METI
Ministry of Economy, Trade and Industry

White Paper on International Economy and Trade 2022

June 2022

Trade Policy Bureau

Ministry of Economy, Trade and Industry (METI)

White Paper on International Economy and Trade

Status

- The oldest white paper in METI. The white paper 2022 is the 74th publication.
- Submitted to the Cabinet every year.

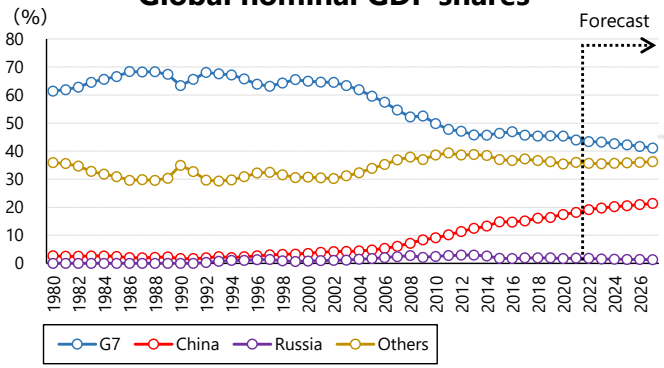
Purpose of writing

- To contribute to the formation of trade strategies through the analysis of international economic trends and foreign policies that affect trade, and to provide the public with the ideas that lay the basis for trade policy and its directions.

Economic Impacts of Russia's aggression against Ukraine

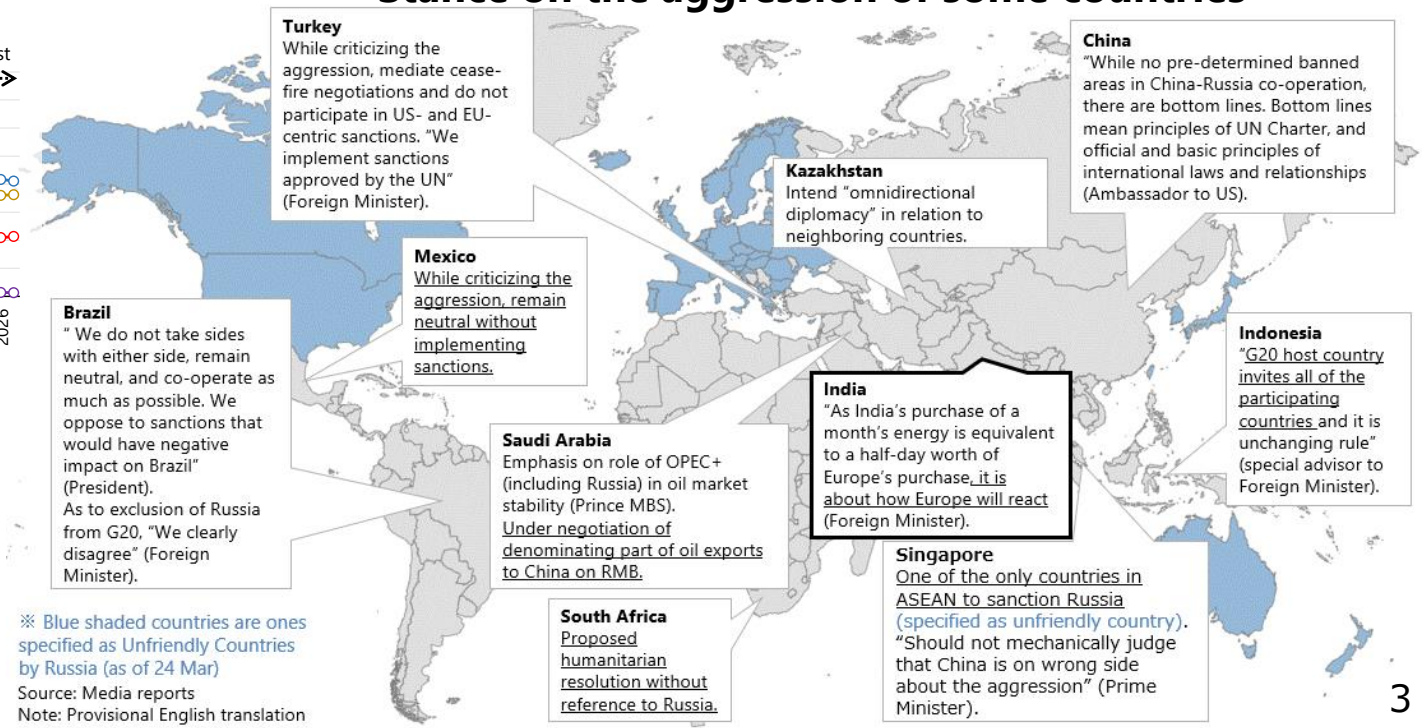
- Since Russia's aggression against Ukraine, **G7 and other advanced economies** have expeditiously introduced unprecedented large-scale economic sanctions including energy procurements from Russia, **swiftly reviewing their economic and political relationships with the country**.
- The aggression caused **the most serious concern for global fragmentation since the Cold War ended,** and could **accelerate the process of global economic structural change** as represented by the multi-polarization in self-centrism and strengthened economic national security, leading to **a historic turning point of the current international economic order.**
- **Many of the emerging and developing economies have avoided decisive actions including economic sanctions and taken a neutral stance in consideration for their economic and political relationships with Russia.**

Global nominal GDP shares



Source: IMF.

Stance on the aggression of some countries



※ Blue shaded countries are ones specified as Unfriendly Countries by Russia (as of 24 Mar)
Source: Media reports
Note: Provisional English translation

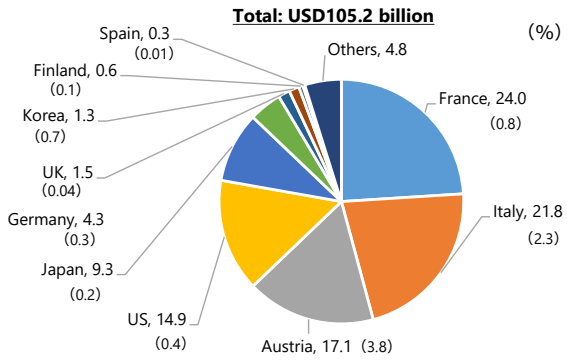
- Russia and Ukraine **do not have major shares of global GDP**, but **<u>are major suppliers of energy and food. Economic impacts on individual countries differ depending on import dependency.</u>**

Nominal GDP (2021)

Ranking	Country	Nominal GDP (USD trillion)	Share (%)
1	US	23.0	23.9
2	China	17.5	18.1
3	Japan	4.9	5.1
4	Germany	4.2	4.4
5	UK	3.2	3.3
6	India	3.0	3.2
7	France	2.9	3.0
8	Italy	2.1	2.2
9	Canada	2.0	2.1
10	Korea	1.8	1.9
11	Russia	1.8	1.8
	⋮		
54	Ukraine	0.2	0.2

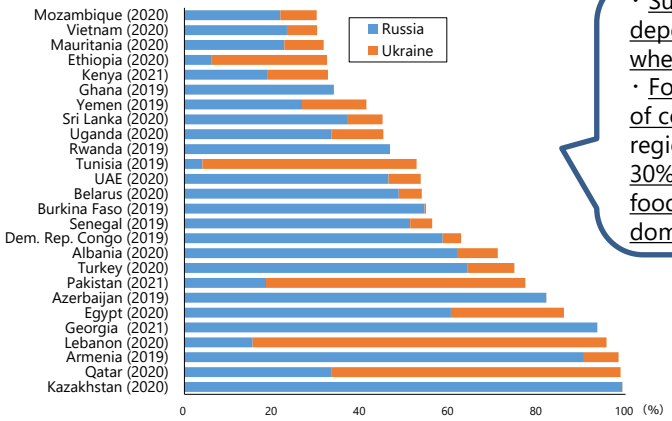
Source: IMF.

International credits to Russia (Q4 2021)



Source: BIS.
Note: Numbers in parenthesis show shares of credits to Russia in respective countries.

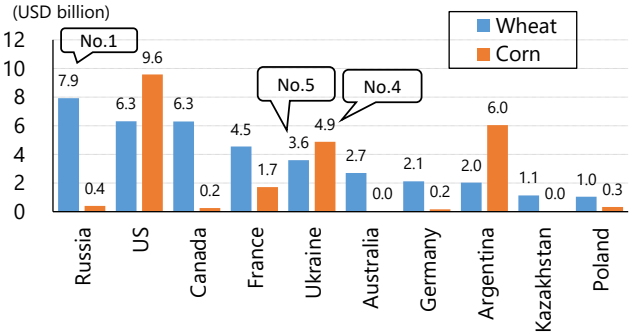
Wheat import shares of Russia and Ukraine



Source: UN Comtrade.

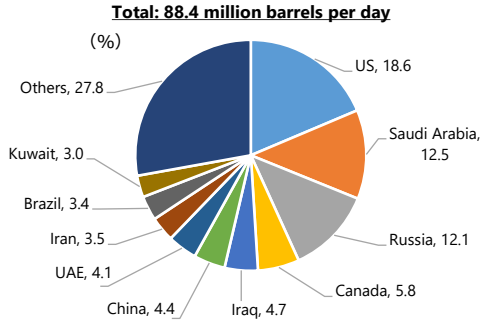
- <u>Sub-Saharan Africa depends 85% of wheat imports.</u>
- <u>Food takes up 40% of consumption</u> in the region and <u>more than 30% of surge in global food prices feeds into domestic prices</u>.

Exports of wheat and corn (2020)



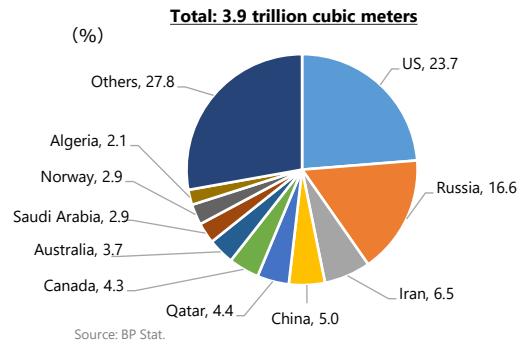
Source: UN Comtrade.

Global crude oil production (2020)



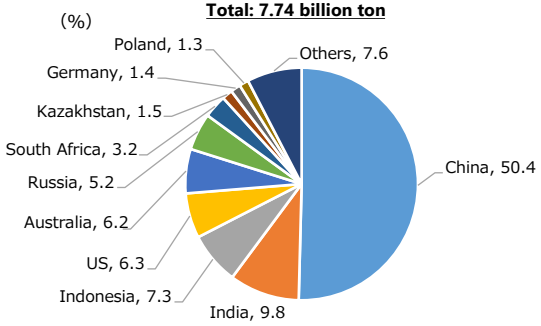
Source: BP Stat.

Global natural gas production (2020)



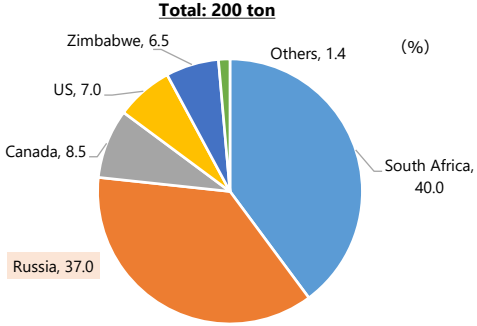
Source: BP Stat.

Globl coal production (2020)



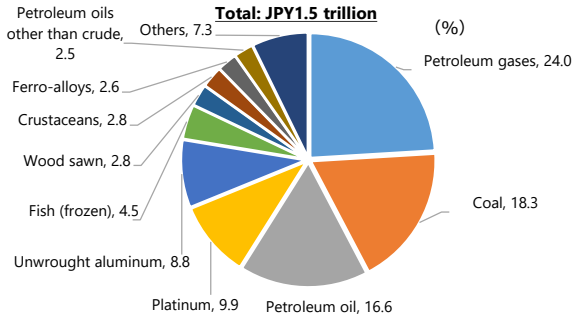
Source: BP Stat.

Palladium production (2021)



Source: USGS.

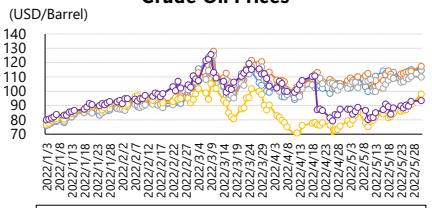
Japan imports from Russia (2021)



Source: Global Trade Atlas.

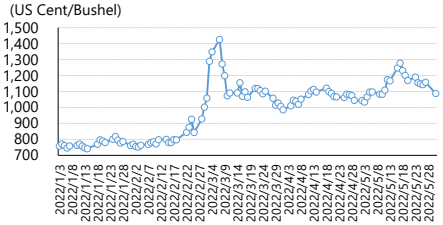
- **While the situation persists, the impact of the aggression could globally prevail in the form of supply disruptions, price surges in commodities, disruptions in supply chains, trade and financial markets, and cost-push inflation amidst monetary tightening by major central banks.**

Crude Oil Prices



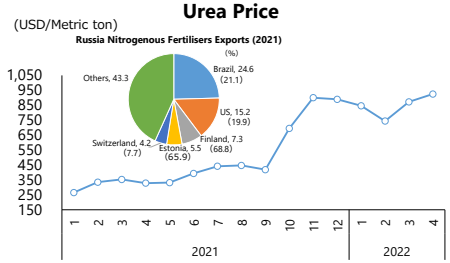
Source: Refinitiv.

Wheat Future Price



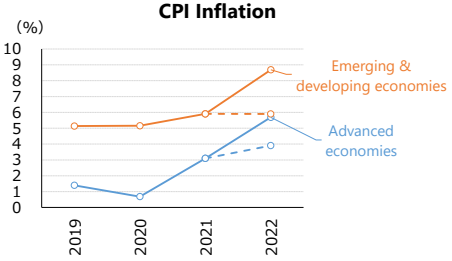
Source: Refinitivs

Urea Price



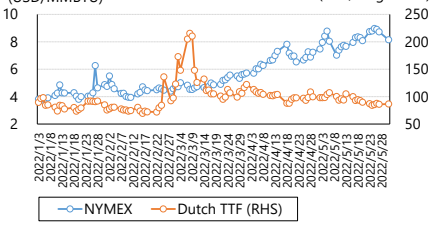
Sources: World Bank, Global Trade Atlas. Note: Numbers in parenthesis are import shares of Russia.

CPI Inflation



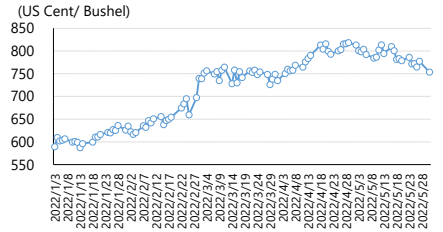
Sources: IMF. Note: Dotted lines show forecast as of Jan. 2022 and real line show forecast as of Apr 2022.

Natural Gas Prices



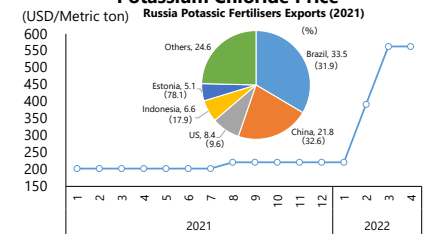
Source: Refinitiv.

Corn Future Price



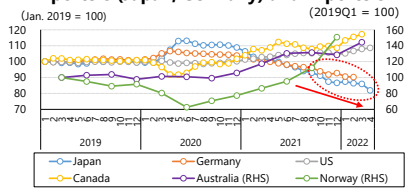
Source: Refinitiv.

Potassium Chloride Price



Sources: World Bank, Global Trade Atlas. Note: Numbers in parenthesis are import shares of Russia.

Terms of Trade for Commodity Importers (Japan, Germany) and Exporters

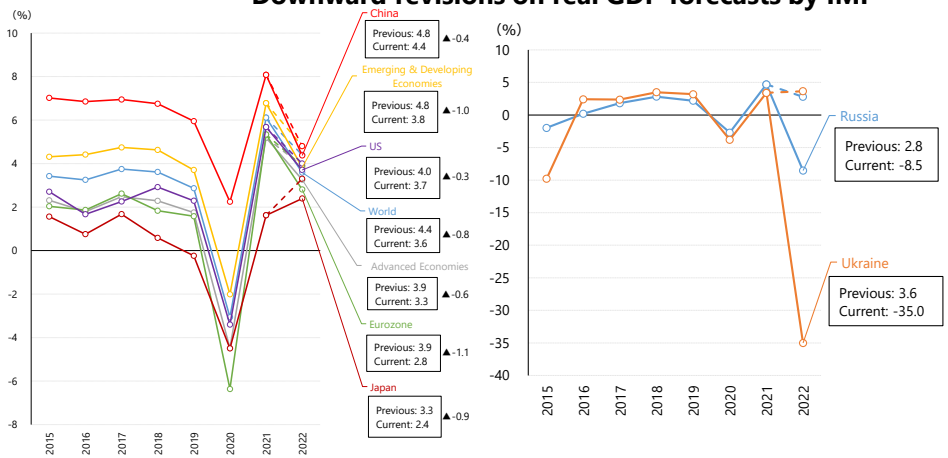


Source: CEIC.

Due to surging commodity prices such as oil.
BoP under mounting pressure due to an increase in vaccine imports and a significant decline in international tourists.

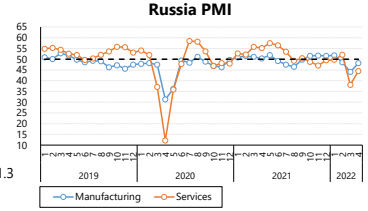
- **The IMF's global growth forecast in 2022 was revised down (4.4%→3.6%) due to the Russia's aggression against Ukraine mainly in the Euro area and emerging and developing economies. Ukraine and Russia are projected to contract significantly.**

Downward revisions on real GDP forecasts by IMF



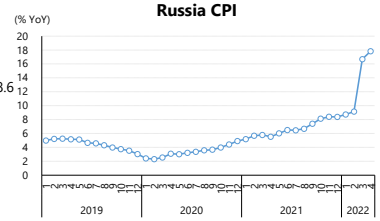
Sources: IMF. Note: Dotted lines show forecast as of Jan. 2022 (Oct. 2021 for Ukraine) and real line show forecast as of Apr 2022.

Russia PMI



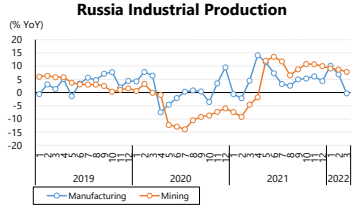
Source: CEIC.

Russia CPI



Source: CEIC.

Russia Industrial Production



Source: CEIC.

Russia Economic Outlook

		2021 (Actual)	2022	2023	2024
Real GDP	Russian Central Bank (May 2022)	4.7	-8.0 ～ -10.0	-3.0 ～ 0.0	2.5 ～ 3.5
	World Bank (Apr 2022)		-11.2	0.6	1.3
CPI	Russian Central Bank (May 2022)	8.4	18.0 ～ 23.0	5.0 ～ 7.0	4.0
	World Bank (Apr 2022)		22.0	13.0	8.0

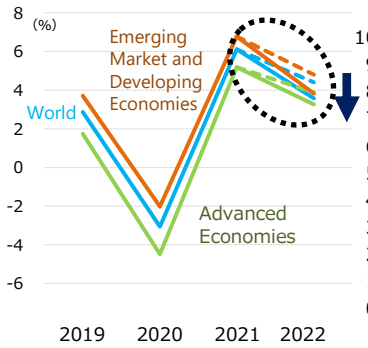
Sources: Russia Central Bank, World Bank.

Key points of analysis: White Paper on International Economy and Trade 2022

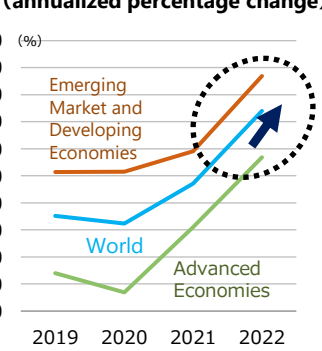
Growing uncertainty

- Ukrainian situation
- Worsening geopolitical environment
- Supply restrictions
- Surging energy prices: global inflation
- China's "zero-Covid" policy and its economic slowdown
- Risk of recurring pandemic
- Risk of economic deterioration in emerging countries
- Increase in global debt

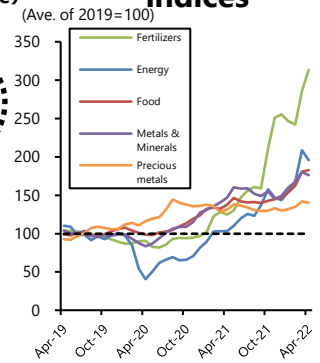
Real GDP growth rate(%)



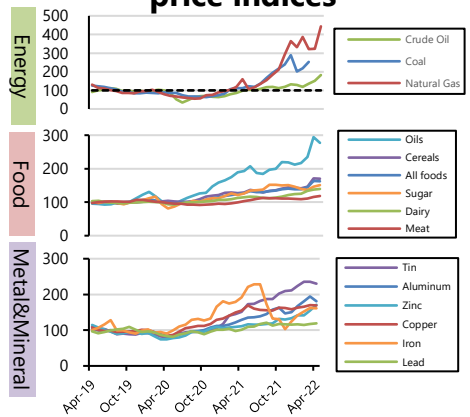
Inflation rate, CPI (annualized percentage change)



Commodity price indices



Major commodity price indices



Four global trends

(1) Accelerating digital transformation (DX)

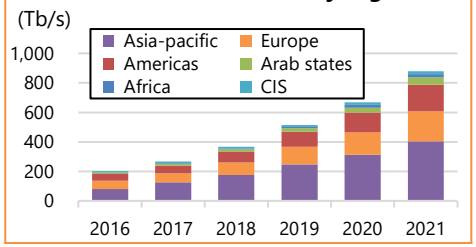
■ **Evolving DX** powered by IoT, AI and other advanced techs

- **Sluggish progress in Japan's DX**
  - IMD World Digital Competitiveness Ranking 2021: Japan 28th
  - Number of unicorn companies: 24th; Japan (5) (1st; US (569), 2nd; China (173))

■ **Expansion of digital protectionism**

■ **Importance of international rulemaking that supports the free flow of data**

Cross-border data flow (by regions)



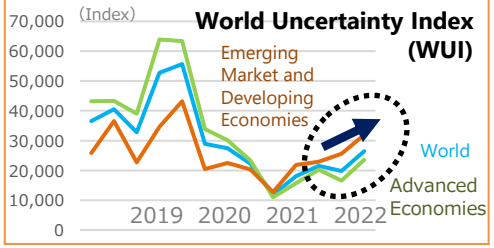
(2) Mounting geopolitical risks

■ **Geopolitical risks such as US-China conflict, dragging pandemic, Russian aggression against Ukraine**

- **Trends driven by increasing economic security needs (putting your own country first, stepping up cooperation with like-minded countries, and reducing external dependency)**

■ **Importance of resilient supply chains and international rulemaking based on different positions of each country**

World Uncertainty Index (WUI)



(3) Growing emphasis on shared values

■ Trends to focus on **shared values** such as **environment/climate, circular economy** and **human rights**

- **Rules affect the cost structure, funding, and terms/conditions of transactions and competitions.**
- **Companies placing shared values at the core of their business to create new competitive edge**

■ **Importance of global rulemaking based on different positions of each country**

Trends in climate rulemaking

- **Idea of a climate club**
- **CBAM under consideration**
- **Agreement to remove additional tariffs on steel and aluminum**
- **FMC・IDA (Initiatives to boost demand in clean technologies)**

(4) Accelerating shift in industrial policy by government

■ Major countries **shifting to** adopt **proactive industrial policies**

- **Response to social and economic challenges**
- **Fierce competition in advanced technologies**
- **Response to economic competition arising from geopolitical risks**

■ **Importance of taking markets created by government-led procurement and investment**

Trends in reinforcing industrial competitiveness

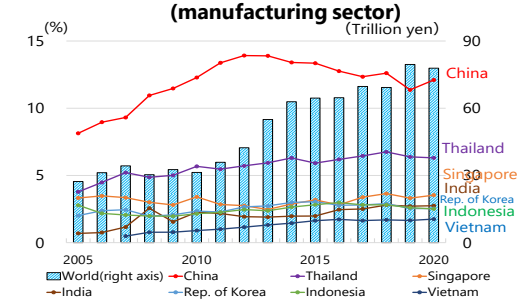
- **Supply chain resilience**
- **Green and digital transition**
- **Strategic autonomy, industrial alliances in Europe**
- **Strengthening of domestic manufacturers**

Implications for international trade: Japan's challenges and opportunities

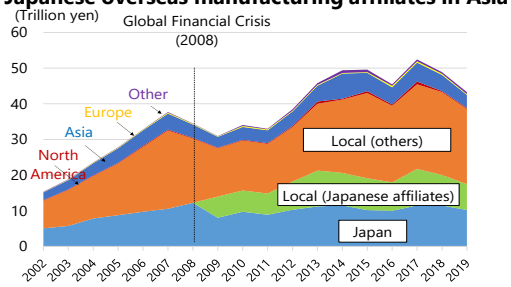
Building resilient global value chains based on shared values

(1) In Asia, manufacturing companies are making steady progress in diversifying production bases and supply chains, factoring in geopolitical risks, pandemics and natural disasters. Carrying out measures to build resilient supply chains is critical.

Country share in Japan's outstanding direct investment (manufacturing sector)



Procurement sources of Japanese overseas manufacturing affiliates in Asia

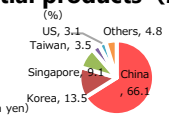


(2) With the expansion of global markets of semiconductors and storage batteries, it is crucial to ensure economic security by reducing dependence on foreign sources for critical items and controlling sensitive and emerging technologies based on geopolitical risks. Japan needs to develop domestic energy resources from the perspective of stable energy supply.

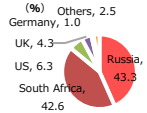
Import partners on essential products (2020)

Photosensitive semiconductor devices

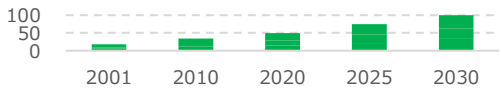
Lithium-ion battery



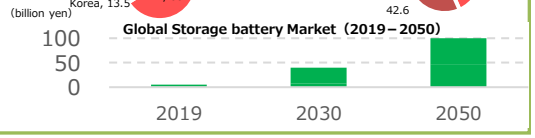
Palladium



Global Semiconductor Market (2001–2030)



Global Storage battery Market (2019–2050)

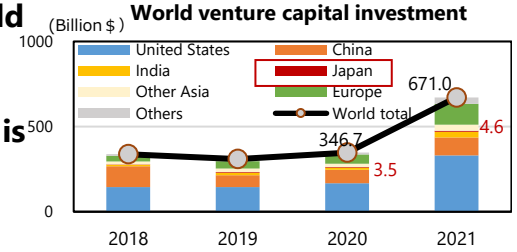


(3) With heightened focus on shared values, response to various considerations such as decarbonization, the environment and external stakeholders is required, resulting in increasingly complex supply chain management. It is critical to create value by formulating an Asia-wide platform for data sharing while enhancing visualization and collection of data, using data linkage.

Innovation-driven changes in global trade structure and economic growth

(1) Japan lags behind the world in developing startups, while increasingly, startups are leading the world's growth. It is critical to promote a virtuous cycle of the ecosystem and proactively work with Asia, a high-growth potential market, on DX and value creation to gain new economic opportunities.

World venture capital investment

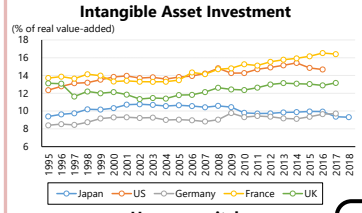


Ongoing Projects by Japanese companies (e.g. medical field)

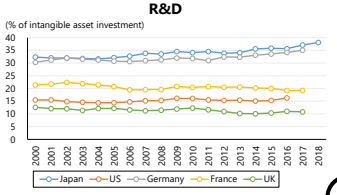
A trading company invests in companies of Asia and others, which holds and utilizes a total of over 400 million patients' data to realize efficient and enhanced medical services.

(2) Investment in intangible assets, particularly in human and organizational capital, is at a low level in Japan compared to other countries. Raising productivity through boosting investment in intangible assets is essential.

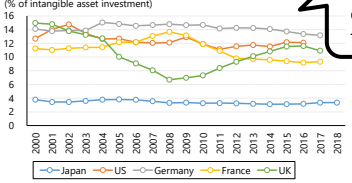
Intangible Asset Investment



R&D

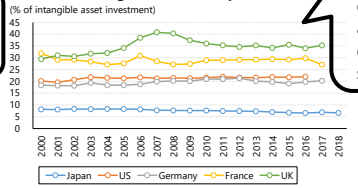


Human capital



Expenditures on employee trainings

Organizational capital



Expenditures on legal, accounting, consulting services

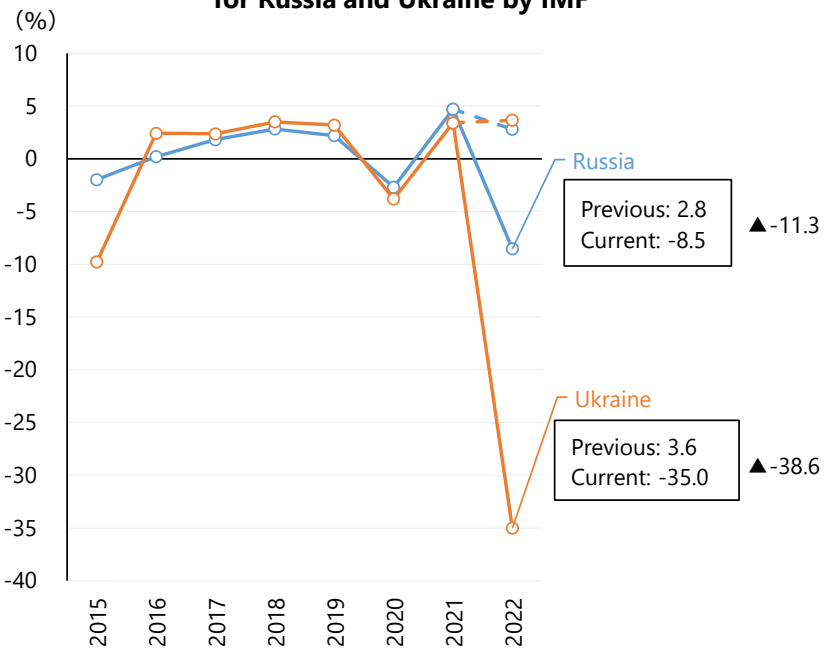
(3) It is important to flexibly respond to impacts on employment, disparity and inequality in line with the accelerated development of emerging technologies. At the same time, it is vital to drastically put TradeTech and other technologies into practice, taking experiences of Asia, which is fast growing, employing a leapfrog approach, as a reference.

Table of contents

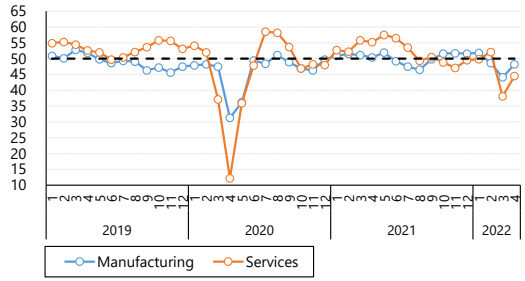
Russian and Ukrainian economies to severely contract

- **<u>Growth forecasts for Russia and Ukraine were revised severely downward due to the aggression. In addition to international organizations such as IMF and World Bank, the Russian Central Bank also forecasts severe contractions and inflation surges.</u>**
- Russia's economic indicators are worsened with economic sanctions, which is consistent with the forecasts with **<u>sluggish PMI and industrial production, and surges in CPI inflation rate.</u>**

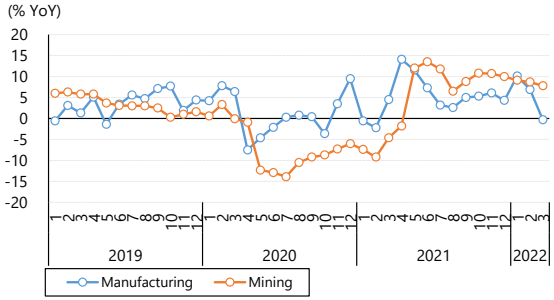
Downward revisions on real GDP forecasts for Russia and Ukraine by IMF



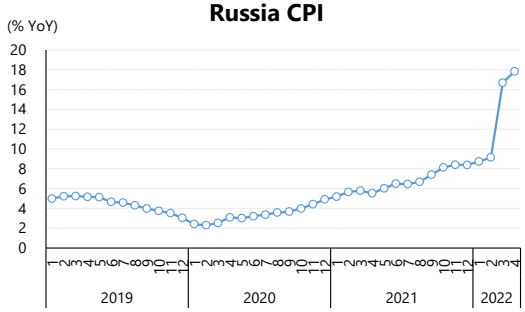
Russia PMI



Russia Industrial Production



Russia CPI



Russia Economic Outlook

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Real GDP	Russia Central Bank (May 2022)	4.7	-8.0 ~ -10.0	-3.0 ~ 0.0	2.5 ~ 3.5
	World Bank (Apr 2022)		-11.2	0.6	1.3
CPI	Russia Central Bank (May 2022)	8.4	18.0 ~ 23.0	5.0 ~ 7.0	4.0
	World Bank (Apr 2022)		22.0	13.0	8.0

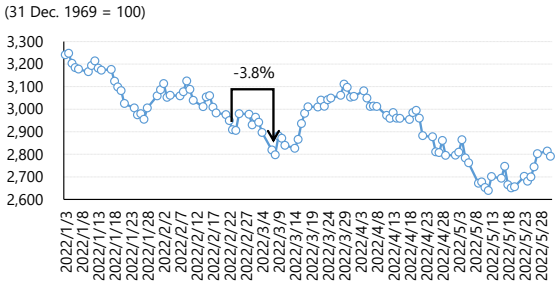
Source: IMF.

Sources: CEIC, Russia Central Bank, World Bank.

