Entering the next High – the role of technology development and global alliances in the coming decades

REDDAL

IRAMOT 2020 – Innovation management in the face of crisis

Keynote speech, December 2-3, 2020

Today's agenda

The many faces of COVID-19 – not only a pandemic, but a driver of economic development on multiple levels

The Western and Asian democracies – increased innovation and inequality forcing a new direction to be set; some countries grabbing the opportunity to long-term focused renewal

The East – China taking a grand role in societal change and innovation; SEA following, setting direction for countries around

Iran and innovation – sanctions fueled Iran's "resilient economy" strategy, resulting in technological advancement and closer relationships with China and Russia

The larger view – the decades ahead (approx. 2025-2040), if you believe in saecula and cyclicality, should be about a new "High" after the current era of "Crisis"

Conclusion – what all this means for innovators and innovation management

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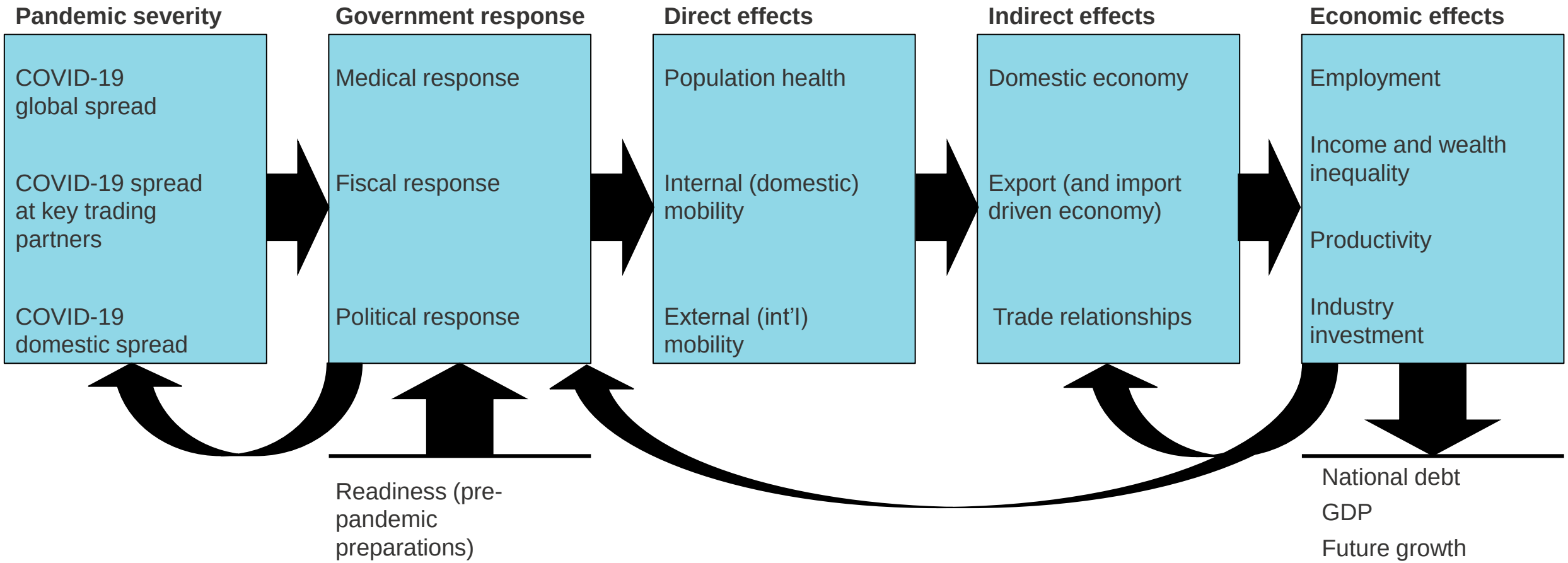
COVID-19 has effects far beyond just the pandemic – it is reshaping the economy both on national and global levels, and the dynamics include feedback loops

The complex dynamics of COVID-19

The complex interactions and circular dependencies create a system hard to control and steer.



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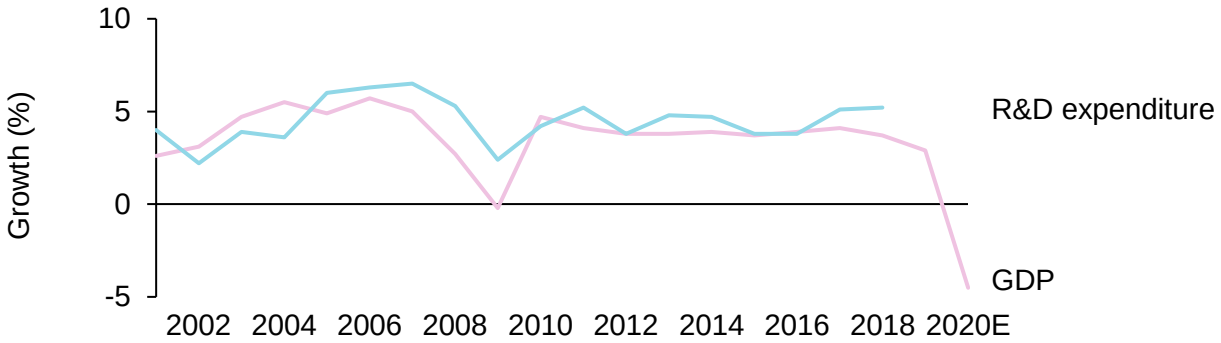
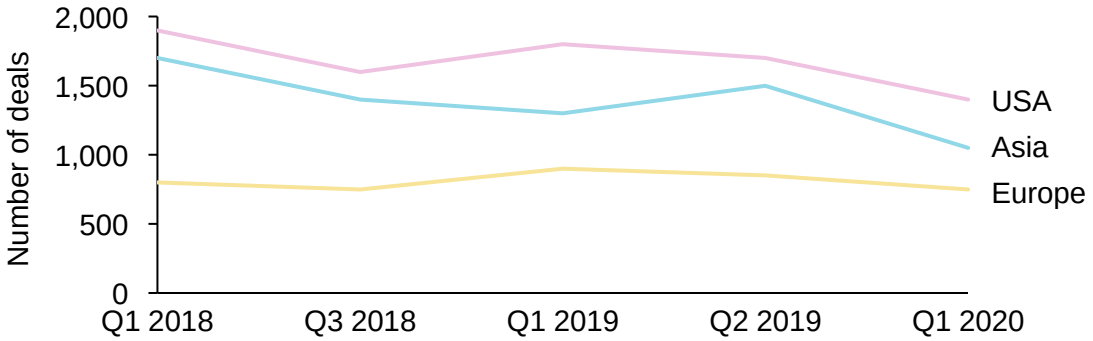
In the West, digitalization and eco-friendly technology innovations have remained resilient, but there is a fear that incentive for R&D funding may drop due to pandemic

Technological innovation trends in democratic countries

Development of R&D expenditure and GDP in 2001-2020[1]



Development of VC deals in Q1 2018-2020[1]



Political determination to foster innovation has been strong globally

- In 2018 R&D spending grew more than GDP and number of VC deals was high
- Innovation is increasingly central to growth strategies; pandemic has not reduced the potential for breakthrough technological innovations
- Growth and resilience is projected for
  - Digital solutions, such as 5G networks, edge computing, robotics
  - Pharmaceuticals and biotechnology, such as telemedicine, wearable health technology
  - Eco-friendly technology, such as clean energy technologies
  - Some traditional sectors, such as retail e-commerce

Challenges exist, however

- Risk that declining GDP 2020 drags down political incentives for innovation, R&D expenditures and number of VC deals
- Capital/willingness to fund innovations might be drying out; number of VC deals declining since Q1 2018; unsure how start-ups survive the pandemic and if survivors remain attractive for investors (yet, note that there is significant capital overhang)
  - Recovery of number of VC deals likely to be slower than the R&D expenditures in the following years[1]
  - Impact of fewer VC deals is mixed, as it affects the most early-stage, R&D-intensive start-ups outside of VC hotspots (China, India, Singapore, Israel, US, UK, Luxembourg); hotspots expected to recover first

[1]Global Innovation Index 2020, Cornell University, INSEAD, and WIPO.

Source: Statista, 8 Key Tech Trends in a Post-COVID-19 World, 8. Jun 2020, OpenMind; Frost & Sullivan Reveals 9 Global Trends Generating Growth Opportunities from COVID-19, 28. Sep 2020, PR Newswire; An Update to our 2020 Technology Vision Trends, Jun 2020, Accenture; Global Innovation Index 2020, Cornell University, INSEAD, and WIPO.

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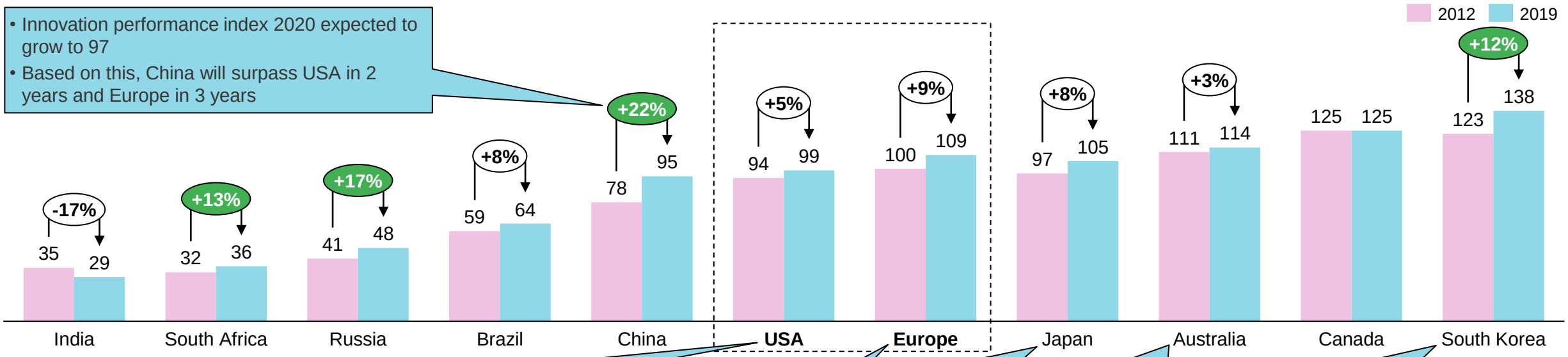
In 2012-2019, Europe and the US were left behind compared to leading innovator countries; also China expected to pass in 2-3 years

Innovation performance comparison

Global innovation performance index development, 2012-2019



- Innovation performance index 2020 expected to grow to 97
- Based on this, China will surpass USA in 2 years and Europe in 3 years

- Relative strength for performance is SME product and process innovation
- Innovation performance index 2020 expected to stay at 99

- Innovation performance index 2020 expected to grow to 112 after accounting for the effects of the pandemic
- European Commission states innovation has been an essential part for the EU's recovery from pandemic as innovations further the EU's digital and environmental transformation
- The growth is fueled especially by increased broadband penetration and R&D expenditure

- Relative strengths for performance are R&D expenditure and patent and trademark applications
- Innovation performance index 2020 expected to grow to 107

- Relative strengths for performance are patent and trademark applications and the volume of scientific publications

- Innovation leader
- Relative strength for performance is IP applications
- Innovation performance index 2020 expected to reach 140

Source: European Innovation Scoreboard 2020, 23. Jun 2020, European Commission.

