Source: IMF, FT, UNCTAD definition of Asia

**Our extensive Asian network places us at the heart of many of these megatrend opportunities.** In 2020, Asia's economy officially overtook the rest of the world combined and kicked off a new era of Asian economic leadership that some experts are calling the "Asian Century". Today nearly half of the world's 500 biggest companies by revenue, and over a third of the world's 330 unicorns, are Asian.

But Asia is not just an engine of growth. It is also becoming a centre of activity. The new Regional Comprehensive Economic Partnership (RCEP) which came into force at the start of this year is the world's largest trading bloc by economic size. Members include 15 East Asian, Southeast Asian, and Pacific nations and the bloc accounts for 30.5 percent of the world's GDP, against the European Union's 17.9 percent and the USMCA's (United States-Mexico-Canada) 28 percent. Intra-regional trade prior to RCEP already amounted to US$2.3 trillion in 2019, and this number is now expected to rise by a further US$42 billion.

**The Covid pandemic has also opened the world's eyes to Asia's operational capabilities.** Despite the fact that most Asian countries have lower average incomes and a less mature public sector than in the US and Europe, they were able to demonstrate remarkable efficiency in dealing with the pandemic.

To date, many global investors still appear to think that US and European companies are at the forefront of key investment themes. But not only does Asia offer some of the world's most exciting megatrend opportunities, Asian companies are often best placed to tap them. UOB Asset Management's network of investment managers across the region allows for intensive research into the sectors and companies that have the potential to benefit from key trends.

# Part One: Changing Demographics

## Asia Is Getting Younger ... And Older

There have been many demographic transformations in play in Asia over the past few decades. However, several have reached a critical point in Asia's development and its relationship with the rest of the world. These are expected to have a significant impact on the region's investment landscape over the medium and long term.

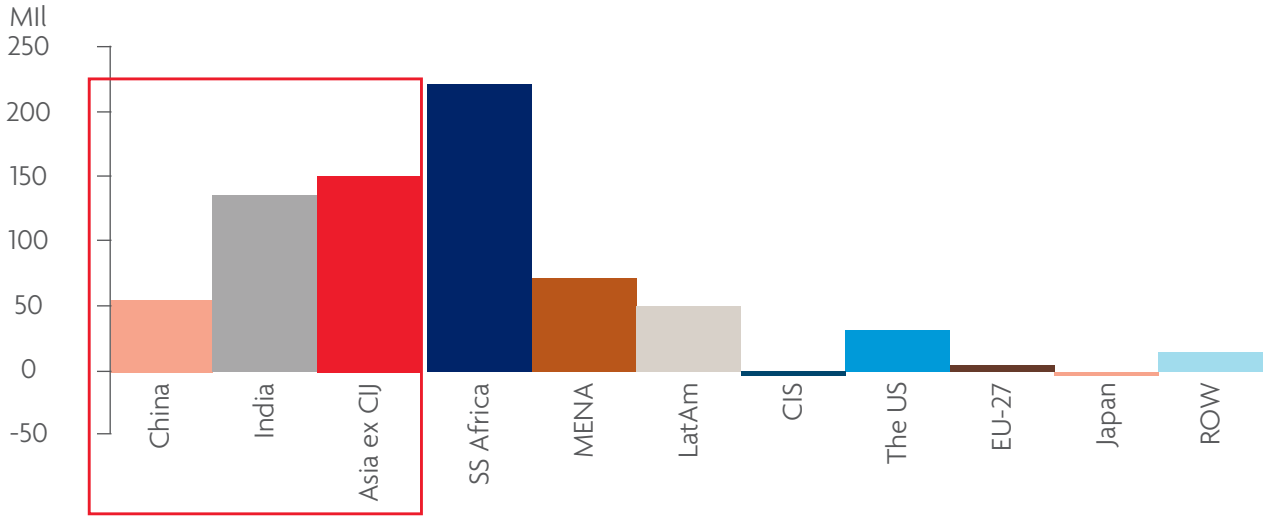
| Changing Demographics | | | |
|---|---|---|---|
| **1. Population growth** | **2. Rise of millennials** | **3. Increasing affluence** | **4. Aging societies** |

### 1. Population growth

**The world's population is still growing exponentially.** It took more than 50,000 years for the world population to reach 1 billion people. Since 1960, we have added successive billions every one to two decades. According to the International Monetary Fund, the world population was 3 billion in 1960. It took just 40 years for the population to double to 6 billion. The United Nations projects that in the next 40 years, the population across the globe will surpass 9 billion, led by emerging markets in South Asia and Africa.

### Figure 2: More and more Asians

Population change by region, 2010 - 2020




Source: UN, OECD, UOB Economics, December 2019

**Today, less developed countries represent the vast majority - 84 percent - of the world's population.** This share was just 68 percent in 1950 and will continue to rise sharply because virtually all of the nearly 2 billion net additions to world population projected over the next three decades will occur in less developed regions countries. This is a major concern, because less developed regions, as classified by the United Nations, tend to be more fragile - politically, socially, economically, and ecologically - than their more developed counterparts.

**However, strong population growth also means a younger population profile for these countries.** A large population of younger individuals represent a more attractive balance between working age populations and retired workers. Growing populations also mean a large market for products and services, and a larger work force at a time of increasing labour shortage and supply chain kinks in the developed regions. And finally, the population skew toward younger profiles brings with it attractive sectors such as millennials.

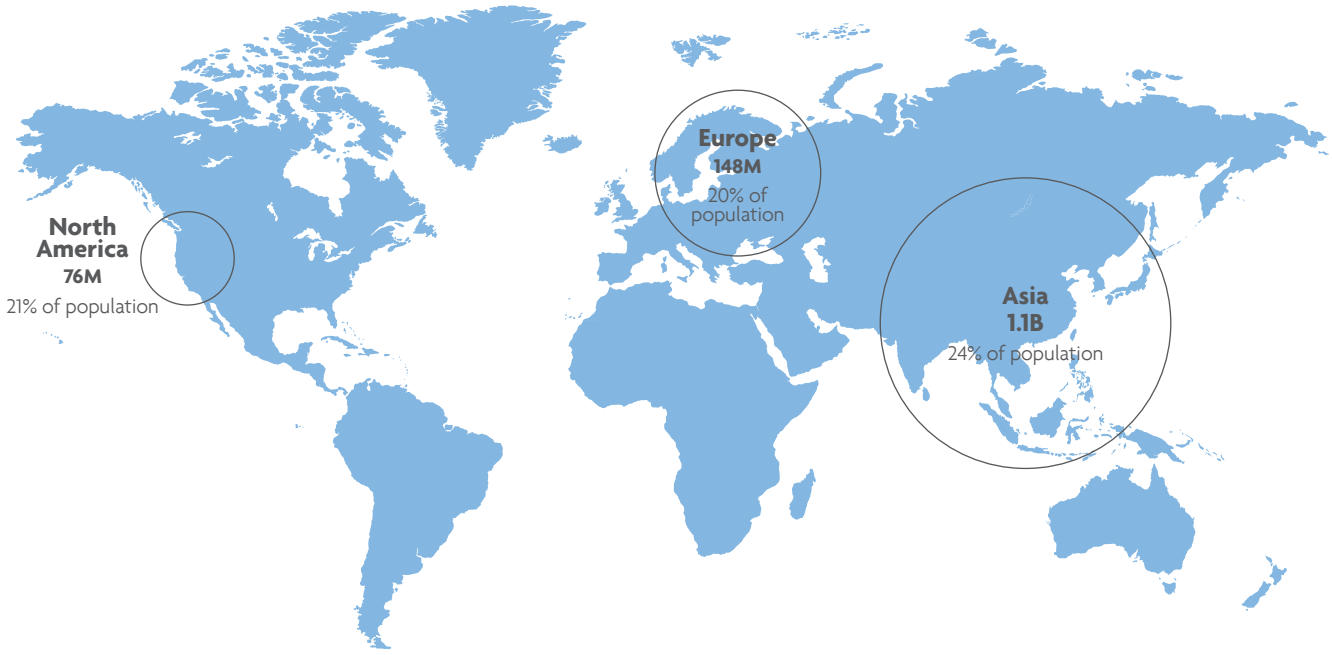
## 2. Rise of millennials

**Consumers who are both youthful and affluent are a welcome prospect for businesses.** Formally defined as the cohort of individuals born between 1980 – 1994, millennials globally are widely recognised to be better educated, more digitally savvy, and often more affluent than their parents. Millennials offer businesses the opportunity to cultivate customers who they can grow with and learn to support. This in turn helps secure a revenue stream that remains intact for many years, if not decades. Marketing departments around the world are targeting millennials as a key customer segment, and not surprisingly, many have their eye on Asia.

**The number of millennials in Asia are a quarter of the world's millennial population.** This is far in excess of those in the US and Europe. The same is true for those coming of age, i.e. Gen Zers – born between 1995 and 2012. Besides their total size, these Asia millennials and Gen Zers have consumer traits not shared by their US and European counterparts. According to a report by the Singapore Economic Development Board and Economist Intelligence Unit, they are not just digital natives but also mobile natives. Their heavy use of mobile e-payment and chat services to make and influence purchasing decisions means that they have broader and more complex tastes than Western millennials.

### Figure 4: Asian millennials rule

Millennials (born 1980 – 1994) by region




Source: United Nations World Population Prospects, 2019

Chinese millennials are a particular force to be reckoned with. They were the first in the country to be born into the country's modern economic era and as such are also the first to enjoy true spending power and financial freedom. It is estimated that 70 percent of Chinese millennials own their own home, compared to 40 percent worldwide, based on an average annual income of about US$20,000 and an equivalent in annual debt.

Overall, Chinese millennials have more disposable income than their parents or their US counterparts, and are highly digitally aware. Therefore in contrast to the US, where the boomer generation remains the country's market movers, millennials are redefining all aspects of China's economic growth, social structures, and public sphere.

**Millennials in developing Asian markets will also come to prominence over the next decade.** However, unlike their Chinese counterparts, this is not the result of individual earning power, but of inter-generational wealth transfers. It is estimated that US$930 billion will change hands over this period as Asian Boomers enter their 70s and 80s. This transfer exercise will see millennials in control of 35 percent of Asia's wealth in the next five to seven years.

## 3. Increasing affluence

**If demographics is destiny, then a growing middle class is a decisive factor in investment outcomes.** While access to growing populations is a plus for corporates, profitability is based on those growing populations developing a middle class that will consume discretionary goods, build homes, furnish homes, buy cars, and raise children.

This aligns to widely applied definitions of "middle class". Over the years, analysts have used either an absolute global definition or a relative one for each country. In both cases, the definition is anchored on purchasing power. A range of US$11 - US$100 in purchasing power parity (PPP) per capita per day is commonly used to characterise "middle income" households. Meanwhile, those only capable of daily spending that is less than US$11 is characterised as "poor and vulnerable".