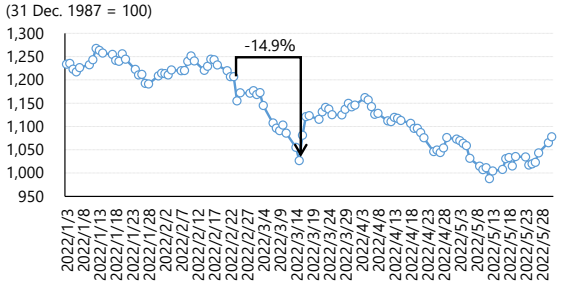
Impact of the aggression on financial and commodity markets

- **The aggression created fragility in equity markets and surges in commodity prices due to supply contraction concerns.**
- **Surges in energy and crop prices could affect energy and food security.**

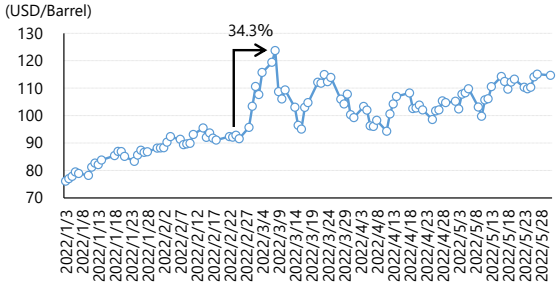
MSCI World Index



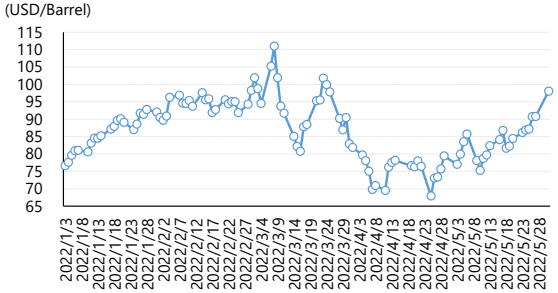
MSCI Emerging Market Index



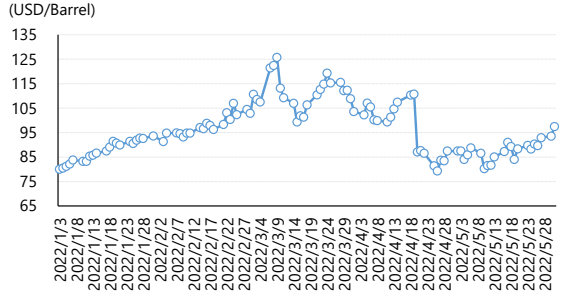
WTI Crude Oil



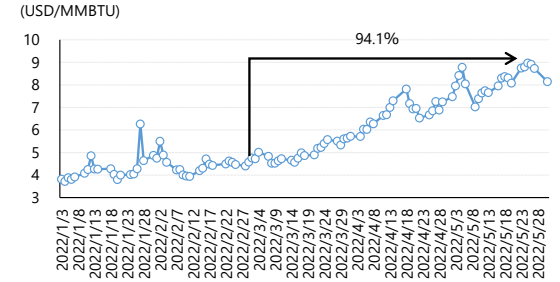
Urals Crude Oil



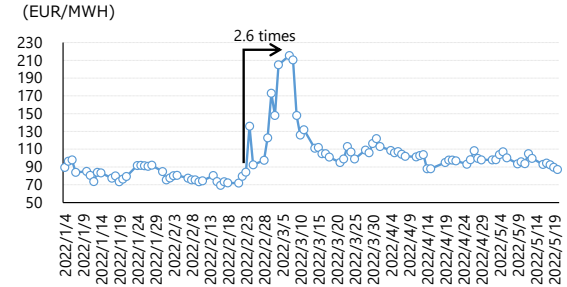
ESPO Crude Oil



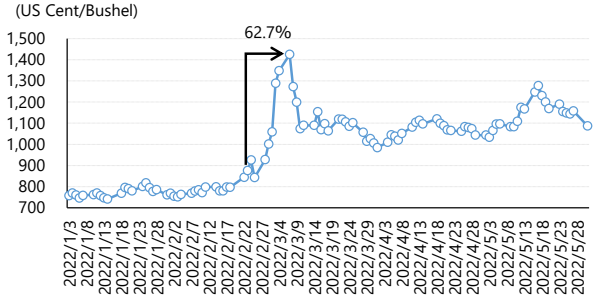
NYMEX Natural Gas



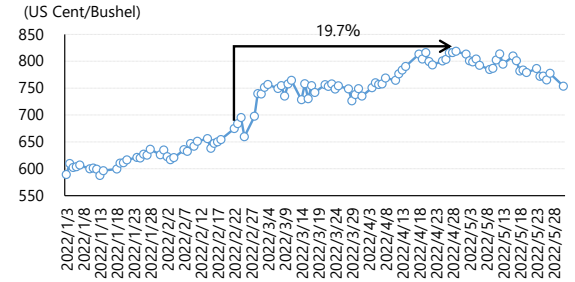
Dutch TTF Natural Gas



Wheat Future



Corn Future

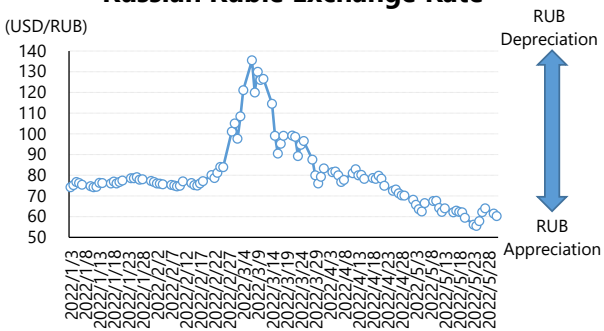


Source: Refinitiv.

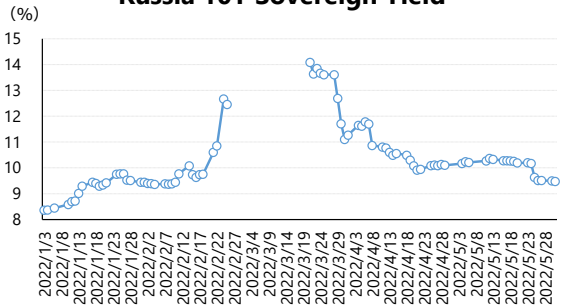
Turmoil in Russian currency and financial markets

- **The Russian Ruble recovered** from a significant depreciation **on the back of capital controls and weaker demand for foreign currencies**. The **Central Bank of Russia raised the policy interest rate** to defend the currency, **followed by adjustments**.
- **The Russian equity markets remain subdued** due to economic disruptions. **Russian bond yields and CDS temporarily surged due to concerns of default.**

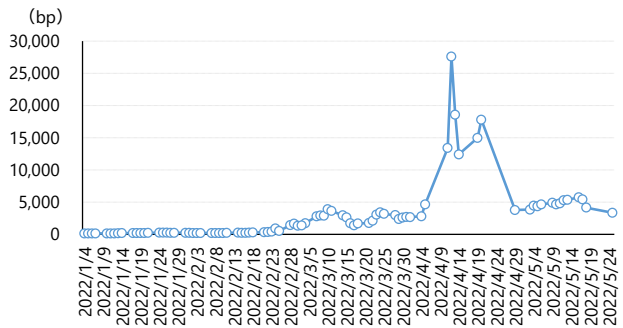
Russian Ruble Exchange Rate



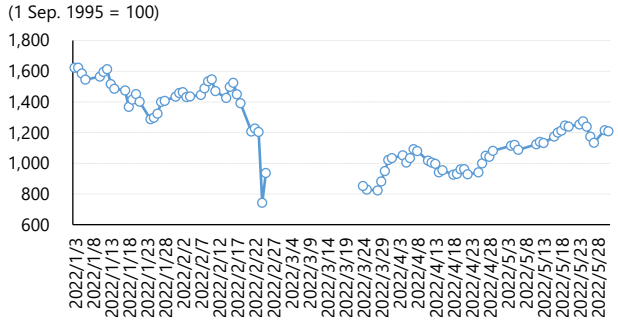
Russia 10Y Sovereign Yield



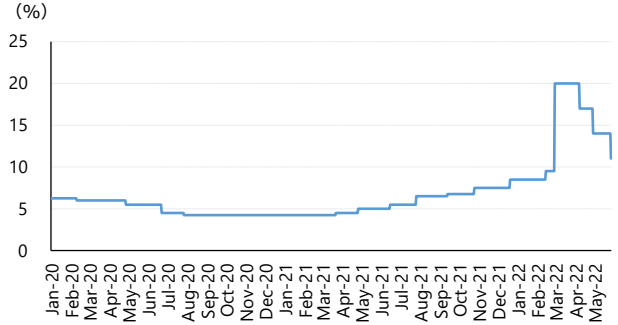
Russia 5Y CDS



Russia Equity Market (RTS)



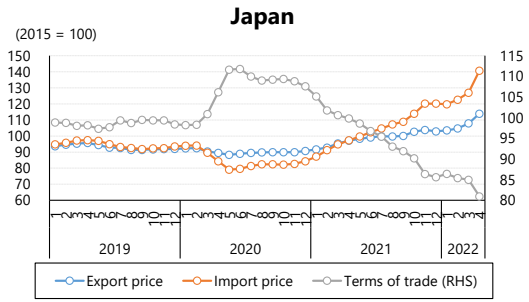
Russia Policy Interest Rate

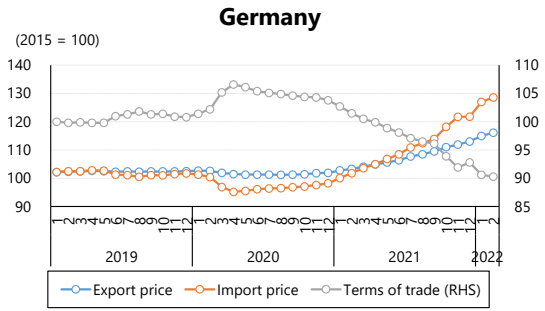


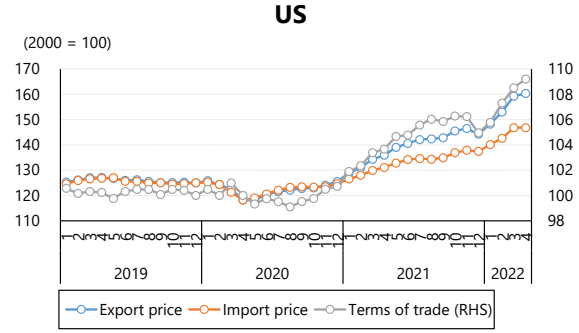
Source: Refinitiv.
Note: Blanks for 10Y government bond and equity market are suspended periods.

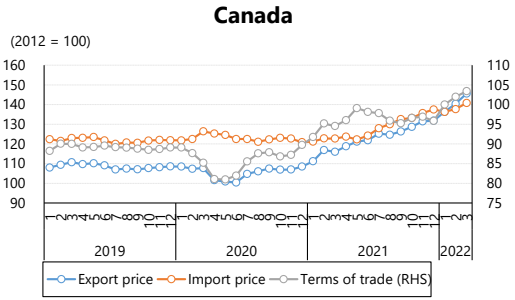
Deteriorating terms of trade for commodity importers

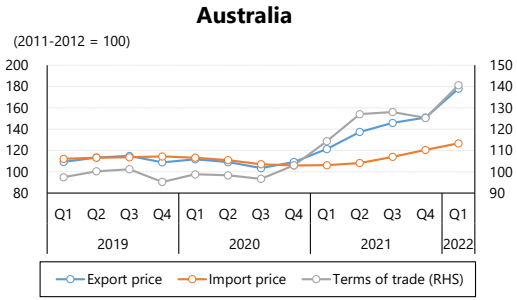
- In addition to already surging commodity prices, the aggression accelerated **the price surge, which deteriorated the terms of trade of commodity importers such as Japan and Germany while those of commodity exporters improved.**
- **Japan's terms of trade deteriorated significantly also due to currency depreciation with balance of payments under pressure due to increasing commodity prices, imports of medical goods (vaccines), and a sharp decline in international tourists.**

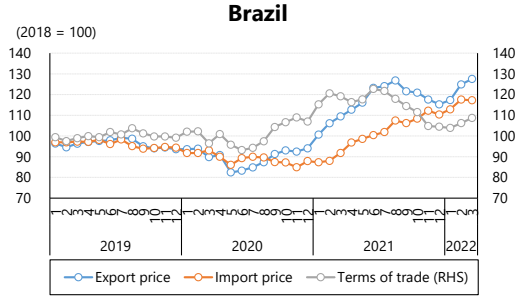


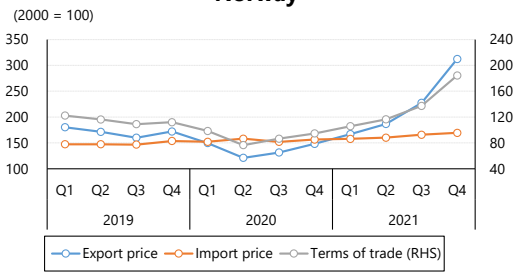








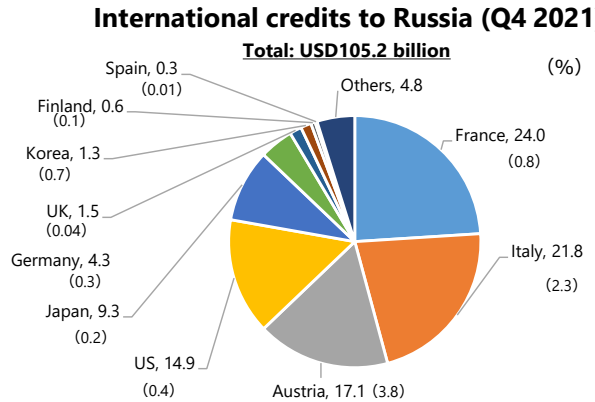


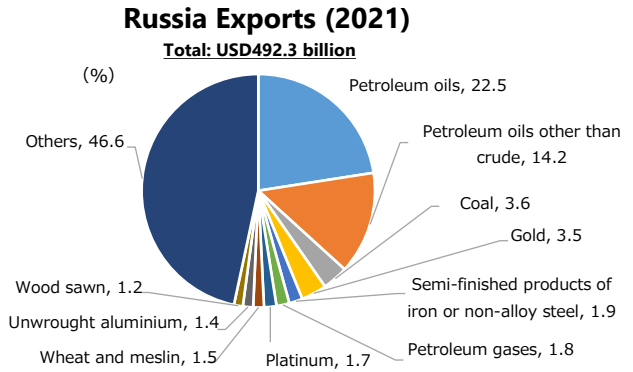


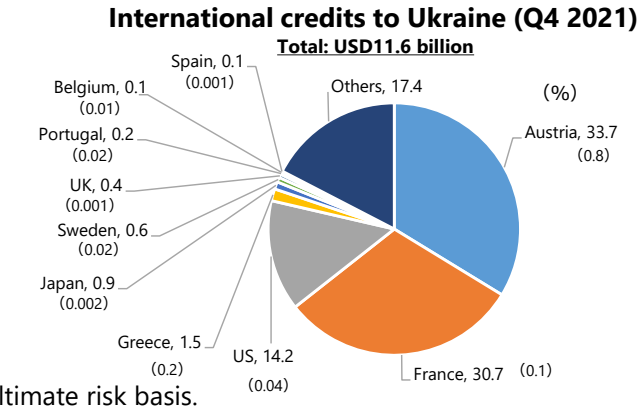
Source: CEIC.
Note 1: Terms of trade = Export price / Import price.
Note 2: As the data is based on index, terms of trade at 100 does not mean export price is equal to import price.
Note 3: Data for Norway excludes oil platforms.

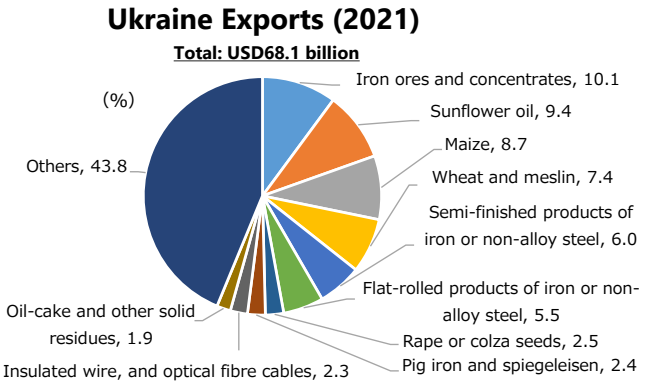
Trade and financial linkage with Russia and Ukraine

- **Despite the higher shares of some European countries in international credits to Russia and Ukraine, the Russian and Ukraine shares in the European countries are not high, suggesting limited impacts from financial linkage.**
- While limited in the total trade volume, **Russia is a major exporter of energy** (oil, oil gas), and **Ukraine is a major exporter of crops** (corn, wheat) **with the economic impacts of the aggression on individual countries differing depending on the import dependency of individual countries.**









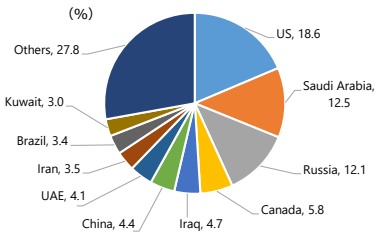
Sources: BIS, Global Trade Atlas.
Note 1: International credits are ultimate risk basis.
Note 2: Numbers in parenthesis in international credits are shares of Russia or Ukraine in international credits of respective countries.

Russia's energy exports

- **Russia exports energy-related goods to European and Asian countries. These exports are an important revenue resource for Russia, and those countries (especially European countries) are dependent on Russia for their energy consumption.**
- **Japan is a major export destination of coal and LNG for Russia.**

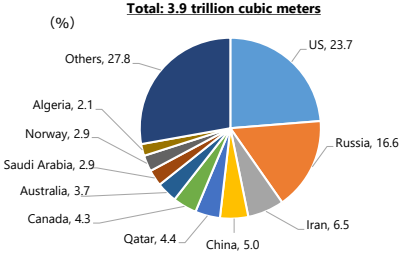
Global crude oil production (2020)

Total: 88.4 million barrels per day



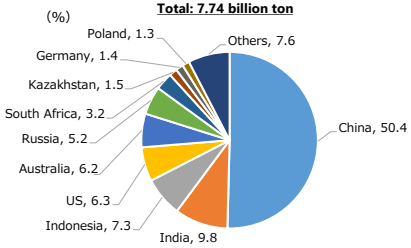
Global natural gas production (2020)

Total: 3.9 trillion cubic meters



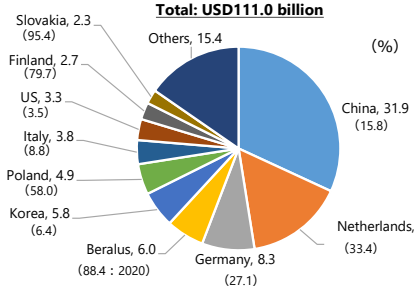
Globl coal production (2020)

Total: 7.74 billion ton



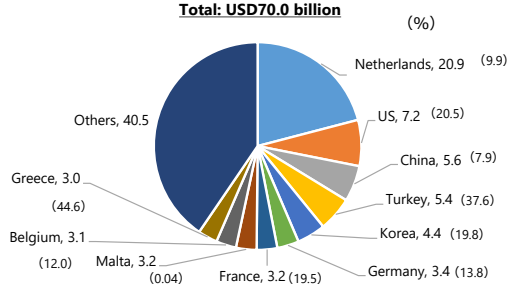
Russia oil exports (2021)

Total: USD111.0 billion



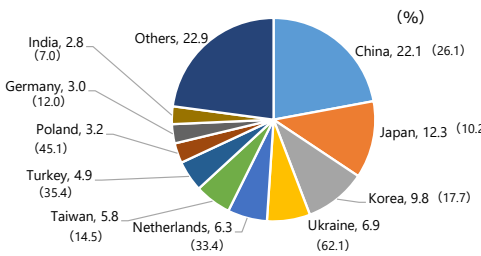
Russia oil (other than crude) exports (2021)

Total: USD70.0 billion



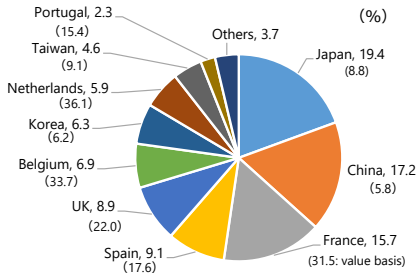
Russia coal exports (2021)

Total: USD17.6 billion



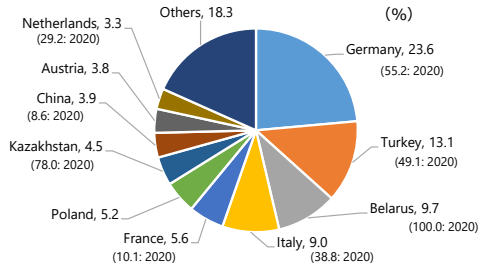
Russia LNG exports (2021)

Total: 66.1 million cubic meters



Russia gaseous natural gas exports (2021)

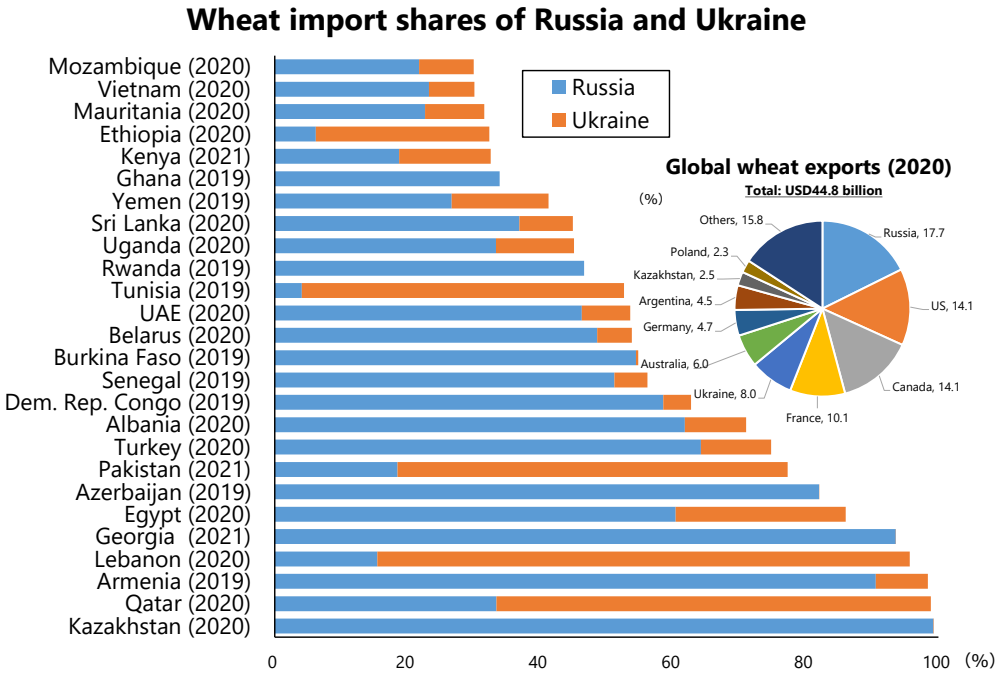
Total: 204.4 billion cubic meters

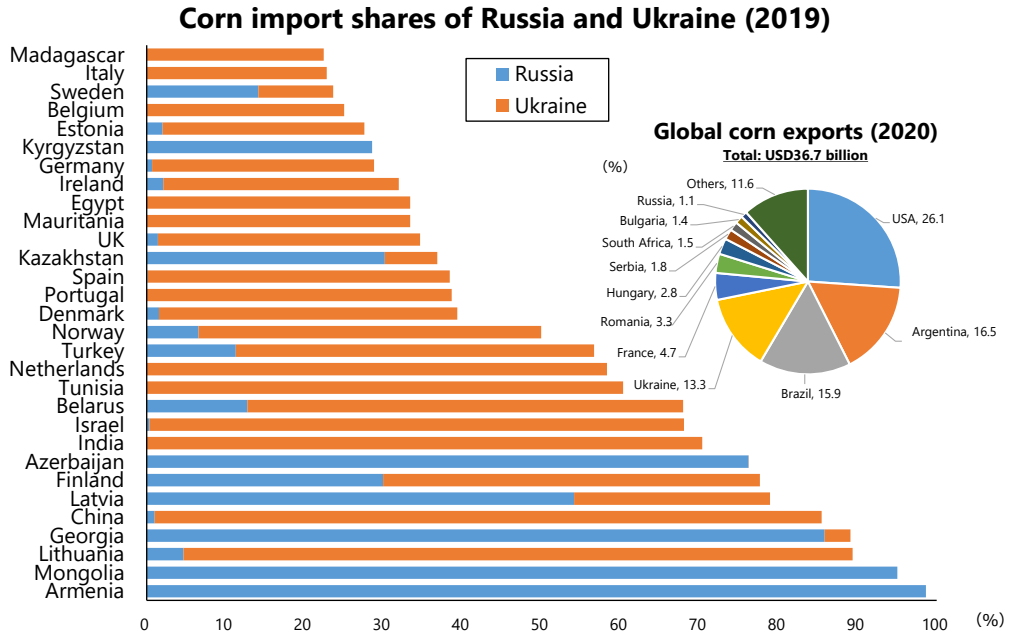


Source: Global Trade Atlas.
Note: Numbers in parenthesis are shares of imports from Russia in respective countries.

Food import dependency on Russia and Ukraine

- Russia and Ukraine are major exporters of crops. **In terms of wheat, Russia is ranked No.1 and Ukraine is ranked No.5. In terms of corn, Ukraine is ranked No.4 and Russia is ranked No.11.**
- **Developing countries (mainly Middle-East and African countries) are highly dependent on Russia and Ukraine for food imports.**

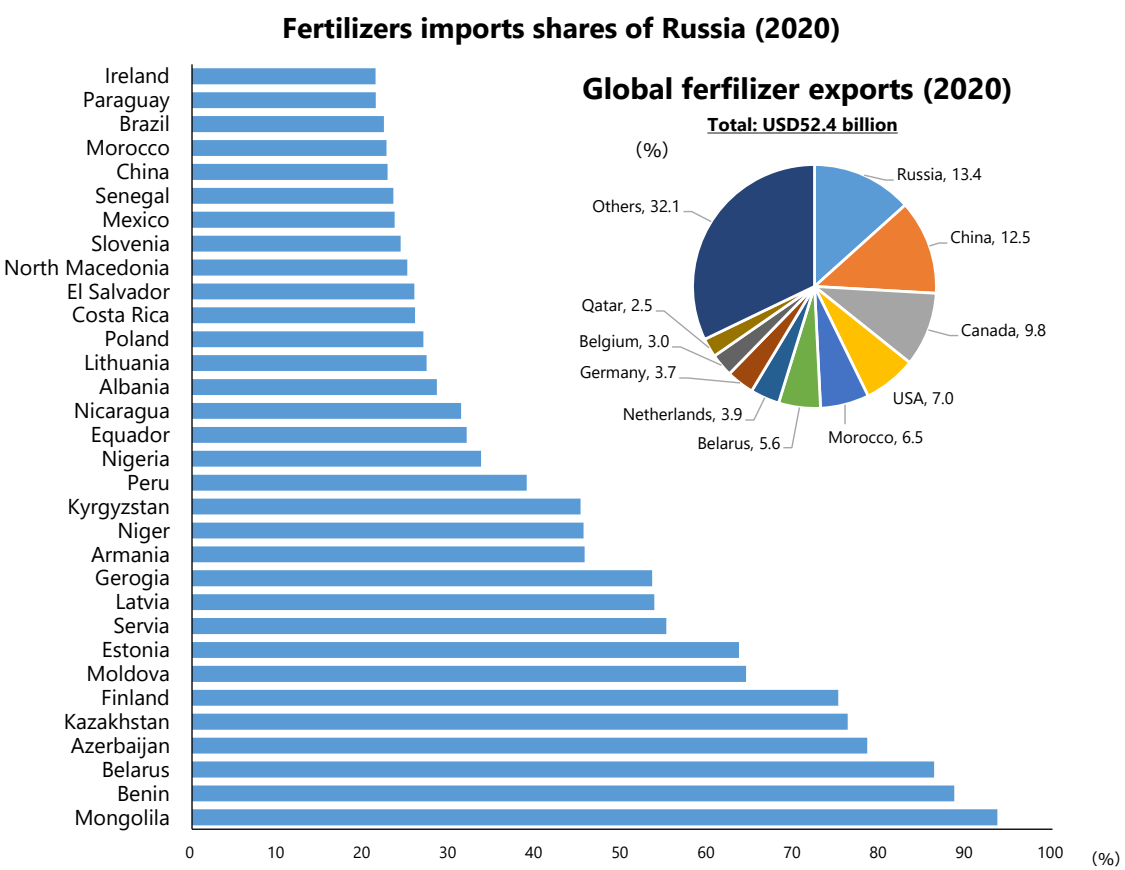




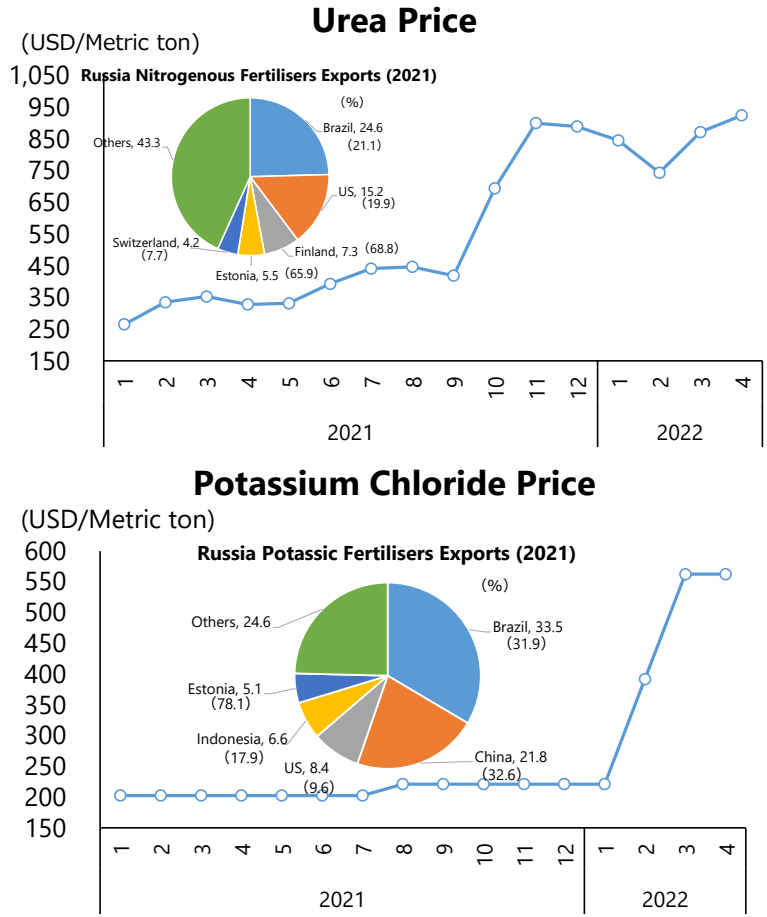
Source: UN Comtrade.
Note: Wheat (HS1001), Corn (HS1005).

Import dependency on Russian fertilizers

- **<u>Russia is the No.1 exporter of fertilizers, and emerging/developing countries are highly dependent on Russian fertilizers.</u>**
- **<u>Prices of fertilizers surged</u>** due to the aggression, raising **<u>concerns related to food security.</u>**



Source: UN Comtrade.
Note: Fertilizers (HS31).

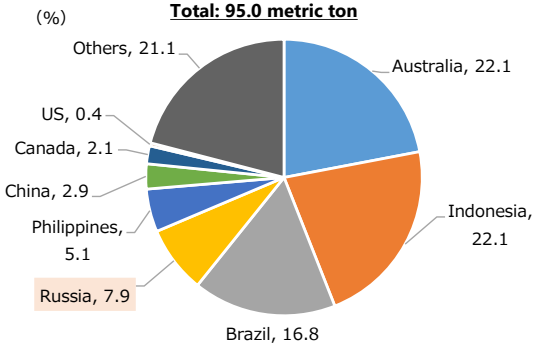


Sources: World Bank, Global Trade Atlas.

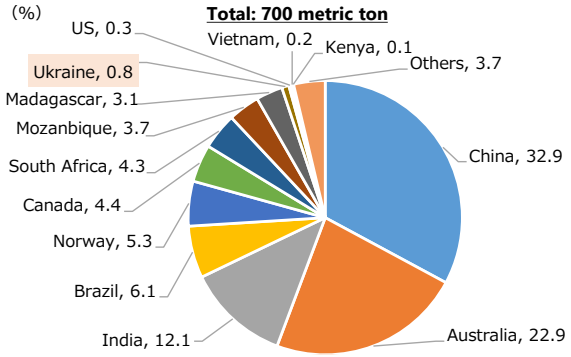
Exports of scarce goods by Russia and Ukraine

- **Russia is the No.4 holder of nickel reserves, the No.3 producer of titanium sponge, and the No.2 holder of palladium reserves, raising concerns for supply disruptions for countries with a high import dependency.**
- **Ukraine is a major producer of neon gas**, and **its export destinations** for rare gases **are countries with fine IC production technologies (South Korea, US, Taiwan), raising concerns related to supply disruptions.**

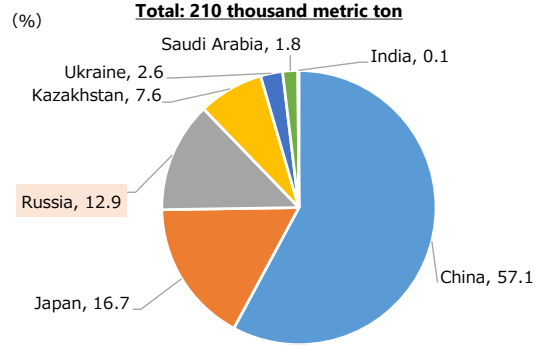
Nickel reserves



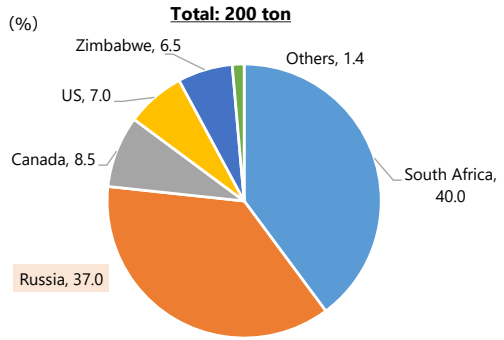
Titanium reserves



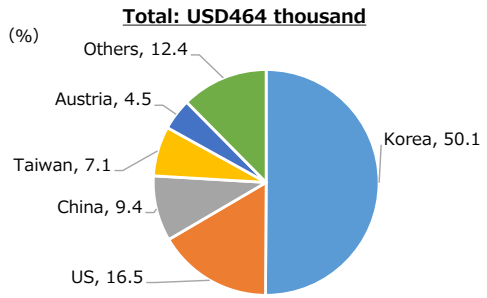
Titanium sponge production (2021)



Palladium production (2021)



Ukraine rare gas (other than argon) exports (2021)

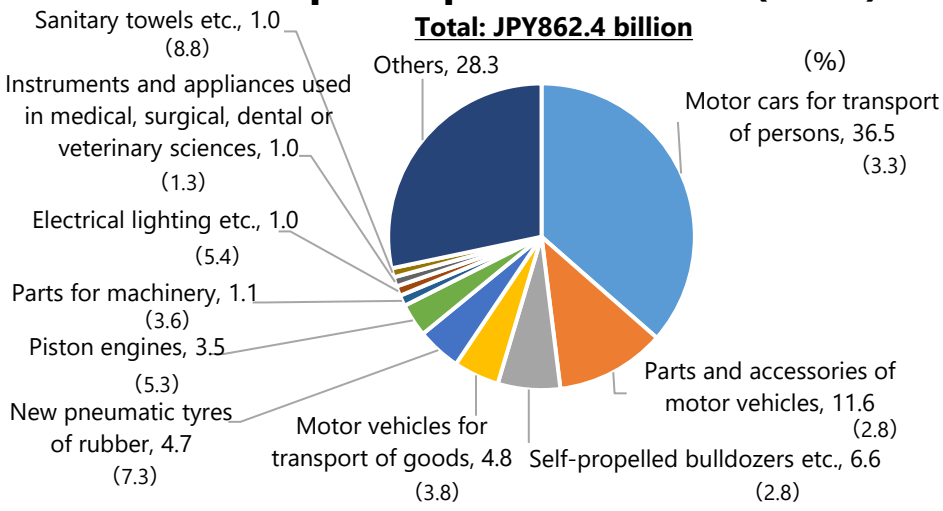


Sources: USGS, Global Trade Atlas.
Note: Rare gas other than argon (HS280429).