While uncertainty remains, COVID-19 already accelerates key trends in economy and technology that alter the world and way of living

COVID-19 impacts on major global trends

		Immediate impacts	Long-term impacts
Impact on economy – fragmentation, localization, inequality	**Globalization**	• Synchronized recessions in developed and developing countries	• Gradual global economic recovery • Globalization recedes further
	Supply chains	• Export restrictions on medical supplies and pharmaceuticals	• Fragmentation and rationalization of supply chain • Acceleration of US-China decoupling in certain industries
	Inequality	• Weak companies, small business, and lowest wage earners disproportionately affected	• First increase in global poverty since 1998 • Big companies get bigger
	Labor dislocation	• Large simultaneous job losses globally	• Uneven recovery affecting most vulnerable workers, companies, and industries • Increased obstacles to new business formation
	Innovation	• Jump in online commerce, surge in digital payments	• Digital wallets and shadow banks proliferate • Online currencies gain value and greater share of global transactions
Impact on technology – reducing dependence on humans	**Robotics**	• Heightened interest in robotics due to public health and labor shortage	• Accelerated replacement of human labor across sectors
	Additive manufacturing	• Rapid production of medical components at points of need	• Accelerated replacement of traditional manufacturing processes with additive technologies
	IoT	• IoT usage remains high, with certain sectors reporting huge increases in data flows	• Increased reliance on IoT in everyday use, especially for health monitoring and surveillance
	Artificial intelligence	• Rapid adoption of AI chatbots and other applications to fill surge needs	• Increased R&D spending related to AI and overall digitalization pushes up adoption timeline across sectors
	Biotechnology	• Surge of investment in synthetic biology in pursuit of therapeutics and vaccines	• Growing global competition for leadership in biotech • Sustained high levels of national investment

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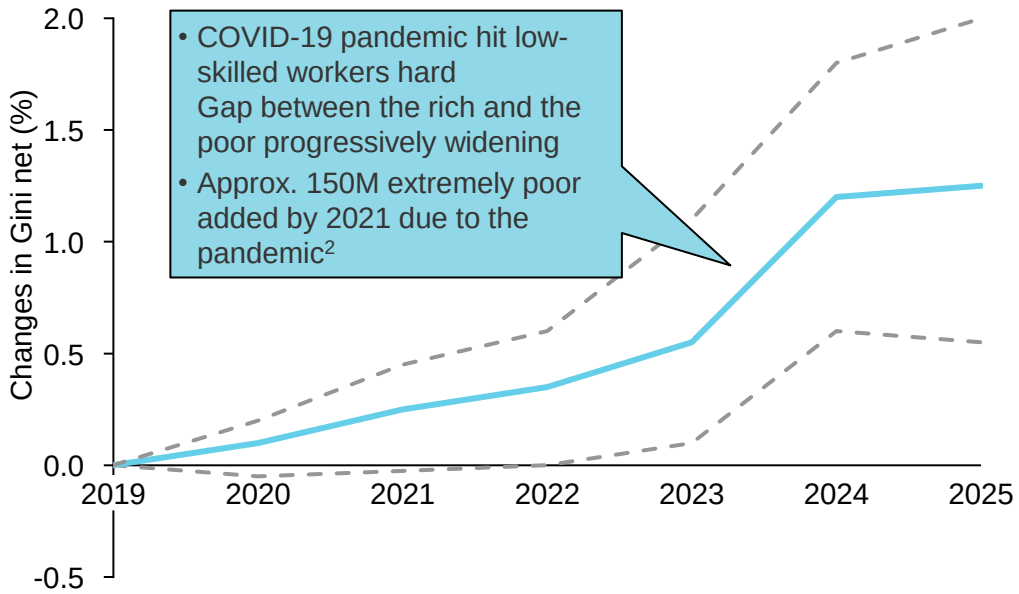
As a major effects of COVID-19 on the economy, the gap in income inequality has widened considerably

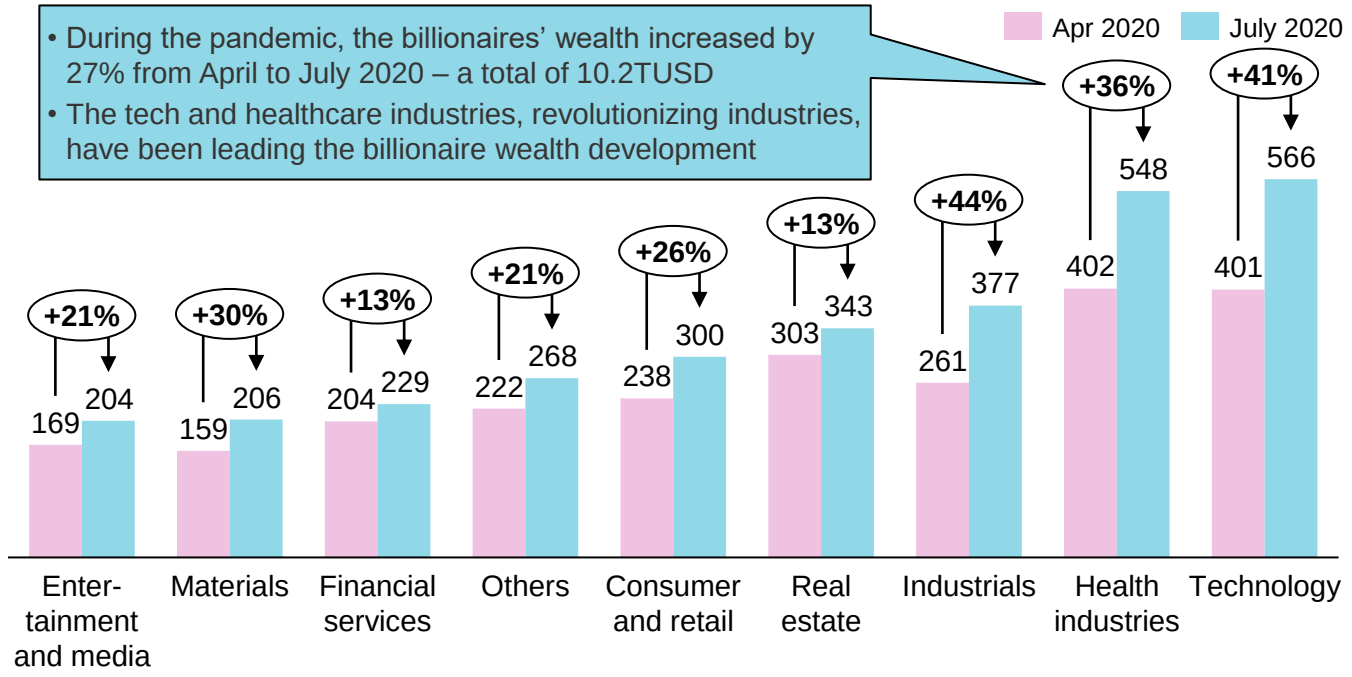
Worsening income inequality vs. increasing billionaire wealth

Impact of pandemics on inequality (change in Gini net, percent)[1]

Average response (with associated confidence bands) of the net Gini to a pandemic for 175 countries, 1961-2017



Billionaire wealth development by industry April – July 2020 (annual growth)[3,4]



Note: Billionaire wealth development research covers more than 2000 billionaires from 43 markets in the Americas, EMEA and APAC. Database includes the 43 largest billionaire markets, which account for about 98% of global billionaire wealth.

[1]Furceri, Loungani, Ostry, and Pizzuto (2020) cited in the pandemic will leave the poor further disadvantaged – IMF, World Economic Forum, 18 May 2020; [2]COVID-19 to Add as Many as 150 Million Extreme Poor by 2021, The World Bank, 7 Oct 2020; [3]Riding the storm: market turbulence accelerates diverging fortunes – billionaires' insights 2020, UBS & PWC; [4]Billionaires see fortunes rise by 27% during the pandemic, BBC News, 7 Oct 2020.

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US-China competition ensures intense advanced technology innovation, while also driving more focus on alliance building

Key areas of technological innovation – US vs. Europe vs. China

	Situation	Complication
5G Technology	• China is ahead in 5G technology; Europe has invested heavily in Chinese equipment since 4G • Although US is strong in IoT, it lags behind China in terms of capability to build 5G infrastructure	• US government concerned that China would affect national security by controlling 5G equipment • Other allies, such as European countries, Korea, and Japan considering not to use Huawei 5G equipment
AI and semi-conductors	• China and US ahead of Europe; China may get ahead of US in coming years (some areas) • In 2016, US was investing 15-23BUSD in AI, Asia (China, South Korea, and Japan) were investing 8-12BUSD, and Europe was investing 3-4BUSD	• The issue of semiconductors is related to the competition in the AI industry - China dependent on advanced US semiconductors • Imports from US could only be replaced by Taiwanese, South Korean, or European countries
Web-based services	• Europe is lagging behind US, China and dependent on US and Chinese systems • US-China competition has been limited since neither operates in the other's market to full extent – dynamics will continue	• Competition among US, Europe, and China could intensify

China deepens its supply side structural reform to ensure optimal resource allocation – key techs are AI, big data and 5G.

China wants to be less dependent on foreign nations in commercial aircraft, semiconductors and defense.

Key drivers are Belt and Road initiative and free trade agreements.