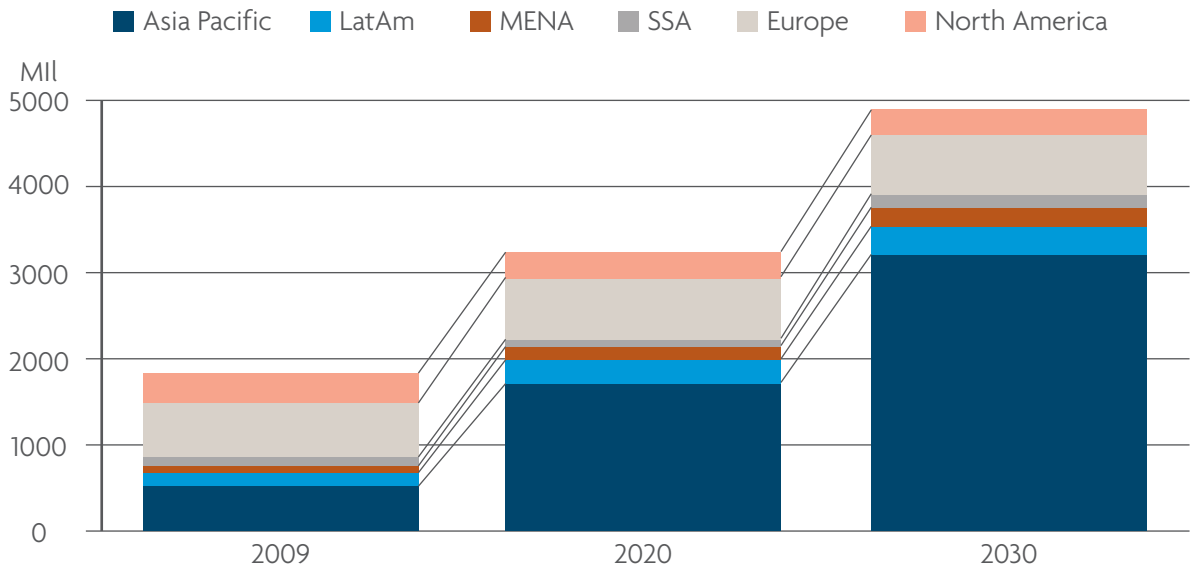
**In 2019, a tipping point was reached.** We know of course that the middle class segment has continued to expand in developing countries. But two years ago, it was estimated that globally, the number of individuals with a purchasing power exceeding US$11 equalled those with a purchasing power below US$11. This suggests that in many developing countries, there is now a critical mass of middle-class households.

**Asia is both the biggest contributor and beneficiary of this demographic dividend.** This region is where the highest middle class growth has and will come from in the coming decade. Going forward, developed markets are not expected to see any meaningful growth of their middle class population. In contrast, the middle class in Asia has more than doubled in the past decade and is expected to double again in the next decade.

Asia's middle class already accounts for more than half of the world's middle class population and over 40 percent of global middle class consumption. In the next decade, the growth of this segment in Asia is expected to be larger than the current total size of the equivalent segment in developed markets. This will not only help sustain global growth, but elevate Asia into a position of global consumer-led economic leadership.

## Figure 3: Asian consumers dominate

Middle class population by region, 2009 - 2030



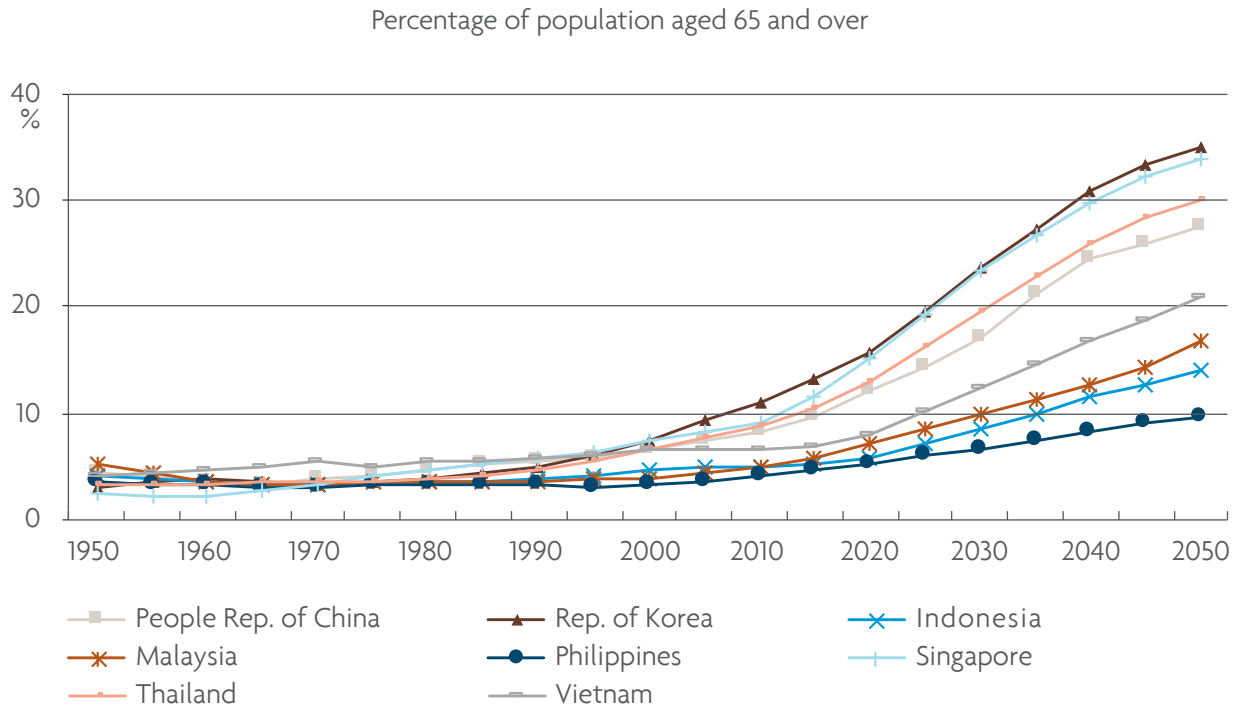

Source: UN, OECD, UOB Economics, December 2019

## 4. Aging societies

**Population aging is the dominant demographic trend of the twenty-first century.** This is not just a reflection of increasing longevity, but also steeply declining fertility rates and the progression of large numbers into the older cohorts. Never before in the history of mankind have such large numbers of people reached or surpassed the conventional old-age threshold of 65. One billion individuals are expected to be added to this cohort in the next three to four decades, on top of the more than 700 million people there today. Of this group, those aged 85 and over are growing especially fast and could exceed half a billion in the next 80 years. This trend is significant because the needs and capacities of the over-85s tend to differ significantly from those of aged 65 to 84.

**A vast proportion of the over-65s will come from the Asian region.** The Asian Development Bank (ADB) estimates that by 2050, 923 million of the world's elderly will be Asian. This puts Asia on track to become one of the oldest regions in the world. But alongside the absolute numbers, the pace of aging in Asia is also breathtaking. In almost all countries, the percentage of over-65s remained well under 10 percent until two decades ago. Since then, this share has risen steadily, especially in countries like South Korea, Singapore, and Thailand, squeezing into 20 years what took 60 years to evolve in developed countries.

### Figure 6: Asia is aging fast




Source: Asian Development Bank

The progression of the population aging phenomenon differs considerably across countries. In Thailand's case, improvements in healthcare, a steep decline in birth rates, and increased life expectancy all helped to double the percentage of over 65s - from 6.6 percent in 2000 to 13 percent in 2020.

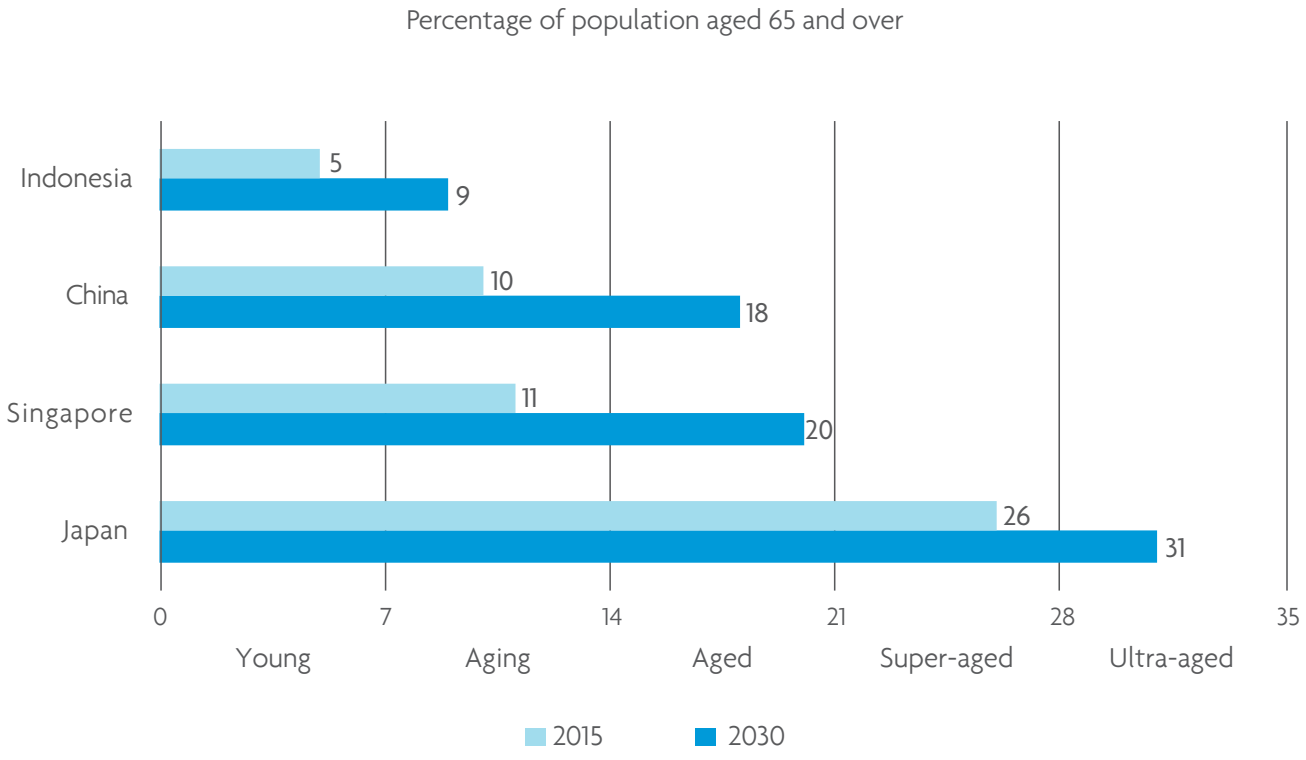
**As elsewhere, Thailand's rapid aging is sounding alarm bells, but also opens up new avenues for growth.** Economists have expressed concerns about the downward pressure on economic growth due to labour and capital shortages that become apparent when populations age. These labour market stresses were further exacerbated during Thailand's Covid outbreak.

It is also worth noting the different problems that wealthy and less wealthy nations may encounter. In a wealthy country, it is common for asset prices to fall as a growing cohort of older people seeks to support itself by liquidating investments. Fiscal problems arise because government coffers become strained by rising pension liabilities. In less wealthy nations like Thailand, there are fewer resources to overcome the challenges of individual aging. A particular issue confronting the country currently is the high cost of treating long-term chronic ailments associated with old age, such as cancer and cardiovascular disease.

**To track the depth of the challenges and opportunities posed by old age, countries are now categorised according to the percentage of elderly in the population.** Those with more than 21 percent of their population aged over-65 are now defined as "super-aged", and more than 28 percent as "ultra-aged". For example, Japan has long been a world leader in term of its old age population. In 2015, the country had close to 26 percent of its population aged 65 and over, triple the world average.