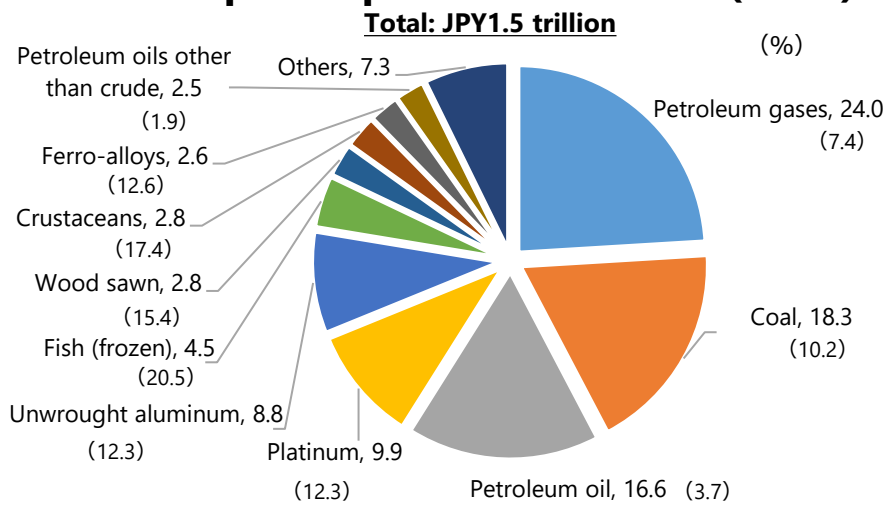
Japan-Russia trade

- Russia is not one of Japan's major trading partners, taking up 1.0% of Japan's total exports (JPY83 trillion) and 1.8% of Japan's total imports (JPY85 trillion).
- **Japan mainly exports auto and related parts to Russia, but they take up relatively small shares of total exports of those goods** (3.3% and 2.8%, respectively).
- However, **Japan mainly imports energy-related goods from Russia and is highly dependent**, if not more highly than some European countries, on some goods (7.4% of LNG, 10.2% of coal, and 3.7% of crude oil).

Japan exports to Russia (2021)



Japan imports from Russia (2021)

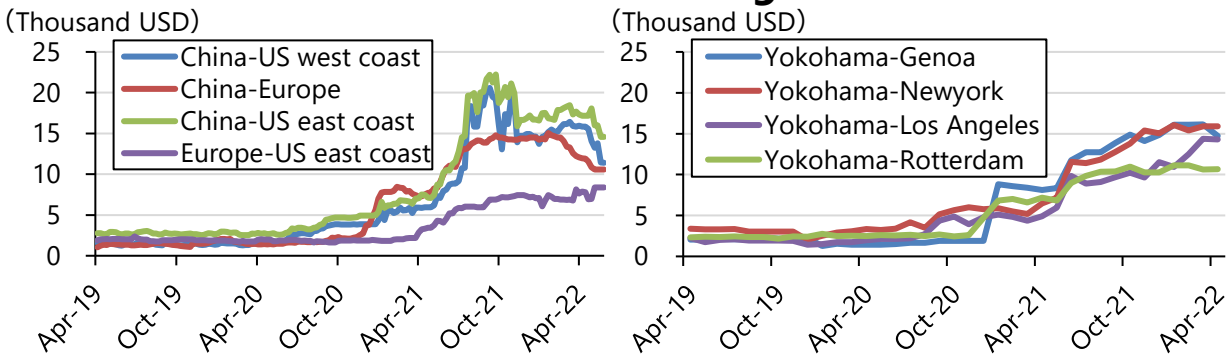


Source: Global Trade Atlas.
Note: Numbers in parenthesis are shares of exports to Russia in Japan's total exports for export side, and shares of imports from Russia in Japan's total imports for import side.

Disrupted international logistics from COVID-19 and Russia's aggression in Ukraine

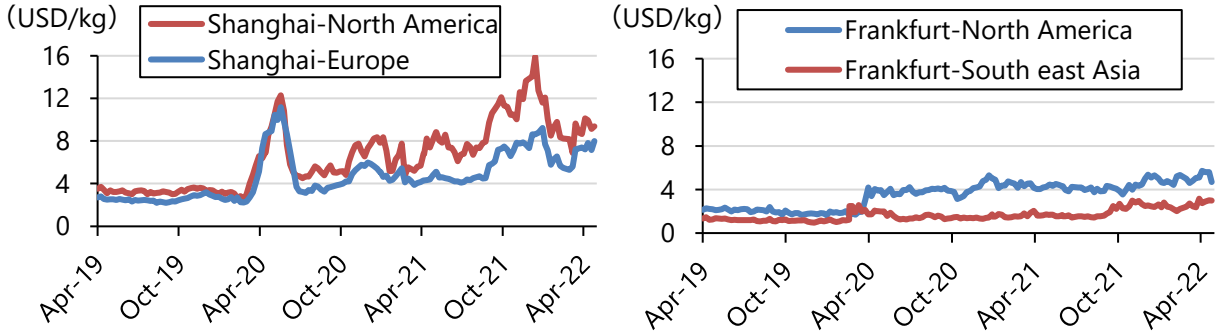
- In addition to **the asymmetric recovery of the global economy** due to COVID-19 and **the distortion of the supply-demand balance due to rapid fiscal support**, **the lockdown in China and Russia's aggression in Ukraine disrupted global supply chains.**
- The combination of **a tight container supply-demand balance in marine transportation** and **labor shortages in land transportation caused freight rates to skyrocket and flight delays**.
- **In air transportation, freight rates soared due to a shortage of cargo space** caused by **a decrease in passenger flights and rising fuel prices.**

Container freight rates



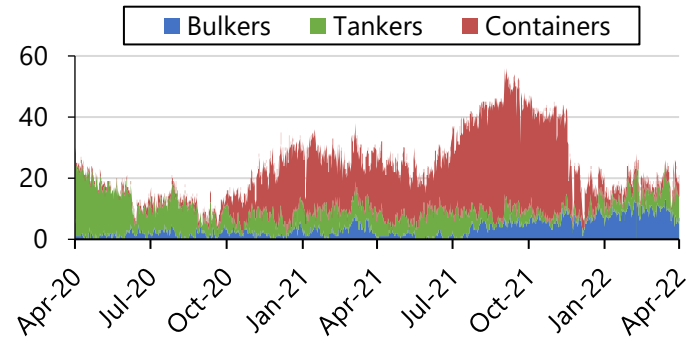
Source: Freightos, Refinitiv, Japan Maritime Center

Air cargo freight rates



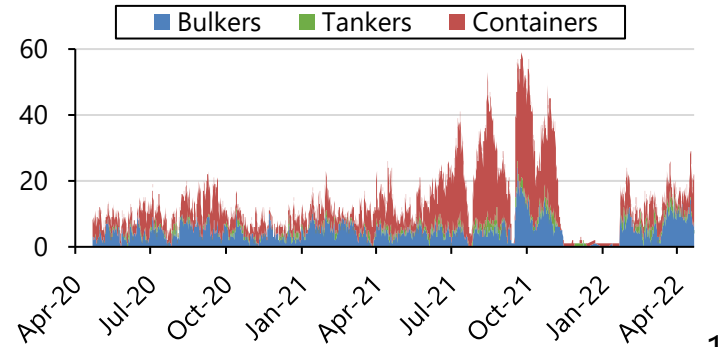
Source: TAC Air Cargo Freight Index, Refinitiv

No. of vessels at LA/LB in US



Source: Refinitiv

No. of vessels at Yangshan in China

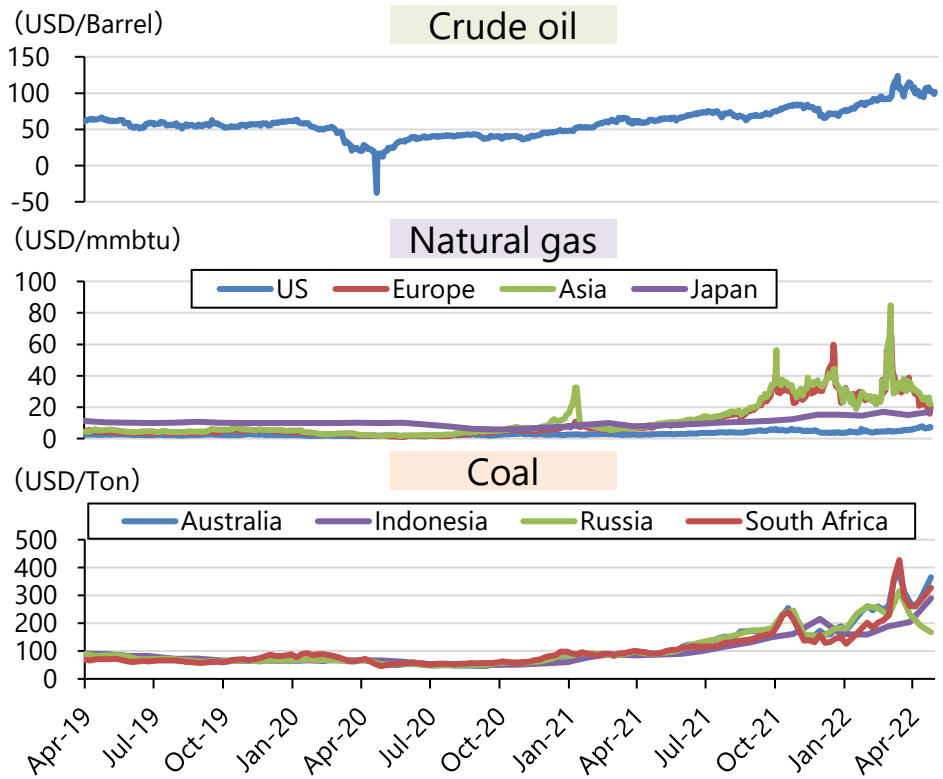


Source: Refinitiv

Deteriorating terms of trade due to a combination of soaring international energy prices and the impact of foreign exchange rates

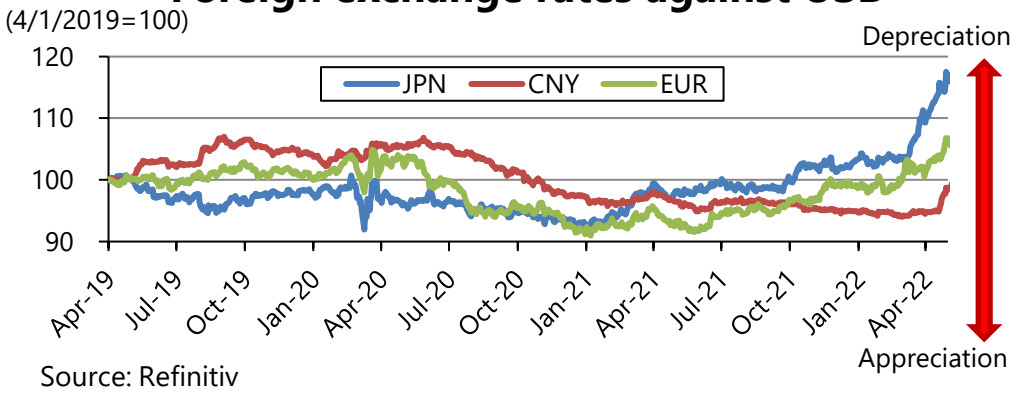
- Crude oil prices soared due to **expectations of a recovery in demand for oil as a result of the global economic recovery** in the wake of COVID-19 and **rising demand for oil as an alternative resource in response to soaring natural gas and coal prices**. The prices soared further due to **concerns over global supply cuts following Russia's aggression in Ukraine**.
- **Japan's high dependence on foreign energy sources, coupled with a weak currency, worsened its terms of trade.**

Major energy price



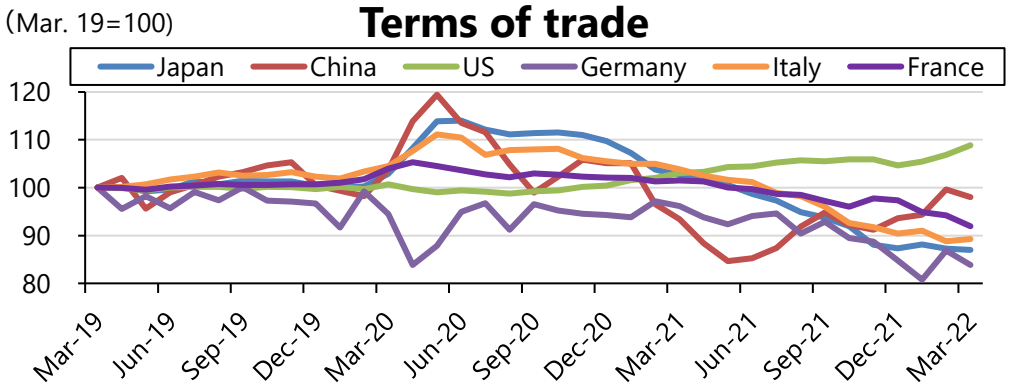
Note: Crude oil is WTI.
Source: Refinitiv, Platts

Foreign exchange rates against USD



Source: Refinitiv

Terms of trade

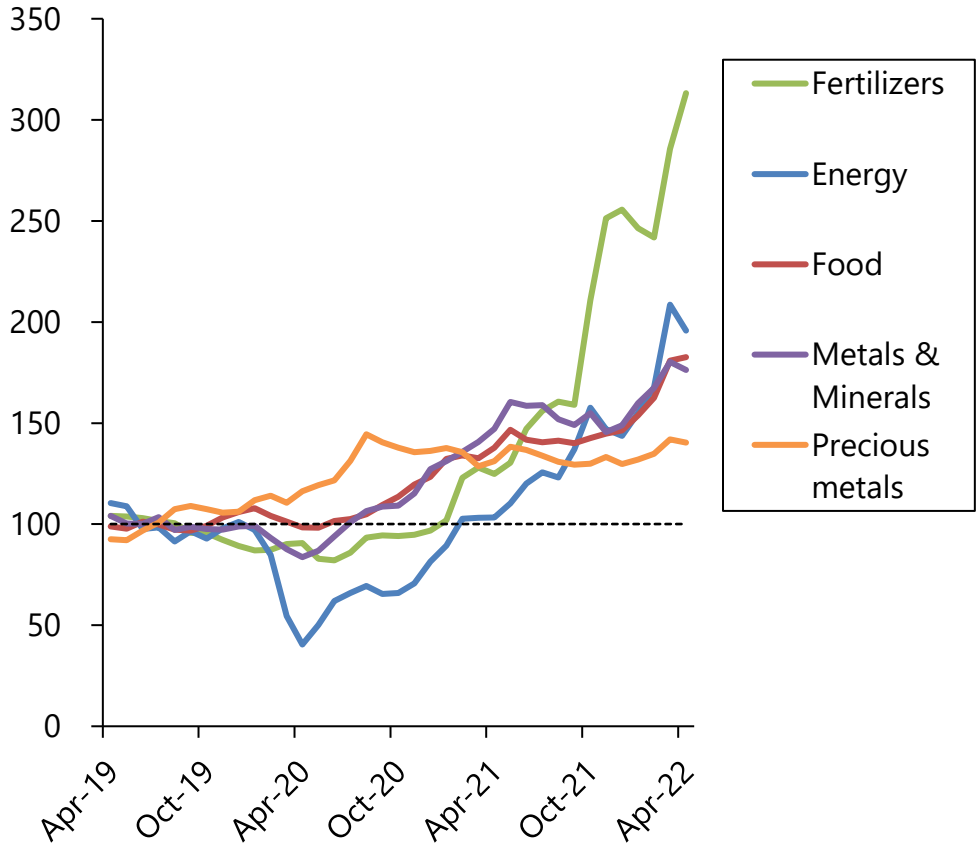


Note: Terms of trade is calculated as export price divided by import price.
Source: Bank of Japan, Insee, CEIC, Refinitiv

Rising commodity prices

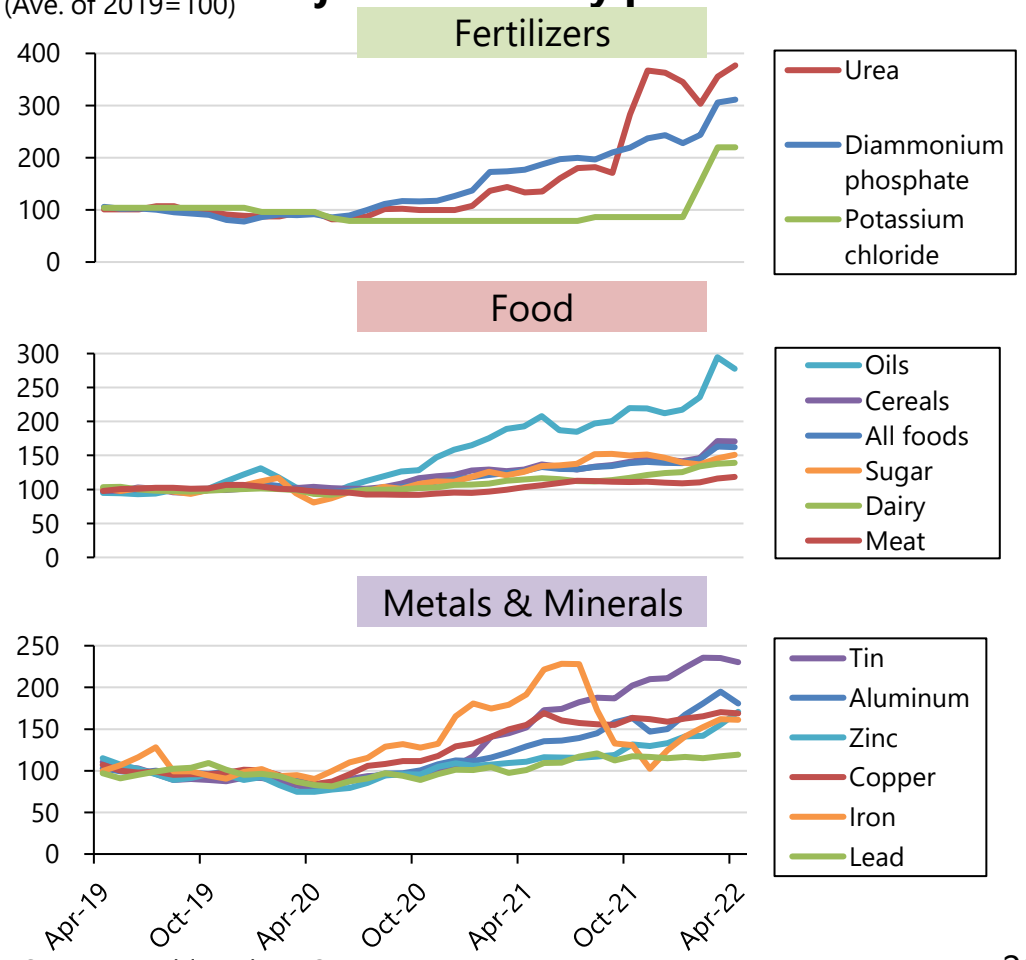
- **Logistical disruptions** from COVID-19, **food crop failures due to extreme weather conditions**, **rapid shifts in resource and energy demand toward decarbonization**, and **distortions and partial disruptions in the supply chain supply-demand balance in the wake of Russia's aggression against Ukraine have caused rising commodity prices**, **affecting energy security and food security.**

(Ave. of 2019=100) **Commodity price indices**



Notes: Dashed line is average of 2019.
Source: World Bank

(Ave. of 2019=100) **Major commodity price indices**

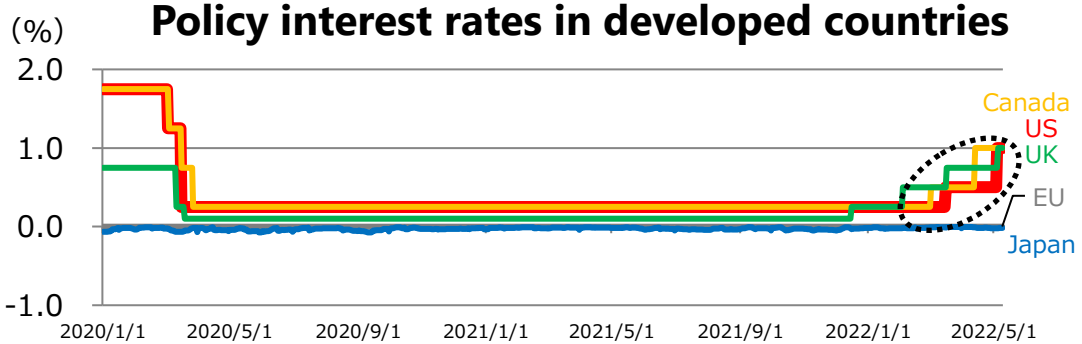


Source: World Bank, FAO

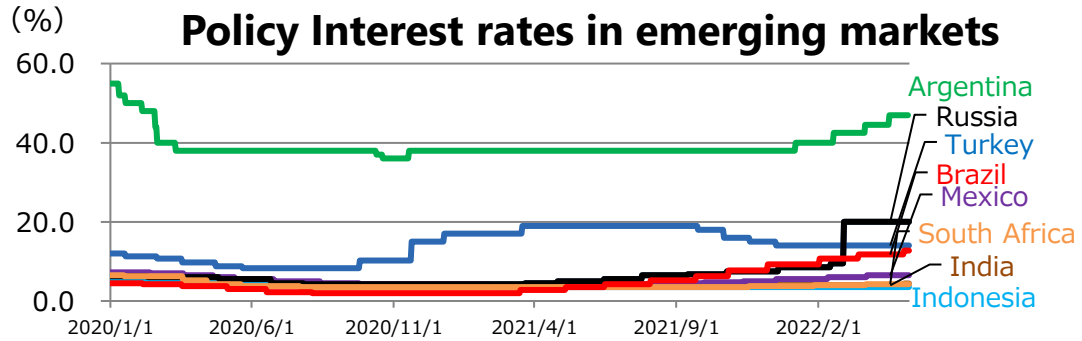
Acceleration of monetary policy normalization and its impact on emerging-market currencies

- **Monetary policy normalization**, including interest rates hikes and reduction in the pace of net asset purchases, **is ongoing in the US and other advanced countries**. This raised concerns about capital outflows and currency depreciation in emerging markets.
- **Emerging countries have been raising interest rates because of rising inflation and to defend the currencies, and it will weigh on economic growth**. Regarding emerging-market currencies, resource-rich countries tend to be appreciated while non- resource-rich countries tend to be depreciated due to commodity inflation.

Policy interest rates in developed countries



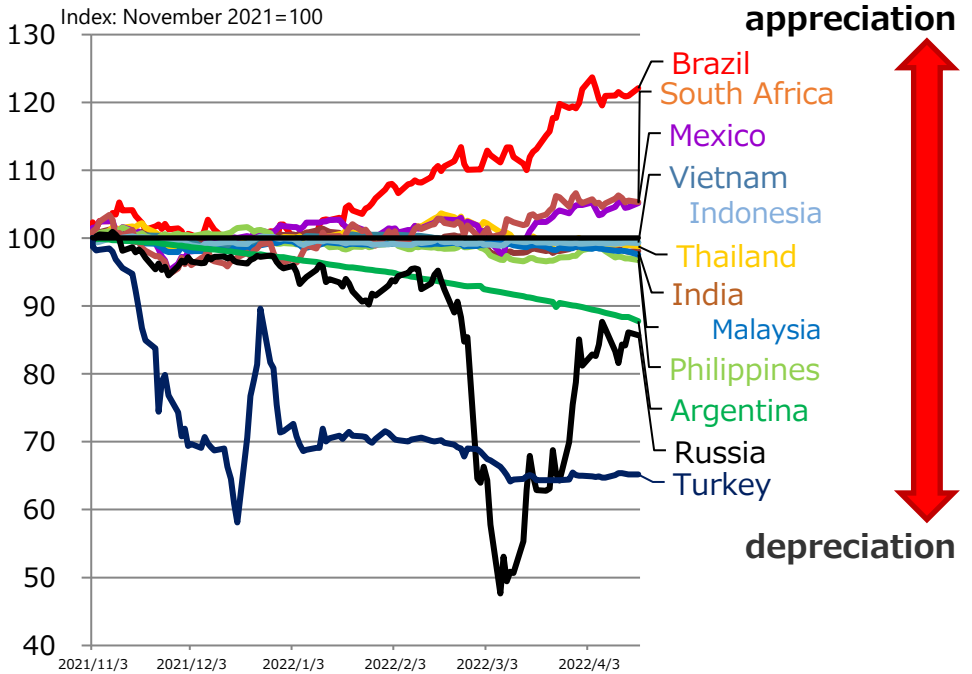
Policy Interest rates in emerging markets



Source : Refinitiv

Exchange rates

(Emerging-market currencies to USD)



Source : Refinitiv

Strong economic fundamentals of emerging markets and increasing uncertainty

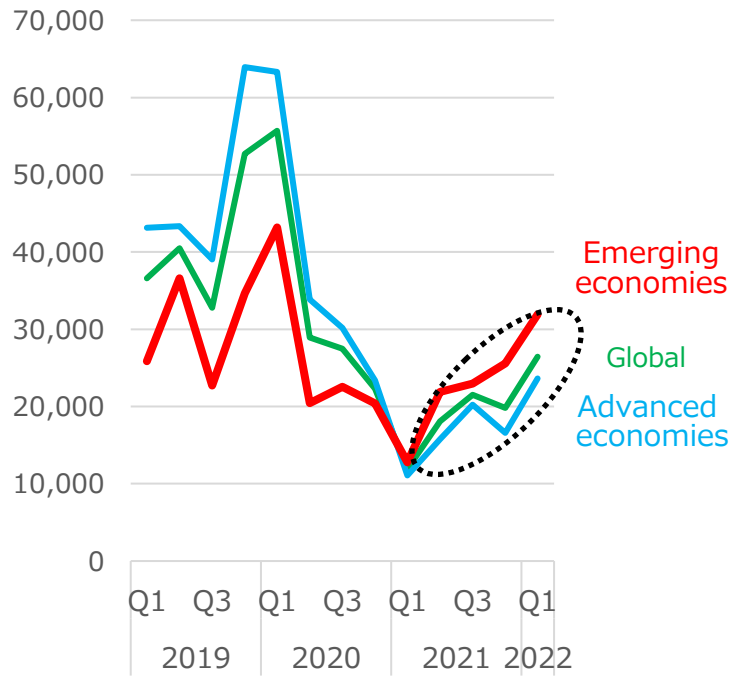
- Building on past experiences (e.g., global financial crisis), **many emerging markets have improved economic fundamentals. Dramatic capital outflow pressure is under control with only limited impacts.**
- **Uncertainty is increasing due to rising energy/food prices caused by Russia's aggression against Ukraine and political instability triggered by the rising prices.** It is necessary to pay close attention to the future movement.

Emerging markets vulnerability heatmap

	Real GDP growth (%)			Inflation(%)			Current account balance (as % of GDP) (%)			Fiscal balance (as % of GDP) (%)			Foreign exchange reserves (as % of GDP) (%)			Gross government debt (as % of GDP) (%)			External debt (as % of GDP) (%)			External debt (short-term) (as % of GDP) (%)		
	2013	2020	2021	2013	2020	2021	2013	2020	2021	2013	2020	2021	2013	2020	2021	2013	2020	2021	2013	2020	2021	2013	2020	2021
Argentina	2.4	-9.9	10.2	10.6	42.0	48.4	-2.1	0.9	1.3	-3.3	-8.6	-4.6	5.0	7.0	6.2	43.5	102.8	80.6	25.5	70.7	55.9	11.0	18.6	15.3
India	6.4	-6.6	8.9	9.4	6.2	5.5	-1.7	0.9	-1.6	-7.0	-12.8	-10.4	15.8	28.7	30.1	67.7	90.1	86.8	22.4	20.9	21.2	5.3	4.0	3.8
Indonesia	5.6	-2.1	3.7	6.4	2.0	1.6	-3.2	-0.4	0.3	-2.2	-6.1	-4.6	10.8	15.3	16.8	24.8	39.8	42.8	29.2	39.4	35.0	4.7	4.1	4.1
Thailand	2.7	-6.2	1.6	2.2	-0.8	1.2	-2.1	4.2	-2.1	0.5	-4.7	-7.8	39.8	63.4	61.3	42.2	49.8	58.0	35.8	36.8	38.2	14.7	15.0	14.7
Turkey	8.5	1.8	11.0	7.5	12.3	19.6	-5.8	-4.9	-1.8	-1.5	-5.1	-3.5	13.7	10.0	12.9	31.2	39.5	41.6	42.3	60.4	54.3	14.9	15.9	14.8
Philippines	6.8	-9.6	5.6	2.6	2.4	3.9	4.0	3.2	-1.8	0.2	-5.7	-6.5	29.3	37.0	35.5	43.8	51.7	57.5	27.6	27.2	27.0	6.0	3.9	3.8
Brazil	3.0	-3.9	4.6	6.2	3.2	8.3	-3.2	-1.7	-1.7	-3.0	-13.3	-4.4	14.5	14.5	20.1	60.2	98.7	93.0	19.7	38.3	35.3	1.3	4.8	4.9
Vietnam	5.6	2.9	2.6	6.6	3.2	1.9	3.6	4.4	-0.5	-6.0	-3.9	-4.2	12.4	41.0	46.4	41.4	41.7	40.2	37.3	47.9	–	7.1	9.8	–
Malaysia	4.7	-5.6	3.1	2.1	-1.1	2.5	3.4	4.2	3.5	-3.5	-4.6	-5.5	41.1	31.4	38.8	55.7	67.8	69.0	68.4	67.6	69.3	33.3	25.9	25.5
South Africa	2.5	-6.4	4.9	5.8	3.3	4.5	-5.3	2.0	3.7	-3.9	-9.7	-6.4	12.4	14.4	16.6	40.4	69.4	69.1	34.0	50.8	38.5	6.8	8.3	6.5
Mexico	1.4	-8.2	4.8	3.8	3.4	5.7	-2.5	2.4	-0.4	-3.7	-4.4	-3.8	14.1	15.1	17.7	45.9	60.3	57.6	31.0	42.3	34.7	7.4	4.9	4.2
Russia	1.8	-2.7	4.7	6.8	3.4	6.7	1.5	2.4	6.9	-1.2	-4.0	0.7	22.3	29.1	46.5	12.3	19.2	17.0	31.8	31.4	27.0	3.9	4.1	4.8

Sources： IMF WEO, CEIC Database, World Bank

World Trade Uncertainty Index

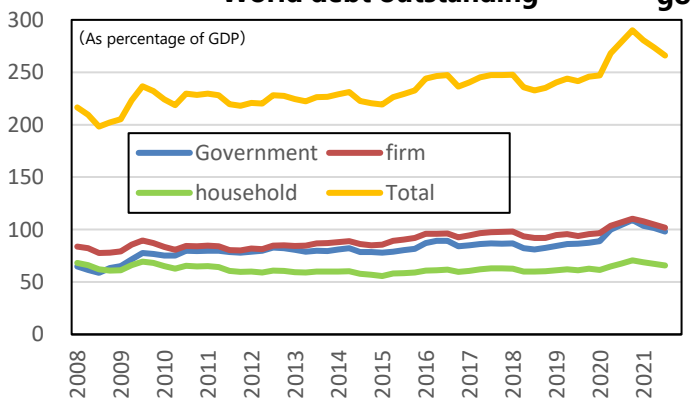


Notes：GDP weighted average
Source：World Uncertainty Index（WUI）

Increasing government debt, and trends of inflation and interest rates

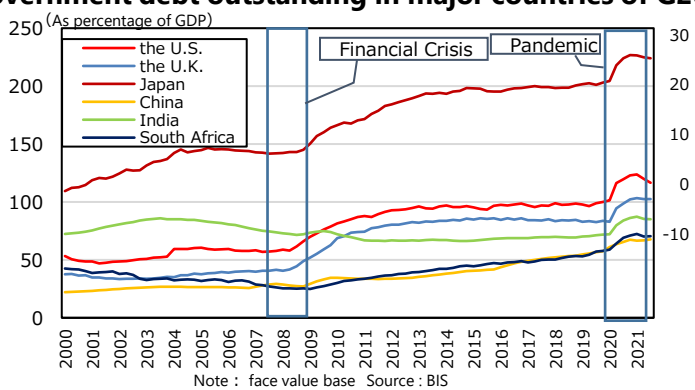
- **World debt had increased** with the prolonged period of **low interest rates,** and **the pandemic accelerated** business cycles and **the increase.**
- **The increase of government debt is staggering due to policy measures such as large-scale economic measures under the pandemic.**
- **The transition of inflation and interest rates are the keys for the stability of debt. Prolonged inflation may enhance the possibility of an earlier-than-expected or a larger rise of interest rates.**