Intense technological innovation in key areas will continue due to the economic, military and political dynamics of Europe, US, and China

"China is playing the long game by extending its global reach, promoting its own political model, and investing in the technologies of the future… the most effective way to meet that challenge is to build a united front of US allies…
even as we seek to cooperate with Beijing on issues where our interests converge, such as climate change, nonproliferation, and global health security."
Joe Biden, Foreign Affairs

Source: Joe Biden on technology and diplomacy, Digital Diplomacy, 17 Aug 2020; The U.S.-China Race and the Fate of Transatlantic Relations, CSIS, 13 January 2020; Op-ed: America and its allies must reject China's Huawei and lead on 5G development, CNBC, 3 Sep 2020; U.S. reminds Korea of the risks of dealing with Huawei, Korea JoongAng Daily, 21 Oct 2020.

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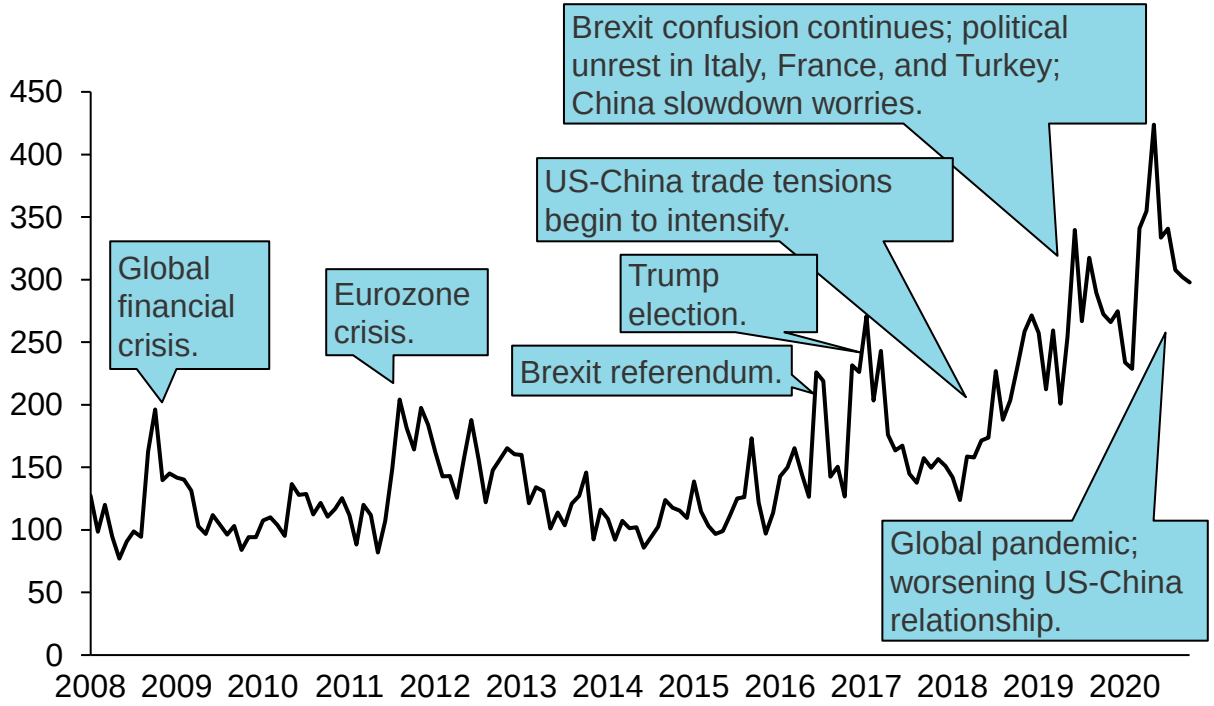
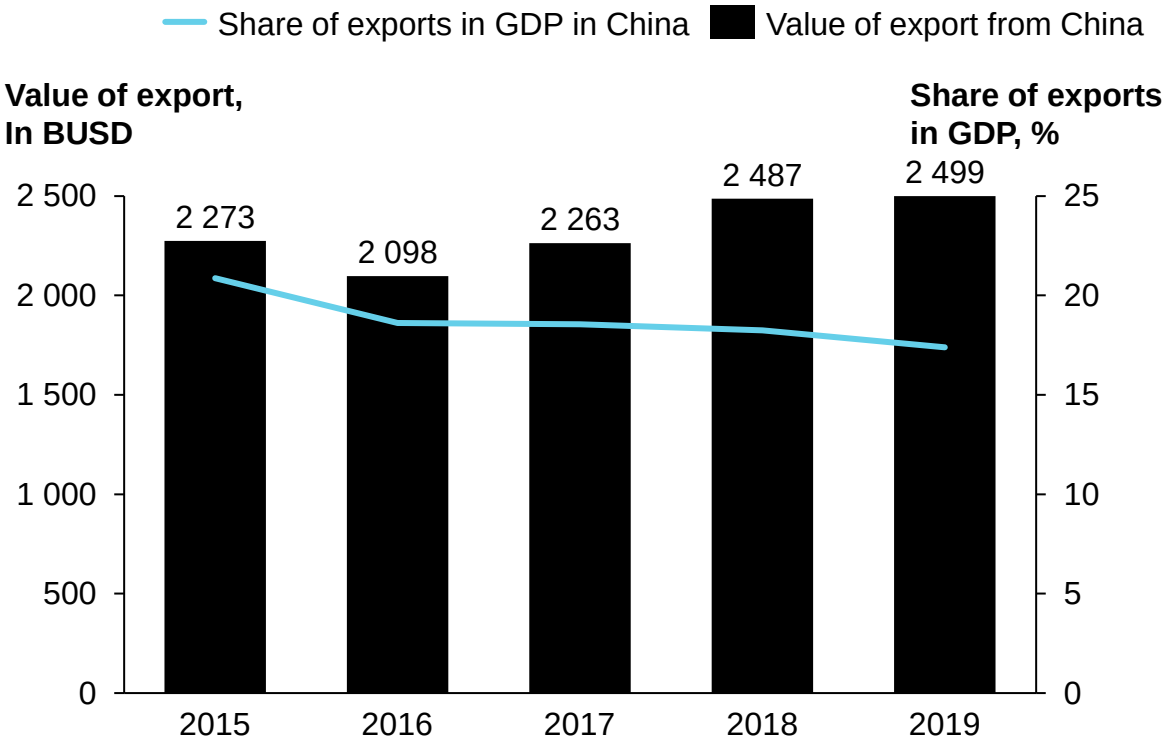
China is seeking to secure its position amid rising uncertainties driven by the pandemic, worsening China-US relations, and rising unilateralism and protectionism

Blurry future of globalization and role of China in it

Global economic policy uncertainty index, January 2008 to October 2020



Importance of export to Chinese economy

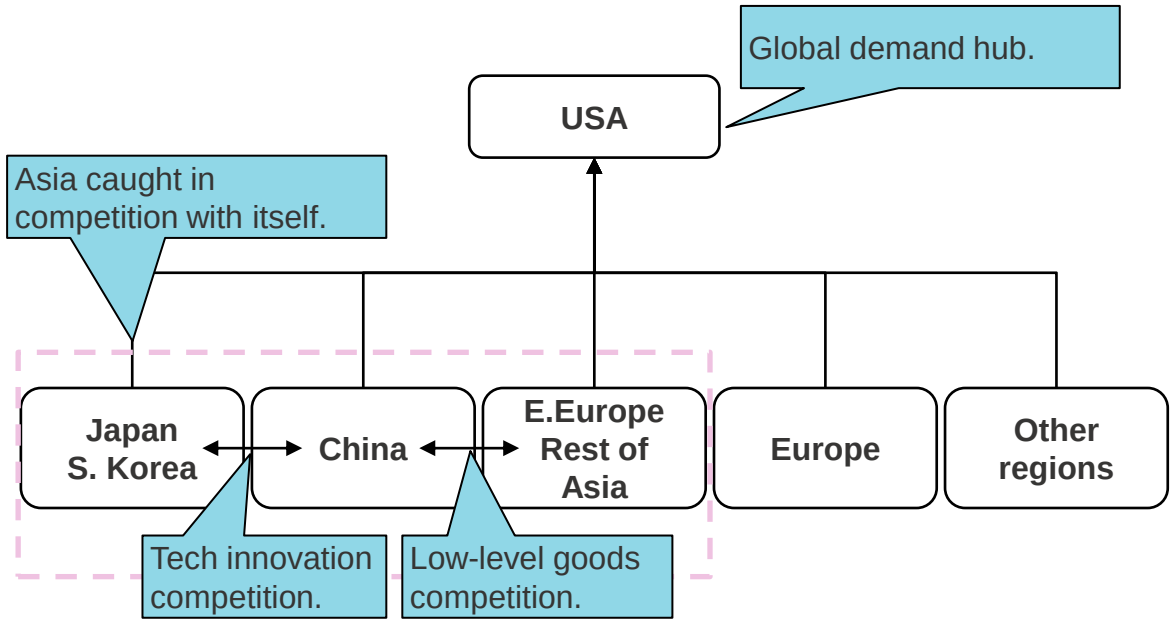


Source: Davis, Steven J., 2016. "An Index of Global Economic Policy Uncertainty," Macroeconomic Review; National Bureau of Statistics of China.