However, by 2030, this number is expected to reach 31 percent, making Japan the first in the world to be termed an "ultra-aged" nation. That said, over the next two decades, it is thought that 29 countries and territories will join Japan in this category. Europe is following in Japan's footsteps and the US is not that far behind.

## Figure 5: Asian super-aged and ultra-aged societies




Source: Marsh & McLennan, Oxford Economics, World Bank, UN Population Division

**At the same time, many Asian countries will enter the super-aged category.** To prepare for this eventuality, governments are considering a number of age-defying policy measures. These include the extension of working lives, increasing the participation of women in the workforce, opening the doors to migrant workers, and upskilling workers to achieve productivity gains.

Technological innovations can also help ameliorate the effects of population aging. These include new drugs to slow the process of aging, the invention and deployment of assistive devices such as robots, and new models of home health care, public transportation systems, and urban design.

# Investment Implications

## Logistics, construction and transportation

**US-China tensions and Covid-induced supply chain disruptions are a big plus for Asia's large and young workforce.** The deepening of US-China tensions is having positive consequences for Asia. In an attempt to sidestep both these superpowers, investments are starting to flow instead to non-partisan countries such as ASEAN nations, Japan and South Korea. Labour-intensive businesses in particular, including electronics and consumer sectors, are most likely to shift their operations given their limited ability to cope with higher tariffs or geo-political shocks. ASEAN countries like Indonesia and Malaysia offer a stable investment climate and a ready pool of workers to capitalise on companies looking to diversify beyond China.

The pandemic-related disruptions to global supply chains are also favouring Asian economies. Few could have foreseen the travel restrictions, quarantine requirements and export bans imposed during the pandemic and many companies were caught short. But there are now concerted efforts to ensure that the resulting shortage of critical goods and raw materials is not repeated. This includes reducing an over-reliance on a few suppliers, switching to more digitalised trade and logistics processes, and the establishment local sales networks. Asian logistics, construction, transportation sectors offering digitised solutions and a productive workforce are the primary beneficiaries of these supply chain relocations and diversifications.

## Consumer services and wealth management

**Asia's growing affluence bodes well for the consumer and wealth management sectors**
As Asia's middle-class individuals progress through their careers and working lives, they are having families, buying houses and cars and spending on education, recreation, culture, arts and entertainment. At the same time, they are thinking forward and planning to provide for their families' future savings, wealth management, insurance, and needs.

Given the speed of growth of this middle class market, companies still have the opportunity to capitalise on first-mover strategies for many consumer and financial products and services. For example, it is estimated that 73 percent of Southeast Asians remain unbanked or underbanked. Furthermore, there are now opportunities to overcome adoption barriers via the use of digital solutions. A report by Google, Temasek Holdings and Bain & Company suggests that up to 40 million people in six ASEAN countries - Singapore, Malaysia, Indonesia, the Philippines, Vietnam and Thailand - came online for the first time in 2020 as a result of the Covid pandemic. This puts internet penetration at nearly 70 percent of the population and paves the way for the growth of digitally-enabled middle class consumption.


## Healthtech, edtech and greentech

**Asian millennials will drive the demand for innovation and sustainability.**
The one billion millennials in Asia provide the market scale for technological innovations. Meanwhile, the pandemic crisis has caused these innovations to come thick and fast. Health concerns, social restrictions and lockdown conditions have all acted as catalysts for sustainable tech advances aimed largely at the digitally initiated.

Within HealthTech, the priority has been to make healthcare more accessible via the use of data, telemedicine and robotics. As infrastructure improves and these services become more familiar, the demand for remote diagnostics, online mental healthcare, virtual fitness, and robot-enabled home palliative care looks set to grow.

Within EdTech, eyes are opening to the potential for non-classroom based learning. While remote schooling is nothing new, EdTech capabilities now extend to e-attendance of even the most prestigious of global educational institutions, made available to students from around the world.

Within GreenTech, post-Covid initiatives have been boosted by millennials' greater sensitivity to social and environmental issues, and heightened awareness of global connectivity. For many, it is not good enough to simply recover to pre-Covid standards. Millennial consumers want more green real estate, green transport, green food production and green infrastructure.

## Travel, recreation and health services

**Older segments of the population have different needs than their younger compatriots**
This is even more apparent for those who live longer, are better educated, and have higher wealth reserves. As these individuals move towards and beyond their retirement age, their spending is likely to veer away from the mass market. In fact to date, the older generation are the key drivers of "experiential commerce" within the more developed markets. Given that they are no longer working but financially secure, this group are making more expensive lifestyle choices, including on big ticket travel, recreation and cultural pursuits.

However, across the wider elderly population, it is healthcare spending that is the biggest concern for governments and biggest opportunity for the private sector. Asian healthcare experts see a strong need for better integration across public-private boundaries to deal with the rapid growth of the elderly population. This collaboration can extend beyond primary and secondary care to training and sharing of medical expertise. Over the next decade, significant organisational and operational changes in Asia's health services for the elderly will throw up the potential for exciting new business models.

# Part Two: Go Green

## The Rise of Collective Solutions

**You may think that UOBAM is so keen on Environmental, Social and Governance (ESG) investing that we naturally have a bias towards this as a megatrend.**

While it is true that we have strong convictions about the viability of investing for both profit and purpose, we are also sufficiently immersed in this subject to understand where the challenges and opportunities lie.

In fact, based on our experience, we see two key developments that make the Go Green megatrend worthy of heightened focus in our investment portfolios. The first is the change in the global response to climate change. Thought previously to be a "tragedy of the commons" problem, the issue has hit a critical threshold on the global agenda, and now has the world's attention in terms of finding and implementing common solutions.

The second is Asia's role in the ESG universe. As the world's fastest growing region, Asia not only has the greatest demand for natural resources but is also at greatest risk from environmental degradation and climate change. This region has good reason to lead the charge against climate change and is starting to do so in some areas.

We believe that these two developments can lead to profound changes in the coming decades. Specifically, solutions to limit carbon emissions and harness new energy sources will alter the fundamental building blocks of modern Asian society and profoundly change the conduct of our everyday lives in the years to come.

## A global response

"Tragedy of the commons" is a classic economic term based on the postulation that individuals have an incentive to consume a scarce resource for their own self-interest and at the expense of other individuals, thereby ultimately depleting that resource entirely. In terms of environmental and natural resources, this term can be extended to nations, and perhaps helps explain the long gestation period during which governments generally seemed reluctant to step up to the plate.

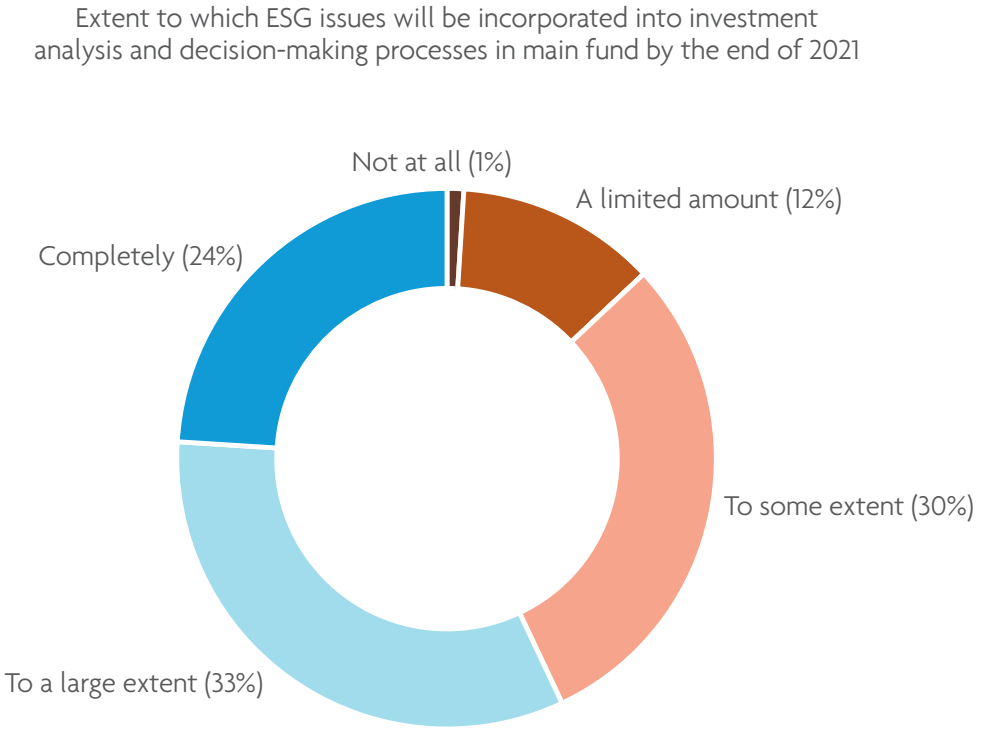
**However, the way the world is addressing environmental and climate issues is changing.** These have become more pressing, and both policymakers and the private sector are developing more collaborative and effective ways to address them. Previous scientific debates around the actuality of climate change have all but dissipated, and the political debate has shifted towards what needs to be done and how to achieve this collectively.

Aware that capital access underpins all enterprise, government agencies had started to direct public funding towards achieving new energy sources and lower carbon footprints. Since then, the world has witnessed a tidal wave of investment capital generated by ESG-focused portfolios. According to the Global Sustainable Investment Association, ESG assets under management (AUM) surpassed US$35 trillion in 2020, up from US$30.6 trillion in 2018. Assuming 15 percent growth, that is, half of the pace of the past five years, ESG AUMs are estimated to exceed US$50 trillion by 2025.

**Asia Pacific's ESG AUMs reached US$93 billion in September 2021, still a small percentage of the global total, but growing at a much faster rate.** In October 2021 alone, flows into Asia-Pacific (excluding China) domiciled ESG funds, according to ratings agency Morningstar, rose by 54 percent to US$1.2 billion. This was boosted in no small part by the Covid pandemic. An MSCI survey conducted in September 2020 found that 79 percent of institutional investors in Asia Pacific increased their ESG investments either "significantly" or "moderately" in response to the pandemic. This was slightly ahead of the global average and marks a radical shift in the way Asia Pacific institutions regard ESG investments in terms of their regional relevance and potential profitability.

"Asia Pacific's ESG AUMs are still a small percentage of the global total, but growing at a much faster rate."