World debt outstanding



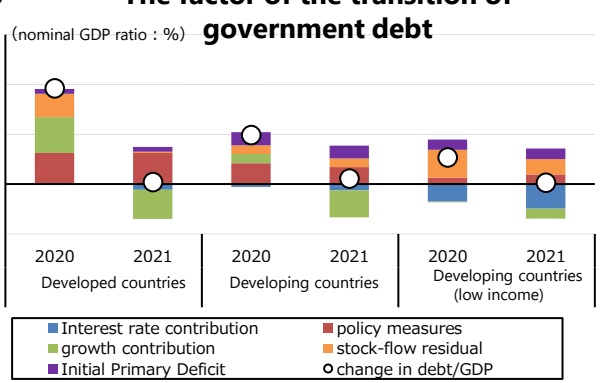
Source : BIS

government debt outstanding in major countries of G20



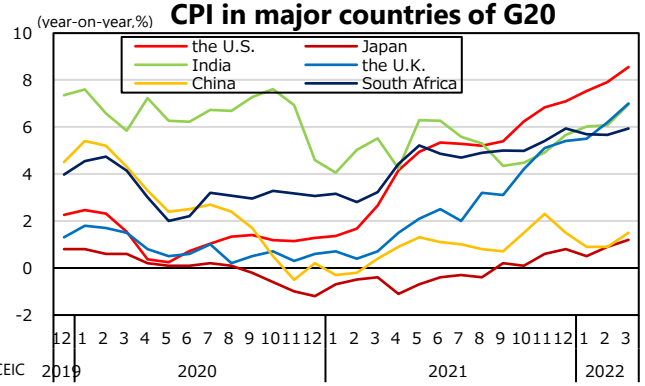
Note： face value base Source : BIS

The factor of the transition of government debt



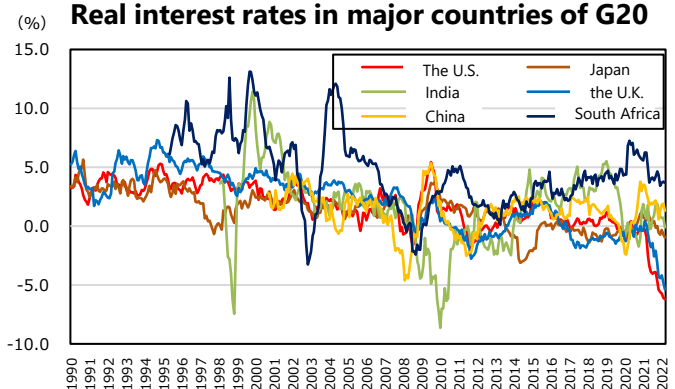
Note：stock-flow residual includes the value change caused by the change of exchange rates
Source：Fiscal Monitor October 2021

CPI in major countries of G20



Source : CEIC

Real interest rates in major countries of G20

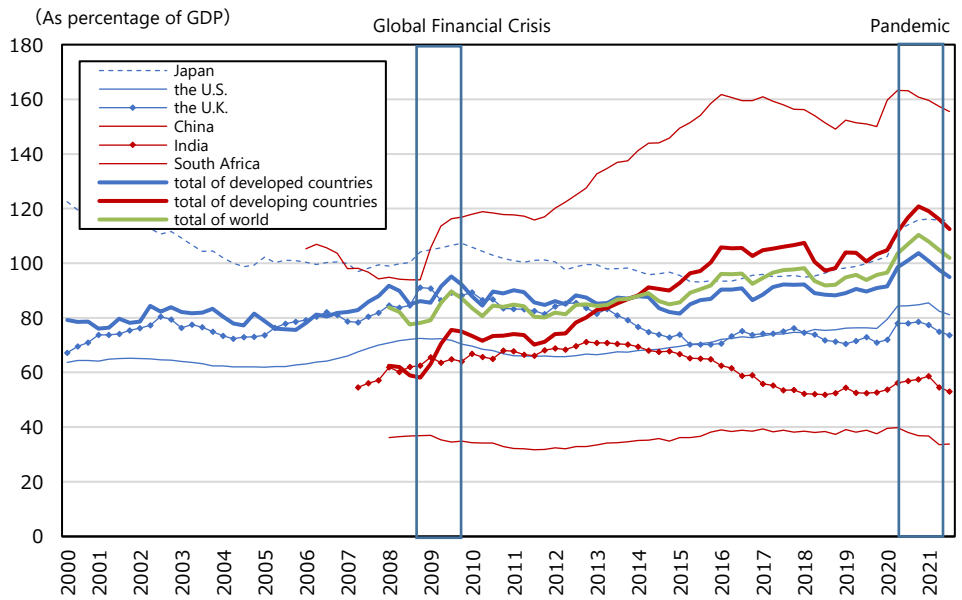


Source : Refinitiv , CEIC

Mounting Private debt

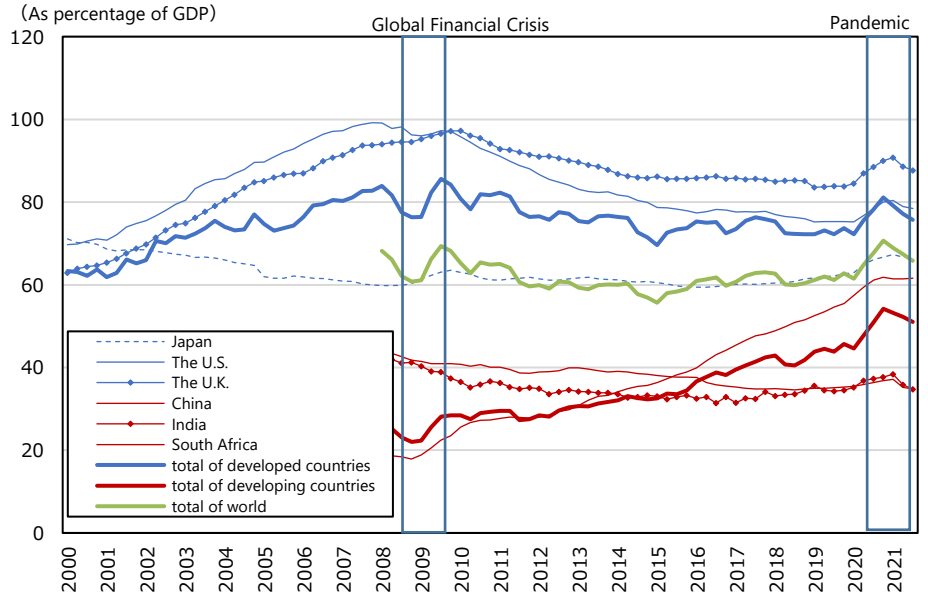
- **<u>Corporate debt has increased with low interest rates and financial difficulties under the pandemic. Leveraged loan and real estate mortgage loan are on the rise. The downgrade of bond ratings</u>** corresponding to the rise of credit risk **<u>might worsen firm's funding conditions.</u>**
- **<u>Household debt has increased because of economic difficulties under the pandemic and housing loans</u>, in conjunction with an increase in card, car and student loans. It is necessary to pay attention to the potential influence of rising interest rates on household debt.**

Firm debt outstanding of major countries in G20



Note：face value base Source : BIS

Firm debt outstanding of major countries in G20



Note：face value base Source : BIS

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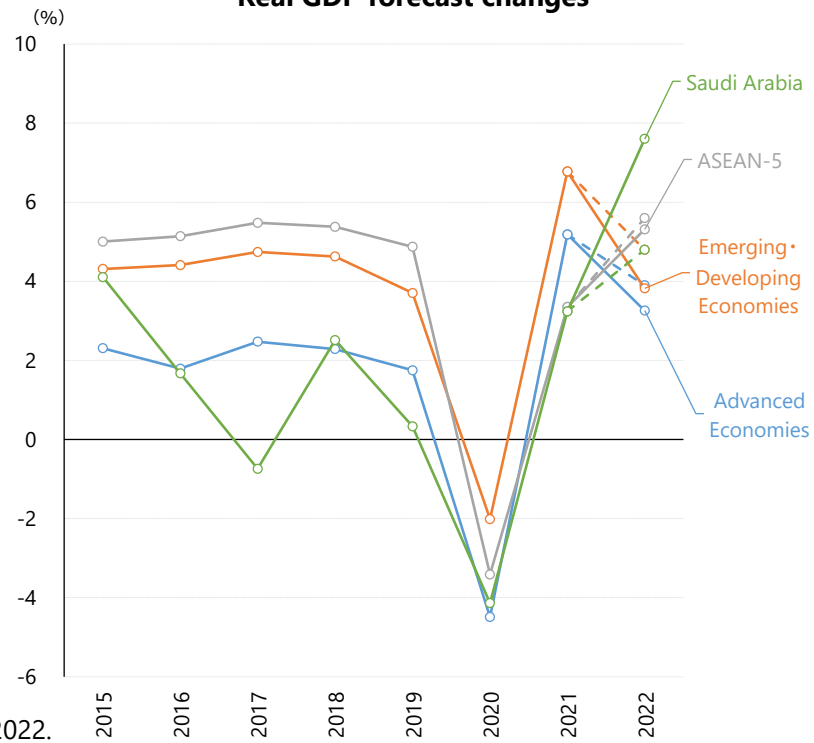
Uncertain global economic outlook due to the aggression

- **The IMF's global growth forecast in 2022 was revised down** due to the aggression **(4.4%→3.6%) with severe impacts expected on commodity importers while some commodity exporters are excepted.** Among advanced economies, **Eurozone forecast was significantly affected (3.9%→2.8%), while the US and Canada are moderately revised down with Japan somewhat in between (3.3%→2.4%）.**
- **The impact of high inflation on household consumption due to a surge in commodity prices and further economic disruptions by the prolonged aggression pose further downside risks.**

Real GDP Forecasts

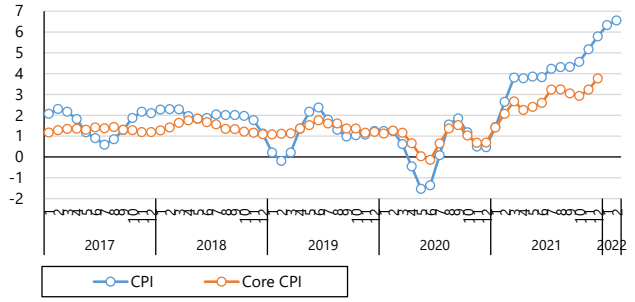
(%)	2020	2021	2022	2023
World	-3.1	6.1	3.6 (-0.8)	3.6 (-0.2)
Advanced Economies	-4.5	5.2	3.3 (-0.6)	2.4 (-0.2)
US	-3.4	5.7	3.7 (-0.3)	2.3 (-0.3)
Germany	-4.6	2.8	2.1 (-1.7)	2.7 (0.2)
France	-8.0	7.0	2.9 (-0.6)	1.4 (-0.4)
Italy	-9.0	6.6	2.3 (-1.5)	1.7 (-0.5)
Spain	-10.8	5.1	4.8 (-1.0)	3.3 (-0.5)
Japan	-4.5	1.6	2.4 (-0.9)	2.3 (0.5)
UK	-9.3	7.4	3.7 (-1.0)	1.2 (-1.1)
Canada	-5.2	4.6	3.9 (-0.2)	2.8 (0.0)
Other Advanced Economies	-3.9	5.0	3.1 (-0.5)	3.0 (0.1)
Emerging・Developing Economies	-2.0	6.8	3.8 (-1.0)	4.4 (-0.3)
Asia Emerging・Developing Economies	-0.8	7.3	5.4 (-0.5)	5.6 (-0.2)
China	2.2	8.1	4.4 (-0.4)	5.1 (-0.1)
India	-6.6	8.9	8.2 (-0.8)	6.9 (-0.2)
ASEAN-5	-3.4	3.4	5.3 (-0.3)	5.9 (-0.1)
Europe Emerging・Developing Economies	-1.8	6.7	-2.9 (-6.4)	1.3 (-1.6)
Russia	-2.7	4.7	-8.5 (-11.3)	-2.3 (-4.4)
Latin & Caribbean Emerging・Developing Economies	-7.0	6.8	2.5 (0.1)	2.5 (-0.1)
Brazil	-3.9	4.6	0.8 (0.5)	1.4 (-0.2)
Middle East & Central Asia Emerging・Developing Economies	-2.9	5.7	4.6 (0.3)	3.7 (0.1)
Saudi Arabia	-4.1	3.2	7.6 (2.8)	3.6 (0.8)
Sub-Saharan Africa	-1.7	4.5	3.8 (0.1)	4.0 (0.0)

Real GDP forecast changes



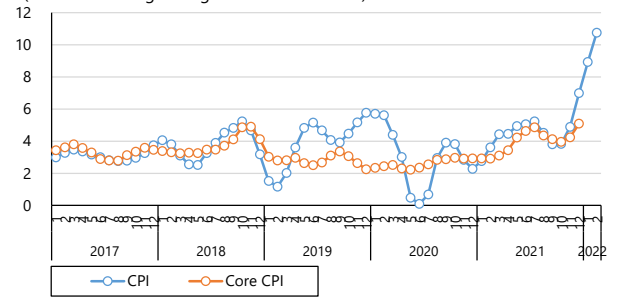
Inflation in advanced economies

(3-month moving average: annualized rate %)



Inflation in emergin & developing economies

(3-month moving average: annualized rate %)



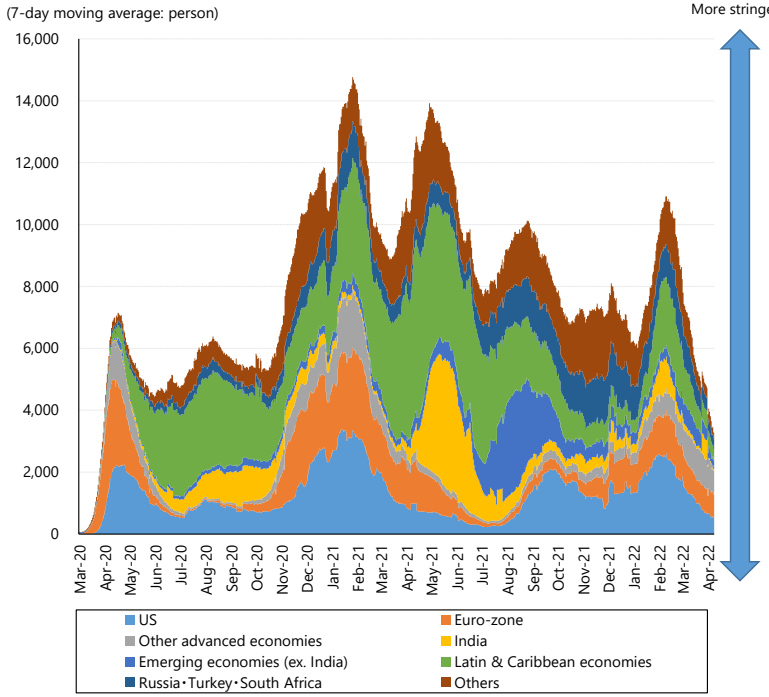
Source: IMF World Economic Outlook April 2022.

Note: Numbers in parenthesis are changes from previous forecasts in Jan 2022. Dotted lines are forecasts as of Jan 2022 and real lines are forecasts as of Apr 2022.

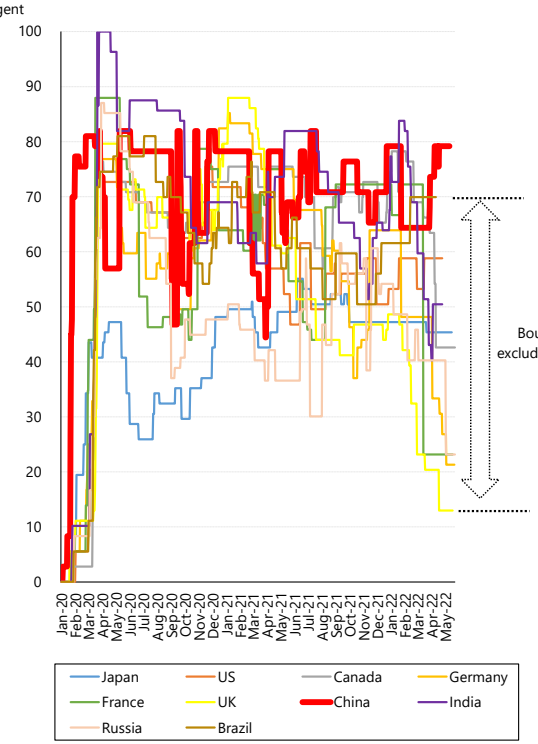
COVID-19 versus resilient demand for face-to-face economic activities

- **<u>Stringent COVID-19 policy eased on the whole with declining casualties.</u>**
- While the pandemic accelerated digitalization process and online businesses expanded rapidly. **<u>The rise of online retail sales shares looks to level off</u>**, suggesting **<u>resilient demand for face-to-face economic activities and their co-existence.</u>**

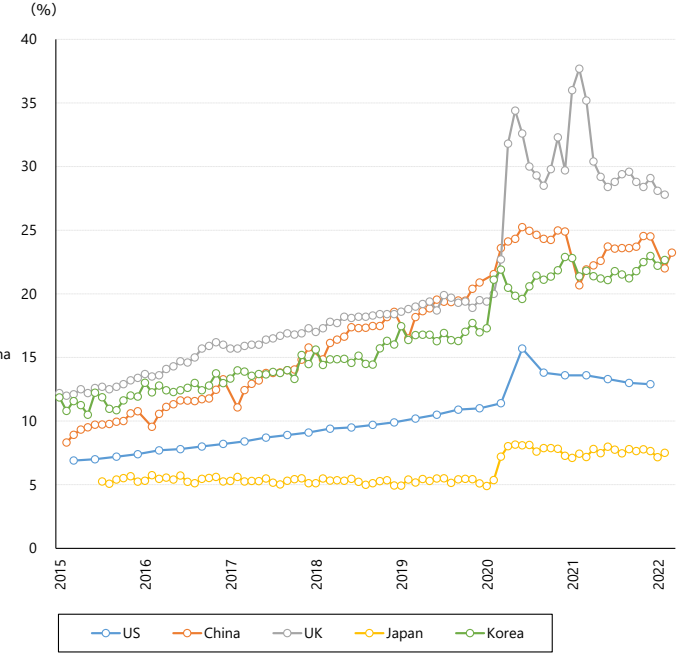
COVID-19 casualties



COVID-19 policy stringency index



Shares of non-store retailers in total retails sales

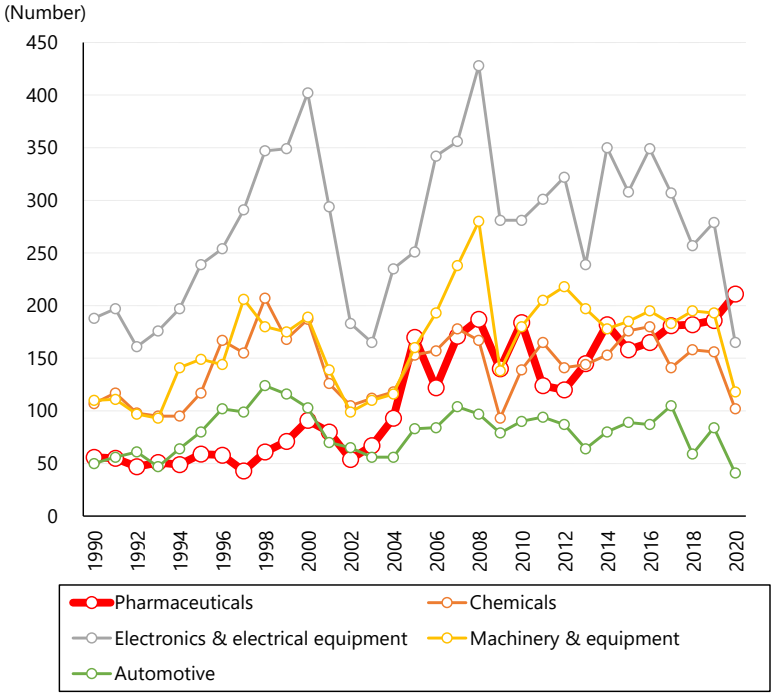


Sources: Oxford COVID-19 Government Response Tracker, IMF World Economic Outlook, National Bureau of Statistics of China, Office of National Statistics, Ministry of Economy, Industry, and Trade, Statistics Korea, CEIC.

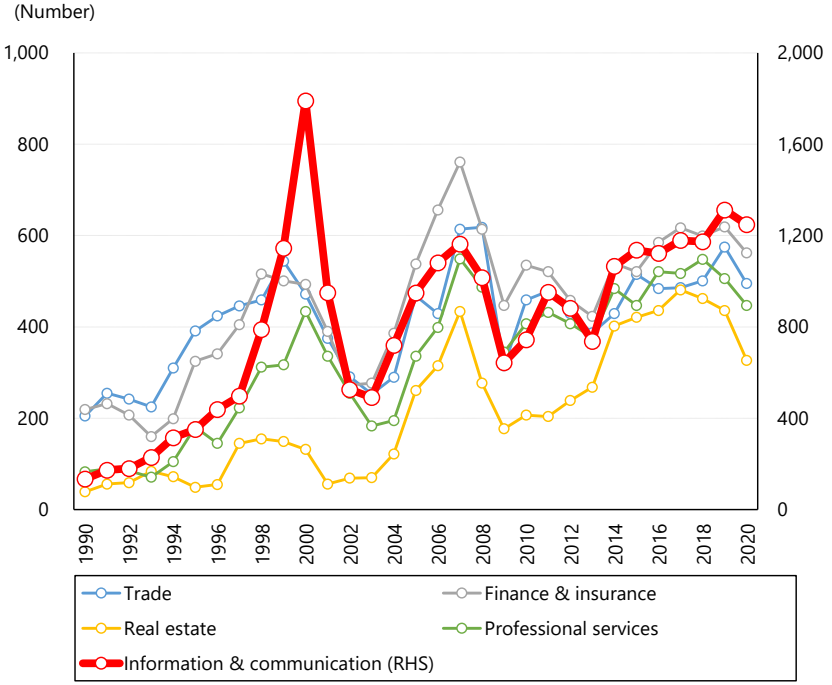
Cross-border M&A amid COVID-19 pandemic

- Despite downward pressure on economic activities under the pandemic, **the number of cross-border M&A deals has increased in pharmaceutical and only modestly declined in information communications.**
- Those trends suggest **persistent needs for the strengthening of vaccine development, medical goods supply chains, and networks of online services companies, and in some sectors, aggressive actions for resilient supply chains construction, and, on the whole, market shares expansion.**

Cross-border M&A in manufacturing industry



Cross-border M&A in non-manufacturing industry

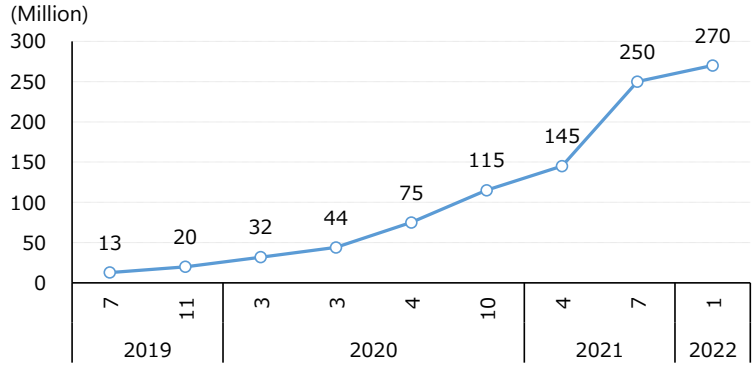


Source: UNCTAD World Investment Report 2021.
Note: Based on acquired side data.

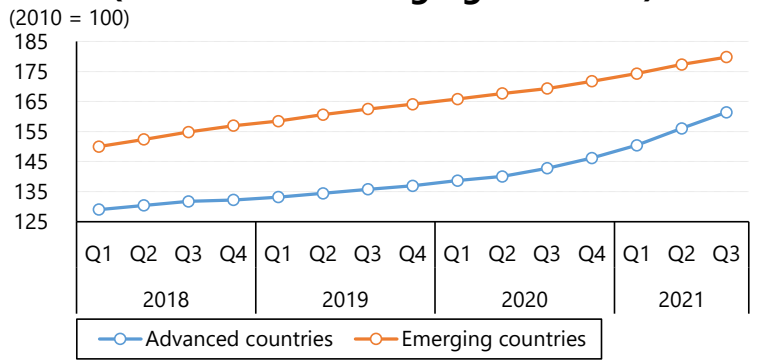
Impact of COVID-19 on real estate market

- COVID-19 **diffused a wider variety of work styles such as work-from-home**, and, coupled with accommodative monetary conditions, **stimulated housing demand while weakening demand for office sites, causing a surge in housing prices and a decline in office rents.**

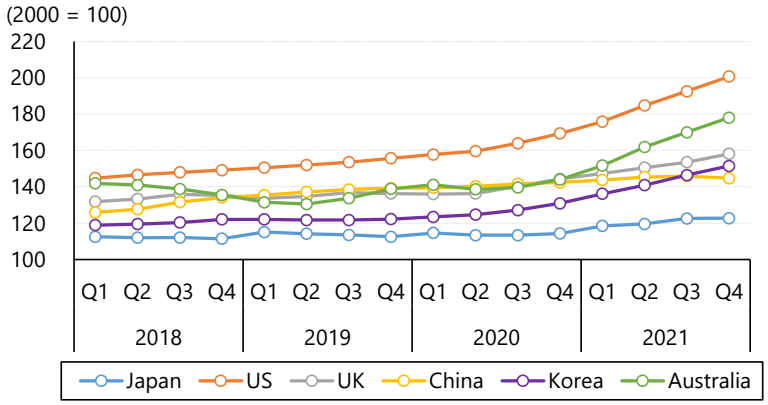
Microsoft Teams monthly active users



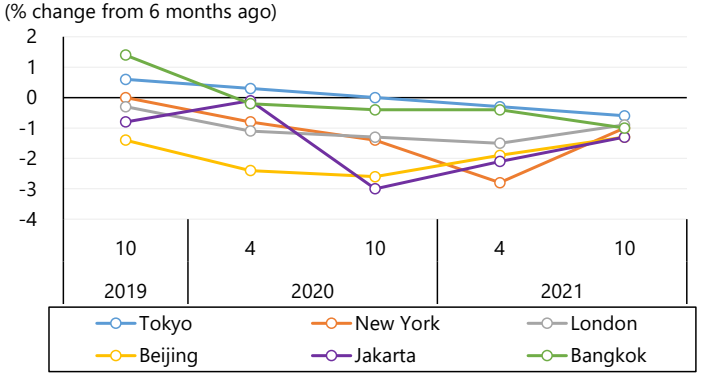
Residential property prices (advanced & emerging countries)



Residential property prices



Office rents of major cities

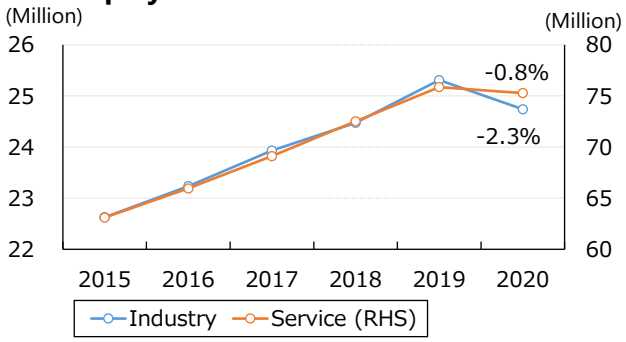


Sources: Microsoft, BIS, Japan Real Estate Institute.

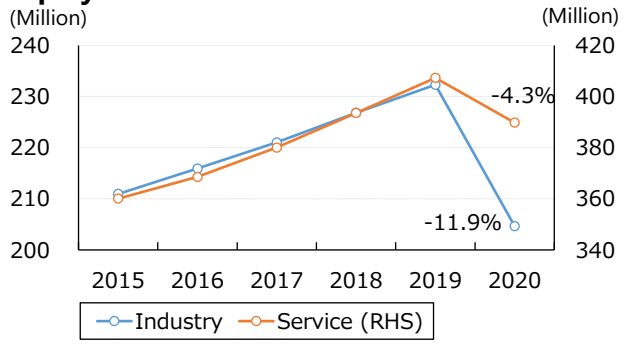
Impact of COVID-19 on employment through supply chain linkage

- **<u>Industrial employment in low-middle income countries are more severely affected</u>** by the COVID-19 pandemic.
- **<u>Emerging and developing countries are more integrated into global supply chains</u> and the pandemic likely had <u>repercussion impacts from the global downside pressure on manufacturing employment</u> in middle-income countries.**

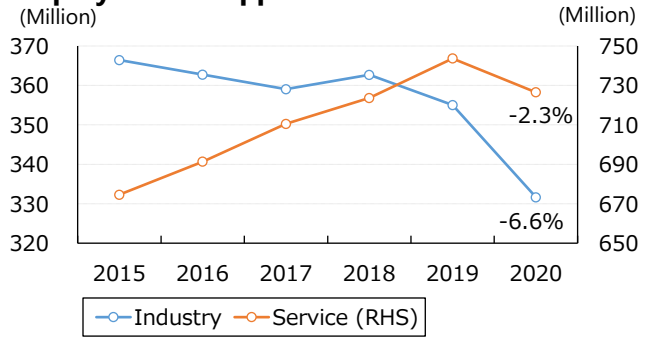
Employment in low-income countries



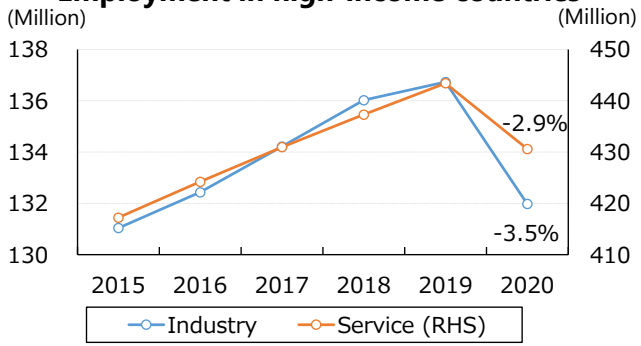
Employment in lower middle-income countries



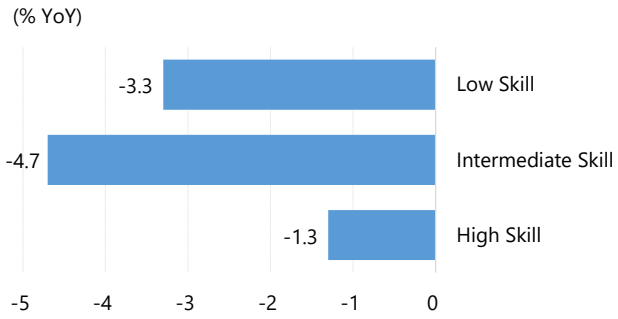
Employment in upper middle-income countries



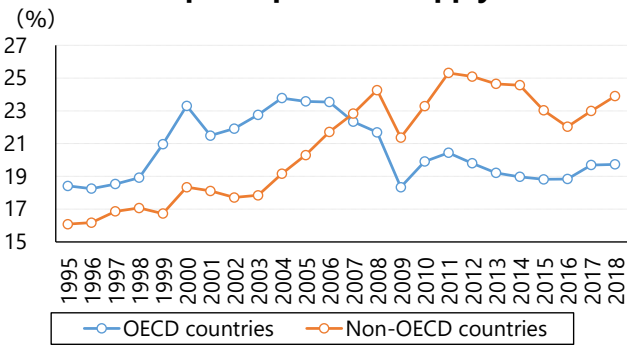
Employment in high-income countries



Employment changes by skill (2020)



Forward participation in supply chain



Sources: ILO, OECD.

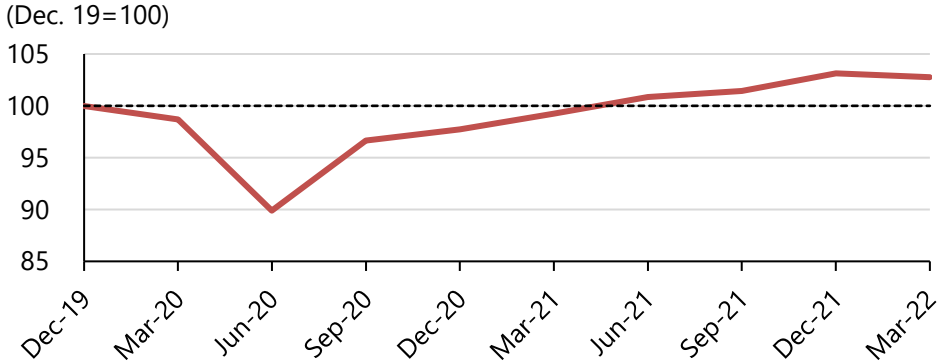
Note 1: Skill classification is based on ISCO-08. Low skill includes groups 6 & 9 (Skilled Agricultural, Forestry and Fishery Workers, Elementary Occupations), intermediate skill includes groups 4, 5, 7, & 8 (Clerical Support Workers, Services and Sales Workers, Craft and Related Trades Workers, Plant and Machine Operators and Assemblers), and high skill includes groups 1-3 (Managers, Professionals, Technicians and Associate Professionals).

Note 2: Forward participation in supply chain is a share of domestic value added embodied in foreign exports.

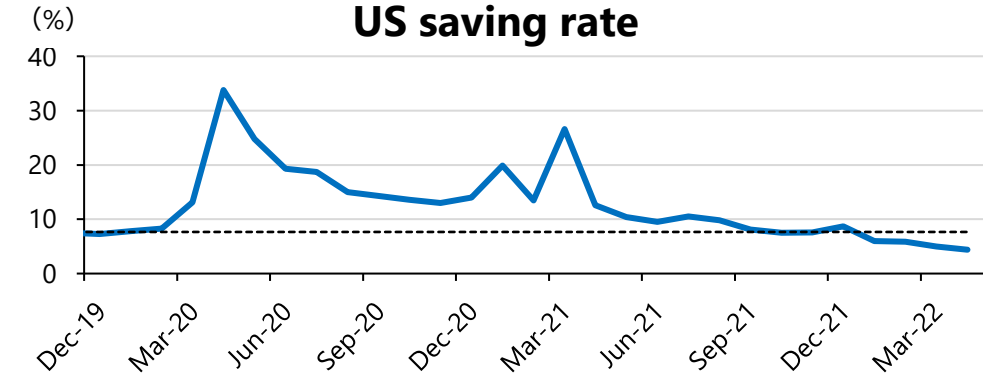
U.S. economic recovery and changing worker behavior toward quit and startup

- In the U.S., **the economic recovery from the COVID-19 Shock is underway** as **consumption is stimulated by massive fiscal supports**. With the resumption of economic activity, **the unemployment rate improved**. **Following the rapid increase in job openings, the number of quits increased to review working conditions (the Great Re-negotiation)**.
- In addition, **the number of applications to start a new business, particularly in the non-store retail industry, remained at a higher level than before the COVID-19**.