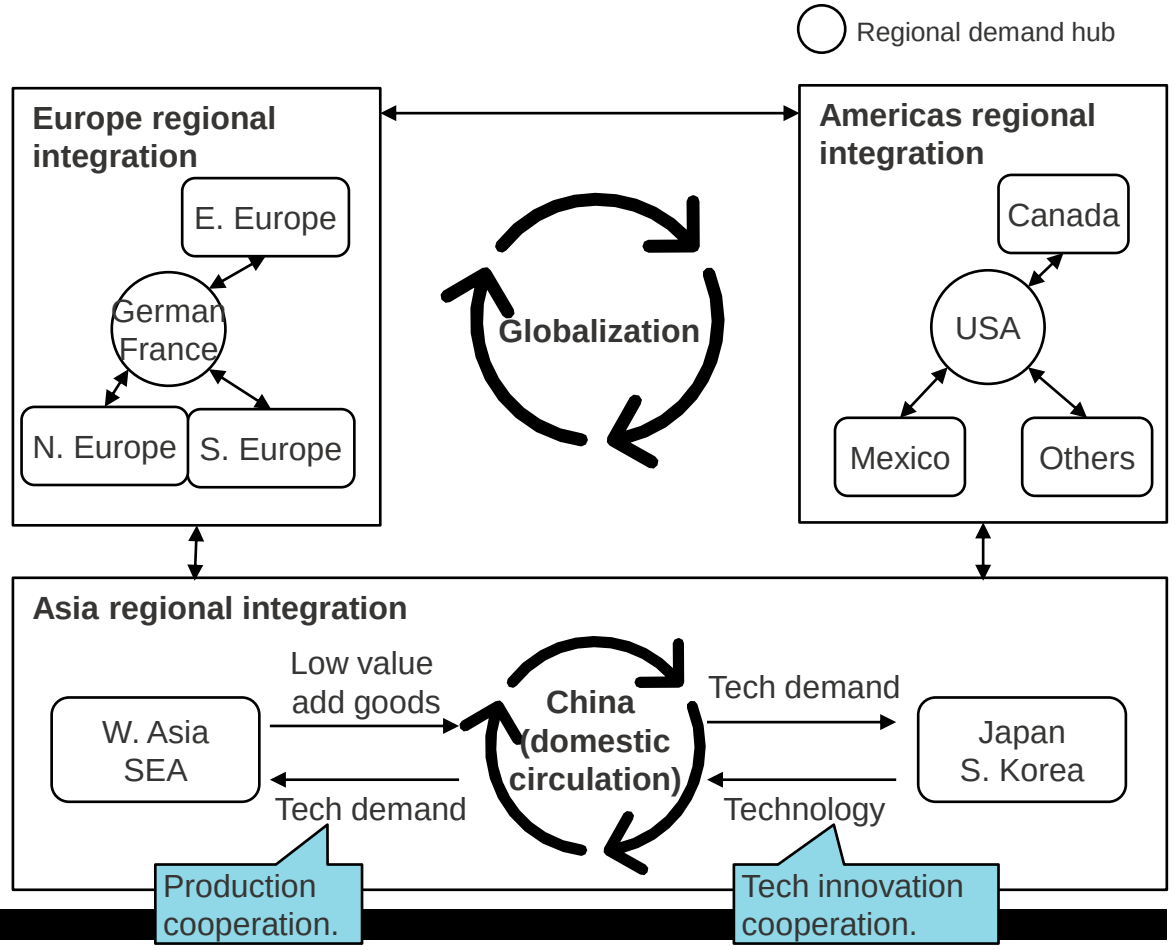
To address the changing global dynamics, China is moving towards a dual circulation model combined with regional integration to give itself more room for movement

From a flat world to dual circulation economy policy

Prior round of globalization: the world is flat



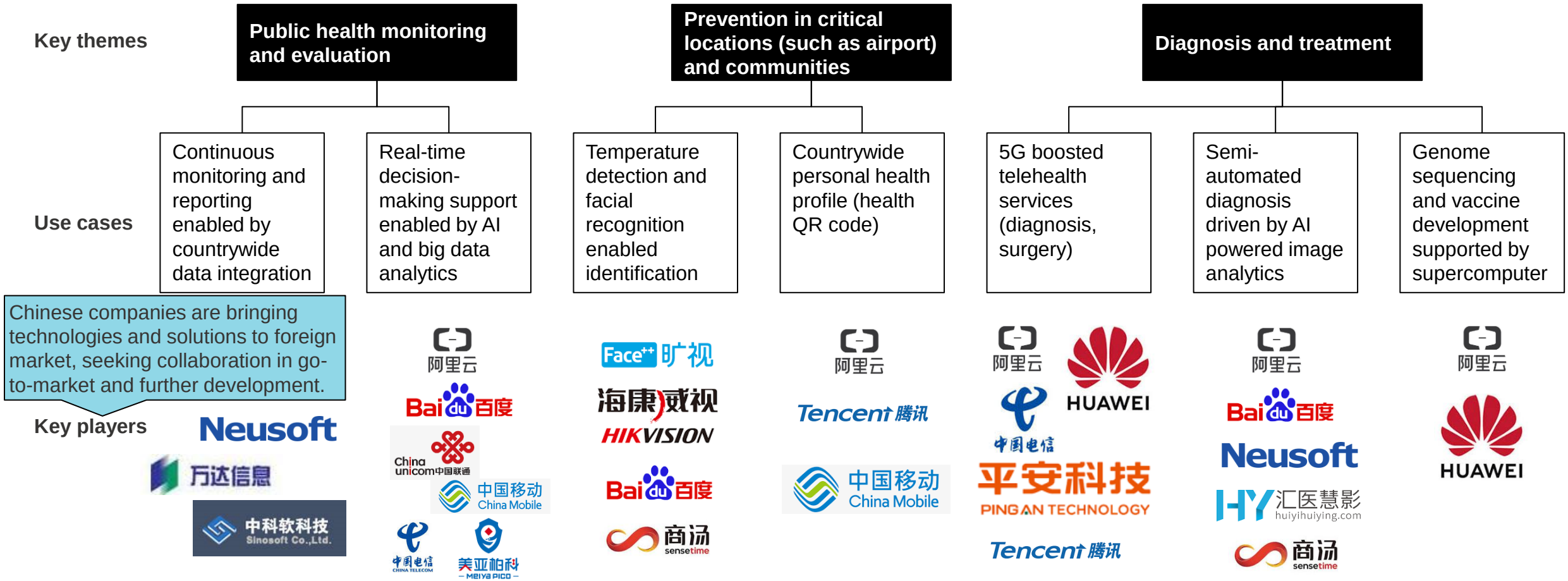
New round of globalization: multi-model structure



Source: Reddal interviews with economists from ICBC International.

Private-public partnerships drive technology development via large scale complex use cases, laying ground for technology transfer also beyond China

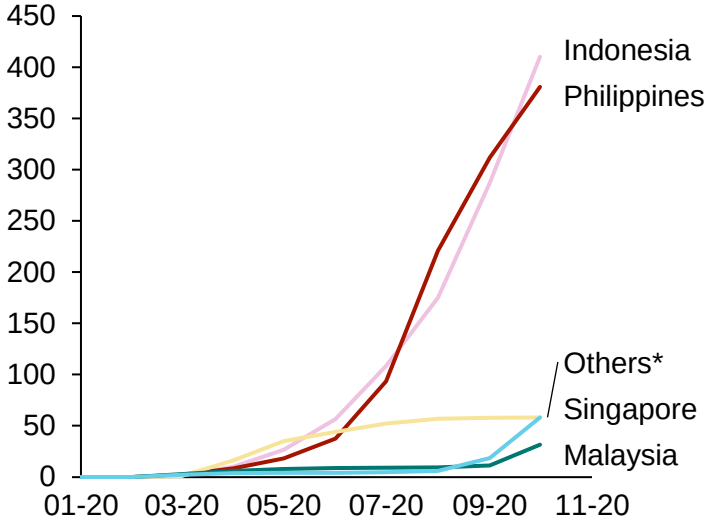
Technology application for epidemic prevention and control in China



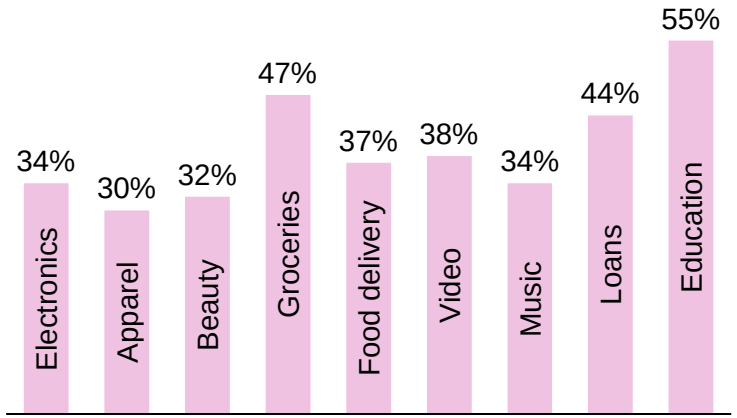
Following economic contraction due to COVID-19, most Southeast Asian economies are expected to rebound in 2021 driven by accelerated digitization across sectors

Impacts of COVID-19 on the economy of Southeast Asian (SEA) countries

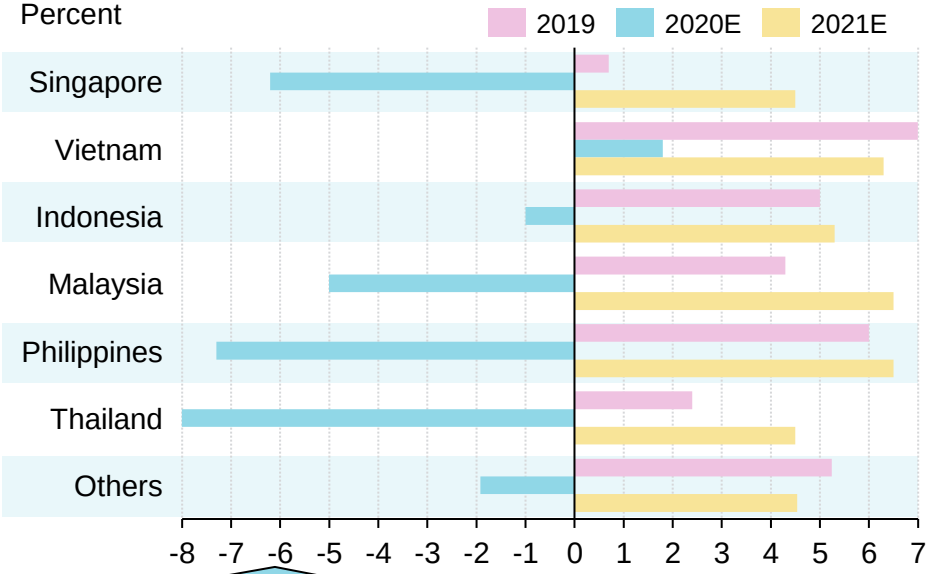
Cumulative confirmed Coronavirus cases in SEA
Thousand cases



Share of new digital consumers out of total service consumers in SEA within the last 6 months
Percent



GDP growth of SEA nations
Percent



- Despite fewer infections than elsewhere globally, SEA countries feel significant pressure on economic and social conditions due to COVID-19; prolonged lockdowns resulted in an income plunge from tourism, aviation and exports – essential to most SEA economies
- COVID-19 has changed Southeast Asians' daily lives fundamentally; digital adoption has accelerated, as consumers embraced teleconferencing, online shopping and digital financial services during the pandemic

- SEA economies expected to shrink by 3.4% in 2020
- Region's economy is expected to generally bounce back in 2021 with stronger growth than in 2019 in most countries due to government fiscal, monetary and structural supports
- A new wave of digitization is expected in many sectors such as healthcare, education, retail, fintech

*Others includes Vietnam and Thailand, where the number of cases is too small to show on chart relative to Indonesia and Philippines.
Source: Humanitarian Data Exchange (2020); Google, Temasek and Bain & Company (2020); Asian Development Bank (2020).