## Figure 1: ESG matters to APAC institutions




Source: MSCI Global Institutional Investor Survey, 2021

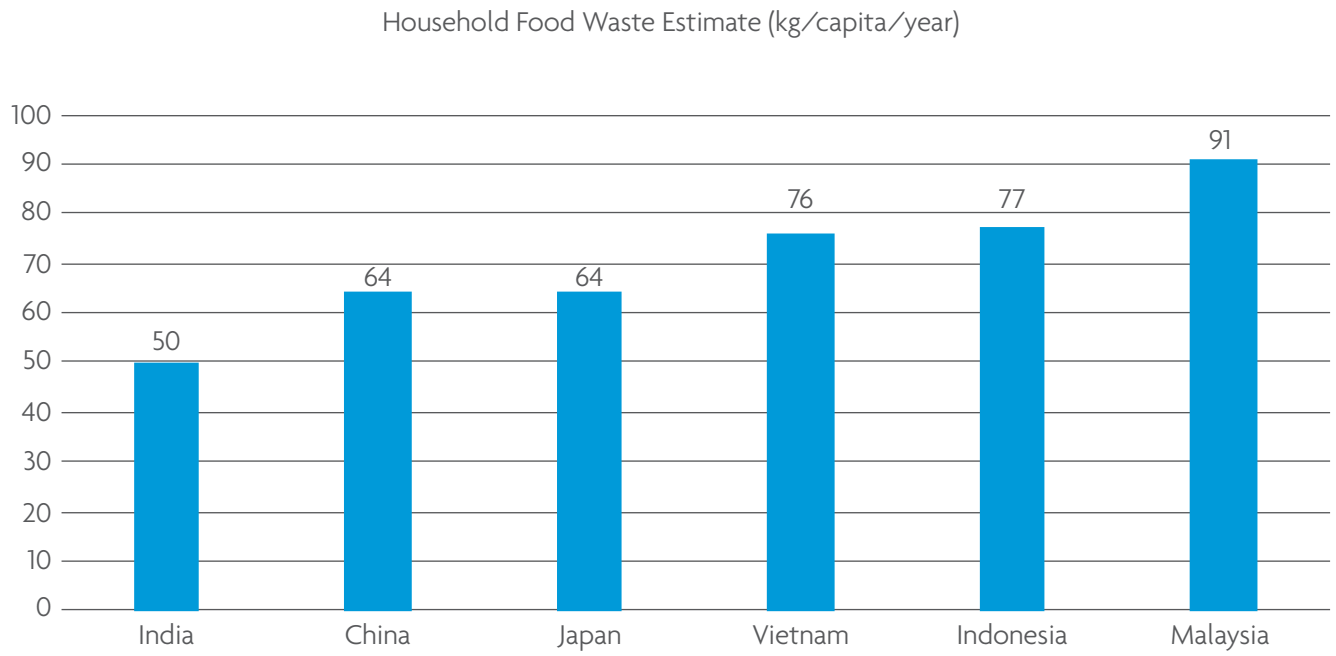
**The entire industry of ESG analyses is also rapidly evolving.** As an investment analyst, it is no longer enough to study historical company valuation models. There is now a strong demand for sustainability data and formulas to factor into accounting and financial analysis. Meanwhile regulators are imposing new rules for more sustainability reporting and transparency. Over the next few years, companies will experience profound changes in their access to capital if they are not making choices to enhance their ESG profile. Within Asia, stemming food waste and the transition away from coal stand out as significant challenges, but also as opportunities to make radical advances.

## Waste not, want not

**Around the world, the problem of food waste has reached crisis proportions.** Yet until relatively recently, this was met with general complacency. The Covid-19 outbreak in 2020 served as a wake-up call to governments and the public about the vulnerability of food supplies. Disruptions to food supply chains, and farm and haulage labour shortages during the pandemic, have helped focus the mind on the 931 million tonnes of food that the United Nations estimates was wasted globally in 2019. Of this, the largest percentage – 61 percent – came from households, and the rest from food service and retail. This is 17 percent of total global food production and accounts for up to 10 percent of global greenhouse gas emissions.

**Asia is thought to contribute to about half of the world's food waste.** Also more than half of waste in Southeast Asia is food-related. When reviewing the extent of food waste in China, the authors of the United Nations Food Waste Index report noted that a prominent urban-rural divide exists and the average of 64kg per capita per year belies a heavy skew towards the urban population, an observation that has relevance for other fast developing countries in Asia and the rest of the world.

## Figure 2: High food waste in Asia




Source: UN Food Waste Index Report 2021
Based on measured data points or extrapolation, medium confidence estimate

There are also differences in the phases of the food waste problem depending on the country's development. In more developed and urban Asian economies, the greatest wastage is during the "downstream" phase that is, the processing, distribution and consumption of food. But in more developing and rural economies, the issues to be addressed lie in the "upstream" phase, (also referred to as "food loss"), that is, the production, yield handling and storage of food. The latter is particularly a problem within ASEAN, given that agriculture remains a major economic force, contributing to around 23 percent of Cambodia and Myanmar's GDP and around 15 percent of Vietnam's and Indonesia's GDP.

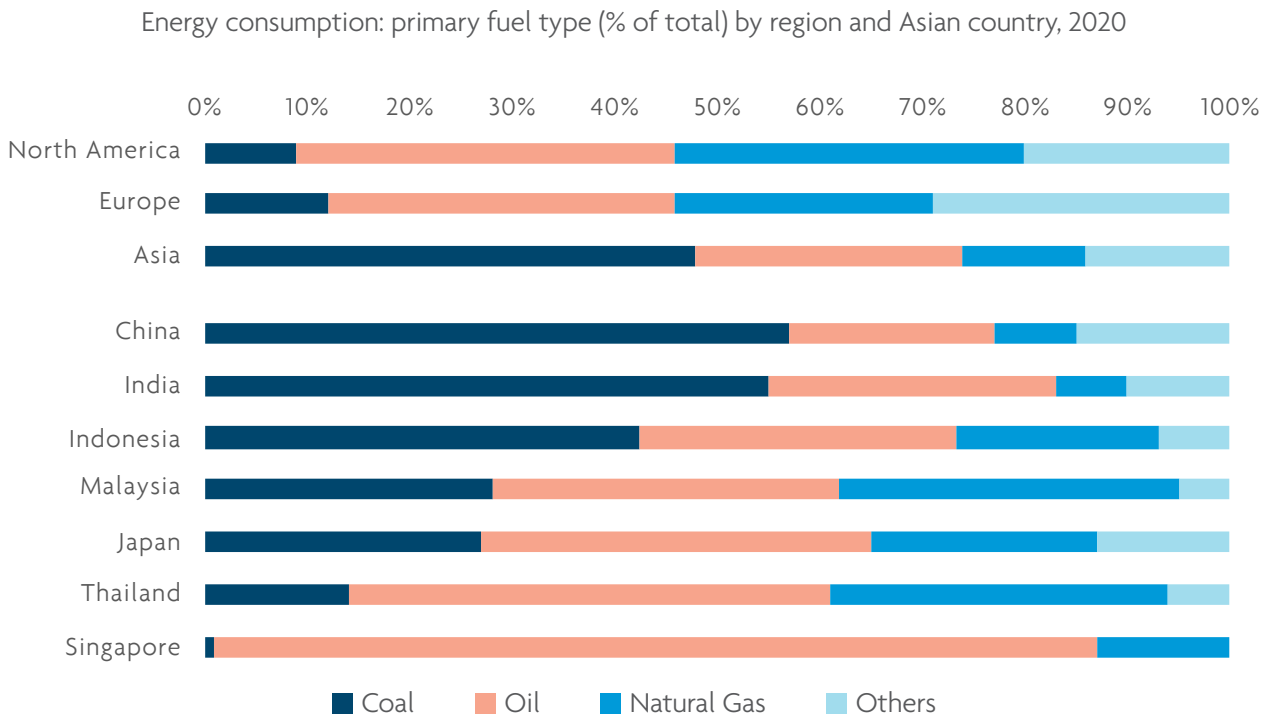
The food waste crisis has spawned a range of business lines. These are looking to address, for the more developed Asian countries, the prevention, redistribution and recycling of excess food. For the more developing ASEAN countries, AgriTech solutions have emerged that allow farmers to achieve a more consistent yield and production to avoid over-planting, and infrastructure and storage solutions are aimed at the efficient transportation of perishable foods from remote to distribution centres.

## The transition to clean energy

**Asia's adoption of energy alternatives to fossil fuels and in particular, coal, is crucial for the whole world.** As one of the fastest growing regions in the world, Asia's demand for natural resources is immense. From 2020 to 2050, Asia's energy demand is expected to more than double, creating a substantial energy gap. To date, that gap is largely filled by fossil fuels like oil and thermal coal that are major carbon emitters compared to other energy sources.

In 2020, 48 and 26 percent of the region's fuel consumption was driven by coal and oil respectively, as its primary fuel type. This contrasts with Europe and North America where non-coal/oil fuel types, i.e. natural gas, nuclear energy, hydro-electricity and renewables, when totalled together, now cross the halfway mark of total energy consumed.

## Figure 3: Coal and oil still dominate in Asia




Source: BP Statistical Review of World Energy 2021
Note: Others refer to nuclear energy, hydro-electricity and renewables

**However, the region is taking steps to address its coal dependency.** Driving this is the growing recognition that Asia stands to bear the brunt of climate change. It is estimated that floods and other climate change related effects could cause Asia to lose 26.5 percent of its GDP by 2048. So it was perhaps not surprising that in China's 14th Five Year Plan released in March 2021, there were significant policy measures set out for containing pollution, protecting the environment, and reducing carbon emissions. In fact, according to the government, this last objective would propagate other environmental improvements by becoming the "ring in the bull's nose".

**But reducing the country's deep reliance on coal is no easy task.** Following the release of the plan, it became clear that the Chinese government's attempts to limit local coal production plus reduced imports from Australia was resulting in the worst power shortages for several years. Energy-intensive industries, electricity-generating companies, and households were affected, leading the authorities to stress the need for a balance between carbon emission and developmental goals, and between the short and long term.

**Nevertheless, reducing carbon emissions remains high on the agenda for Asian economies.** The Chinese authorities said in September 2021 that the country would no longer build new coal-fired plants overseas. Many other Asian nations also stepped up their climate commitments at the conference, including Thailand, Vietnam, and Singapore. In Indonesia, efforts to align with its pledge to reduce 29% of its greenhouse gas emissions by 2030, has resulted in the recent passing of its Harmonized Tax Law (UU HPP). This law sets out a carbon tax rate of IDR 30/kg tax for CO2e emissions, equivalent to US$2.1 per tonne of CO2e. Also now in place is a cap on emissions, whereby industries exceeding the cap are taxed accordingly.

There was also good progress made on the implementation of carbon markets with Asia as an active participant. Going forward, more carbon tax schemes and emissions trading systems are expected to be rolled out in the region. China's national emissions trading system (ETS), launched in July 2021, is the world's largest and covers 2,162 companies within its power generation sector. These companies alone are responsible for 4.5 billion tonnes of carbon emissions annually and the objective is to expand the system to other sectors. By being cost effective and market driven, the ETS offers one of the most potent ways for China to meet its emission reduction targets.

# Investment Implications

As companies expand their green-related products and services, there is increased scope for investors to participate in this activity. In our view, here are the top three opportunities that investors may want to consider to leverage the Go Green megatrend in Asia.

**1. Renewable energy**

**2. Green real estate**

**3. Green finance**

## 1. Renewable energy

Policy developments in recent years have created two forms of opportunities: companies that are well positioned for the transition and pure play companies in climate mitigation and adaptation.