US real GDP

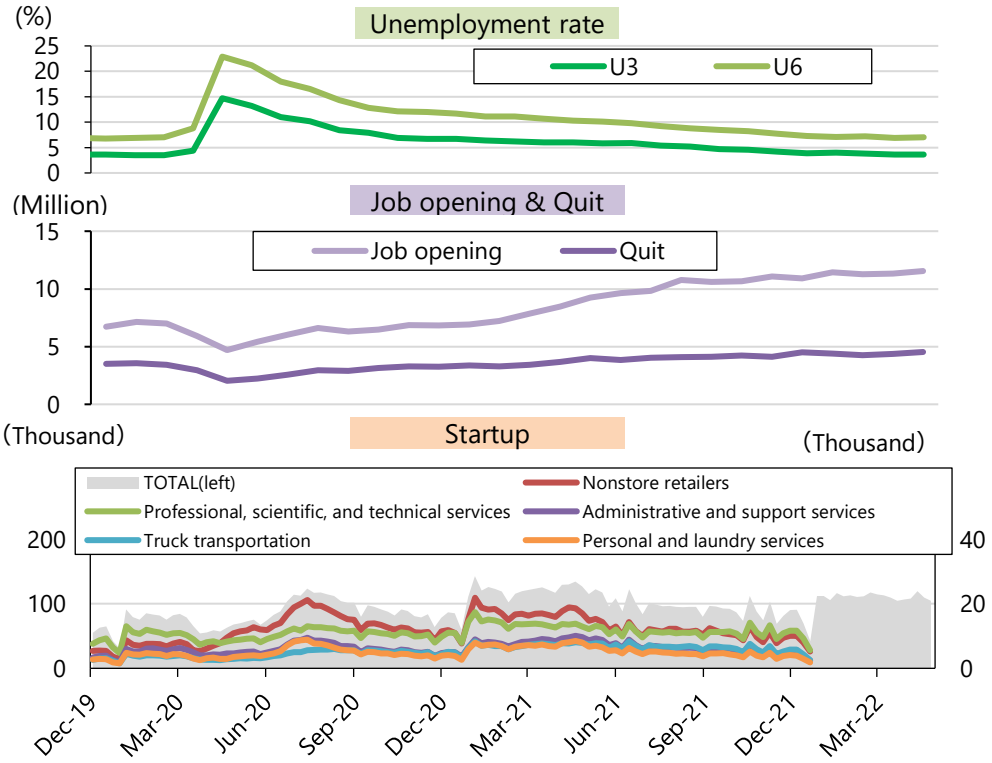


US saving rate



Note: (Upper) Seasonally adjusted annual rate.
(Lower)Dashed line is average of 2019.
Source: BEA, CEIC

Key indices in US labor market

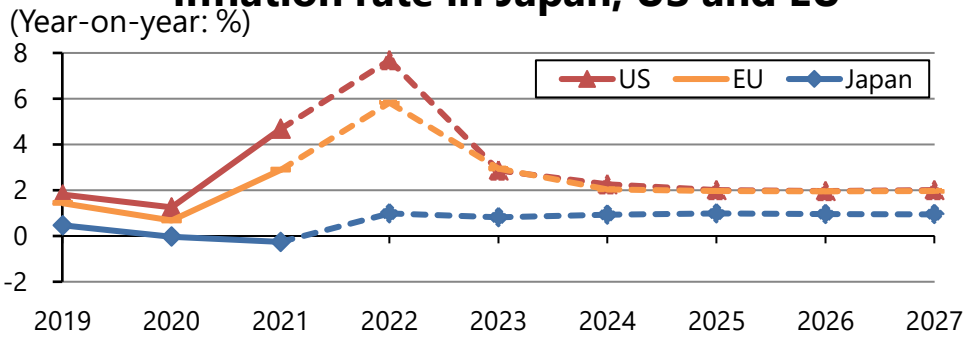


Note: (Lower)Top 5 industries are shown. *published until the end of 2021
Source: BLS, BEA, CEIC

Historic levels of high inflation in the U.S.

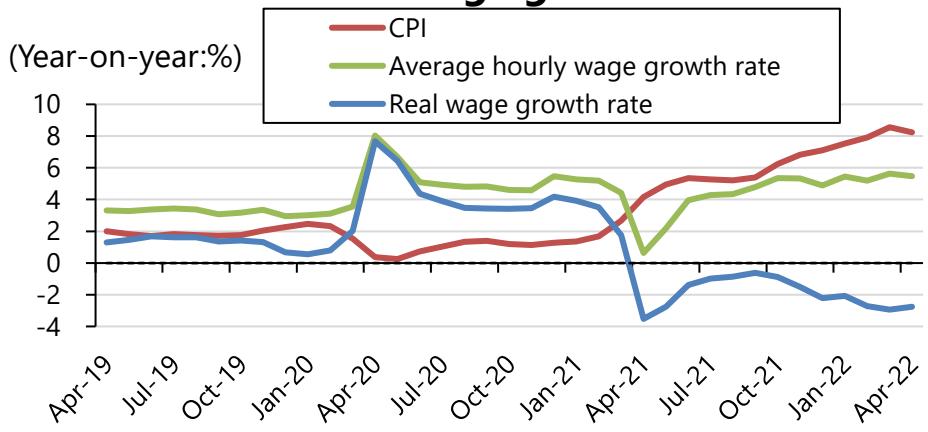
- **Inflation in the U.S. is running at historic levels and remains high**, well above the 2% inflation target. **The Fed will continue to raise interest rates throughout 2022, with inflation control as a top priority**.
- While prices of a wide range of goods and services are rising, nominal wages are rising, reflecting labor shortages and rising prices, but **real wages remain negative, which may put downward pressure on the future economic growth**.

Inflation rate in Japan, US and EU



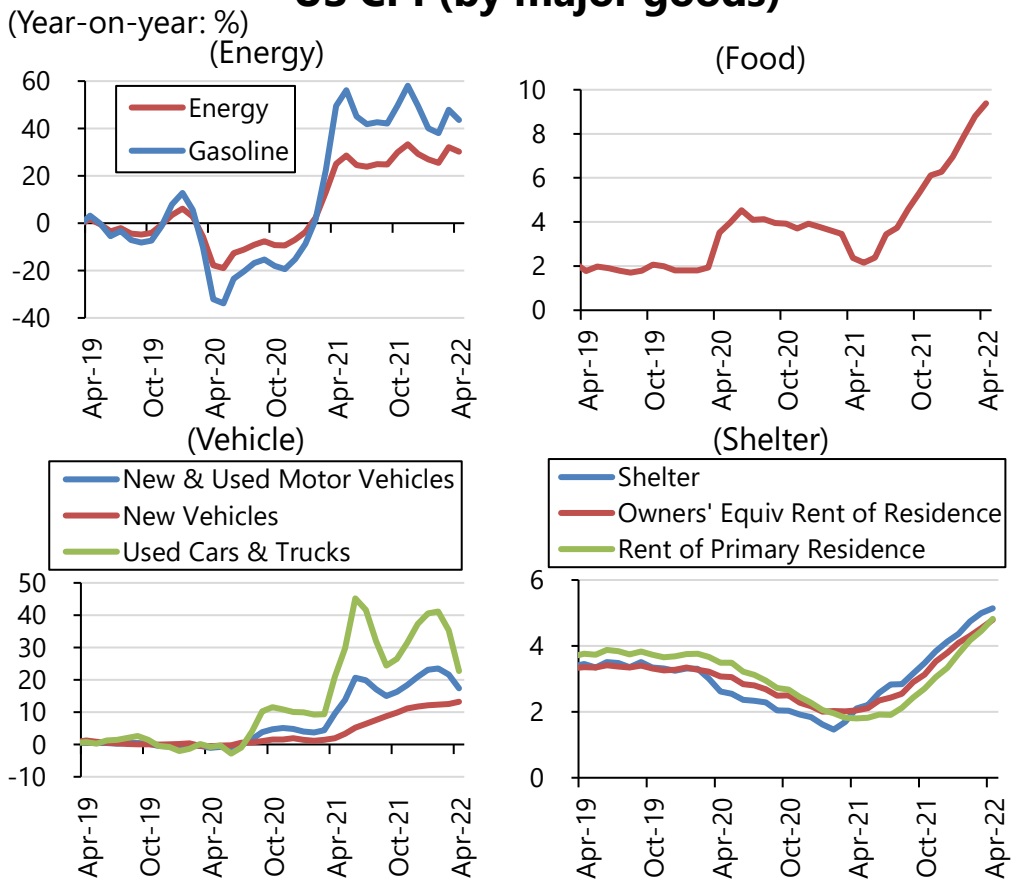
Note: Numbers for 2022-2027 are forecasts.
Source: IMF WEO

US real wage growth rate



Note: Real wage growth rate= Average hourly wage growth rate - CPI
Source: BEA, BLS, CEIC

US CPI (by major goods)

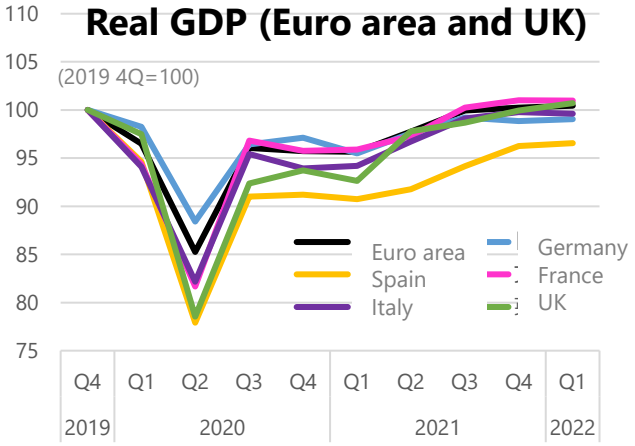


Source: BLS, CEIC

Europe's economy, and its industrial policies designed to achieve strategic autonomy and establish global standards

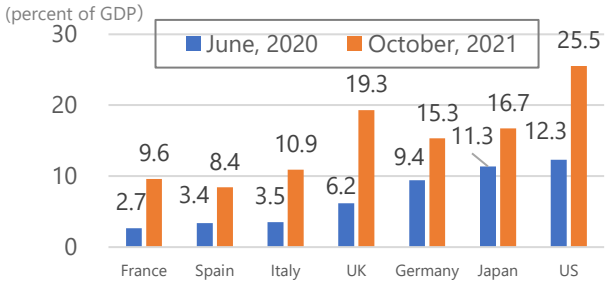
- The European economy is on a recovery trend, supported by large-scale fiscal measures. However, the **future looks increasingly uncertain with the economy facing significant inflation including a surge in energy prices due to Russia's aggression against Ukraine.**
- The EU places the **green and digital transitions** as core pillars of its economic recovery. **Its industrial policies focus on achieving strategic autonomy**, seeking **to strengthen its industrial competitiveness and reduce external dependency**. At the same time, it is **leading the way in the rulemaking in areas of shared values** such as climate change and human rights and is also **striving to set new global standards**.

Real GDP (Euro area and UK)



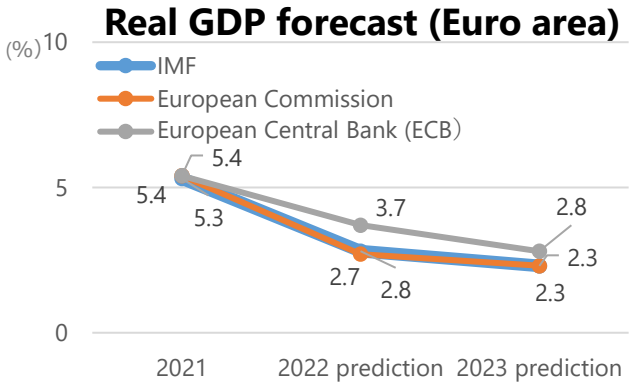
Note: Seasonally adjusted. Source: Eurostat

Fiscal measures in response to COVID-19



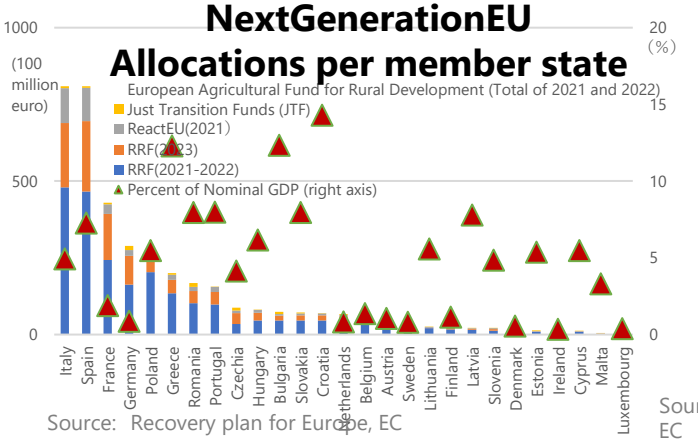
Source: IMF Fiscal Monitor

Real GDP forecast (Euro area)



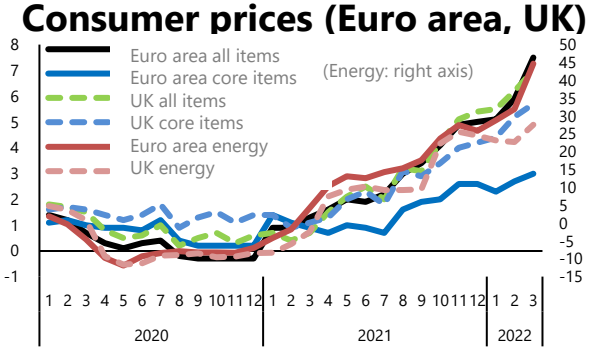
Sources: IMF, European Commission(EC), ECB

NextGenerationEU Allocations per member state



Source: Recovery plan for Europe, EC

Consumer prices (Euro area, UK)



Note: Annual rate of change, Sources: Eurostat, ONS

EU's industrial policy

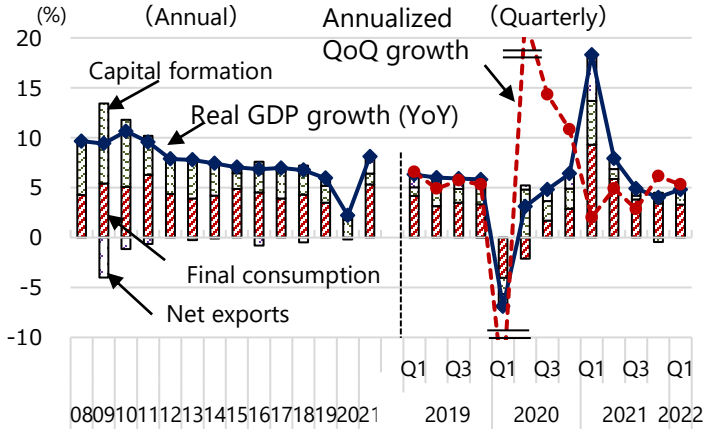
New Industrial Strategy (March 2020)
(1) Maintain European industry's global competitiveness
(2) Make Europe climate-neutral by 2050
(3) Shape Europe's digital future
Updated Industrial Strategy (May 2021)
(1) Strengthen single market resilience
(2) Deal with the EU's strategic dependencies Aim to reduce external dependency in six areas (raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors, cloud and edge technologies). In specific, support industrial alliances (e.g., European Battery Alliance, European Clean Hydrogen Alliance, European Raw Materials Alliance, Industrial Alliance on Processors and Semiconductor Technologies, and European Alliance for Industrial Data, Edge and Cloud).
(3) Accelerate twin transitions

Source: EC

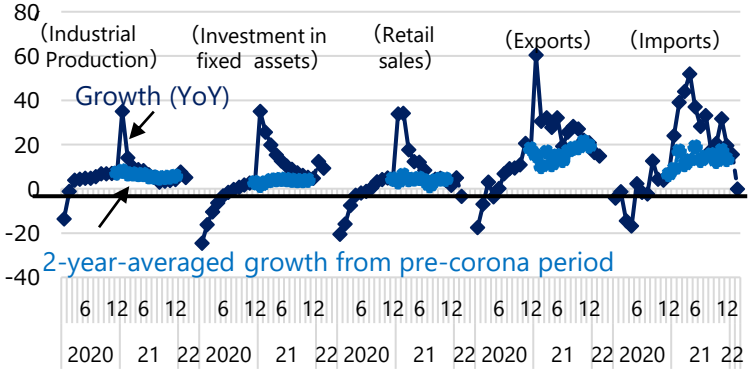
China's depressed economy and imminent demographic problem

- China's real GDP recovered to its pre-Covid-19 level, however, **since 2021, economic growth has been gradually slowing due to renewed domestic Covid-19 outbreaks, restrictions in the real estate sector and rising commodity prices, together with zero-Covid-19 policy**.
- **Working population has passed its peak level and total population will decrease after 2030**, according to medium UN estimate (assumed fertility rate of 1.7). **The results of the population census (real fertility rate of 1.3) revealed the actual development would be more serious than expected**.

China's real economic growth

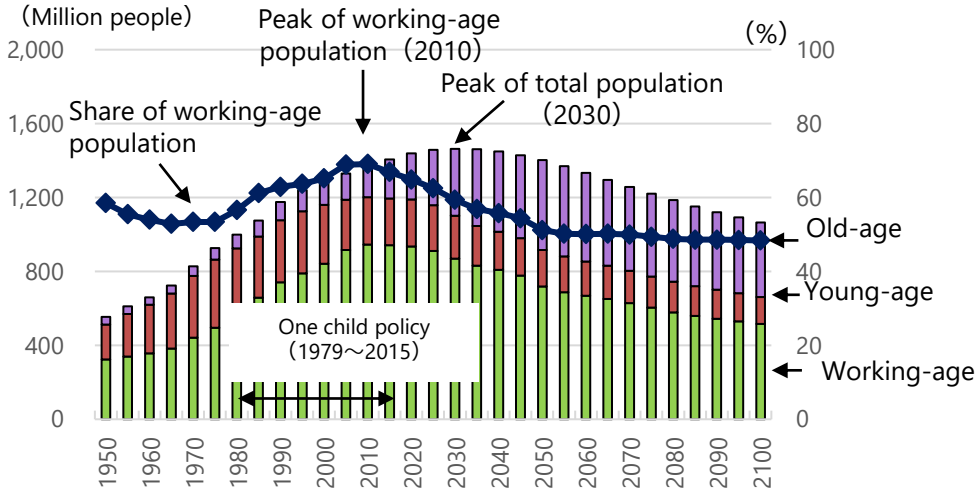


Main monthly economic indicators



Source: National Bureau of Statistics of China, General Administration of Customs, CEIC database.

Population estimates (United Nations)



Fertility rates

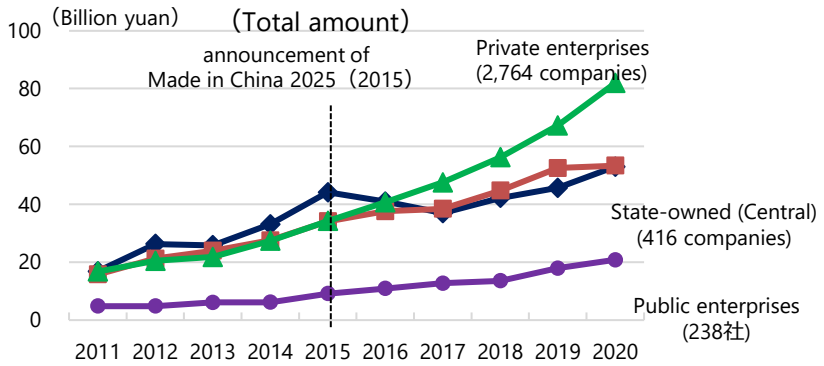
	Time	Fertility rate
Required for constant population level	-	2.1
United Nations / Medium variant	2020-25	1.70
United Nations / Low variant	2020-25	1.45
National Bureau of Statistics of China / Population census	2020	1.30

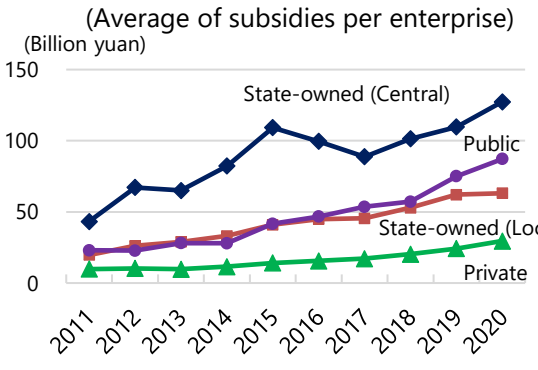
Source: United Nations, "World Population Prospects 2019", National Bureau of Statistics of China, "7th Population census".

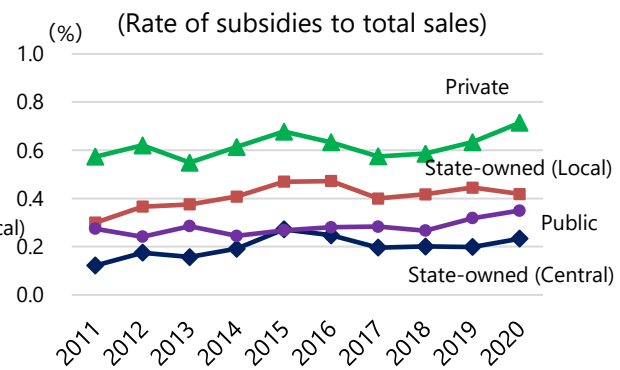
Government subsidies and “Made in China 2025”

- **Government subsidies are widely granted not only to state-owned enterprises but also to private ones**. Rather, since the mid-2010s, **the total amount granted to private enterprises exceeds those to state-owned enterprises** under the jurisdiction of central and local governments.
- **After the announcement of the industrial policy, "Made in China 2025," the share of subsidies for its 10 priority sectors increased**.

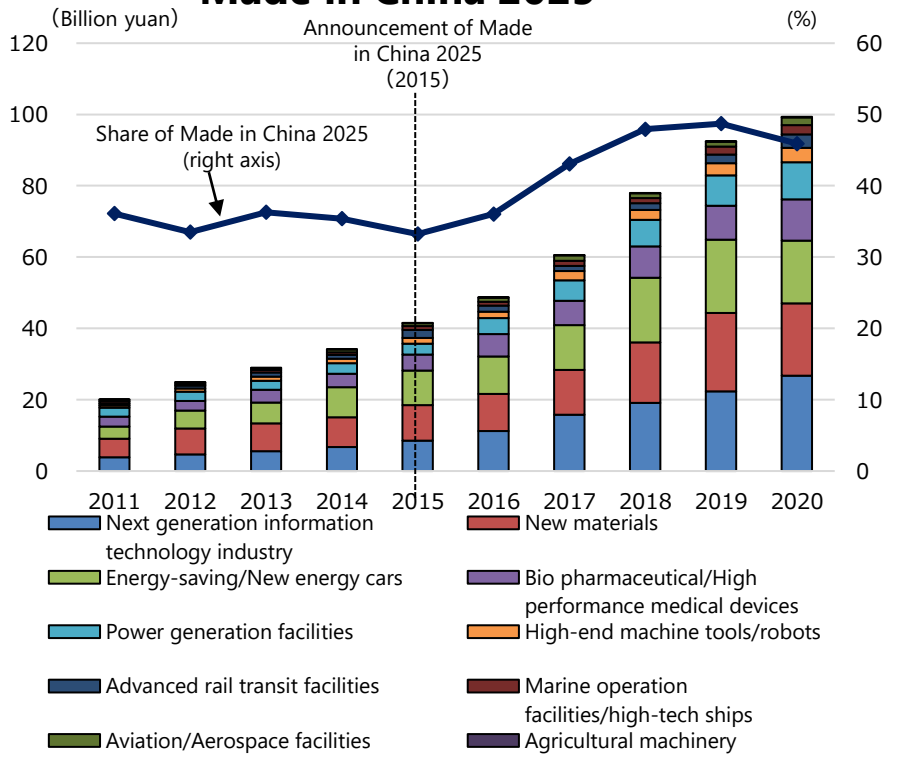
Government subsidies by enterprise type







Government subsidies related to Made in China 2025



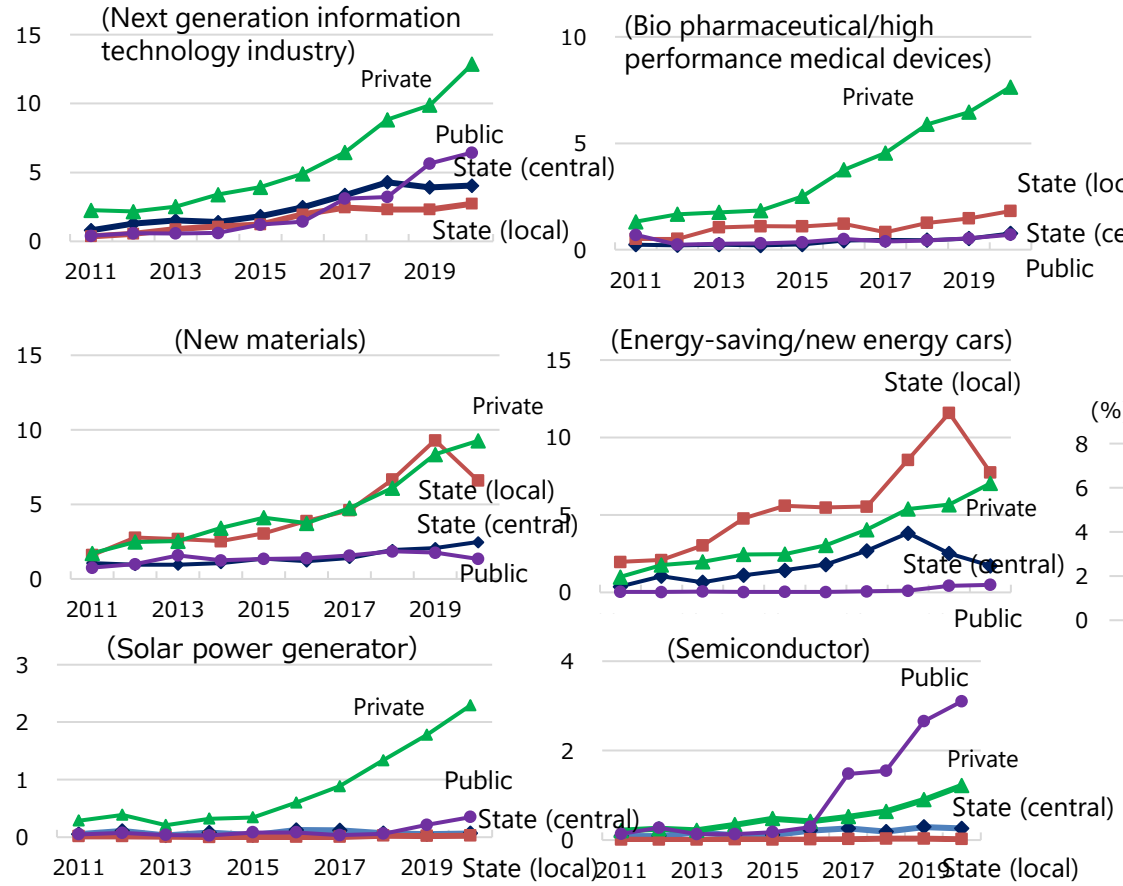
Note:1. The number of companies is as of 2020 on the Shanghai Stock Exchange and Shenzhen Stock Exchange.
2. The data of companies that are considered to fall under "Made in China 2025" are aggregated. The amount may be overestimated due to data restrictions. For example, detailed industrial sectors may be widely selected. The whole subsidies of the company may not be necessarily related to the initiative. On the other hand, there is a possibility that the companies may not be included if the activities are carried out across multiple sectors.
3. The share of the initiative declined in 2020, partly because some of subsidies might be used for measures against COVID-19.
Source: Public information of each company

Government subsidies by industry and enterprise type

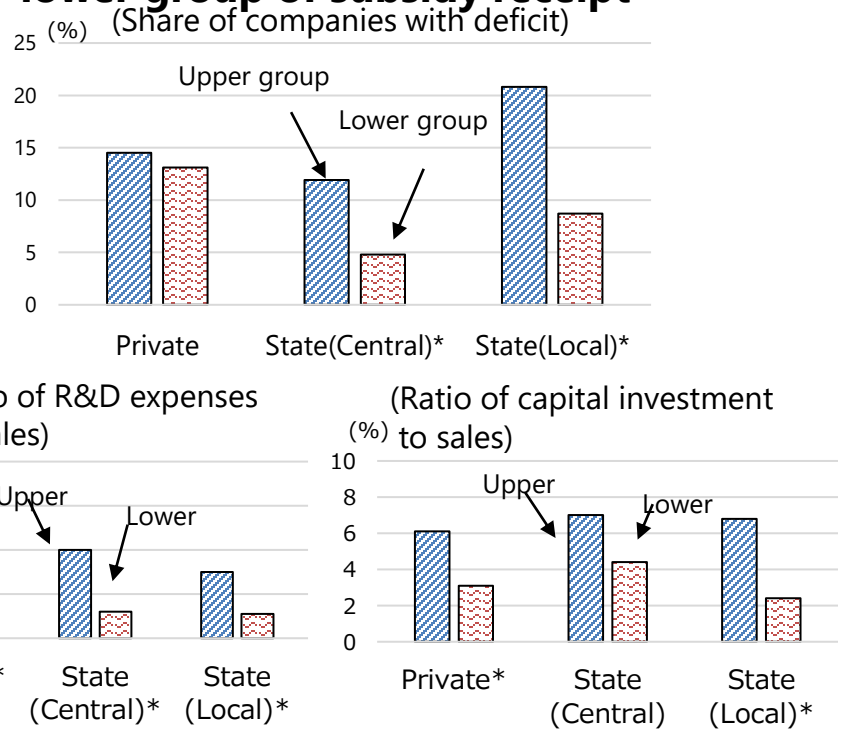
- **Private enterprises have significantly expanded government subsidy receipts** in new industrial sectors close to consumer field, such as the **next-generation information technology industry** and **bio pharmaceutical/high performance medical devices**.
- A Comparison of the upper group of enterprises, which receive generous subsidies, with the lower group, suggests a possibility that **government subsidies** may be used for **deficit compensation**, **research and development** , and **capital investment**.

Government subsidies by enterprise type in major industries

(Unite: Billion yuan)



A comparison between the upper group and the lower group of subsidy receipt



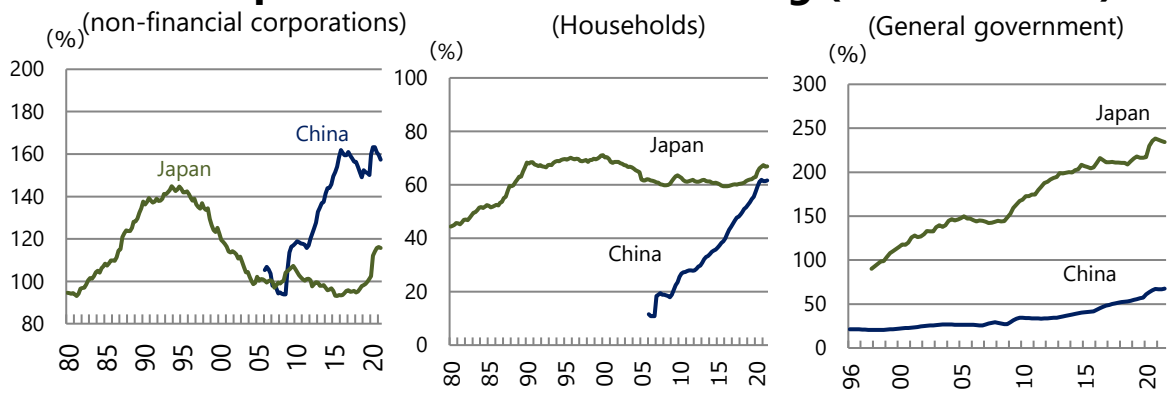
Note: 1. A comparison between the upper group and the lower group, in terms of intensity, the ratio of subsidies to sales.
2. The mark "*" means a significant difference between the two groups statistically.

Source: Public information for each company.

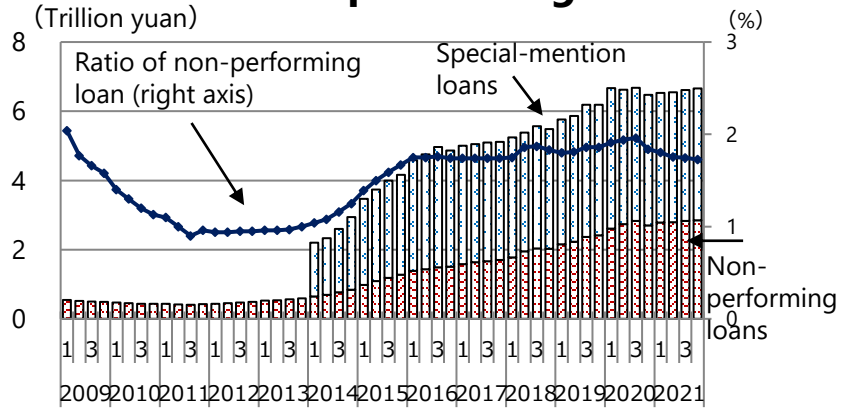
China's financial risk

- China's **non-financial corporate debt** is at a higher level than that **in Japan's bubble period**, and the **household debt** is expanding mainly in housing mortgage loans. On the other hand, **China's total debt is about the same level as that in the US and Eurozone**.
- **Bank ratios of non-performing loans** have decreased; however, special-mention loans also exist, which include concerns about future repayments. With regards **to local government debt**, the financial burden varies greatly across regions.