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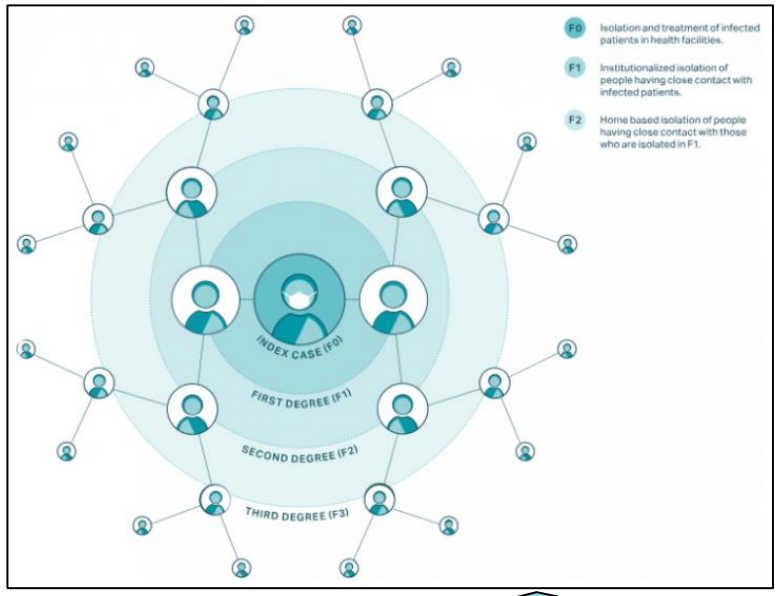
Vietnam successfully controlled the pandemic and is emerging strong with trade agreements and international collaboration further boosting outlook

Vietnam as an emerging success during the pandemic

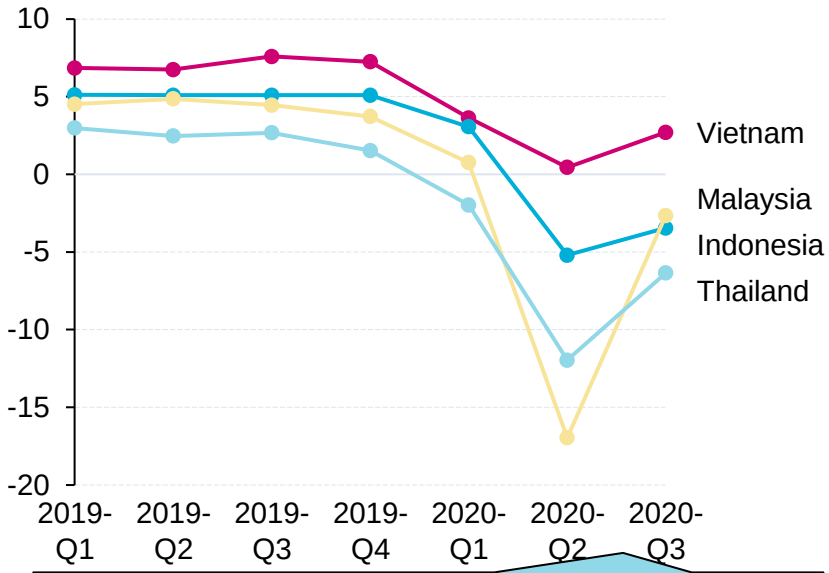
Third-degree contract tracing for COVID-19 in Vietnam



- The government response towards the pandemic was early and effective in Vietnam; travel restrictions and extensive tracing-testing-isolation-social distancing measures were introduced already late January
- Vietnam was the first SEA nation to begin lifting lockdown measures

Year-on-year change in GDP of selected SEA nations

Percent



- While many other SEA nations are struggling to recover, Vietnam's economy has maintained steady positive growth, mainly driven by exports and retail
- Vietnam is one of the few economies in the world that is not facing a contraction this year

Vietnam's economy outlook

- Trade friction between US and China benefits Vietnam's trade as many manufacturers have relocated their production to Vietnam
- Two free trade agreements signed in 2020 (EVFTA*, RCEP*) give the economy many advantages in economic and technical cooperation with advanced industrialized countries in Asia and Europe
- Vietnam's economy is expected to rebound by more than 7% in 2021, with exports and investments increasing at double-digit rates
- Vietnam's economy outlook over the longer term depends on several factors:
  - How the COVID-19 outbreak will progress and whether vaccination will be successfully tested and introduced
  - US-Vietnam and US-China relations once the new US president starts
  - The country's leadership for the next 5 years, which will be decided in 2021
  - Regional and global economic outlook

*EVFTA – European Union Vietnam Free Trade Agreement; RCEP – The Regional Comprehensive Economic Partnership.

Source: Nikkei Asia (2020); United Nations Office for the Coordination of Humanitarian Affairs (2020); Atradius (2020); Reuters (2020); Nikkei Asia (2020); Reddal analysis.

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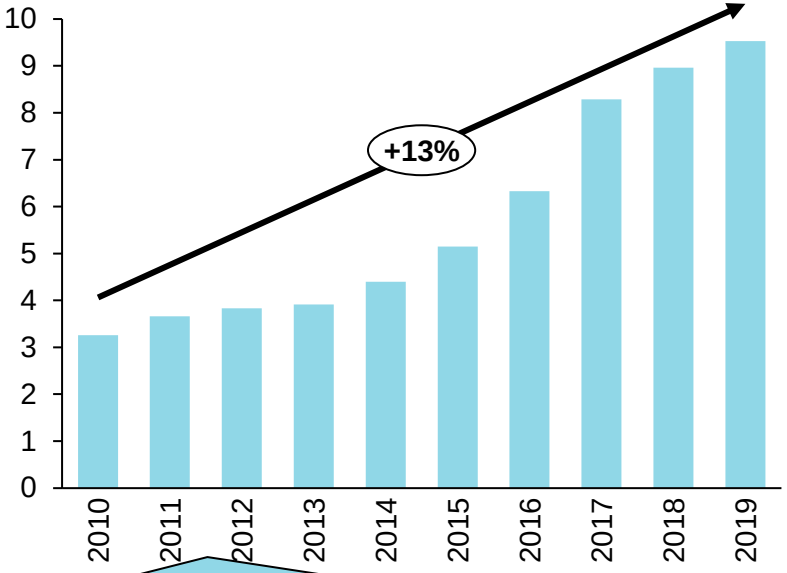
Technology development has long been the focus of SEA regional strategy and is forecasted to speed up by digital economy, FDI and cooperation with other countries

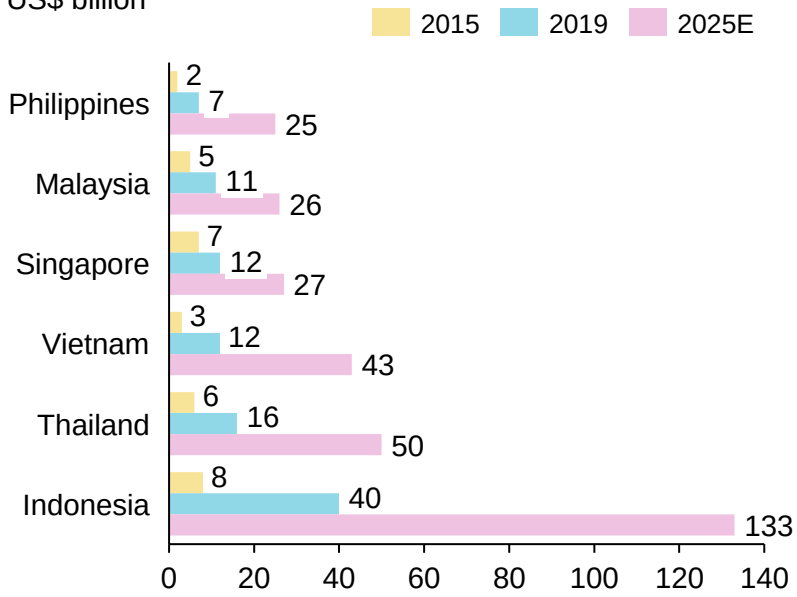
Technology development in SEA

Numbers of patent filings in SEA
Thousand patent filings



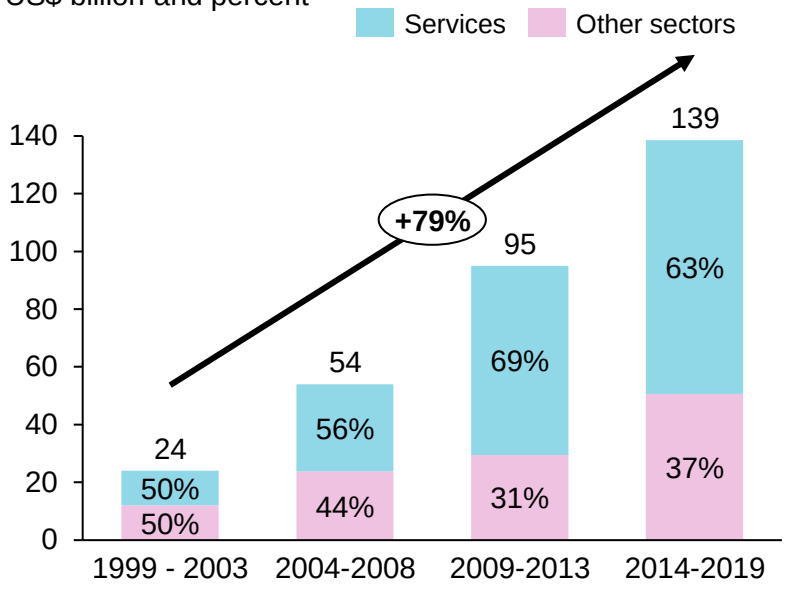
- Research and innovation have long been the cornerstones of SEA regional strategy towards a knowledge-based, innovation-driven economy
- There has been strong growth in patent filing activities over the past decade, especially in digital technologies

Gross merchandise value of SEA's digital economy
US$ billion



- Digital economy is forecasted to exponentially grow in the upcoming years, driven by two main drivers:
  - Participation in digital development
  - Investment in information and communication technology (ICT) infrastructure

Annual average of FDI flows into SEA
US$ billion and percent



- FDI will continue to play an important role in technology development, driven by the region's capacity of technology adoption and innovation
- Cooperation with advanced industrialized countries (for example, through RCEP*) will assist in developing more competitive products

*RCEP: The Regional Comprehensive Economic Partnership
Source: Clarivate (2020); The ASEAN Post (2020); United Nations Conference on Trade and Development (2019); ASEANstats (2020); ASEAN briefing (2019).