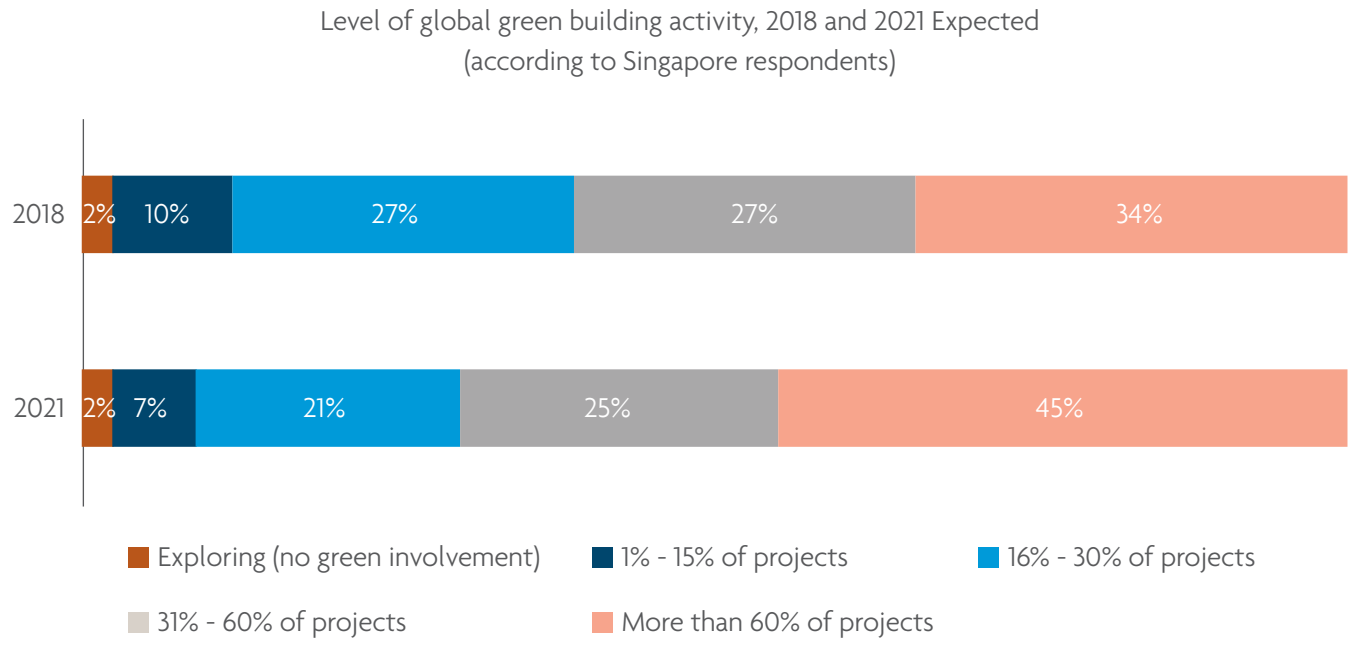
**In the first case, companies that successfully lower their carbon footprint have an increased potential for positive net cash flows.** This is the result of ever-widening adoption of carbon trading systems across the Asian region, including in ASEAN. Companies that manage to limit their carbon emissions will see a significantly reduced negative impact on their bottom lines. The experience of the EU ETS suggests that in the near term, companies will need to pay somewhere between US$50 – US$100 for every tonne of CO2 emitted. This could prove to be a hefty liability for major emitters.

**In the second case, companies involved in achieving energy efficiency, and in the production and use of renewable energy, are set to enjoy substantial investment support.** According to the IEA World Energy Investment 2021 report, the majority of investments into new power generation - 70 percent - is now flowing into renewable sources. Interest in funding coal and fossil fuel projects is being replaced, especially given that wind and solar photovoltaic (PV) deployment today is yielding four times more electricity than ten years ago, due to improved technology. In contrast, the Asian Development Bank announced last year that they will conditionally cease funding of new coal-fired power plants, coal mining, and oil & natural gas production and exploration.

It is also useful to note that investment interest now extends to the entire value-chain of renewable technology, including solar glass, PV cells and other equipment manufacturers as well as those involved in the raw material inputs, transmission, energy storage and distribution of renewable energy. In terms of newer technologies, there is a growing demand from harder-to-decarbonise sectors like aviation and shipping. This includes the use of hydrogen fuel cells and electric airplanes, and energy efficient manufacturing techniques such as membrane filtration of food and beverages as a replacement for traditional thermal processes, which has the potential to reduce energy consumption by 90 percent.

## 2. Green real estate

### Figure 4: Developers are growing their green portfolios




Source: Dodge Data & Analytics 2021, as cited in the 2021 Green Buildings Trends Study

**Buildings are thought to be responsible for as much as 39 percent of annual global greenhouse gas emissions.** Breaking this down, building operations contribute about 28 percent annually, while embodied carbon, that is, building materials and construction, contribute an additional 11 percent annually, of which concrete, steel and aluminium are particular culprits.

Policy and private sector initiatives aimed at establishing new green buildings and decarbonising existing ones are therefore not only of huge benefit to the environment but also embodies huge investment opportunities. After all, the rapid expansion of building construction and the need to reduce emissions is estimated to be worth US$17.8 trillion in emerging market cities until 2030.

**Policy support for the greening of the real estate sector is evident across Asia.** Countries at the forefront include:

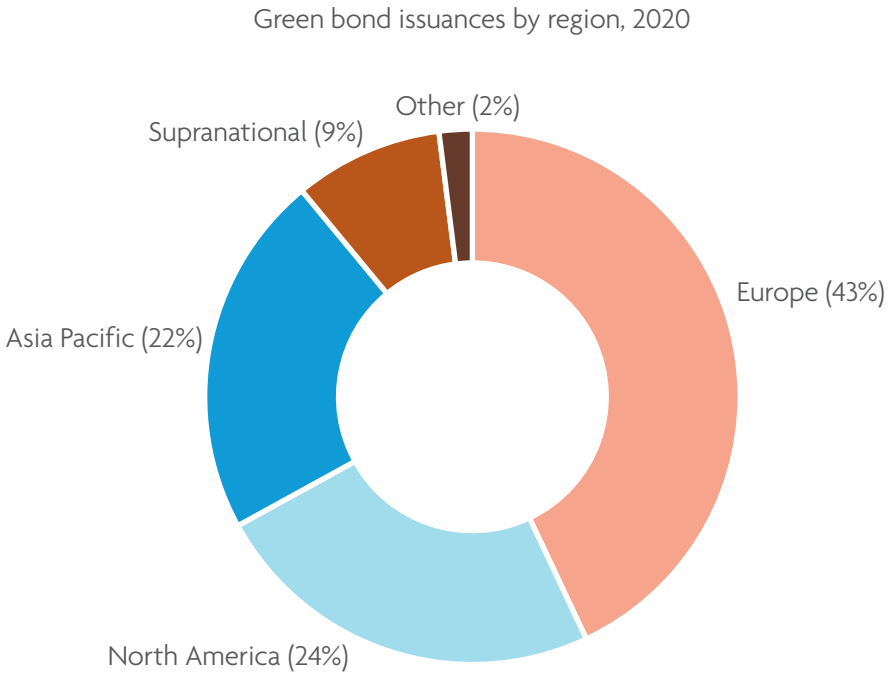
- Singapore - New buildings to become 50% more energy efficient relative to 2005 levels, reaching 80% by 2030.
- South Korea - $61 billion has been set aside for constructing zero-energy public buildings and sustainable energy sources.
- Thailand - Buildings' energy demand to be cut by 30% by 2036.
- Vietnam - Plans to improve the manufacturing process and use more sustainable raw materials in the production of cement and other building materials.

**There is also strong private demand for green buildings.** As many as 70 percent of the Asia-Pacific corporate occupiers surveyed by Jones Lang LaSalle (JLL) say that they are willing to pay a premium to occupy green-certified buildings. This is in order to meet their own sustainability goals on which ESG ratings are now based. Given the limited stock of green buildings and the time it will take for new ones to become available, these rental and capital value premiums look set to see strong support in the coming years. Conversely, buildings that are clearly in breach of modern environmental and energy efficiency standards are falling out of favour, and will likely be forced to accept lower rentals. Herein lies a clear example of the green premiums and brown discounts coming into play across the region.

As a result, there is a robust market for green buildings in Asia, Within ASEAN, Singapore in particular has shown a high level of building activity. According to the annual World Buildings Trends Study, nearly half of all Singapore-based developers surveyed said that by 2021, over 60 percent of their portfolios would consist of green buildings. Not surprisingly, given corporate sustainability mandates, a majority – 57 percent - of Southeast Asian green projects are expected to be in the commercial sector. And nearly half of the respondents in Singapore anticipate working to retrofit existing buildings, prompted by environmental regulations. While initial costs are a concern, the payback time for green retrofits is expected to be no more than five years.

## 3. Green finance

### Figure 5: Asia is a major issuer of green bonds




Source: Climate Bond Initiative, 2020

As the name implies, green bonds are normal fixed income instruments but created to enable capital-raising and investment for new and existing projects with climate and environmental benefits. The market has exploded over the past few years, and is well past being regarded as a niche investment opportunity. Since the first green bond was issued in 2007, the global green market continues to accelerate and issuances to date are estimated at US$1.2 trillion. Climate Bonds Initiative forecast this figure to nearly double by 2023, based on the 49 percent annual growth rate seen over the last five years.

**Of this global total, over a fifth - US$219.3 billion - were issued by Asian nations in 2020.** China and Japan are respectively the second and ninth largest issuers of green bonds, with China accounting for over half of Asia's share. The latter saw new record highs in 2021, with Chinese energy consumer companies and government-backed entities taking over from the financial sector as the primary issuers of green bonds. While these bonds do not yet meet global definitions of "green", there are moves to achieve greater alignment in order to tap the offshore market.

**The investment appeal of green bonds, and the wider ESG investments universe, extends beyond the ability to encourage green business models and dis-incentivise bad ones.** They are also a means to achieve capital gains or income over the long term given the ongoing battle to resist climate change and environmental degradation. These investments commonly demonstrate lower volatility, given that ESG-focused companies tend to be more resilient and future-ready, navigate risks better, and are less likely to be holding stranded assets. Finally, they provide a potential hedge against risks not covered by conventional investments. Green bonds, for example, are thought to play a significant role in hedging against abrupt changes in climate-related policies.

# Part Three: The Digital Economy

## The Democratisation of Digital Services

**The digital transformation that we are witnessing in society today is an investment megatrend that dates back to the 1990's dot-com boom.** The boom turned into a bubble but its underlying ability to disrupt traditional business models was unstoppable. Today, the impact of the digital trend is so profound that it can be justifiably described as game-changing, and new digital business opportunities are expanding at a rate that many investors already find difficult to keep up with.