Comparison of debt outstanding (Ratio to GDP)

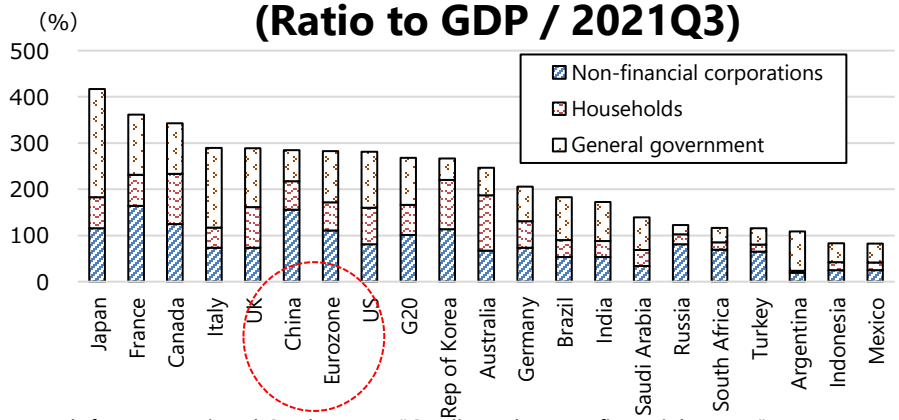


Bank non-performing loans



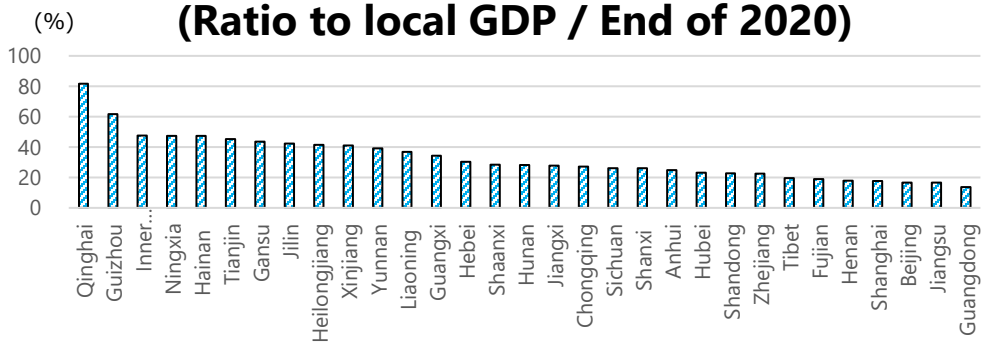
Note: 1. The ratio of non-performing loans is against total outstanding.
2. The statistics for special mention loans started in 2014.
Source: China Banking and Insurance Regulatory Commission, CEIC.

Major countries' outstanding debt (Ratio to GDP / 2021Q3)



Source: Bank for International Settlements "Credit to the non-financial sector".

Outstanding debt of local governments (Ratio to local GDP / End of 2020)

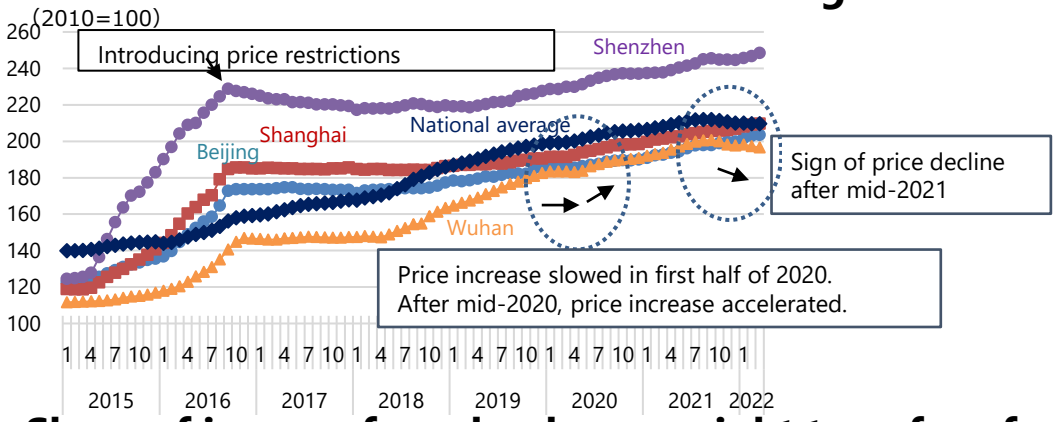


Note: Figures include general debt and special debt.
Source: National Bureau of Statistics of China, CEIC.

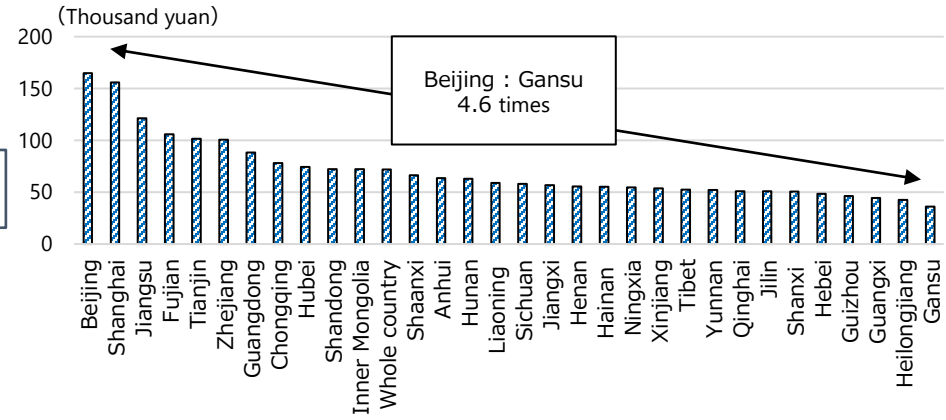
China's structural problems

- **Chinese government has introduced regulations on real estate sector since mid-2020 because of bubble concerns**. There seemed to be signs of price declines due to market deterioration, which might lead to **financial problems for local governments that depends on land-related income**.
- In China, **there remain large disparities between regions, urban and rural areas, and individuals**. Chinese government promotes the slogan "Common prosperity"; however, the introduction of real estate tax, which is expected to have a large effect, has a long way to go to be realized.

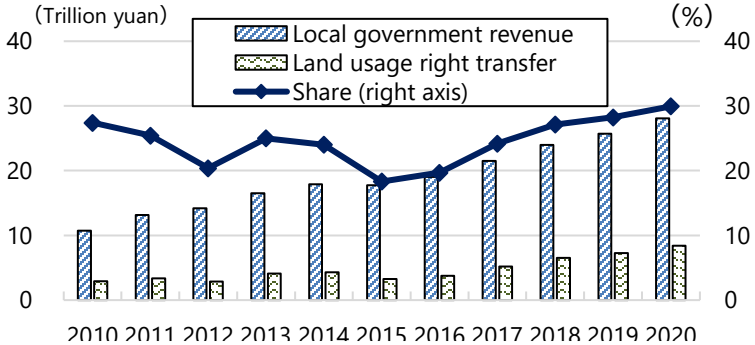
Sales price of newly constructed commercial residential buildings



GDP per capita by provinces (2020)

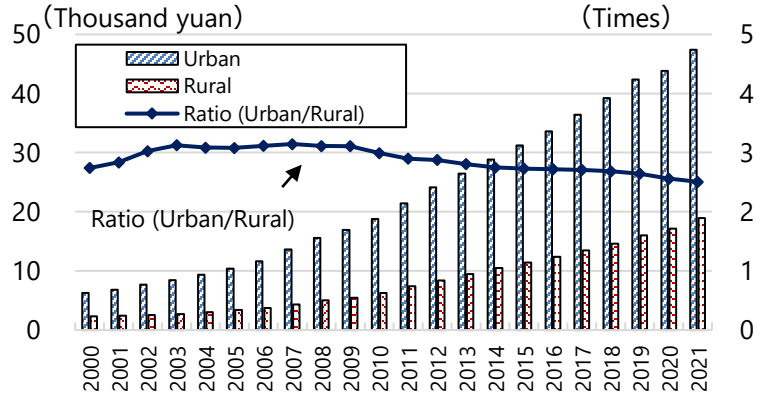


Share of income from land usage right transfer of local government revenue



Source: Ministry of Finance of the People's Republic of China, CEIC database.

Disposable income per capita

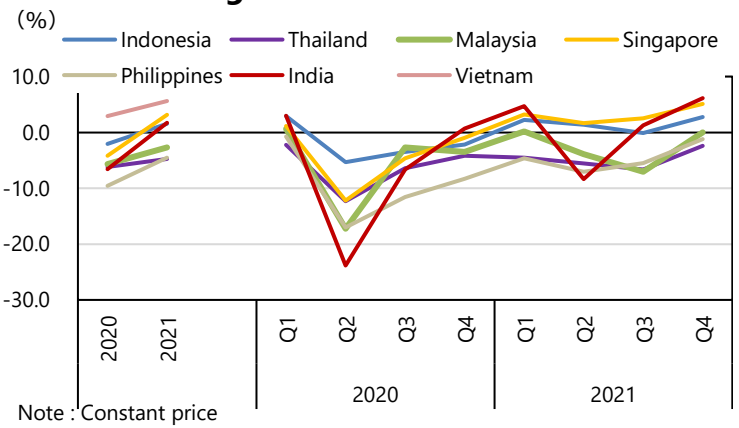


Source: National Bureau of Statistics of China, CEIC database.

Trends in India's and Southeast Asian economies

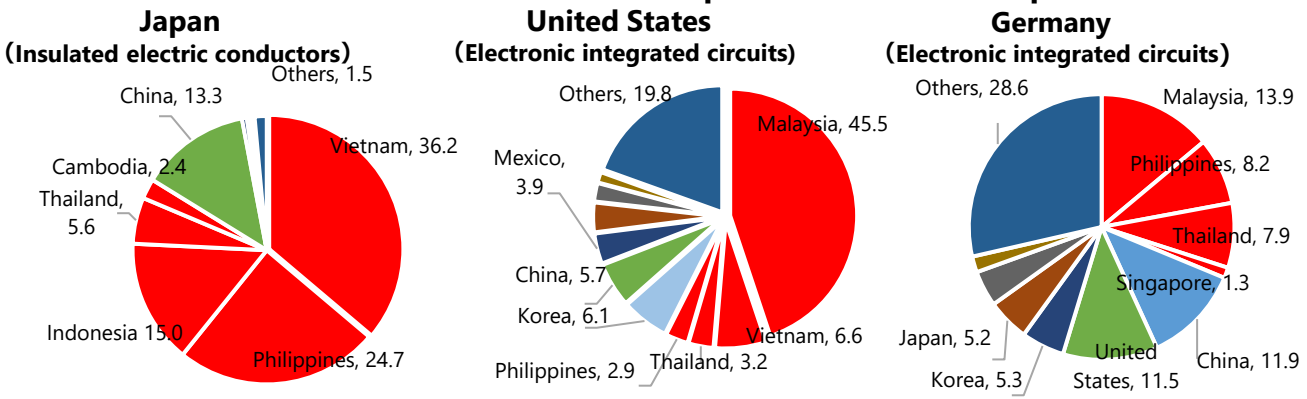
- **The extent of economic recovery differs from country to country(Thailand and the Philippines are not at the level of 2019 in 2021Q4）.** Backed by rising oil prices etc., **inflationary pressure is increasing.**
- **ASEAN countries play significant roles as the production bases of materials and parts in the global supply chains.** The suspension of factory operations in the mid-2021 affected the world auto productions of automobiles.
- For the growth in the post COVID-19 era, measures need to be taken to resolve the medium-to long-term challenges such as the "Middle Income Trap", sustainability, etc.

GDP* growth rate（from 2019 level）



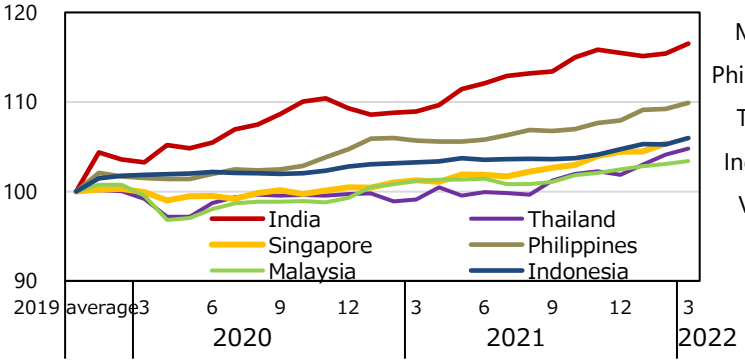
Note : Constant price
Source：Figures from each country, CEIC Database。

The share of ASEAN in the import of materials and parts （%）



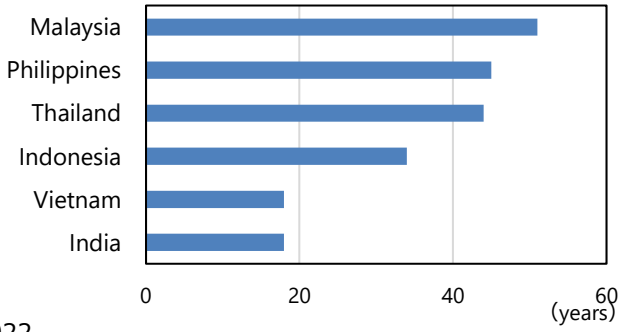
Note : Top 10 countries. Red parts are ASEAN countries.
Source：UN Comtrade.

Consumer Price Index



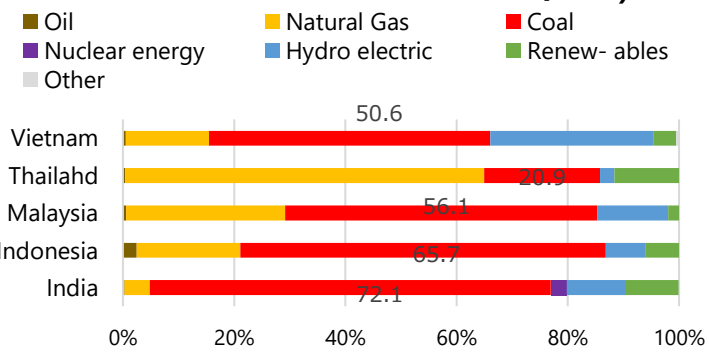
Source : Figures from each country, CEIC Database。

Years as the middle-income* country



Note : GNI per capita 1,046～12,695＄（World Bank July 2021）
Source : Felipe, Jesus et al.（2014）,World Bank "WDI"

Electricity generation by fuel in India and ASEAN countries（2020）



Source : "BP Statistical Review of World Energy (July,2021)"

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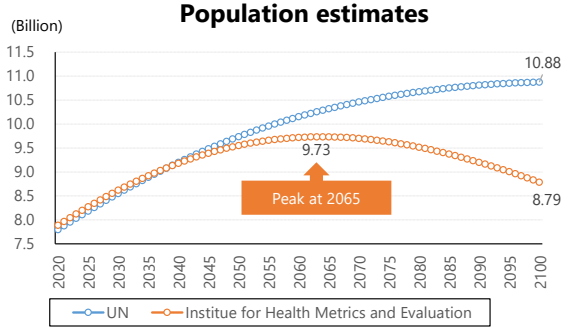
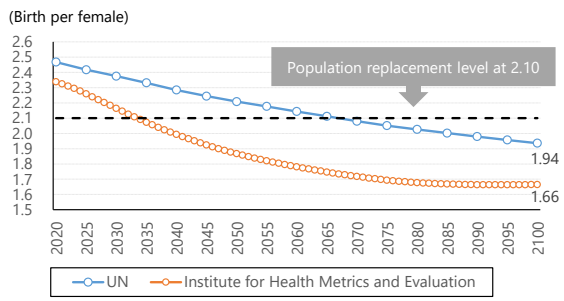
Population dynamics amid declining birth rates and COVID-19

- **<u>While the UN medium-variant projection forecasts a long-term increase in world population, there is an estimate forecasting a peak in 2065. The forecasts depend on the trend of the long-term decline in birth rates.</u>**
- While **<u>COVID-19 has not shown any clear impact on birth rates</u>**, it could have **<u>longer term potential impacts on family plans due to less occasions for encounters and downside impacts on employment and income.</u>**

Population estimates



Birth rate estimates



UN population estimate

2020

Rank	Country	Population (Billion)
1	China	1.44
2	India	1.38
3	US	0.33
4	Indonesia	0.27
5	Pakistan	0.22
6	Brazil	0.21
7	Nigeria	0.21
8	Bangladesh	0.16
9	Russia	0.15
10	Mexico	0.13
11	Japan	0.13

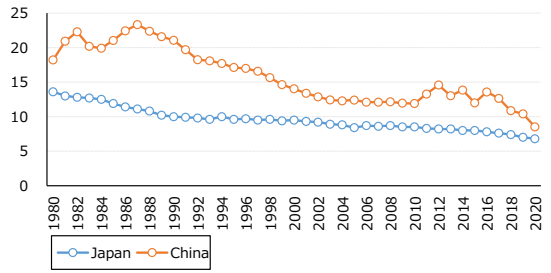
2050

Rank	Country	Population (Billion)
1	India	1.64
2	China	1.40
3	Nigeria	0.40
4	US	0.38
5	Pakistan	0.34
6	Indonesia	0.33
7	Brazil	0.23
8	Ethiopia	0.21
9	Dem. Rep. Congo	0.19
10	Bangladesh	0.19
⋮		
17	Japan	0.11

2100

Rank	Country	Population (Billion)
1	India	1.45
2	China	1.06
3	Nigeria	0.73
4	US	0.43
5	Pakistan	0.40
6	Dem. Rep. Congo	0.36
7	Indonesia	0.32
8	Ethiopia	0.29
9	Tanzania	0.29
10	Egypt	0.22
⋮		
39	Japan	0.07

Crude birth rates (Japan & China)

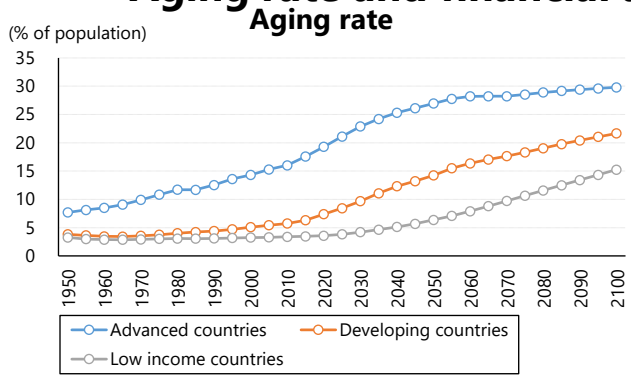


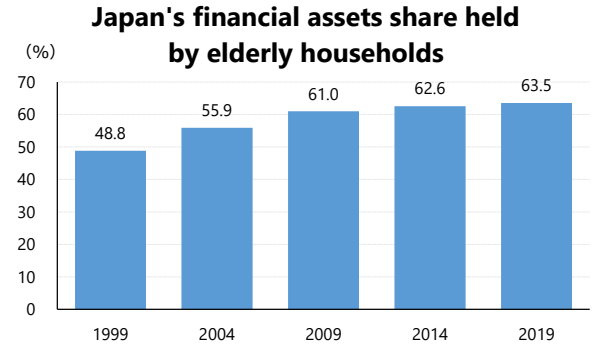
Sources: United Nations, Institute for Health Metrics and Evaluation, Ministry of Health, Labour, and Welfare, National Bureau of Statistics of China.

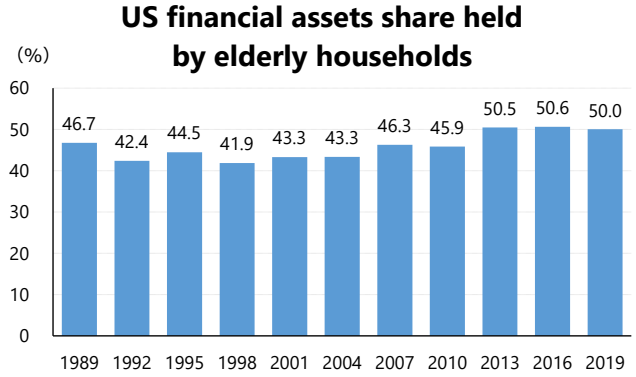
Growing importance of silver economy market

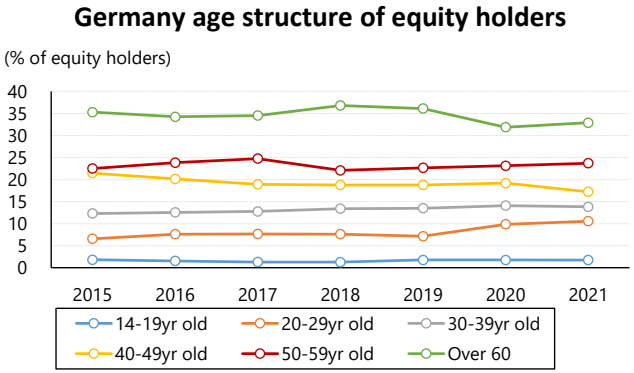
- As evident in Japan, **aging society leads to the expansion of "silver economy market"** especially in advanced economies, **likely followed by developing countries from a long-term perspective.**
- **Japan's experiences of adopting to aging society should be valuable for developing business strategies with elderly households taking up majority of financial assets and thus expected to have stronger potential purchasing power.**

Aging rate and financial assets held by elderly households









Sources: UN, Ministry of Internal Affairs and Communications (Japan), FRB (US), Aktieninstitut (Germany).
Note 1: For Japan, elderly households refer to ones whose heads of household are aged over 60, and financial assets do not include real estates.
Note 2: For US, elderly households refer to ones whose heads of household are aged over 65, and financial assets do not include real estates.

Formation of megacities and growing demand for urban infrastructure

- **By 2035, 18 of the world's 41 megacities with more than 10 million population would be formed in China and India. Many of sub-megacities would emerge in developing countries.**
- **Global urban infrastructure demand is estimated to be USD38 trillion between 2020 and 2030, and public and private cooperation and funding by private sector are indispensable.**

Megacities in 2035

Asia

Country	City	Populaiton (million)	Population share (%)
Bangladesh	Dhaka	31.2	16.3
China	Beijing	25.4	1.8
	Chengdu	11.2	0.8
	Chongqing	20.5	1.4
	Guangzhou	16.7	1.2
	Nanjing	11.5	0.8
	Shanghai	34.3	2.4
	Shenzhen	15.2	1.1
	Tianjin	16.4	1.1
	Wuhan	10.0	0.7
	Xian	10.4	0.7
India	Ahmedabad	11.3	0.7
	Bangalore	18.1	1.2
	Chennai	15.4	1.0
	Delhi	43.3	2.8
	Hyderabad	14.2	0.9
	Calcutta	19.6	1.3
	Mumbai	27.3	1.7
	Surat	10.8	0.7
Indonesia	Jakarta	13.7	4.5
Japan	Osaka	18.3	15.5
	Tokyo	36.0	30.4
Malaysia	Kuala Lumpur	10.5	27.3
Pakisitan	Karachi	23.1	8.9
	Hahore	19.1	7.3
Philippines	Manila	18.6	14.1
Korea	Seoul	10.3	19.5
Thailand	Bangkok	12.7	18.3
Vietnam	Ho Chi Minh	12.2	11.2

Americas

Country	City	Populaiton (million)	Population share (%)
Argentina	Buenos Aires	17.1	33.6
Brazil	Rio de Janeiro	14.8	6.5
	Sao Paulo	24.5	10.7
Colombia	Bogota	12.8	23.6
Mexico	Mexico City	25.4	16.6
Peru	Lima	13.0	33.9
US	Los Angeles	13.8	3.8
	New York	20.8	5.7

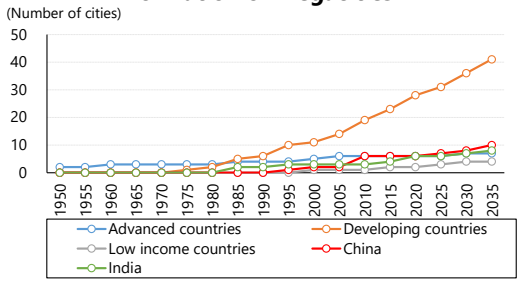
Europe

Country	City	Populaiton (million)	Population share (%)
France	Paris	12.1	17.5
Russia	Moscow	12.8	9.3
UK	London	10.6	14.7

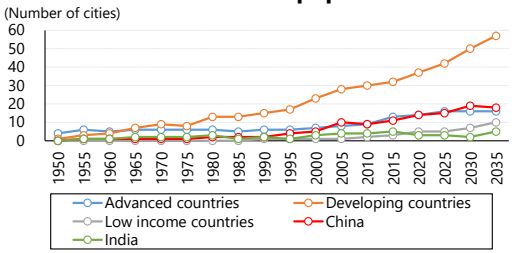
Middle East・Africa

Country	City	Populaiton (million)	Population share (%)
Angola	Luanda	14.5	28.1
Dem. Rep. Congo	Kinshasa	26.7	19.3
Egypt	Cairo	28.5	22.2
Iran	Tehran	10.7	11.8
Iraq	Baghdad	10.8	18.0
Nigeria	Lagos	24.4	8.2
Turkey	Istanbul	18.0	19.8
Tanzania	Dar Es Salaam	13.4	14.0

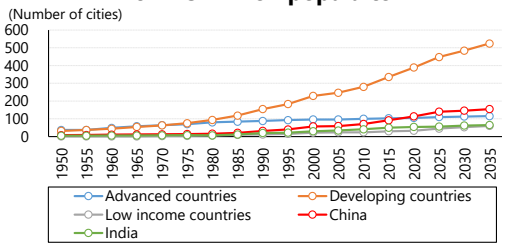
Formation of megacities



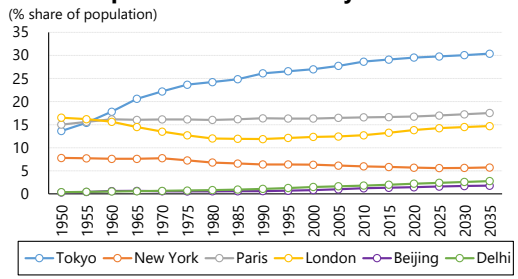
Formation of cities with 5-10 million populaiton



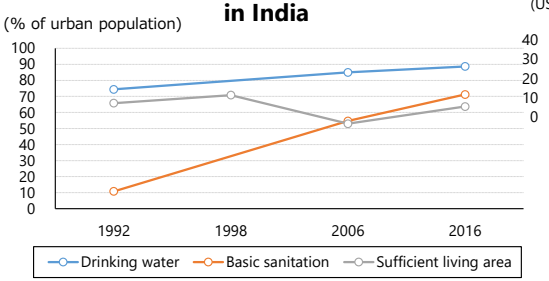
Formation of cities with 1-5 million populaiton



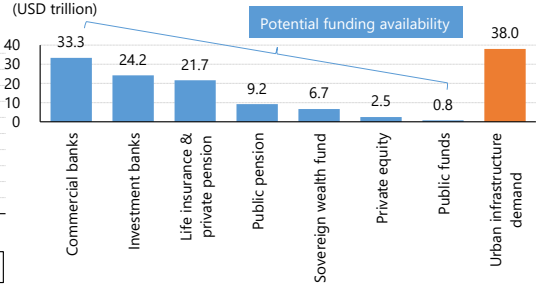
Population shares of major cities



Availability of major living infrastrucrures in India



Urban infrastructures: Demand vs Funding



Source: UN.
Note 1: Megacities are cities with more than 10 million population.
Note 2: Drinking water service means access to improved water source with collection time no more than 30 minutes for a round trip, basic sanitation means sewered and non-sewered toilet facilities are not shared with other households, and sufficient living area means not more than three persons per room.

Increasing global trends(1) : Accelerating Digital transformation (DX)

- Since 2010s, **DX has been progressing mainly in IoT and AI. Emerging technologies** and **development of global data flows are rewriting the rules of the economy.**
- **While promoting DX corporate transformation and productivity improvements, an increasing importance is placed on firms converting to new business models that create added values by using data analytics for cross-border data flows, collaborating with startups, promoting Asia DX and making use of intangible assets such as human capital.**
- **Under the expansion of digital protectionism** in emerging economies, **it is important to form international rules to support the free flow of data through DFFT.**

Products and services created by digital transformation

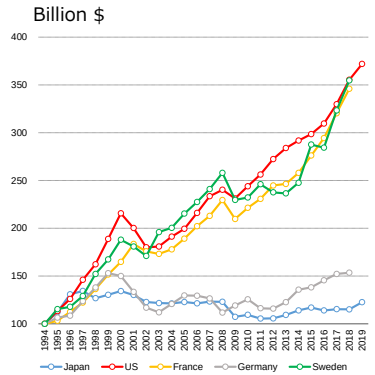
Technology		Data	Innovative Product and Service
Common Base Technology (AI、IoT、Robot)	Driving Control	Accident・Camera Information	Mobility service by unmanned Autonomous driving etc
	Production Management	Accident・Near Miss Accident	Improvement of safety and productivity by early detection of abnormalities and/or signs, and upgrading of insurance and rating
	Bioinformatics Genome Editing	Biological	New Drug Discovery、Functional food, Advanced Materials Manufacturing, Bioenergy etc
	Drug develpment Nursing	Health Care, Nursing	Personalized <edicine Nursing Care Plan for Independence etc
	Energy Demand Equipment Control	Customer	Energy Demand Response Monitoring Service etc
	Fintech	Purchasing・Commercial Financial Market	Credit by transaction and settlement data 、Advancement of Asset Management Advisory Services etc

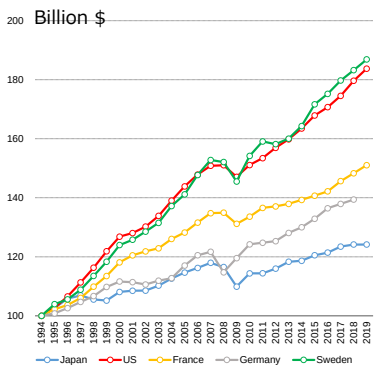
source：METI

Distribution of unicorn companies by country (April 2022)

Rank	Country	(Billion $)	Ratio (%)	Number of Companies	Key Technology		
					1st	2nd	3rd
1	US	1,902	52.4	569	Fintech	Internet Software Service	Other
2	China	677	18.6	173	E-commerce	AI	Hardware
3	India	193	5.3	65	Fintech	Internet Software Service	Edtech
4	UK	190	5.2	43	Fintech	Hardware	Other
5	Germany	74	2	28	Fintech	Internet Software Service	Data Management,Analysis
24	Japan	8	0.2	5	Other	AI・Mobile Communications	Fintech
Total	—	3,629	—	1,083	Fintech	Internet Software Service	E-commerce

Level of digital investment and nominal GDP





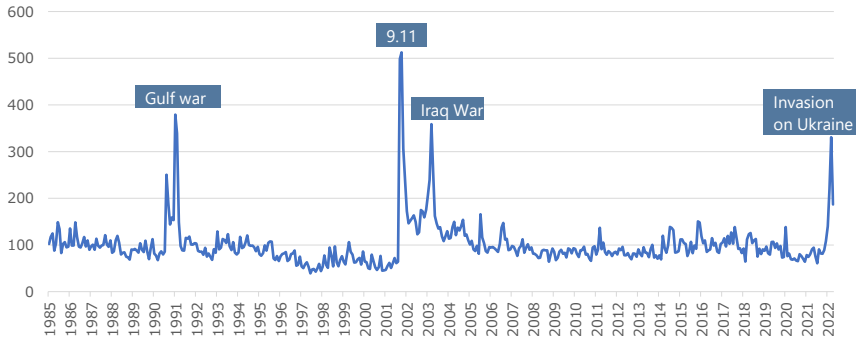
source：METI outsourced project

Increasing global trends (2): Mounting geopolitical risks

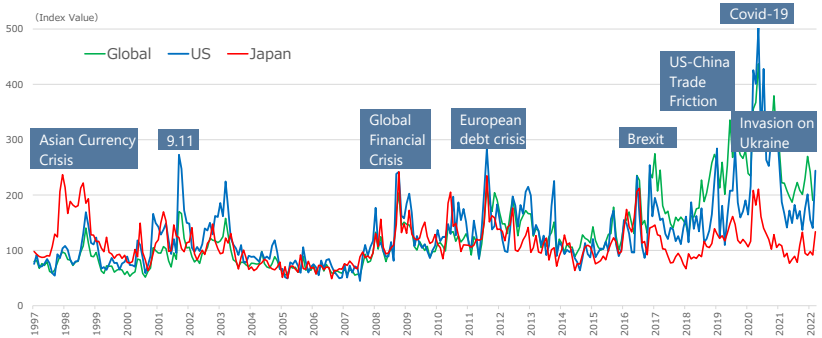
- **Geopolitical risks and global uncertainty have increased significantly with Russian aggression against Ukraine, prolonged pandemic and intensifying U.S.-China conflict.**
- **It is important to formulate international rules based on the differences in the positions of each country, while keeping a close watch on growing geopolitical risks and economic security needs. Companies are required to develop resilient supply chain strategies that make rapid and flexible response to sudden changes in circumstances.**

Increased Uncertainty

Geopolitical Risk Index



Economic Policy Uncertainty Index



Source: Economic Policy Uncertainty

Major regulations related to US-China technology competition

Strengthening export control (Direct Product Rule)

- In May 2020, regulatory measures were put in place to prevent Huawei and its global affiliates from acquiring dedicated (application-specific) semiconductors, etc., using U.S. technology via third countries.

Strengthening export control (Entity List)

- After June 2020, 257 China-related companies and individuals were added to the list. Expanded transactions subject to export control for Huawei, etc.

Tightening investment regulations (FIRRMA)

- CFIUS's jurisdiction to review FDI from a national security perspective was expanded, and the scope subject to its review was broadened to include (1) sensitive technology, (2) critical infrastructure, (3) non-passive and non-controlling investments, and (4) real estate transactions. Definitions of the scopes and details of the procedures were clarified

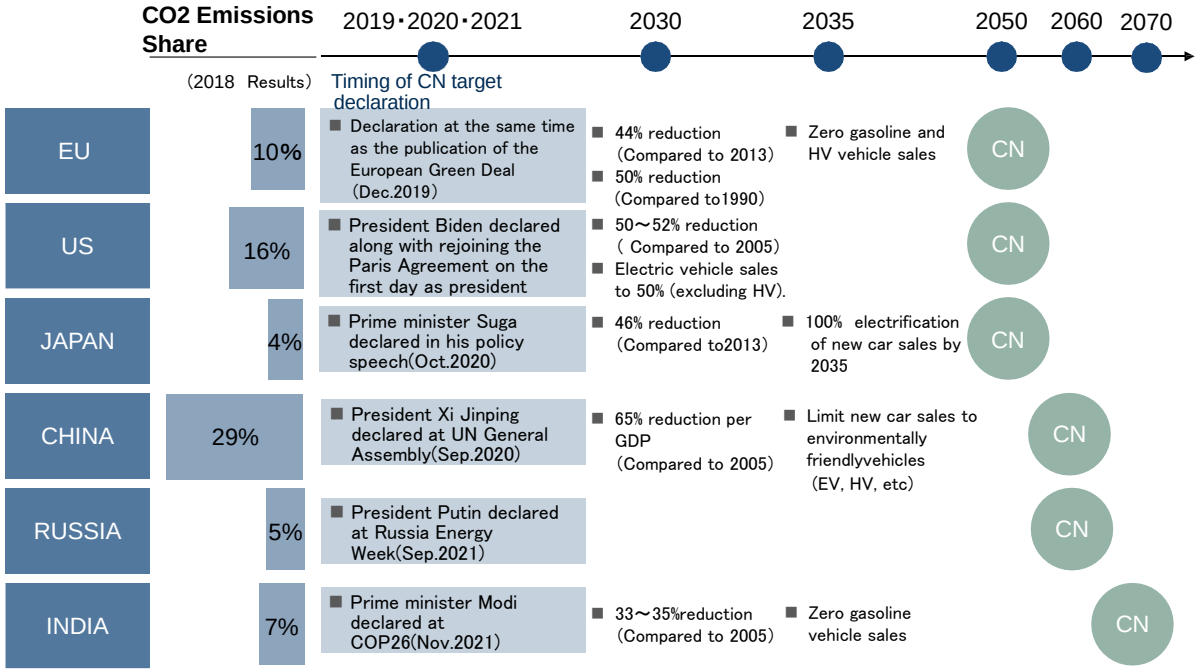
Economic Security Law

- Establishment of basic guidelines for securing supplies of key materials
- Designation of key materials
- Formulation of supply security plans by private sectors and support measures, etc.