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Public and private sectors across the region need to jointly support workforce and business owners in enhancing their capabilities to adopt technology and establish innovation

Technology development in SEA and recommendations

Examples of technology advancements in recent years

Sharing economy
- Super app for ride-hailing, food delivery and payment (e.g. Grab, Gojek)

Fintech
- Consumer lending (FinAccel)
- SME lending (Funding Societies, Validus)
- Insurance and InsurTech (Igloo

Logistics
- Last mile delivery (for example, Ninja Van, Skootar, Logivan)

Healthcare
- Telehealth, telemedicine applications (Doctor Anywhere, Halodoc)
- Artificial Intelligence (for example, AI agent forecasting dengue incidences)
- Robotics (for example, “ninja robots” for COVID-19 treatment)

Connectivity
- 5G
- Wi-Fi 6
- Software-defined Wide Area Network (SD-WAN)

Recommendations for the way forward

Workforce skills

Equipping workforce with necessary skills to enhance technology adoption.

SME technology capabilities

Supporting small and medium enterprises (SMEs) – core of the region’s economies – with tech adoption and participation in global supply chains.

Leapfrogging and boosting old industries with tech

Establishing “innovation nichés” by using “leapfrogging” (skipping development stages) and “feedback” (introducing advanced technologies into old industries).

International collaboration

Leveraging technology cooperation with advanced industrialized countries to accelerate technology adoption.

Localization

Localization strategy for individual nations based on their own capability level of innovation and technology.

Source: Asia IoT business platform (2020); The ASEAN post (2020); Barrier and Ducray (2020); Modern Diplomacy (2020); Economic Research Institute for ASEAN and East Asia (2020); Reddal analysis.

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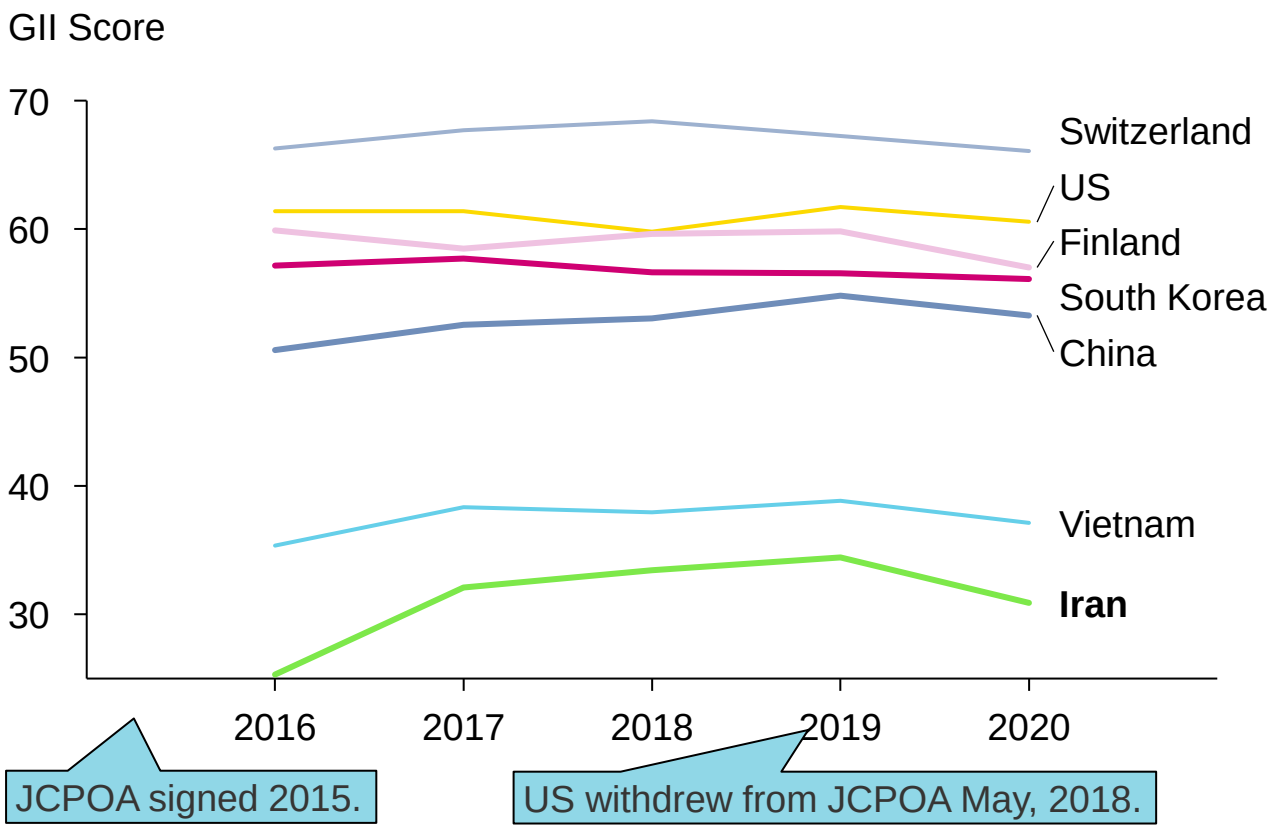
Lifting of sanctions boosted innovation in Iran, however USA unilateral sanctions against the country in 2018 is a key factor slowing the progress

Iran's global innovation index (GII) score compared to selected countries, 2016-2020

Global innovation index score – selected countries, 2016-2020



Source: www.wipo.int, www.aei.org, www.businessinsider.com.

Comments

- Iran continuously improved its GII score after JCPOA 2015-2019, but score deteriorated in 2020 after USA unilateral sanctions
- Over the last two decades, Iran has made significant progress in health and medical sector, expanding both market size and coverage
- The development of biopharma sector in Iran (a complex, high-tech sector) resulted in several successful local export firms
- Restricted access to foreign mass market apps and platforms has prompted developers inside Iran to get creative and meet the growing demand by developing domestic applications and platforms
- Iranian engineers and scientists are adept at developing cutting edge military technologies (consider development of UAVs, satellites and missiles), driven by government needs

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There have been technological advancements in various fronts from medical to mobile/app and military equipment technologies

Technological advancements of Iran in recent years

Medical developments

2008
- ReciGen® (interferon beta-1a) for enhancing immune cell activities; γ-mmunex® (interferon gamma-1b) for improving immune system produced

2012
- Herceptin (trade name for trastuzumab) introduced for fighting breast cancer

2013
- Production of PegaGen® (pegylated filgrastim) for fighting cancer

2014
- Glatiramer (trade name Osvimer®) and deferasirox (trade name Osveral®) for multiple sclerosis treatment

2016
- Production of Cinnal-f® (follitropin alfa) for infertility treatment; CinnoRA® (adalimumab) for autoimmune diseases

2019
- Production of human recombinant factor VIII (hr FVIII) under trade name Safacto (SD8) for hemophilia patients

Developments in mobile/app technologies

- Snapp!: Offering services like requesting ride, ordering food, hotel reservations and plane tickets
- digikala: E-commerce organization in multiple online industries including FMCG, fashion, e-books, big data and fintech
- An electronic payment service provider
- آپارات: A video sharing service like YouTube
- alibaba.ir: Online travel agency
- بازار: An Iranian Android marketplace with nearly 160,000 applications available
- A domain for local designers, bringing to life a boom of economy in the newborn design scene of Iran
- KiliD: A platform providing concise information about real state market using AI
- An educational software that was launched following the spread of the coronavirus

Developments in military technologies

UAV technology
- In 2020, Iran's systems go from small, lightweight short-range drones all the way up through medium-to-heavy UAVs in the intelligence, surveillance and reconnaissance roles (ISR)

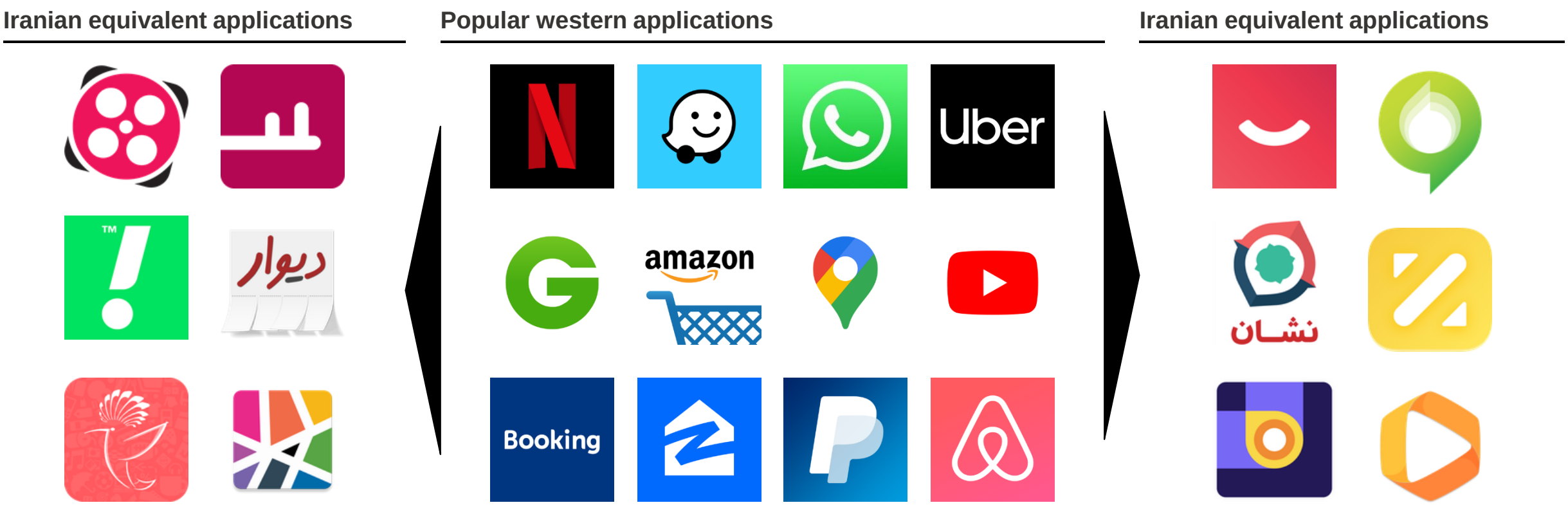
Missile technology
- Iran is recognized as having the most developed short- and medium-range missile system in the region
- Among other missiles, it has 300-kilometer range Shahab 1 missiles
- Tehran has also worked on the development of intercontinental missiles.