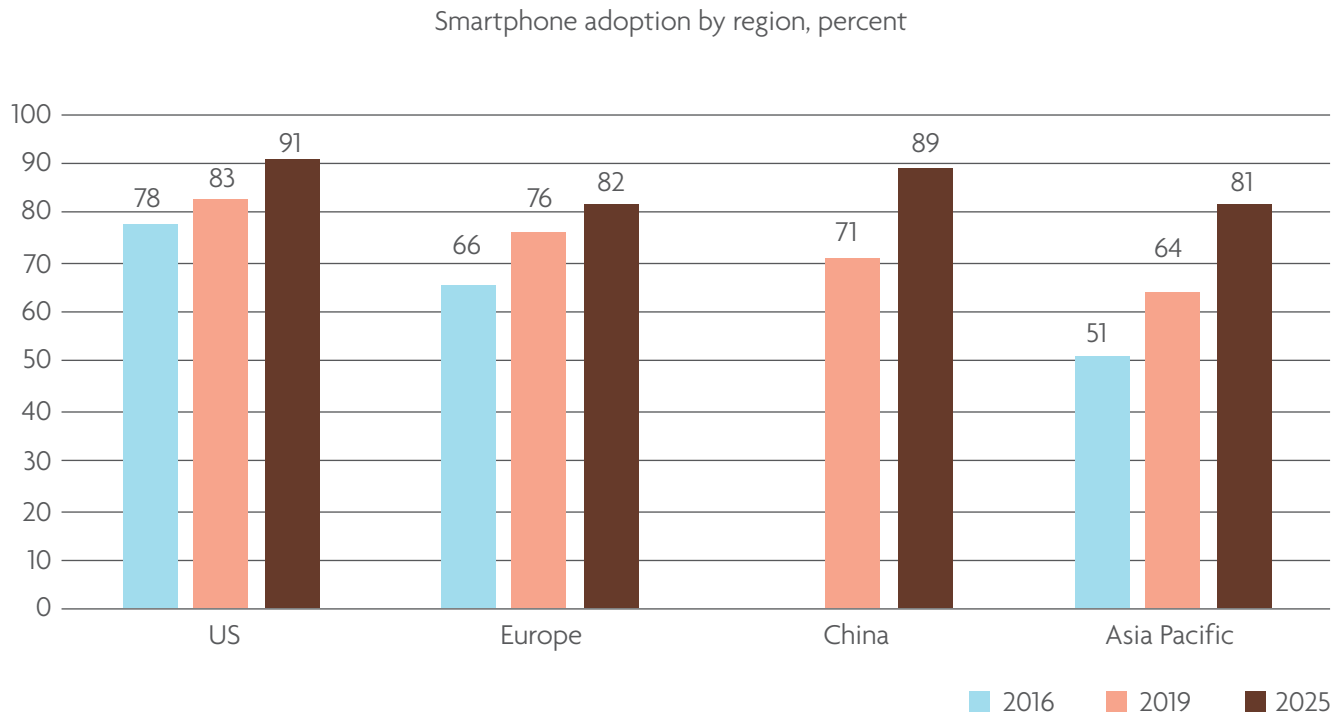
And yet, despite its already phenomenal growth, the last two years have marked a shift in the evolution of the world's digital readiness. In the pre-Covid era, it can be said that the focus was on innovation and invention, that is, the deepening of the digital economy. Covid-induced global lockdowns brought forth a different emphasis – the need to broaden the digital economy – to include previously unserved populations and hesitant sectors,

The scale of change, even in developed economies, has been significant. The 2021 European Commission's Digital Economy and Society Index (DESI) helps give some idea of this change. In just one year, connectivity in the form of access to Very High Capacity Networks (VHCNs) increased from 50 to 59 percent of households across EU member states. Within EU-based companies, over a quarter (26 percent) adopted cloud technologies in 2020, compared to just 16 percent in 2018.

### Asians embrace digital

**But it is in the developing, high population economies that this "Covid effect" is particularly striking.** Having kicked off the need for stay-at-home solutions, the drive for digital inclusion is now set to multiply exponentially. For example, smartphone adoption saw a jump everywhere in the world during the pandemic but will continue to accelerate aggressively in Southeast Asia over the next few years.

## Figure 1: Asia Pacific set to be world's fast growing digital economy

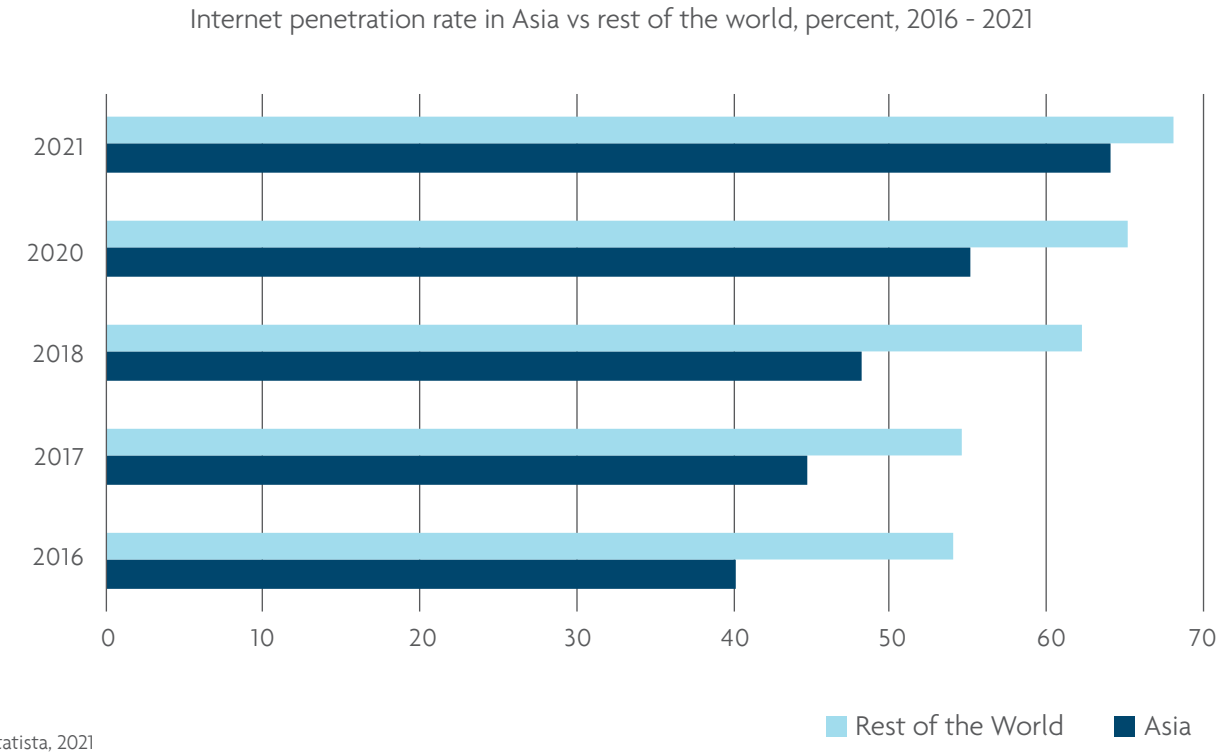



Source: UNCTAD, Digital Economy Report 2021

Similarly, Asia is fast catching up on the rest of the world in terms of its internet penetration. In a November 2021 report by Google, Temasek Holdings and Bain & Company, it is estimated that the internet economy across six Southeast Asian countries, currently worth over US$170 billion, will double by 2025 and hit US$1 trillion by 2030. The report suggests that 40 million Southeast Asians came online for the first time during the pandemic. This raised the number of internet users in the region to over 440 million last year, more than the entire US population.

This number is further dwarfed by the 854 million internet users in China, the largest population of internet users in the world. Experts say that this level of adoption can be attributed to the country's rapid economic development, but also the cultural inclination towards technology. Hard on China's heels is India, with an estimated 636 million users in 2021. India is set to show the fastest-growing penetration rates in Asia over the next few years given that over half of its population is still offline.

## Figure 2: Asia Pacific's Internet usage is approaching the global average




Source: Statista, 2021

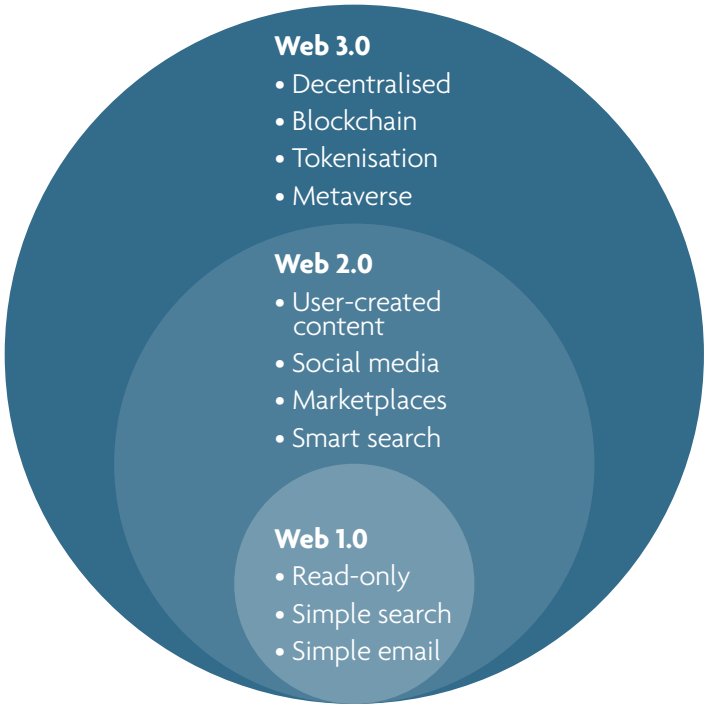
**Internet and smartphone penetration rates have major implications for the "democratisation" of e-commerce, social media and other digital services.** It is important to note that digital adoption does not only advance the information technology industry. There are profound transformations taking place within many sectors including logistics, finance and payments, travel, media, manufacturing and healthcare; plus knock-on effects across the entire economic spectrum, including potential improvements in productivity, operational efficiencies, user experiences, and risk management.

Growth opportunities arising from the digital economy are therefore correspondingly large and difficult to decipher. In an effort to make sense of what this economy represents in the current age, it is useful to look at its evolution and its role in our everyday lives. As each of these technological paradigms have reshaped the way we live, work and play, so have the leaders of these paradigms evolved from Ask.com to Amazon.com, with future leaders possibly only a few years away.

## How did we get here?

**It is sometimes easy to forget that the digital revolution is only 30 years old, and is the outcome of a phenomenal coming together of computer hardware and software.** Dennis Khoo, in his book, *Driving Digital Transformation*, notes that a fundamental driver of digital transformation is the astronomical increase in processing power seen over the past 30 years. Indeed, as predicted by Gordon E. Moore, the co-founder of Intel Corporation, processing power is doubling every two years. It is this power, coupled with the ubiquity of the internet, that Khoo says have enabled companies to achieve the reach and scale they require to turn digital transformation into profits.

**Indeed, at the same time that computer processor technology was ramping up, internet-based applications were also fast evolving.**




The first version of the internet, Web 1.0, prevalent from 1990 – 2000, was also known as the "read-only" web because it was used for passively consuming information made available by content providers. Websites contained static content with minimal functionality for back-and-forth interaction, but nevertheless gave rise to a large number of search engines, including Lycos and Netscape in 1994, and Yahoo, Internet Explorer and AltaVista in 1995. Despite these limitations, it would be wrong to assume that this was a period of slow growth. From the first website in 1991, there were close to 1.8 billion by 1997.

A mere decade after the invention of the World Wide Web sees the start of Web 2.0 - the "social" web, marked by new functionalities for communication, connectivity and convenience. The first large retailers started to take the internet seriously towards the end of the 1990s, and marketplaces like Amazon Marketplace and Alibaba were launched during this time. In 2000, online advertising via the Google search engine took off, bringing e-commerce into the homes of ordinary consumers.