Increasing global trends (3): Growing emphasis on shared values

- **There is a growing movement toward emphasizing the importance of shared values such as "green" (including climate, environment and circular economy) and "social values" (including human rights, labor, equality and health) <u>in achieving sustainability and solving social issues.</u>**
- It is increasingly important for companies to shift from engaging in traditional CSR activities to **<u>positioning shared values at the core of their business activities, as a means of building new advantages towards value-added creation</u>.**
- **<u>Under the expansion of digital protectionism</u>** in emerging economies**, <u>it is important to achieve DFFT by forming international rules to support the free flow of data.</u>**

Carbon Neutral Declaration by major countries



source：media reports

International Trends in Business and Human Rights and Japan's Efforts

- Increased awareness of human rights in corporate management is accelerating internationally
- Accelerating movements to link human rights protection and foreign economic policies in US and Europe.
- In March 2022, METI set up a study group to formulate cross-industry guidelines for respecting human rights in supply chains with the aim of compiling a draft by the summer of 2022.

⇒ **Promote efforts to enhance predictability of measures in each country through international cooperation from the perspectives of creating an environment in which businesses can proactively promote respect for human rights on a level playing field.**

Increasing global trends (4): Accelerating shift in industrial policy by government

- **Major countries are developing proactive industrial policies and focusing on strengthening industrial competitiveness** to respond to intensifying technological competition in advanced fields and competition arising from social and economic challenges and geopolitical risks**.**
- Based on government policy trends and engagement policies, **it is important for companies to develop corporate strategies with a view to capturing the market created by government initiatives through government procurement and investment.**

Industrial Policy Shifts in Countries and Regions

Supply chain resilience

■ **Executive Order on Ensuring the Future Is Made in All of America by All of America's Workers**

・Strengthening of U.S. products in government procurement

■ **Executive Order on America's Supply Chains**

・Report on vulnerability and policy recommendations for four key products (semiconductors, storage batteries, critical minerals, pharmaceuticals) and six categories (including defense, telecommunications, energy, transportation)

■ **Creating helpful Incentives for the Production of Semiconductors (CHIPS) for America Act**

・promotion of factory location, equipment installation support and R&D in US

Updated Industrial Strategy（May 2021）

(1) Strengthen single market resilience

(2) Deal with the EU's strategic dependencies

(3) Accelerate twin transitions

European Industrial Alliance

■ European Battery Alliance（Oct. 2017）

■ European Clean Hydrogen Alliance（July 2020 ）

■ European Raw Materials Alliance（September 2020）

■ Alliance on Processors and Semiconductor Technologies（July 2021）

■ European Alliance for Industrial Data, Edge and Cloud（July 2021）

Made in China 2025

■ **Established ten focus areas and achieve 70% self-sufficiency by 2025**

⇒ Eliminate choke points in the supply chain

Step 1 (2025):
Become a major manufacturing power

Step 2 (2035):
Become a mid-tier global manufacturing power

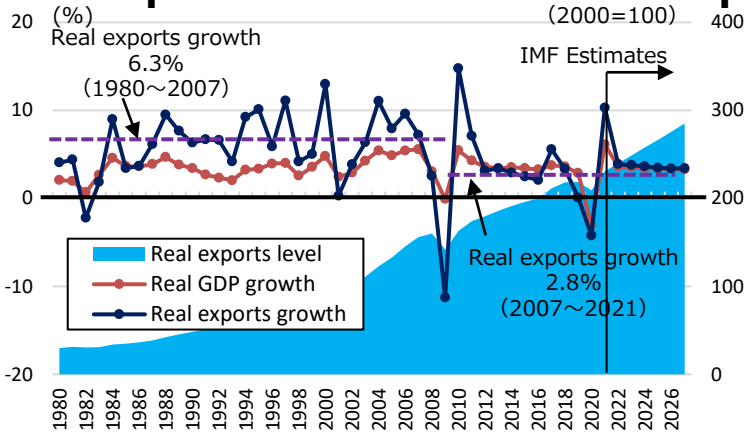
Step 3 (2049):
Join the top class of global manufacturing powers through innovation leadership

Table of contents

Changing world trade structure: Centered on intermediate goods and

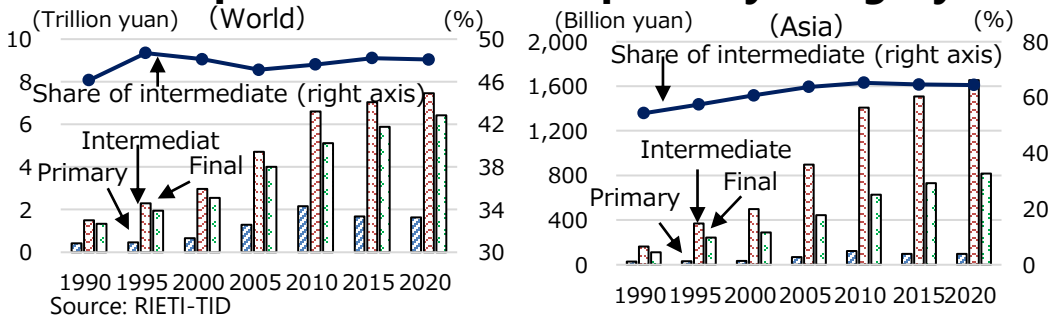
- **World export expanded steadily**, although there were temporary decreases due to the global financial crisis and pandemic. On the other hand, **in relation to the economic growth**, from 1980, **export expanded significantly at 1.8 times larger rate compared with GDP until the financial crisis**. And **its expansion slowed to 0.9 times after the crisis**, which was called as **slow trade**.
- **Together with tariff reduction thanks to economic partnership agreements, trade expanded, especially in intermediate goods, with neighboring countries** at lower transportation costs.

Developments of world GDP and exports



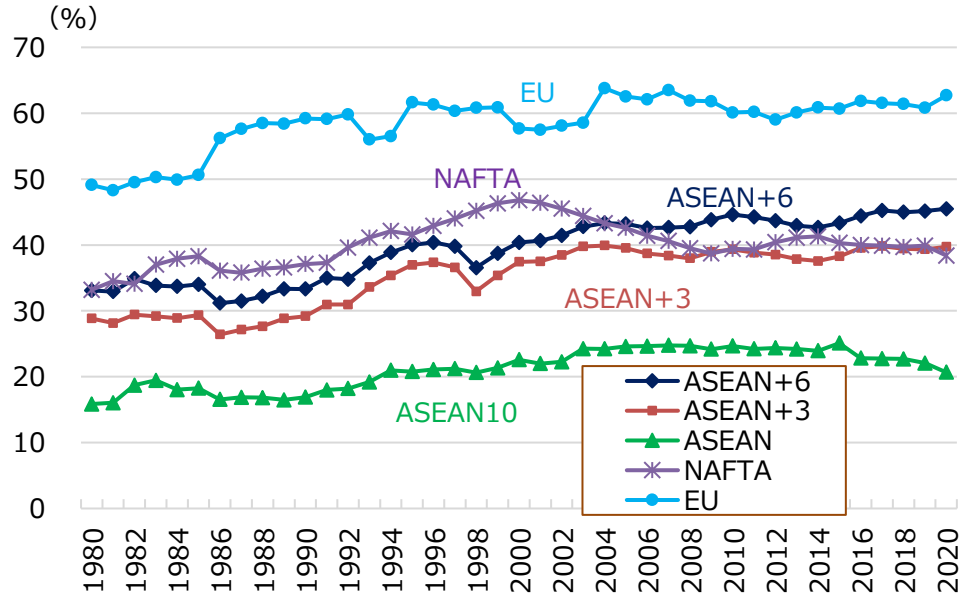
Note: The figures on and after 2022 are estimates by IMF.
Source：IMF "World Economic Outlook」database (Apr,2022)".

Developments of world exports by category



Source: RIETI-TID

Changes in intra-regional trade ratios for major regions

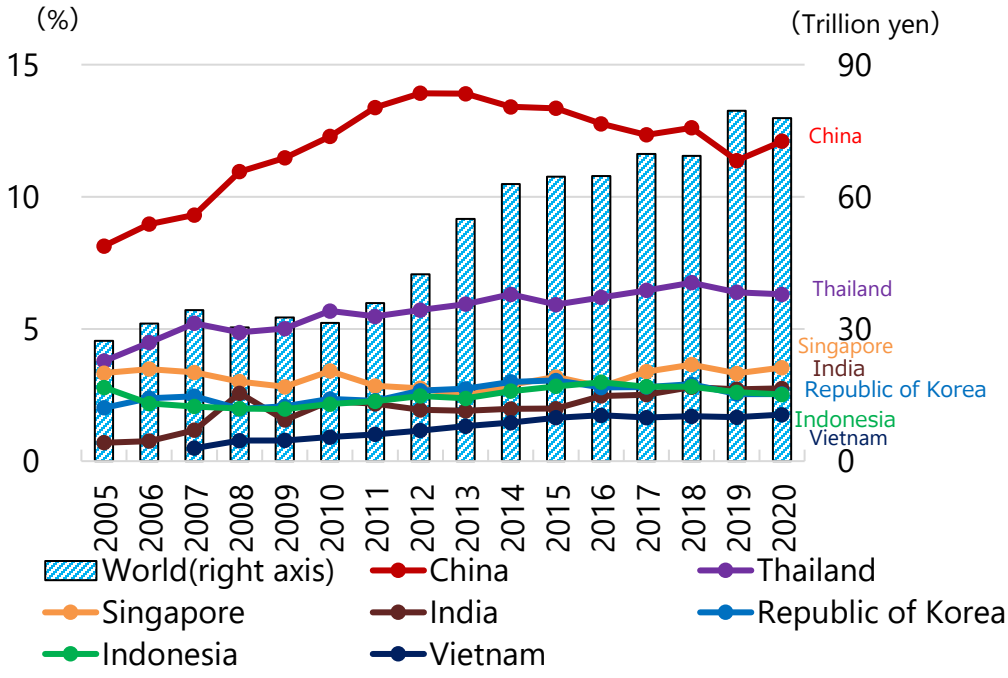


Note: 1. Intra-regional trade ratio = Each country's trade value with countries within the region / Each country's total trade value.
2. The ratio for EU is calculated on basis of member countries of individual year.
Source: World Bank "WITS" database.

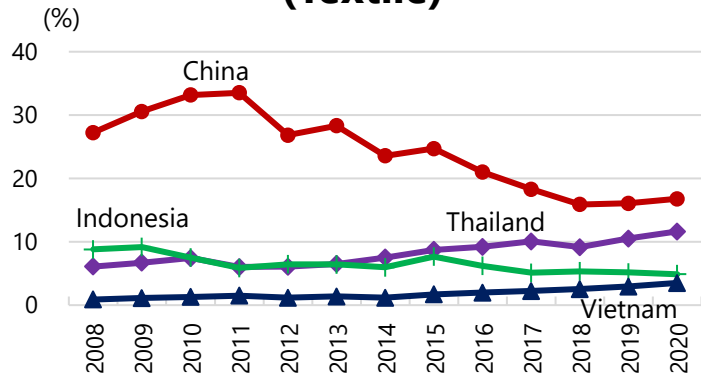
Changes in target countries of Japan's foreign direct investment

- **Japan's foreign direct investment is on an increasing trend, mainly in Asia. China's share remains high but turned to decline after the peak of 2012** and **those of Thailand, India and Vietnam were on rise. The investment is gradually diversified**.
- By industry, **in the textile industry, the shares of China and Indonesia decreased, while those of Thailand and Vietnam increased. In electrical machinery, China and Thailand are on the rise, however, in recent years, there are signs of hitting the ceiling**, and although the level is still low, India and Vietnam are on an upward trend.

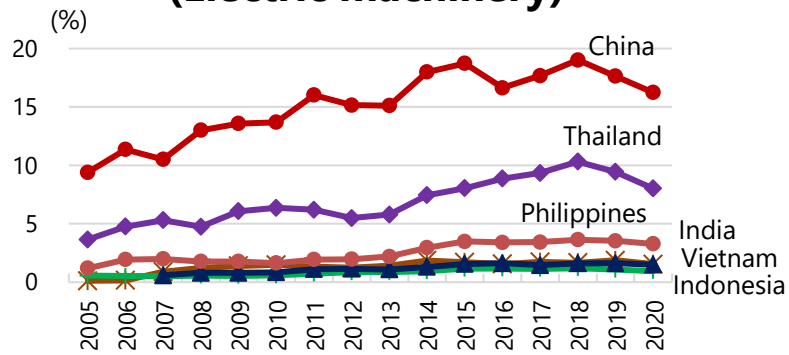
Country share in Japan's outstanding direct investment (manufacturing sector)



(Textile)



(Electric machinery)

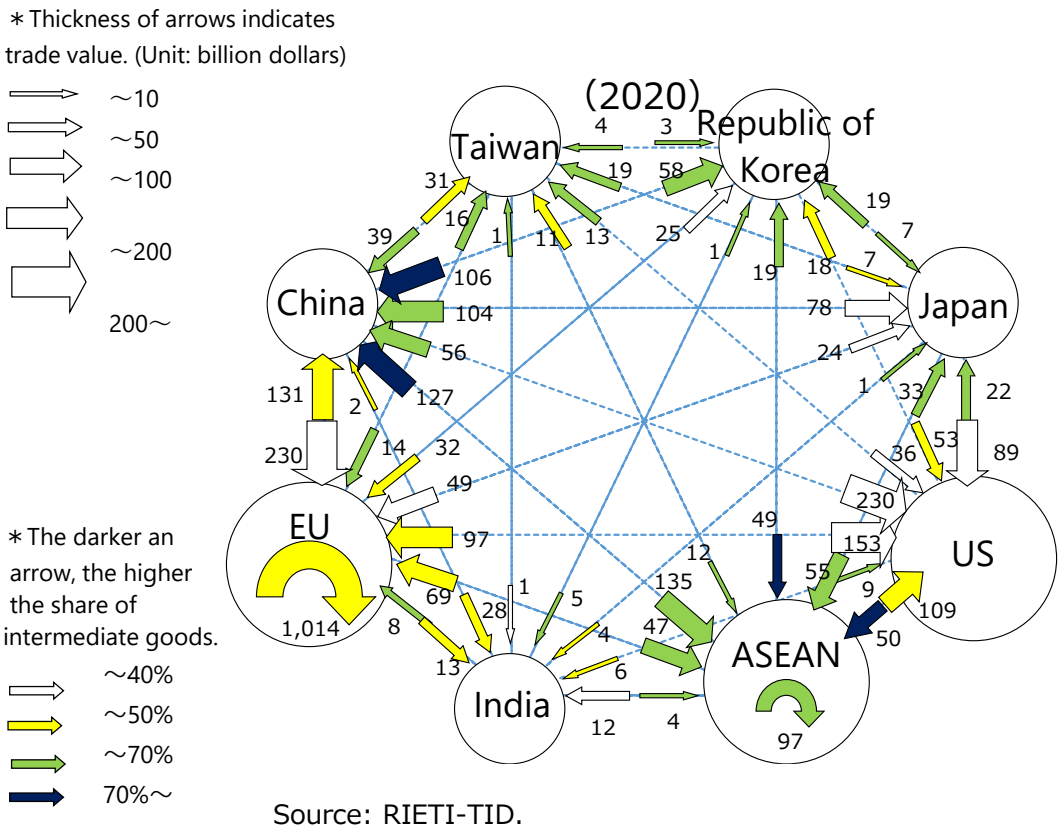


Source: Ministry of Finance "International Investment Position of Japan".

Japan's participation in global value chains: machinery industries in Asia

- **The exports of intermediate goods from Japan, the Republic of Korea and Taiwan to China and ASEAN, imply an international division of production in Asia**. On the other hand, **final goods are main export items from China and ASEAN to Europe and the United States**.
- China's gross exports to the United States include foreign value added created overseas, including Japan (**forward participation**), and Japan's exports to the United States also include foreign value added created in China and other economies (**backward participation**).

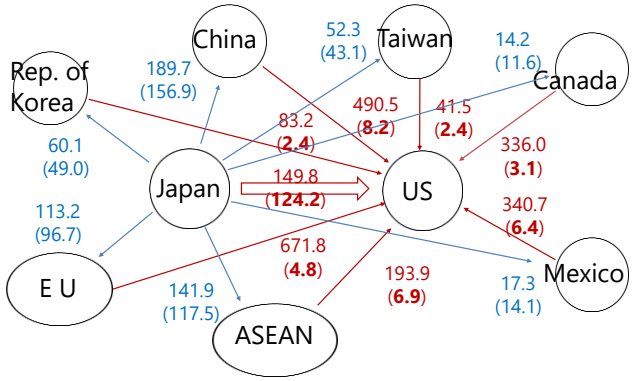
Trade flow (Machinery industries)



Source: RIETI-TID.

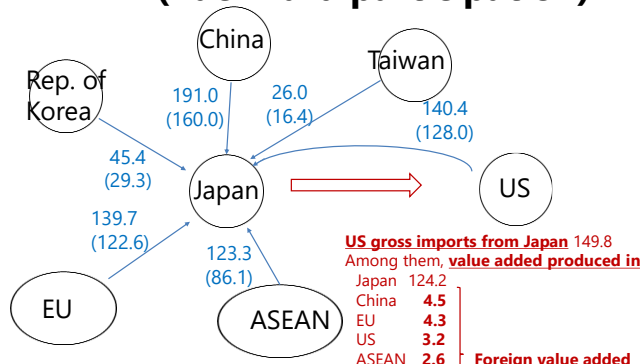
An example of GVCs surrounding Japan

(Forward participation)



*Blue arrows :
gross imports by individual countries /regions from Japan.
( ) means value added produced in Japan.
*Red arrows:
US gross imports from individual countries /regions.
( ) means value added produced in Japan.

(Backward participation)



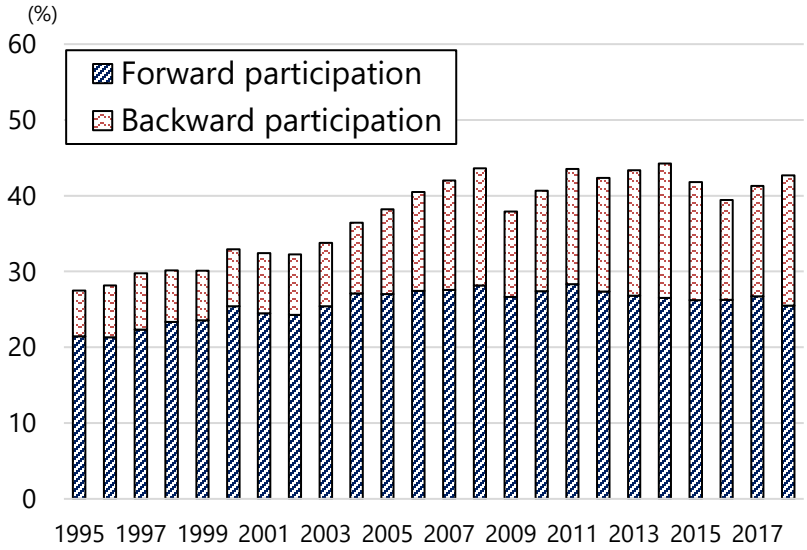
*Blue arrows :
gross imports by Japan from individual countries /regions.
( ) means foreign value added produced outside Japan.
*Red arrows:
US gross imports from individual countries /regions.
( ) means value added produced in Japan.

Note: Figures in 2018
Source: OECD TiVA.

Japan's participation in global value chains: backward participation rate has increased with increasing imports of intermediates from China

- As for Japan's participation in global value chains, **the degree of forward participation rate, supplying intermediates to other countries' exports, remains stable, while the backward participation rate, receiving foreign intermediates, increases rapidly**.
- Looking at the value added of Japan's exports to the United States, **the share of China increases rapidly, with growing presence as a supplier of intermediates.**

Participation of Japan in global value chains

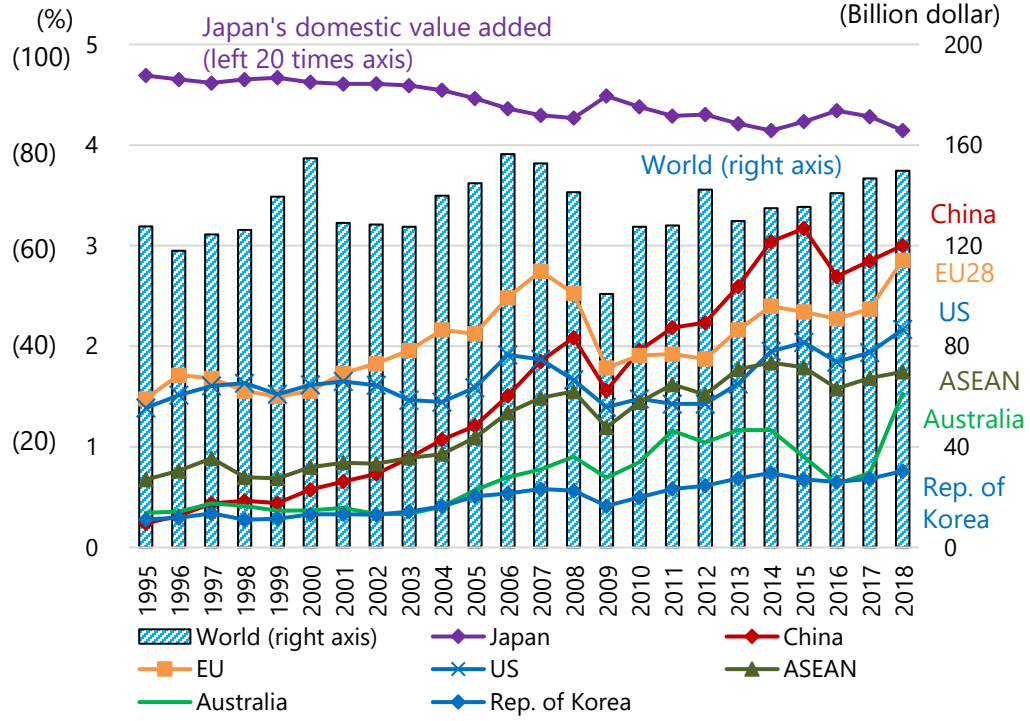


Note: 1. Forward participation rate = the domestic value added from own country, embodied in the gross exports of foreign countries / own country's total gross exports

2. Backward participation rate = the foreign value added from partner countries embodied in the gross exports of own country / own country's total gross exports

Source: OECD TiVA.

The value added of Japan's exports to the United States

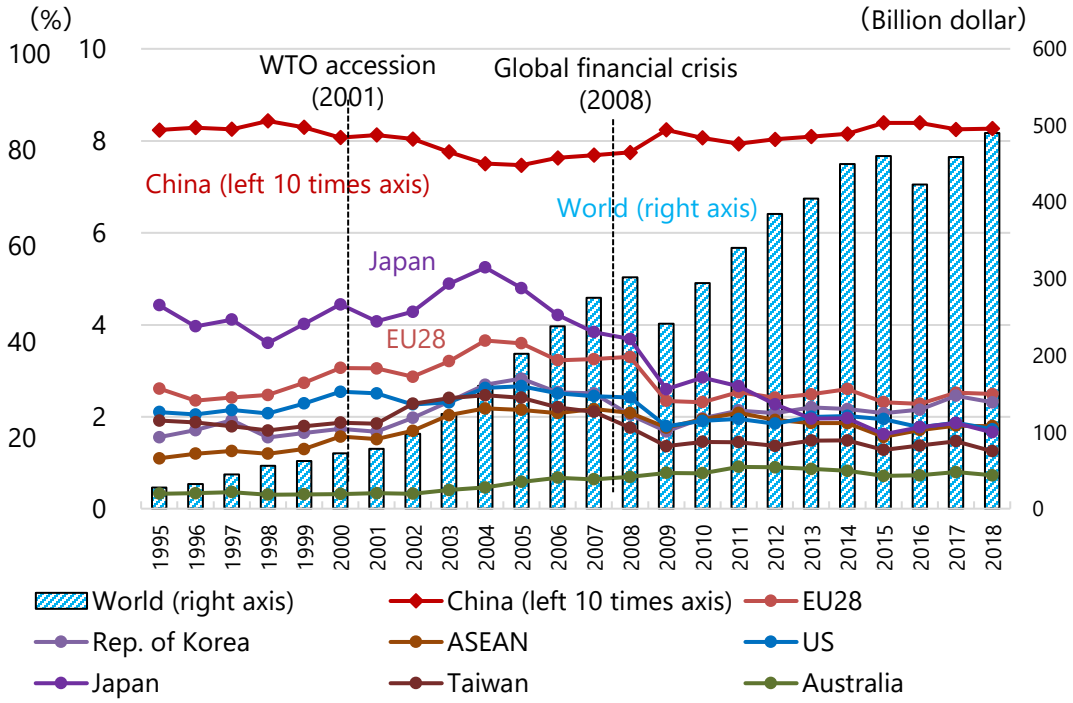


Source: OECD TiVA.

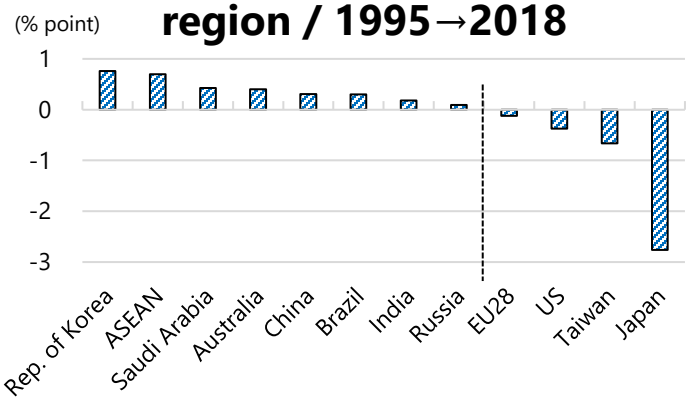
China's exports to the United State in value added

- **China's exports to the United State** include intermediates from Japan and other Asian countries as well as Europe and the US, **with about 20% of value added originated overseas**. **In the long run, the shares of Japan, Europe and the US decline, while those of ASEAN and Republic of Korea increase, strengthening relations with China**.
- **Each of EU, Republic of Korea, ASEAN, the US, Japan, and Taiwan has around a 10% share of foreign portion of value added of China's exports to the US**. The resource-rich countries such as Australia, Russia and Saudi Arabia follow.

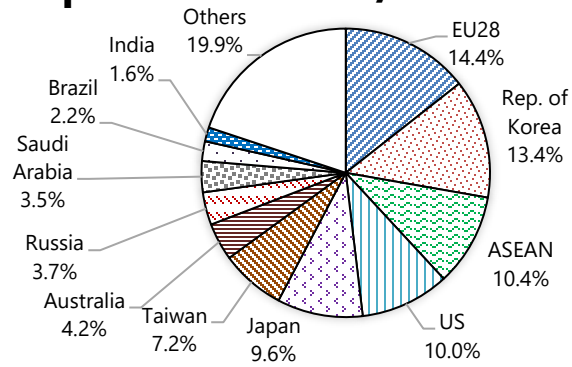
The value added of China's exports to the United States



Change in shares of each country and region / 1995→2018



Share of foreign value added in China's exports to the US / as of 2018

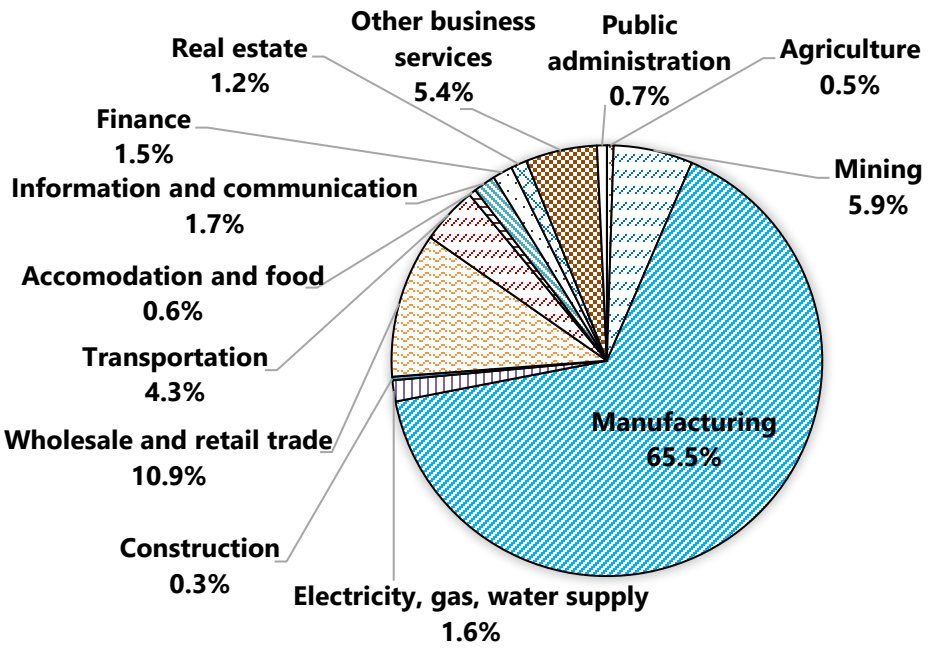


Note: In the right bottom figure, China's share in value added is 82.7%. The figure represents the breakdown of foreign portion of value added (remaining 17.3%).
Source: OECD TiVA.

Indirect trade in services

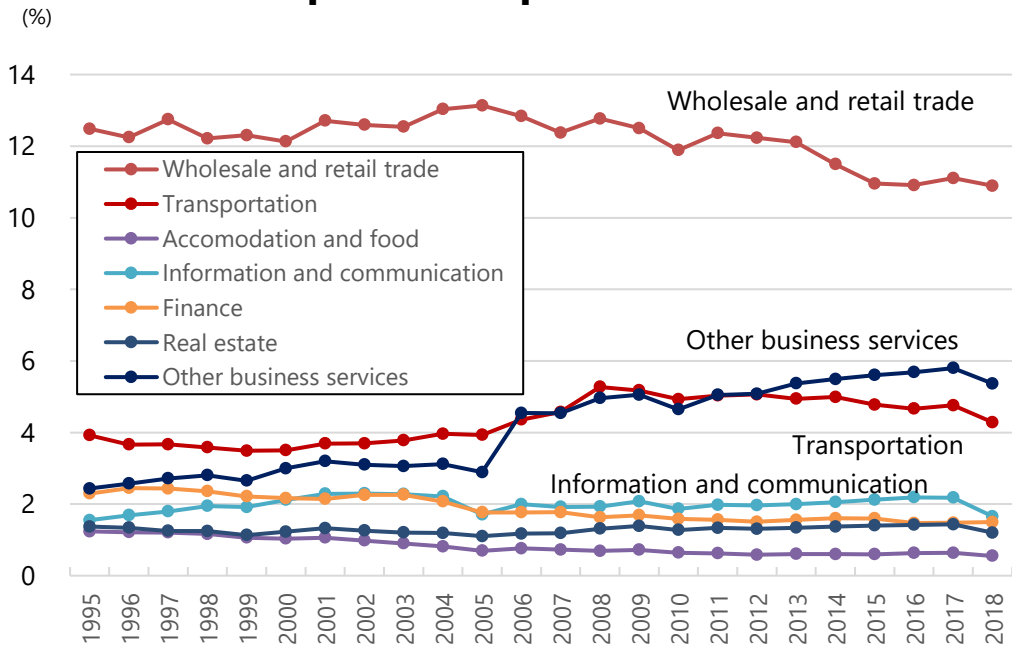
- **While around two-thirds of Japan's export of goods originates from manufacturing industries in value added term, the remaining one-third of value added comes from various service sectors as intermediate inputs**.
- Among services, **the shares of "wholesale and retail trade" and "transportation services" decrease, while the share of "other business services" expands, with an increasing importance of R&D activities, consulting, legal, finance and accounting services**.

Value added in exports of Japan's manufacturers (Industrial breakdown)



Note: As of 2018.
Source: OECD TiVA.