Satellite technology
- Iran successfully launched its first satellite into orbit 10 years ago
- Since then, Iran's space agency has successfully launched more than a half dozen satellites
- More satellite launches are slated for this year

Source: www.wipo.int, www.aei.org.

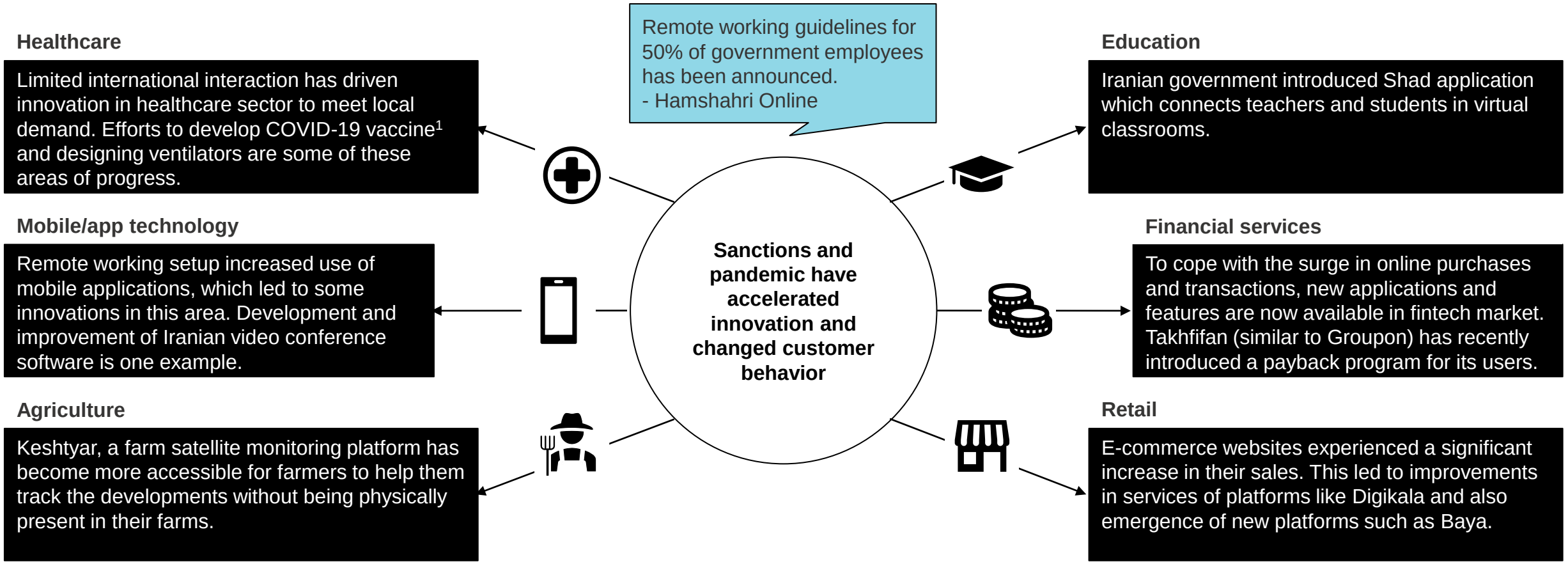
From an app store named after the Persian translation for “apple”, to a payment platform called ZarinPal, Iran's most popular apps are strikingly similar to their Western equivalents

Iranian apps and their Western equivalents



During COVID-19 crisis, social distancing and demand for healthcare products are drivers of innovation on many fronts

Technological advancements due to COVID-19



Healthcare

Limited international interaction has driven innovation in healthcare sector to meet local demand. Efforts to develop COVID-19 vaccine[1] and designing ventilators are some of these areas of progress.

Mobile/app technology

Remote working setup increased use of mobile applications, which led to some innovations in this area. Development and improvement of Iranian video conference software is one example.

Agriculture

Keshtyar, a farm satellite monitoring platform has become more accessible for farmers to help them track the developments without being physically present in their farms.

Education

Iranian government introduced Shad application which connects teachers and students in virtual classrooms.

Financial services

To cope with the surge in online purchases and transactions, new applications and features are now available in fintech market. Takhfifan (similar to Groupon) has recently introduced a payback program for its users.

Retail

E-commerce websites experienced a significant increase in their sales. This led to improvements in services of platforms like Digikala and also emergence of new platforms such as Baya.

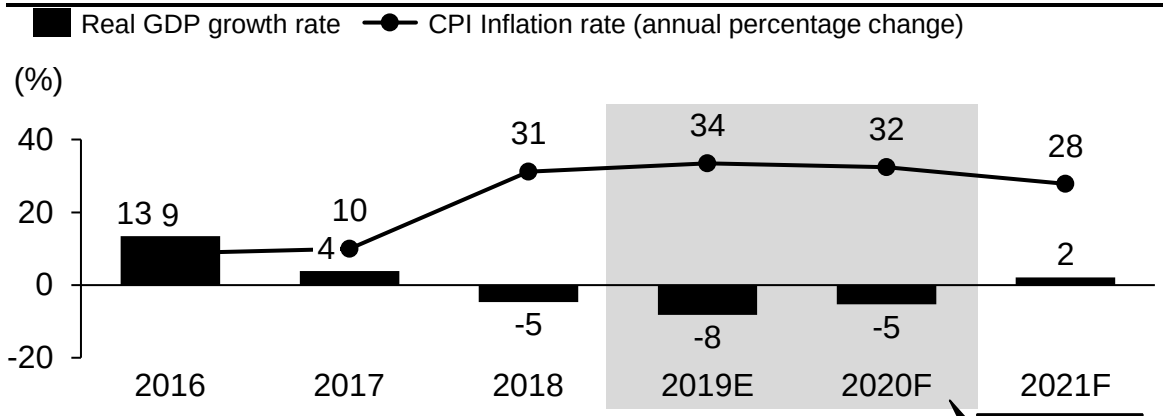
[1]https://www.tehrantimes.com/news/454829/High-hopes-for-COVID-19-vaccine-in-Iran.

REDDAL

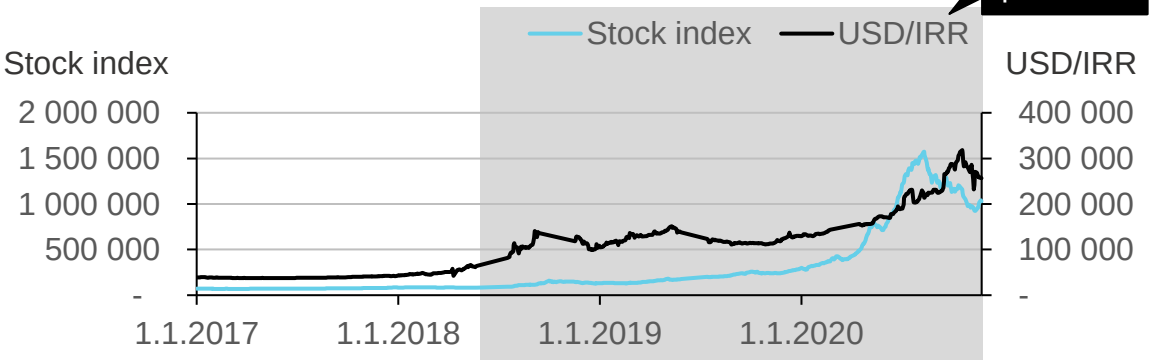
Although sanctions have had negative economic impact and limited Iran's interaction with the world, it has been a driver of domestic innovation and self-sufficiency

Impact of sanctions, subsequent limitations and Rial devaluation crisis on innovation

Iran real GDP growth rate[1] and inflation rate[2]



Iranian currency exchange rate (USD to IRR)[3]



Positive impacts

- Export diversification and increased income from non-oil exports
- Reallocation of investment funds and import substitution
- Development of new technologies internally to meet industrial and consumer demand
- Increased collaboration with China and Russia in terms of science and tech

Iran's science, technology and innovation development

Negative impacts

- Tightened budget to be allocated to science, technology and innovation (STI) development
- Limited interaction with Western governments in terms of knowledge transfer

Source: [1]World Bank, Global Economic Prospects June 2020; [2]UN, World Economic Situation and Prospects 2020; [3]TGJU.

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US withdrawal from JCPOA and subsequently European parties' failure in committing to their responsibilities, caused Iran to further strengthen its relationship with China and Russia

Iran's relationship with east and west

Influential factors in Iran's loss of trust in West

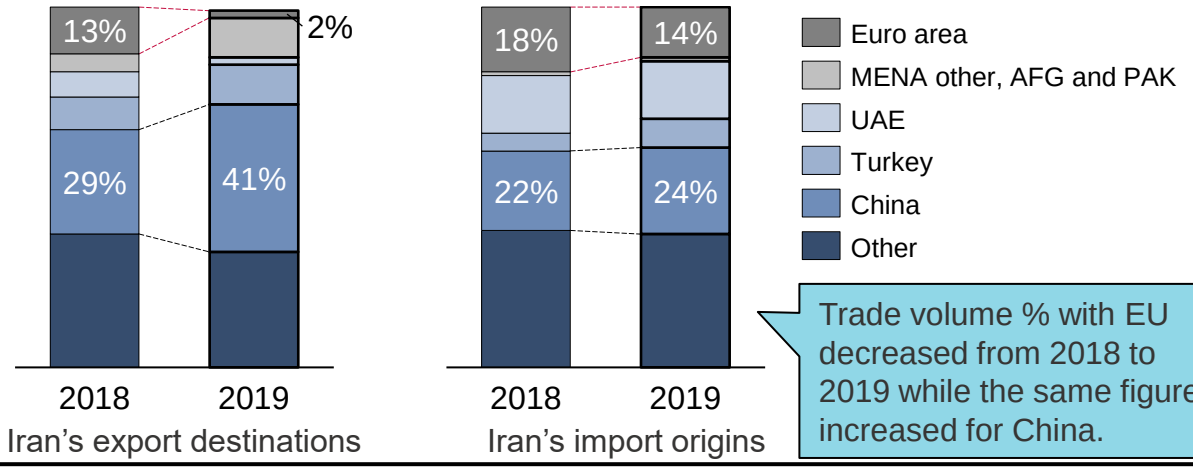
- US withdrawal from JCPOA
- EU's failure in fulfilling its responsibilities under JCPOA

Factors indicating tighter relationship of Iran with East

Political arrangements

- Iran-China 25-year pact
- Potential extension of Iran-Russia 20-year deal
- Iran, Russia and China joint military exercise in 2019

Trade volumes[1]



Source: [1]World Bank, Iran economic monitor, spring 2020.