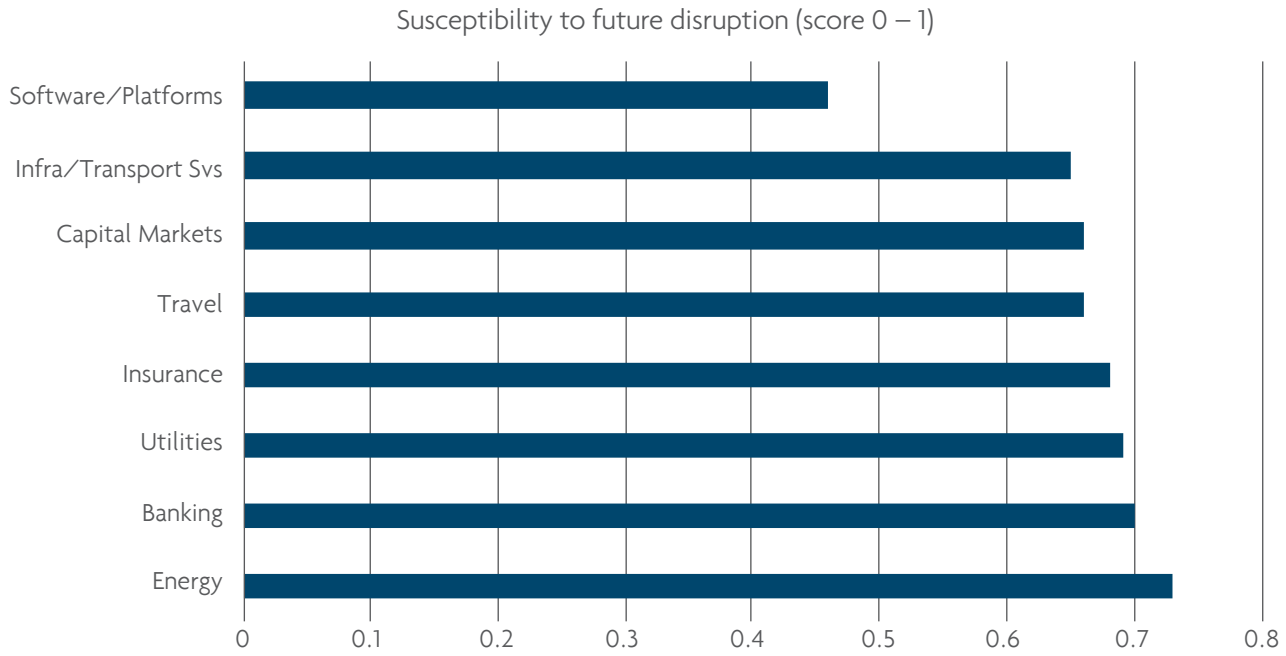
Web 3.0, described as the next internet revolution, is premised on the concept of a "decentralised" web. In the wake of concerns about data security, privacy and the amassing of personal data by the big social media platforms, Web 3.0 leverages blockchain technology to deliver a different approach to connectivity – one that is peer-to-peer rather centrally controlled. By using a distributed ledger, users can continue to have a digital record of their internet activities, but enjoy greater transparency, common accessibility and increased security. Blockchain is the technology behind cryptocurrencies and NFTs (non-fungible tokens), and like Web 2.0, is taking time to find its way into people's everyday lives. This is where the Metaverse comes in. Going forward, big tech companies are promising virtual worlds where people can interact with each other, shop for clothes or buy a house, all without the need for a centralised marketplace or payment platform.

## So much for big tech companies. What about the rest?

Ever since Google and Amazon first demonstrated the power of converting traditional advertising and retailing business models into digital-first paradigms, every industry has faced digital disruption to a greater or lesser extent. As Khoo details in his book, and also Accenture in their report, *Disruption Need Not Be an Enigma*, the potential threat and opportunities posed by digital disruption differs across industries. There are two interrelated forces at play – the ability for incumbents to successfully and financially adapt to digital business models, and the competition from disruptors ie venture-capital funded startups who are "native" to such models.

This in turn is driven by a variety of factors, including an industry's rate of innovation, structural incumbent advantages and weaknesses, existing barriers to entry, and availability of new sources of value. Based on a composite index measuring 20 different industry sectors by current level of disruption and susceptibility to future disruption, Accenture's index tells us that as of 2018, energy, banking and utilities were the top three most susceptible industries. However, software and platforms aside, the variance across industries is relatively small.

## Figure 3: All major industries are facing digital disruption




Source: Accenture report: Disruption need not be an enigma, 2018

**In Asia, the Covid-19 pandemic served as a wake-up call to companies to speed up their adoption of disruptive technologies.** The International Finance Corporation (IFC), part of the World Bank Group, notes that most businesses advanced their technology usage in response to Covid lockdowns, but at markedly different scales depending on countries' levels of income.

Focus areas also differed with middle-income countries like China and India making significant progress in digital health and educational services, while businesses in lower-income countries launched new e-commerce, digital financial and digital payment services.

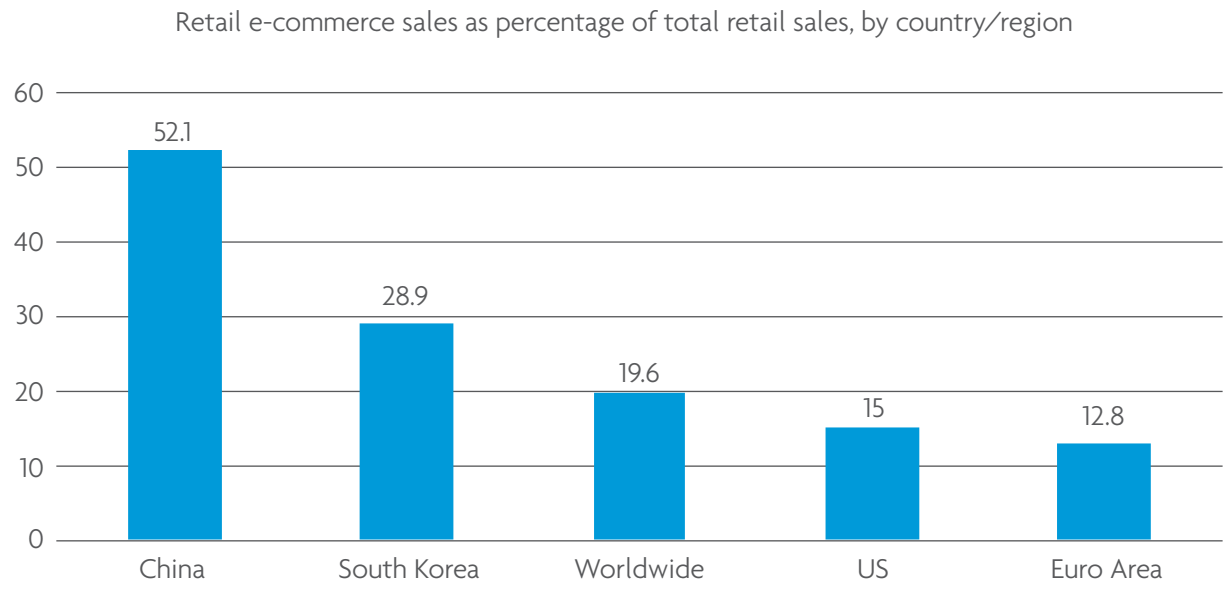
The IFC report concluded that an acceleration in the digitalisation of business operations is primarily driven by responses to financial shocks such as increased cost of operations and reduced access to international capital. Their research suggests that emerging market companies in a post-pandemic world will demonstrate a stronger momentum towards contactless systems, digitally-based local logistics support systems, and digital B2B marketplaces supporting the diversification of international supply chains.

## Asia makes e-commerce history

**But experts agree that the low-hanging fruit of Asia's digital economy is e-commerce.** Growing at an average of 25 percent per annum, the region leads global e-commerce growth, and represents the lion's share - over 60 percent - of total global e-commerce spending estimated at US$4.92 trillion.

The pandemic helped to further intensify this growth and gave rise to a global historic first. It was reported in 2021 that amid tight lockdowns, China's e-commerce volumes as a share of its total retail sales looked on track to cross the 50 percent benchmark, the first country ever to do so. A major contributor to this growth is what is termed "social commerce", that is, WeChat's ability to combine shopping and social networking into a single platform.

## Figure 4: China's e-commerce share of retail sales is well ahead of other countries




Source: eMarketer, 2021

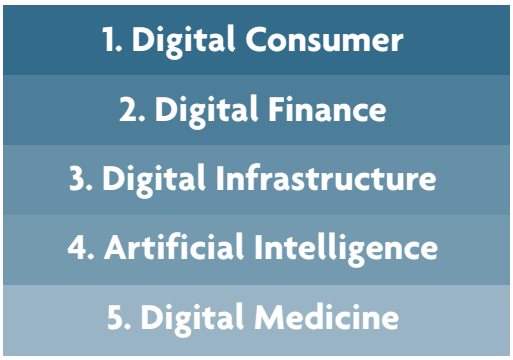
Over in Southeast Asia, according to the ASEAN Studies Centre, ASEAN e-commerce year-on-year revenue of US$11 billion between 2018 and 2019, jumped to US$17 billion between 2019 and 2020. This step-up was generated by both the number of people joining the online shopping revolution for the first time, and the larger volume of purchases per shopper.

A Facebook survey suggests that up to 70 percent of Southeast Asians aged 15-years and above now shop online. While there are still a number of key policy initiatives required, the appetite and cultural acceptance of e-commerce is firmly in place. And there remains plenty of headroom, with ASEAN online retail sales thought to currently account for less than 10 percent of total retail spending.

# Investment Implications

**The digital economy has grown over the past three decades into a multi-headed monster, and it can be difficult to cut through the noise in order to uncover suitable investment opportunities.** This is especially the case as, even among "digital-native" companies, these can range from small start-ups to the almighty FAANG (Facebook, now part of Meta Platforms. Amazon, Apple, Netflix, Google, now part of Alphabet) group of mega-cap stocks.

However, there are **five key themes** that UOBAM analysts focus on, and that we think are of particular interest to investors:




## 1. The digital consumer

**It is clear that consumers around the world adopted a more digital lifestyle during the pandemic.** However, within developed economies, recent surveys suggest that some of the digital habits adopted during Covid lockdowns will not necessarily persist into the post-pandemic period and a degree of behaviour "normalisation" can be expected. The industries most likely to be affected by this are those that were the biggest beneficiaries of lockdown conditions, such as streaming entertainment and home deliveries.