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Revising policy frameworks and improving infrastructures are essential to the Iranian technological and economic advancement

Recommended policies at the time of crisis

Coherence across policies: Ensure greater coherence between science and technology improvement policies and other key development policies in order to increase the positive economic impacts of STI.

Set clear targets for R&D spend: Establish short/medium-term targets for an attainable level of R&D spending with a focus on promoting and providing incentives for R&D by the business sector.

Shift from core to competitive funding, based on performance: Make funding of universities, research and technology organizations more competitive to drive improved performance by introducing an R&D “project” or “mission” funding scheme targeting prioritized areas.

Promote FDI and linkages to other nations: Adopt a comprehensive strategy for benefiting from FDI and other external sources of funding, implement policies and create conditions that promote linkages, technology flows and technological learning.

Improve intellectual property related regulations: Improve the credibility and usefulness of the intellectual property rights system through a comprehensive, gradual improvement, encompassing the entire life cycle, from patent application to dispute resolution.

Boost innovation and entrepreneurial eco-system: Nurture the knowledge-based economy across sectors, with continued policy support for startups and new growth areas, including through professional business services and an upgraded innovation system.

Source: www.unctad.org; Reddal analysis.

Today's agenda

The many faces of COVID-19 – not only a pandemic, but a driver of economic development on multiple levels

The Western and Asian democracies – increased innovation and inequality forcing a new direction to be set; some countries grabbing the opportunity to long-term focused renewal

The East – China taking a grand role in societal change and innovation; SEA following, setting direction for countries around

Iran and innovation – sanctions fueled Iran's "resilient economy" strategy, resulting in technological advancement and closer relationships with China and Russia

The larger view – the decades ahead (approx. 2025-2040), if you believe in saecula and cyclicality, should be about a new "High" after the current era of "Crisis"

Conclusion – what all this means for innovators and innovation management

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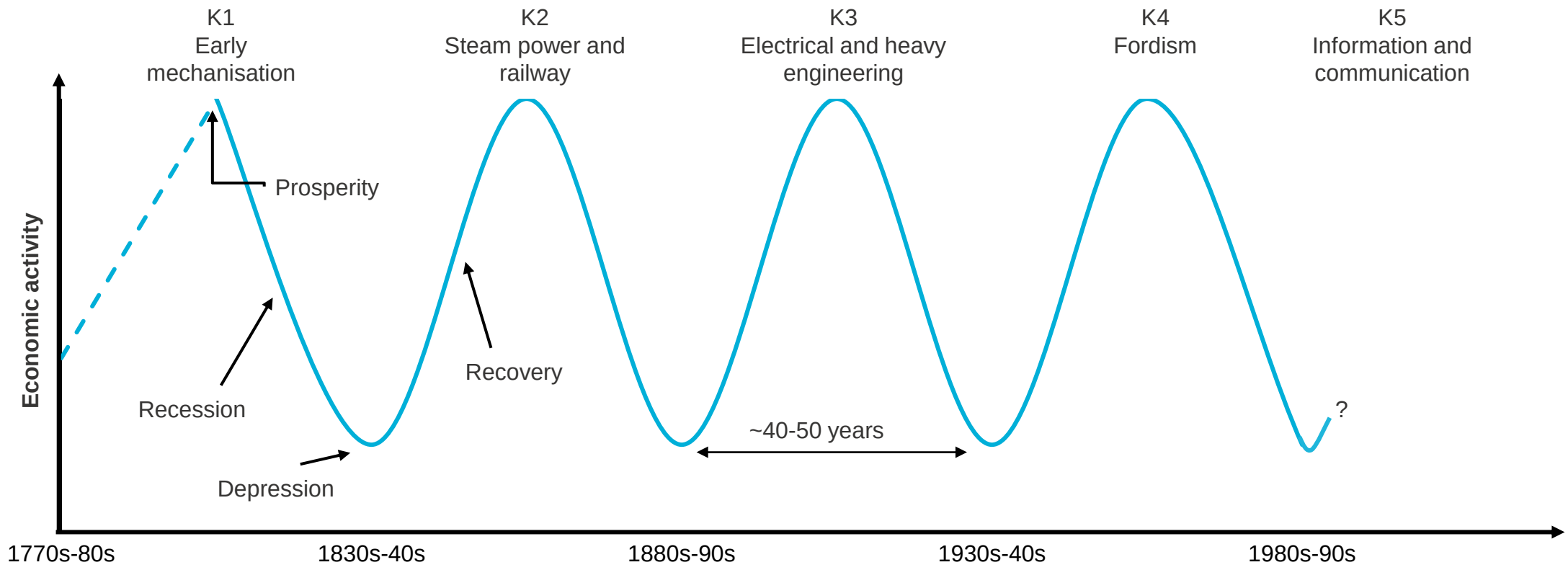
Let’s start by considering Kondratieff’s notion of long-term waves in global economy and Schumpeter’s ”creative destruction”

Kondratieff waves of growth and their main features



Source: See for example, Trott, *Innovation Management and New Product Development*, 5th ed., pp. 6-8, 54-55; see also Shin, *The Global Financial Crisis and the Korean Economy.*

A similar concept has been put forward as a theory for cyclical character of history (as opposed to linear extrapolation) – and it presents an interesting thesis

The concept of "saeculum" applied to recent American history

~80-100 years

	The first turning (High)	The second turning (Awakening)	The third turning (Unraveling)	The fourth turning (Crisis)	The next first turning (High)
Generations • **Elderhood** • **Midlife** • **Young adulthood** • **Childhood**	Nomad Hero ("GI gen." 1901-24) Artist ("Silent gen." 1925-42) Prophet ("Boomers" 1943-1960)	Hero ("GI gen.") Artist ("Silent gen." Prophet ("Boomers") Nomad ("13th gen." 1961-81)	Artist ("Silent gen.") Prophet ("Boomers") Nomad ("13th gen.") Hero ("Millennial" 1982-2000)	Prophet ("Boomers") Nomad ("13th gen.") Hero ("Millennial") Artist	Nomad ("13th gen.") Hero ("Millennial") Artist Prophet
As applied to American history	The American High (1946-1964)	The Consciousness Revolution (1964-1984)	The Culture Wars (1984-2005?)	The Millennial Crisis (2005?-2026?)	(2026?...)
Description	• America rises into global superpower • Growth and prosperity of middle class • Church buttressing gov't • High defense budgets without controversy • Infrastructure development – interstates, suburbs	• Opened with urban riots and campus fury, growing along Vietnam war protests • Rebellious counterculture, feminism, environmental, black power • Rise in crime and family break-up • New age and spiritual rebirth	• Opened with individualism • Increasing reflection over growing violence, incivility, inequality, distrust of institutions and leaders • Splitting into two camps of values	• As the book was written in 1997, it merely provided some forward-looking descriptions of this era (to be discussed next)	• A return to growth and investment, producing more than consuming, building infrastructure and institutions?

The interesting part is here – an expectation of a new "High" to start mid-2020.

Source: Strauss, Howe, *The Fourth Turning* (1997).

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To illustrate the cyclicality, consider what the theory presented for the current times – the fourth turning or "Crisis" that precedes the next "High" (written in 1997)

Characteristics of the fourth turning ("Crisis", 2005?-2026?)

As one of five scenarios:

"The Centers for Disease Control and Prevention announce the spread of a new communicable virus. The disease reaches densely populated areas, killing some.

Congress enacts mandatory quarantine measures.

The president orders National Guard to throw prophylactic cordons around unsafe neighborhoods. Mayors resist. Urban gangs battle suburban militias. Calls mount for the president to declare martial law."

The real question is, have we now reached the end of this "Crisis", or is there still more to come…?

"The climax of the crises takes a form wholly unforeseeable from the advance distance of 25 years. … which could include the following":

- Economic distress – public debt in default, mounting poverty and unemployment, collapsing financial markets or hyperinflation (or deflation)
- Social distress – violence fueled by class, race, religion, abetted by gangs or underground militias
- Cultural distress – media plunging into dizzying decay, decency backlash in favor of state censorship
- Technological distress – cryptoanarchy, high-tech oligarchy
- Ecological distress – atmospheric damage, energy or water shortages, new diseases
- Political distress – institutional collapse, one-party hegemony, major constitutional change, authoritarianism
- Military distress – war against terrorists or foreign regimes with weapons of mass destruction

"Eventually, all of America's lesser problems will combine into one giant problem. The very survival of the society will feel at stake."
"The Spirit of America will return, because there will be no other choice."

Source: Strauss, Howe, *The Fourth Turning* (1997).

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Looking forward, it is good to reflect on the concept of cyclicality and what it might mean – innovation and technology development will be increasingly important

Conclusion – the role of technology development and global alliances in the next decade

There is more to it than what we see now

- Granted, looking at the situation right now, things may seem bleak and difficult – should we follow a linear path this would indeed be depressing
- However, if we consider cyclicality, things were also bleak in last “Crisis” a saeculum ago – but this converted into a “High” as the season changed
- Unclear if the current “Crisis” is over yet, or if there is more to come before the next cycle starts…

New world order emerging – innovation at the core

- As we can see already now, different governments have taken different approaches to the pandemic – but at the same time, there is also clear active development happening increasingly across all regions
  - Rise of the Asian region, while the weaknesses of the West clearly showing
  - New intensity around global alliances
  - Accelerated innovation on multiple fronts, but particularly telecommunication, digital services, artificial intelligence, medicine/biotech and military
  - At the same time, increased inequality and issues of marginalization for some parts of the population

Winning in this world means holistic renewal

- The interesting dynamics is how all this will develop across the coming decades – again, linear thinking may not give us the right perspective
- A critical aspect for all governments and nations continues to be, however, to seek drive innovation and development in a sustainable and future looking way, rather than merely trying to compensate for the damage that the current pandemic has caused
- However, societal issues and inequality must also be addressed

- If the cyclical nature of history indeed holds true, and especially if nations manage to enter the new “High” in a relatively synchronized way, the ones to see the most rapid advancement are those who continue to renew and develop themselves actively in a holistic way

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