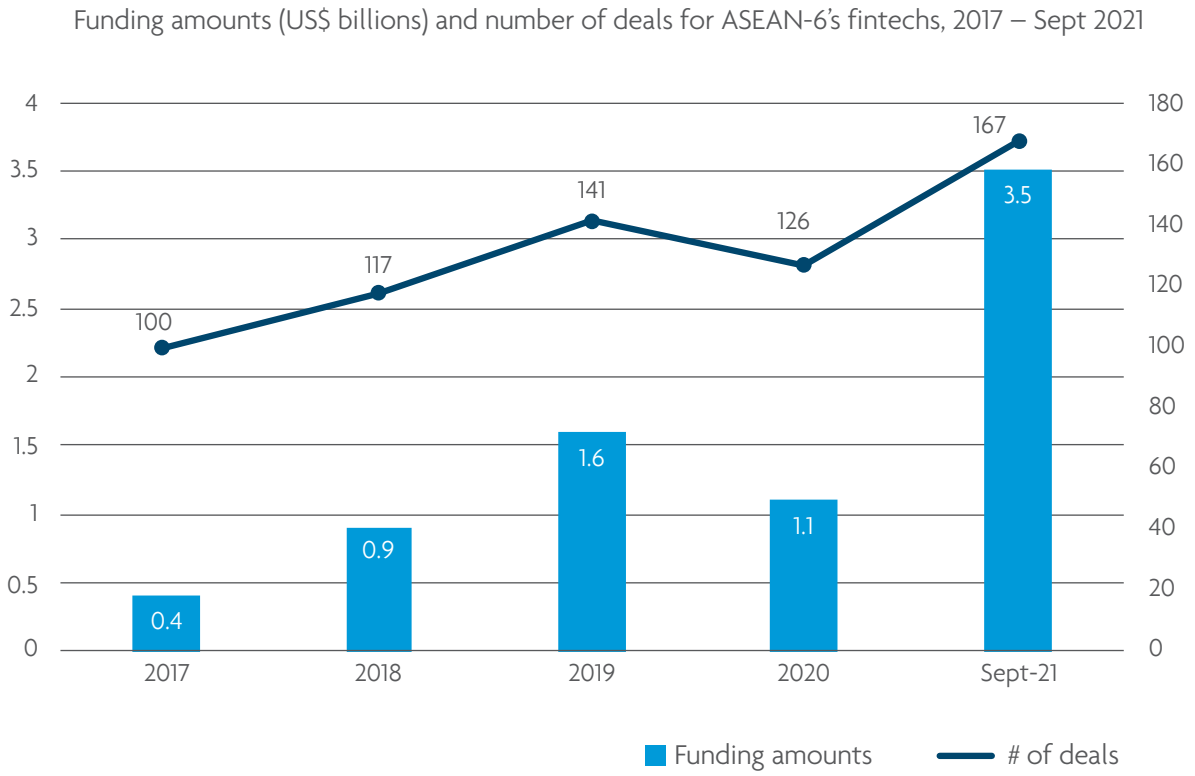
On the other hand, some sectors were able to introduce improvements in convenience, accessibility and efficiency that will be hard to roll back. This digital stickiness is thought to be particularly prevalent in primary healthcare and education, where the experience of previously unattainable reach (for businesses) and access (for consumers) is likely to have both sides clamouring for more. In both these cases, it is the ability to seamlessly integrate the physical world (e.g. classroom lessons) with the digital world (e.g. online lessons) that appears to have the greatest potential for growth. These factors are further multiplied in regions like Asia given their large urban, and dispersed rural, populations.

## 2. Digital finance

**This term is used to describe innovations within the financial services sector, also known as fintech.** These are the technologies aimed at facilitating both improvements to traditional financial services, as well as new forms of financial services not offered by incumbents. The former typically encompasses new digital versions of banking, payment, trading and money transfer services that were previously branch, shop or ATM-based. Meanwhile, advances in the digital space have brought to the world new-age financial instruments such as cryptocurrencies as well as industry-disruptive services such as peer-to-peer lending and equity crowd funding.

Fintech enjoys high venture capital interest and Covid has only intensified this further. CB Insights reported that venture capitalists invested US$91.5 billion into fintech companies in 2021, double the total last year and accounting for a fifth of total global venture capital funding.

## Figure 5: Southeast Asian fintechs received record private funding in 2021




Source: Tracxn, UOB, PwC Singapore, Singapore Fintech Association, as at 30 Sept 2021

Funds directed at fintechs in Asia Pacific reached a record US$15.7 billion, of which Southeast Asian fintechs raised US$3.5 billion, with a large proportion going to late-stage start-ups. According to a report by United Overseas Bank (UOB), PwC and Singapore Fintech Association (SFA), the top three ASEAN fintech hubs were Singapore, Indonesia and Vietnam and here, firms offering digital payments and cryptocurrencies saw the liveliest VC activity.

## 3. Digital infrastructure

**One trend that our analysts find important opportunities, but we think is still underappreciated by the average investor is in the realm of digital infrastructure.** A fitting description of digital infrastructure is the collection of back-end tools, platforms and systems that support the ability of a country, city or organisation to digitally transform. These are not necessarily obvious to the digital consumer, but are fundamental to enabling the digital functionalities that make up the user experience.

Included in this sector are communications infrastructure such as communication cables, fixed and cellular networks, data centres and storage, data processing, cloud computing, data security software and APIs (application programming interface). While in some cases, this involves significant capital expenditure, in others (such as cloud computing), there is now the potential to level the playing field between large and small companies via a pay-as-you-use model.

It is also interesting to note that, according to some experts, today's Covid-induced digital acceleration is "a rising tide that lifts all boats". Higher demand for digital services will naturally filter through into a greater willingness of corporations and governments to invest in digital infrastructure. The growing demand for data security and increasing deployment of 5G technologies also establishes contrasting pressures for data to be housed locally, while at the same time, to be even more accessible globally. The advent of more "hybrid" approaches opens up the potential for joint ventures between traditional and digital infrastructure operators, and the unlocking of even more investment funds.

## 4. Artificial intelligence

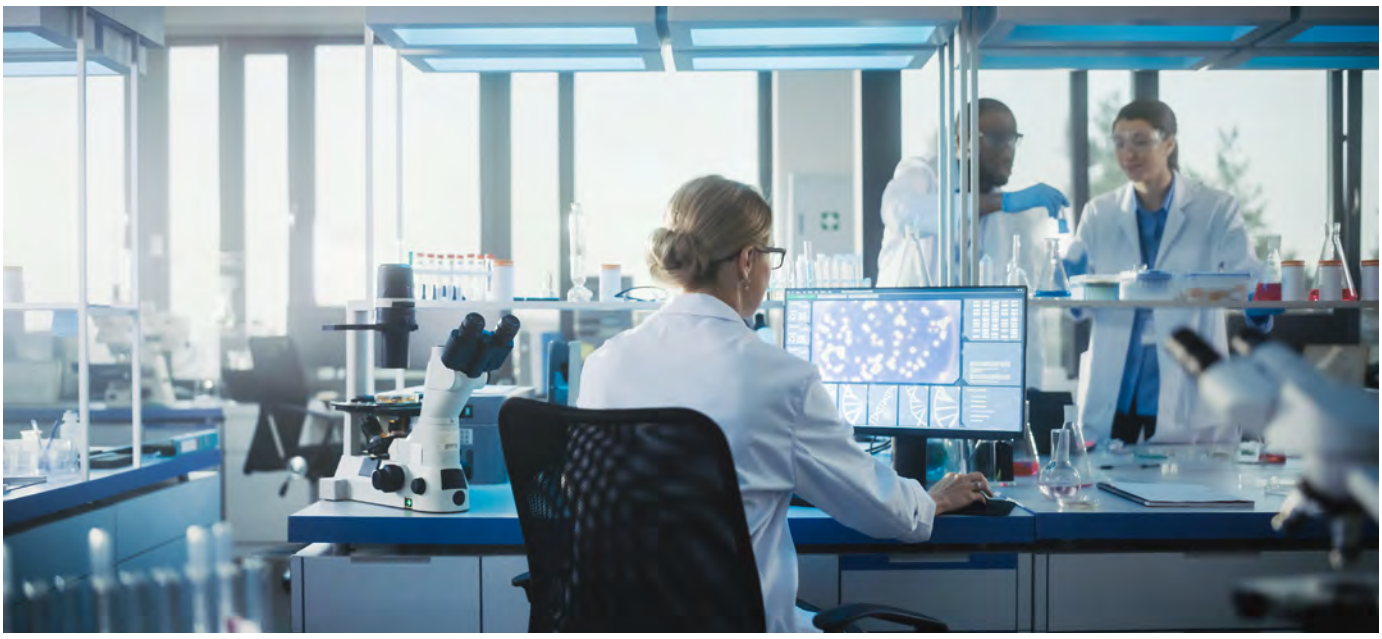
**While seemingly in the realm of science fiction, artificial intelligence (AI) and machine learning (ML) have evolved to become commonplace technologies supporting many digital businesses.** Once thought of primarily as a way for robots to mimic the capabilities of the human mind, AI and ML are in fact the terms now used to describe how big data can be effectively leveraged to automate a wide range of tasks, or predict behaviours and events. Virtual assistants (like Alexa and Siri) and self-driving cars are the best known examples of AI in action, but the technology is actually far more ubiquitous and present in facial recognition, credit scoring, dynamic pricing, detection of tumours, and much more.

Looking forward into 2022 and beyond, AI has the potential for ever-wider implementation across aspects of our everyday lives and day-to-day business operations. But the technology is still in its infancy, and opens the door to revolutionary opportunities that are yet to be imagined and discovered. Coupled with the rise of AI is the rise of AI-powered physical devices, generally referred to as the Internet-of-Things (IoTs). These devices, whether installed in a home, office or factory, allow for data to be captured, analysed and the results implemented, only for the whole cycle to start again.

**As with other digital technologies, Asia is the playground for AI to be tried and tested, given its large population and rising middle class.** The AI market in Asia is estimated by Analytics Insight to be worth US$43.7 billion in 2023, and growing at around 13 percent per annum.

Asian firms are not just watching from the sidelines. In fact, major AI innovations being led by China, India, Japan, Australia and South Korea. China has taken the global lead in terms of annual R&D spending, reaching US$275 billion in 2018 (vs the US's US$131 billion), more than 2 percent of the country's GDP. Much of this is thought to involve AI, given the potential for real economic benefits. ASEAN nations are relatively new to the block, but AI is capable of adding US$1 trillion to the region's GDP by 2030 if properly implemented, according to an EDBI and Kearney assessment.

## 5. Digital Medicine



**We end this report by considering the field of digital medicine because it represents a confluence of Asia's digitalisation, demographic and ESG megatrends.** Digital health refers to a broad multi-disciplinary concept that sits at the intersection of digital technologies and healthcare services, of which digital medicine is considered a subsector. A relatively new discipline, digital medicine applies to the specific use of digital hardware and software to support the practice of medicine, including the treatment and prevention of diseases and the promotion of improved health outcomes for individuals and communities.

The focus within digital medicine is evidence, and this is achieved based on information gathered from medical trials and other clinical methods that have the benefit of regulatory oversight. This evidence can then be put to use to develop drugs, devices and other medical products. Within Asia, health challenges are posed by the uneven distribution of wealth and low incomes, shortage of healthcare facilities in rural areas, chronic diseases such as diabetes, hypertension and obesity, and a rapidly aging population.

The growth of digital medicine in Asia offers the opportunity for such challenges to be met by solutions such as healthcare analytics, said to be worth US$2.15 billion in 2021. This uses patient data and AI technologies to undertake predictive modelling of infectious outbreaks, or to improve diagnostics by detecting abnormalities before the full onset of an illness.

Another area of digital medicine is digital surgery. This is an evolution of robotic surgery and is based on the concept of "training" surgical robots based on past procedures, thereby supporting surgeons in their decision-making and problem solving, enabling real-time data sharing and facilitating advanced imaging and visualisation.

Finally, breakthroughs in the availability of huge computing power mean that we are witnessing major advancements in the ability to sequence and code DNA. Called next-generation sequencing, these technologies offer a better understanding of the human genome. They have particular resonance in Asia as local biomedical companies deepen their efforts to build up genomic information of under-studied Asian populations. In 2019, Singapore-based A*STAR announced the establishment of the world's largest whole-genome sequencing (WGS) analysis of Asian populations, and particularly of Malay and Indian populations. It is expected that this will lead to more accurate diagnosis and treatment of Asian-specific genetic diseases.

**Investing in the digital economy is not for the fainthearted.** The long-term transformation aspects offered or adopted by digital companies have meant a greater, but not unquestioning, tolerance for cash flows and profits being pushed out far into the future. This has caused these stocks to show high levels of price volatility. Those open to growth investing are reminded that, as with the other megatrends detailed in our earlier two reports, they will need a great deal of patience and a long time horizon.

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