Share of service sectors of value added in exports of Japan's manufacturers

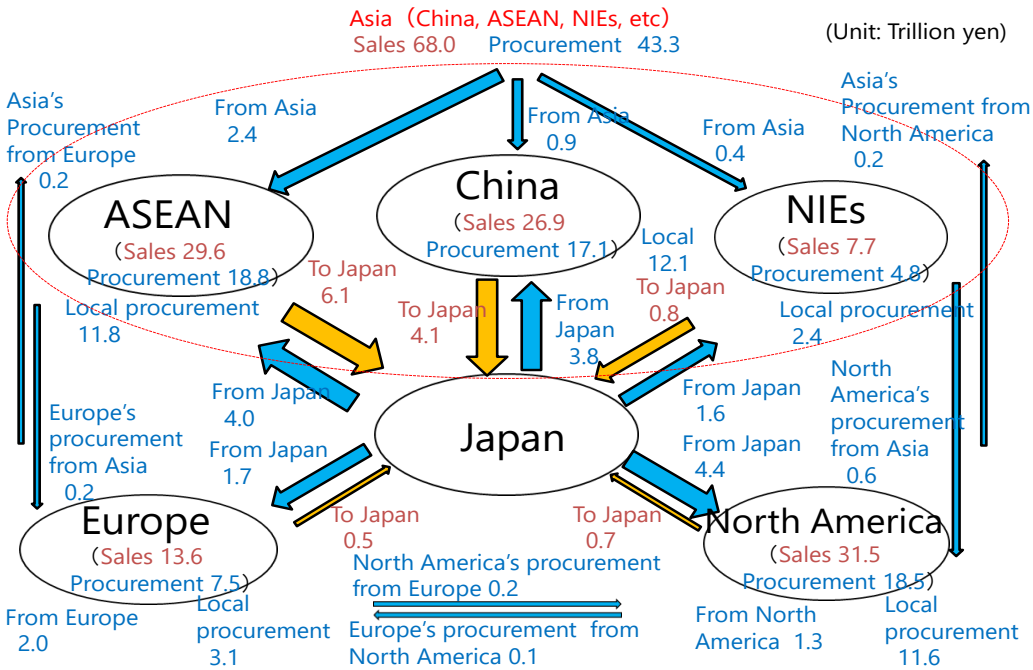


Source: OECD TiVA

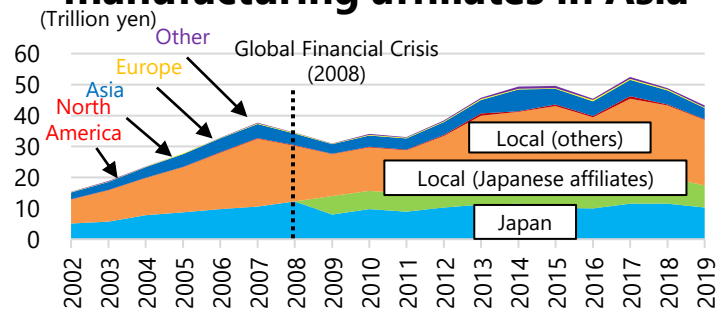
Procurement of Japanese overseas manufacturing affiliates in Asia

- There is **procurement flows between parent companies in Japan, and overseas affiliates in China, ASEAN and NIEs in Asia**. **Especially affiliates in China and ASEAN are supplied with materials from factories in Japan and other parts of Asia**.
- Although, local procurement expands in general, there seem some characteristics among industries. For example, **information and communication equipment has a high procurement rate from Japan, partly because some core-components are modular-typed with lightweight parts and difficult to be produced locally**. On the other hand, **a large part of materials for transportation equipment, which is integral in nature with heavy parts, comes from local suppliers.**

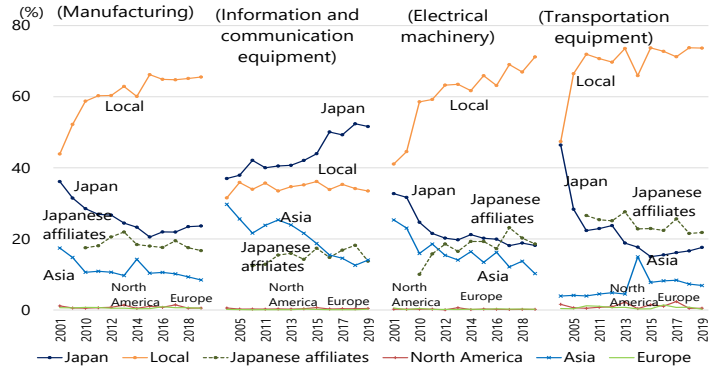
Procurement of Japanese overseas manufacturing affiliates (as of FY2019)



Procurement sources of Japanese overseas manufacturing affiliates in Asia



(Procurement source by industry)

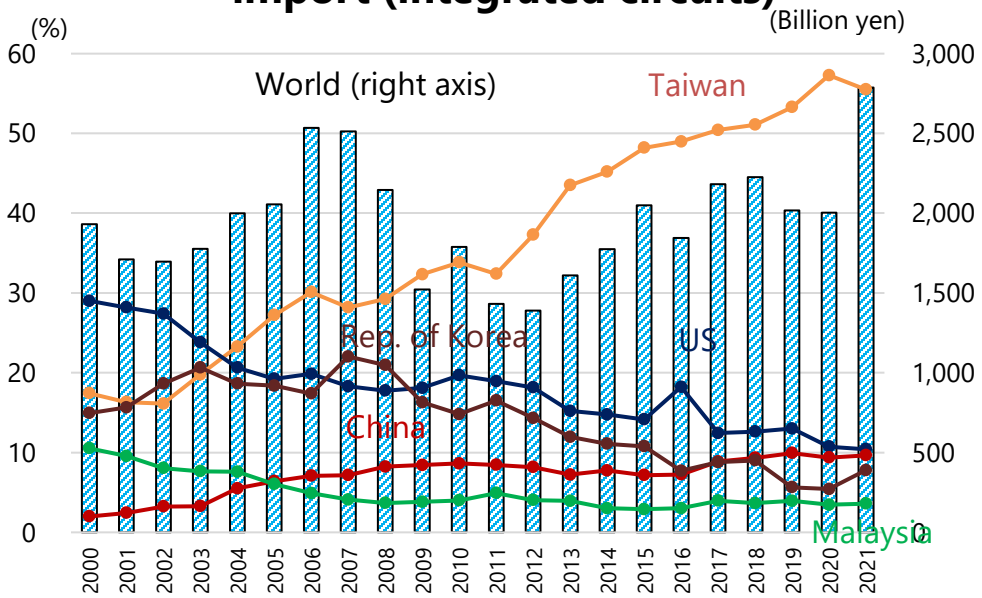


Source: Basic Survey on Overseas Business Activities (Ministry of Economy, Trade and Industry).

Japan's import of semiconductors and automobile parts: Taiwan and China have large shares

- In recent years, **Taiwan covers more than 50% of Japan's imports of high-tech integrated circuits, with rising demand. In the long run, the share of Taiwan is expected to continue to rise, and the dependence on Taiwan remains significant.**
- **China covers about 40% of Japan's imports of auto parts. Although its share seemed to reach a peak, we can see a sign of rising again in these few years.**

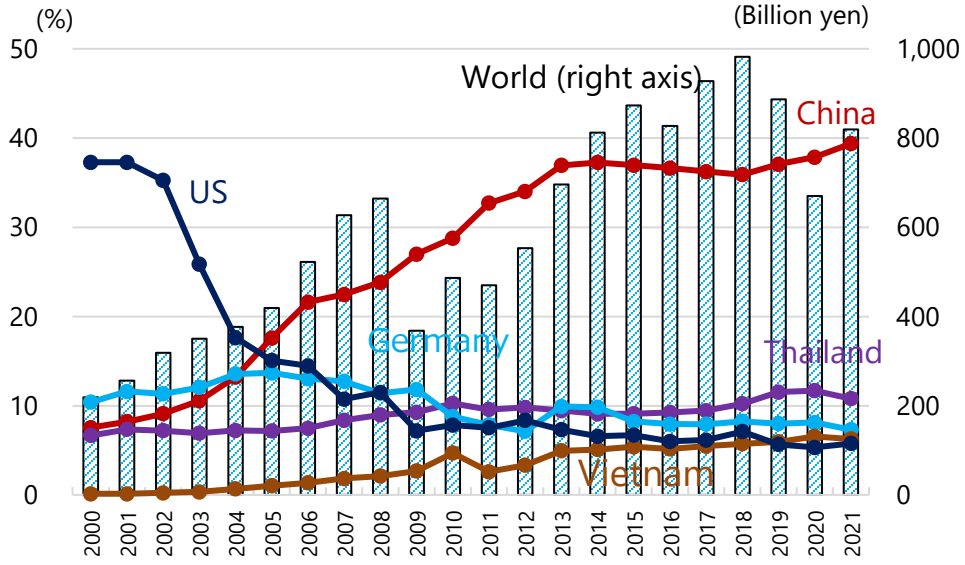
Major partner countries and regions in Japan's import (integrated circuits)



Note: HS8542.

Source: Global Trade Atlas.

Major partner countries and regions in Japan's import (automobile parts)



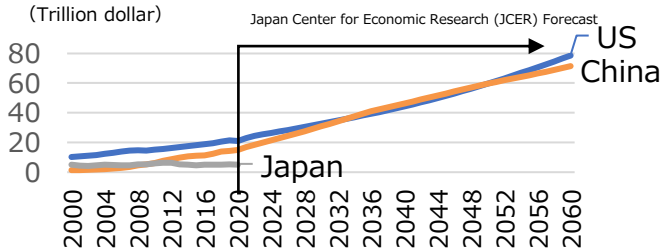
Note: HS8708.

Source: Global Trade Atlas.

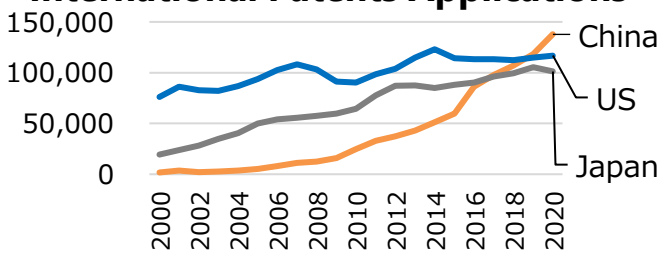
China's innovation, economic growth, and linkages to global economy

- **China has rapidly grown as one of the world leaders** in the economy as well as **in science and technology.** Combined with China's technological innovation, its rapid growth has led to the recent U.S.-China technological competition.
- **China is strengthening its ties to the global economy in investment and trade,** while politically conflicted.

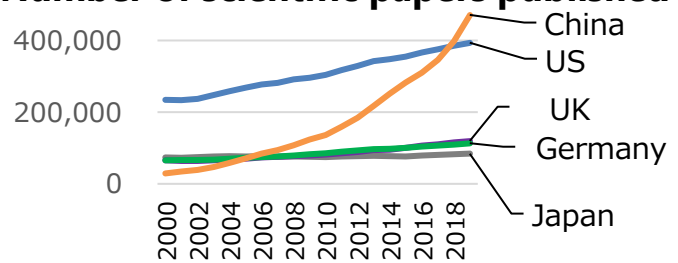
Nominal GDP



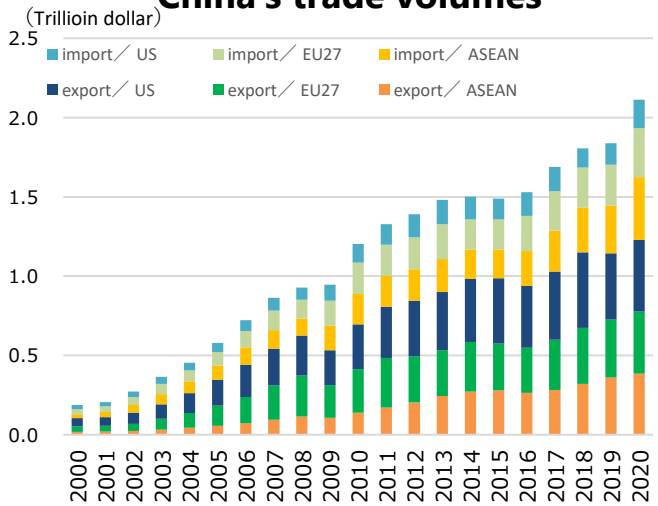
International Patents Applications



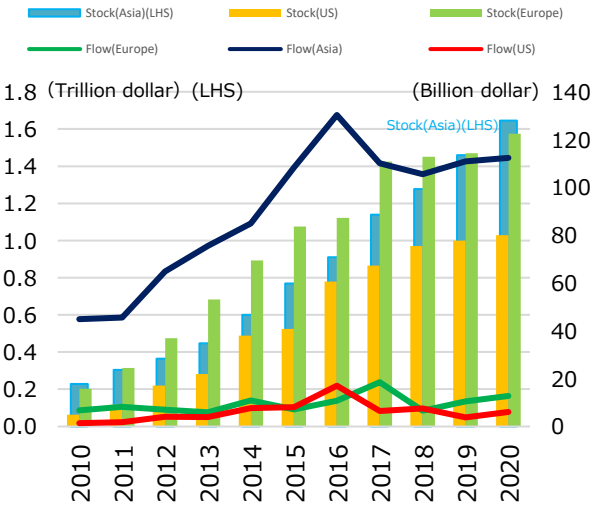
Number of scientific papers published



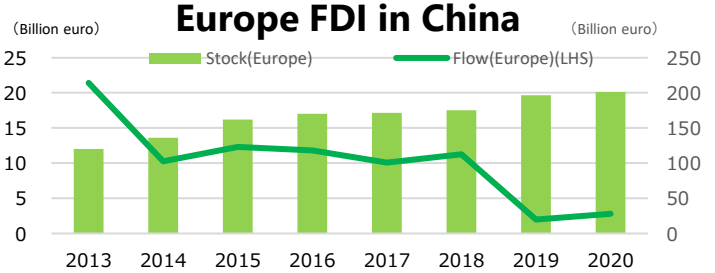
China's trade volumes



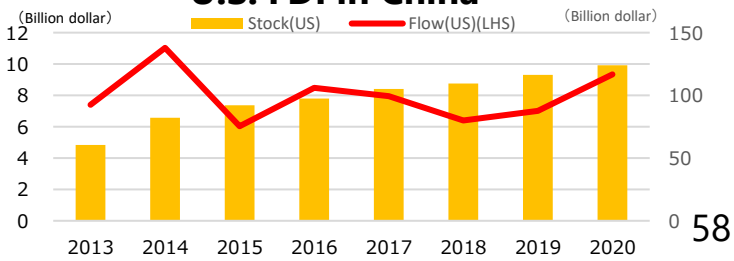
China outward FDI



Europe FDI in China



U.S. FDI in China



Source：(Upper)JCER,WIPO,MEXT (lower)GTA,CEIC

Economic security on highly import-dependent and essential products and emerging and sensitive technologies

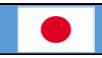
- As uncertainty is heightened by geopolitical risks and pandemics, **economic security demands, including supply chain resilience** (such as development of domestic supply system of highly import-dependent and essential products and diversification of import countries) **and prevention of leakage of emerging and sensitive technologies by strengthening export control and investment regulations), are extremely high. Japan needs to develop domestic energy resources from the perspective of stable energy supply.**

Foreign dependency / substitutability on essential products in 2020

	domestic production (A) (hundred million JPY)	export value (B) (hundred million JPY)	import value (C) (hundred million JPY)	foreign dependency C/(A+C) : (%)	Sub-stitutability C/B :
Semiconductor devices	8,108	7,474	4,007	33.1	0.54
Integrated circuits	41,939	27,246	23,460	35.9	0.86
Batteries	10,651	4,627	1,845	14.8	0.40
Other non-ferrous metals (※)	14,066	9,528	11,888	45.8	1.25
Medicaments	70,370	5,919	28,548	28.9	4.82

(※) gold, silver, platinum, palladium, nickel, tin, cobalt, silicon, etc.

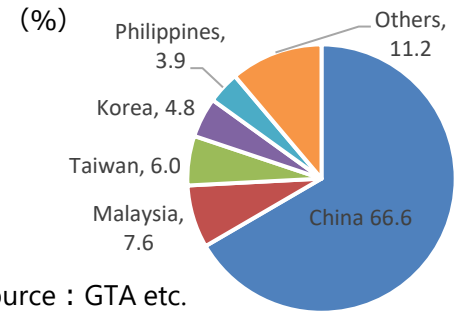
Trade control and foreign investment regulations concerning emerging and sensitive technologies

				
Trade control	●In May 2022, provisions on clarification of the scope of the "deemed export" began.	● In October 2021, "biotechnology-related software" was added to the regulated items list of EAR as emerging technology.	● In September 2021, EU regulations on export controls of emerging and sensitive technologies have been strengthened.	● China's Export Control Law went into effect in December 2020.
Inward Direct Investment	● The threshold for prior screening was lowered from 10% to 1% under the revised Foreign Exchange and Foreign Trade Act in 2019.	●FIRRMA (Foreign Investment Risk Review Modernization Act) was passed in August 2018.	●The EU's first rules for screening foreign direct investment entered into force in April 2019.	● In December 2020, the Measures for the Security Review of Foreign Investment has regulated investments in critical items, sensitive technologies, etc.

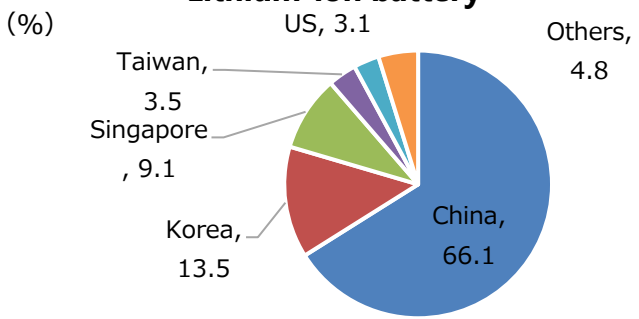
Source：media reports

Share of import partners in 2020

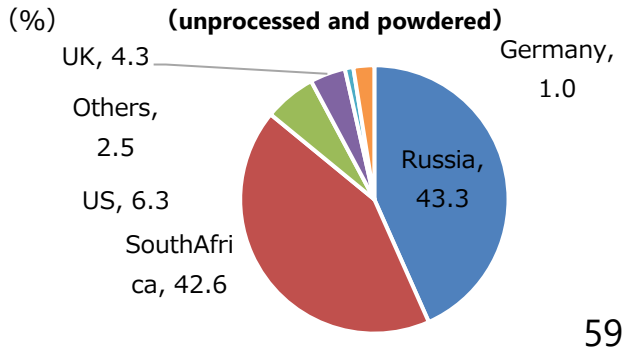
Photosensitive semiconductor devices



Lithium-ion battery



Palladium (unprocessed and powdered)

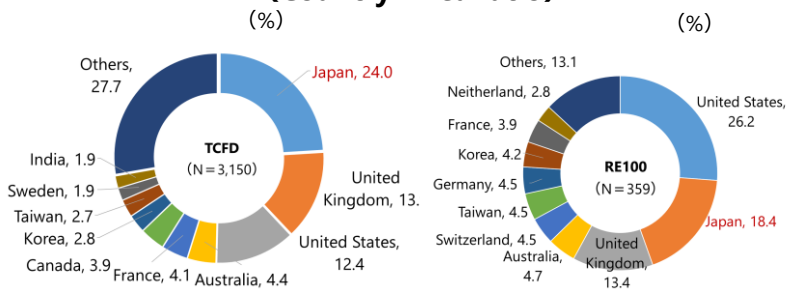


Source：GTA etc.

Toward visibility for shared values and the creation of sustainable global value chains

- As actions are needed to achieve decarbonization, **Japanese firms actively participate in the international initiatives to disclose information and set goals**. To promote decarbonization, **GHG emissions should be measured throughout the whole supply chain**.
- **In addition to decarbonization, various issues need to be considered and disclosed, which makes supply chain management more complicated. Digital technologies are useful for collecting, managing, and analyzing large amounts of information related to sustainability.**
- **Supply chain management using data linkage, which is advancing in Europe, is expected to spread through Japan and Asia.**

Companies striving for decarbonization administration (Country・Area ratio)



Note : As of March 2022

Source : Created by METI referring to the website of Ministry of the Environment

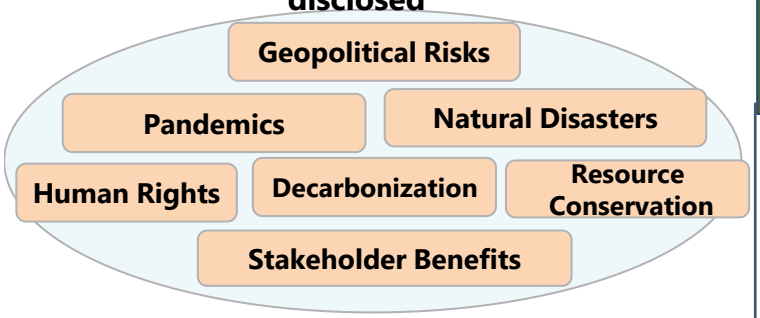
GHG emissions should be accounted for throughout the supply chain

GHG protocol standards
Scope1+2+3＝"Supply-chain emissions"

Upstream（Scope 3）	Own company	Downstream（Scope 3）
●raw materials ●transportation and distribution ●employee commuting ●others	●fuel combustion (Scope1) ●electricity usage (Scope2)	●use of sold products ●end-of life treatment of sold products ●others

Scope1：Direct emissions by own company (fuel combustion、manufacturing process)
Scope2 : Indirect emissions from purchased electricity, heating, steam for own use
Scope3 : Indirect emissions other than Scope 1、Scope 2 (other companies' emissions related to the activities of own company)
Source : Created by METI referring to the website of Ministry of the Environment, GHG Protocol

Various issues need to be considered and disclosed



Digital technologies are useful in securing sustainability in supply chains (Use-cases of Japanese companies)

●Demand forecasting for production and supply in proper amount: SNS image analyses by AI, current trends of clothing are predictable.

●Management of all production-related information: process management by each individual staff using a tablet device, management of machine condition using IoT technology in the plant, digitalizing communication with other companies in the supply chain.

（METI "The report by the Study Group on Sustainability of Textile and Apparel Industry" , July 2021）

Europe is advanced in data linkage.

●IDS
●GAIA-X
●CATENA-X

Using a platform that provides safety, trust, data sovereignty and through which large amounts and variety of data for supply chains (e.g. production site data) are accessible.

●A business use case

NTT（Japan）and SIEMENS（Germany）are participating in a data linkage verification project to reduce CO2 emission and realize a circular economy.

Value creation through an Asia-wide data sharing platform

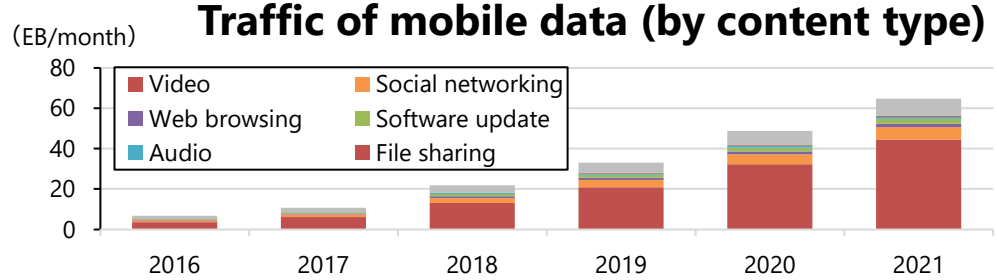
（Creation of 100 good practices over the next five years is announced in "ASIA-Japan Investing for the Future Initiative" ）

Table of contents

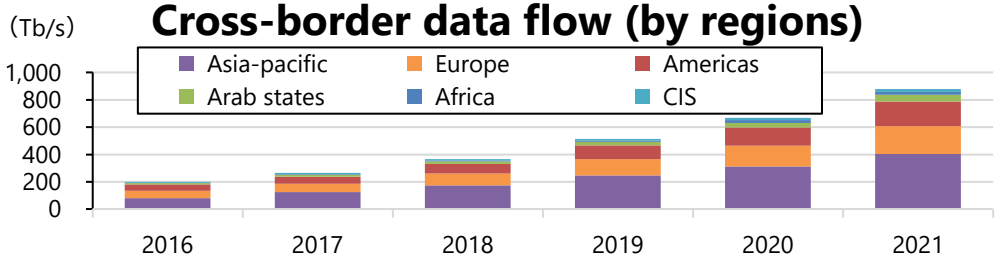
Opportunities and challenges posed by expansion of digital trade

- Digital trade, including trade in data, is expanding, and **cross-border data flows are rapidly increasing, especially in Asia-pacific**. **Digital protectionism is gaining momentum in some emerging countries**, and **it is important to understand trends in regulations such as personal information protection.**
- While **emerging technologies such as robots and AI enable supply chain efficiency and new value creation**, dealing with increasingly complex **rules and technical aspects** and utilizing them not only to replace labor but also **as a labor complement** are major challenges. It is also important **to review employment and education systems** with an eye on future trends.

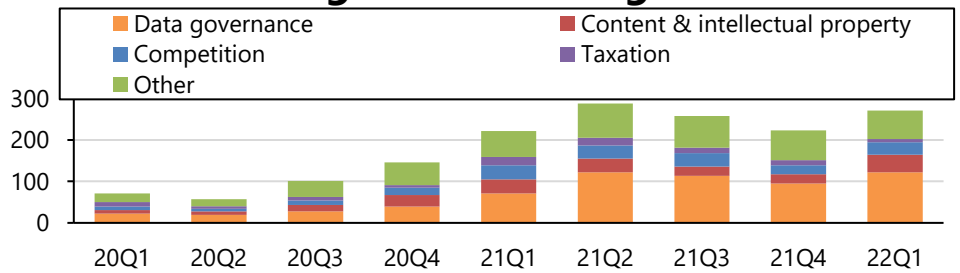
Traffic of mobile data (by content type)



Cross-border data flow (by regions)



No. of digital-related regulations



Note: (Upper, Middle) Number for 2021 is forecast. (Middle) Category of regions is referred from ITU.
Source: ITU, Ericsson, Global Trade Alert

Overview of trade-tech

	Examples of use	Challenges
AI	・Creation and quality improvement of new goods and services ・Substitution of low value-added and routine tasks	・International framework and rulemaking
IoT	・Tracking and monitoring the status of delivered goods	・Vulnerability of network security
Robotics/Automation	・Optimization of logistics and work processes	・Shortage of high-skilled workers, replacement of workers
5G	・Increasing sophistication and speed of digital service trade (e-commerce, online education, etc.)	・Increasing political tensions, especially between the U.S. and China
Blockchain	・Single window for trade-related procedures	・Information protection and transparency control of data ・Interoperability between blockchains
3D printer	・Shortening of supply chains and reduction of inventory control	・Structural changes due to a decrease in intermediate goods manufacturing ・Redefining supply chain management

Necessary/Unnecessary skills, increasing occupations in 2030

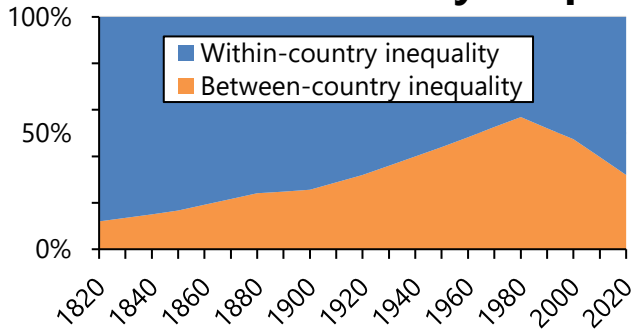
Rank	Necessary skills	Unnecessary skills	Increasing occupations	
1	Learning strategies	Control precision	Wind turbine service technicians	+68.2%
2	Psychology	Wrist-finger speed	Nurse practitioners	+52.2%
3	Instructing	Rate control	Solar photovoltaic installers	+52.1%
4	Social perceptiveness	Manual dexterity	Statisticians	+35.4%
5	Sociology & anthropology	Finger dexterity	Physical therapist assistants	+35.4%
6	Education and training	Operation and control	Information security analysts	+33.3%
7	Coordination	Reaction time	Home health and personal care aides	+32.6%
8	Originality	Arm-hand steadiness	Medical and health services managers	+32.5%
9	Fluency of ideas	Equipment maintenance	Data scientists and math. science, all other	+31.4%
10	Active learning	Response orientation	Physician assistants	+31.0%

Note: "Increasing occupations" is growth rate of total employment by 2030.
Source: H. Bakhshi, J.M. Downing, M.A. Osborne, P. Schneider, "The future of skills: Employment in 2030", BLS

Widening income inequality and skills gap

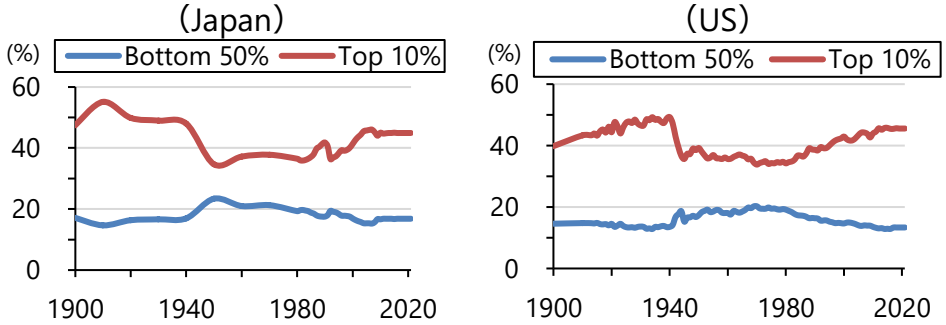
- **Inequality within countries is rising to a greater degree than between countries** around the world, and income inequality is widening in Japan and the U.S. as well.
- **The increased use of emerging technologies such as robots and AI as labor replacement technologies has, in part, contributed to the polarization of the labor market and wage disparities among skills**. Going forward, **it is important to balance economic growth and the correction of disparities through investment in human capital and R&D investment in labor-complementary technologies that reduce labor burdens.**

Within-/between-country inequality



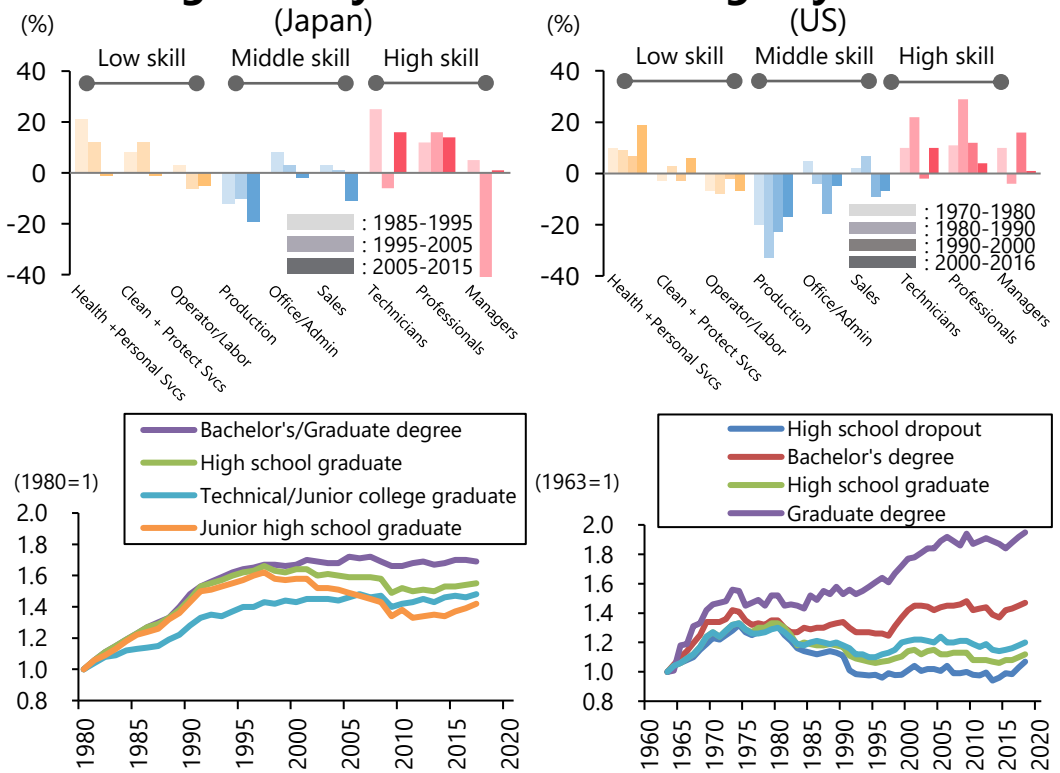
Note: Percentage based on tile index, which, like the Gini coefficient, represents disparity.

Percentage of income accounted for by upper- and lower-income populations in Japan and US



Source: World Inequality Lab, "World Inequality Report 2022"

Working hour by skills and real wage by education

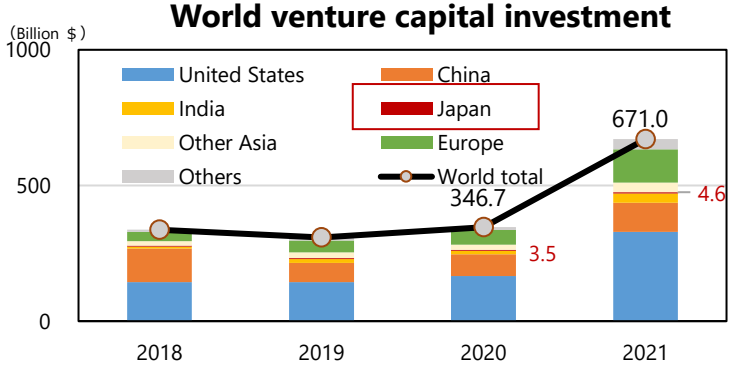


Note: (Lower) Index of real wage
Source: Autor (2019), MIC, MHLW

Recent global trends of startups

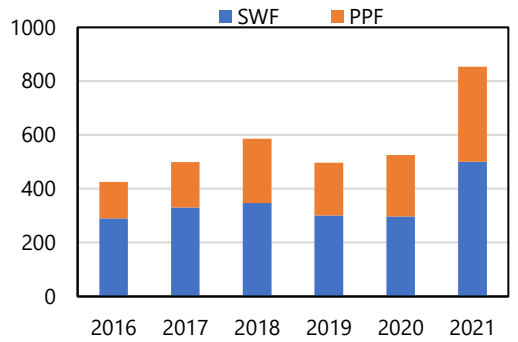
- **World venture capital investment in 2021 almost doubled from the previous year** (from 346.7 billion$ to 671 billion$), and investment by SWF and PPF also increased, but those investment movements lagged in Japan.
- **The business entry rate in Japan has been lower than in other countries, and the number of unicorns is small.** Japan faces various challenges: **the lack of funds and human resources to support commercialization, the slow expansion of global business, the issues related to financing.**

World venture capital investment



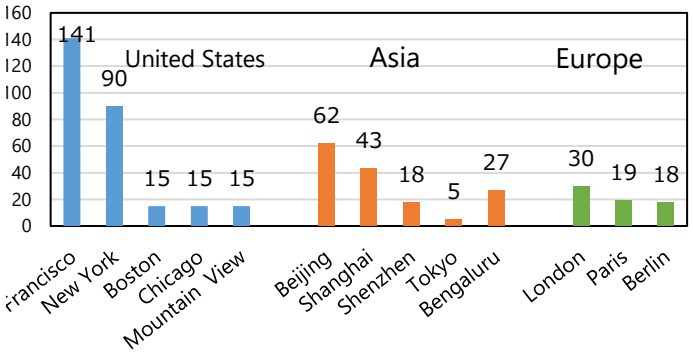
Source : KPMG "Venture Pulse 2021 Q4"

The number of investment by SWF, PPF



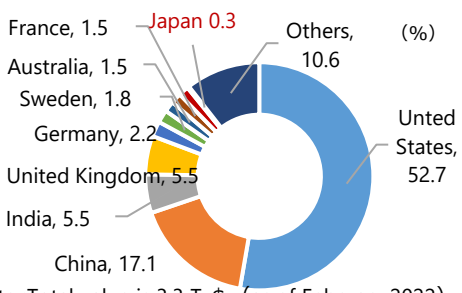
Source :Global S W F "2022 Annual Report"

The number of Unicorns (by cities)



Source :CB Insights

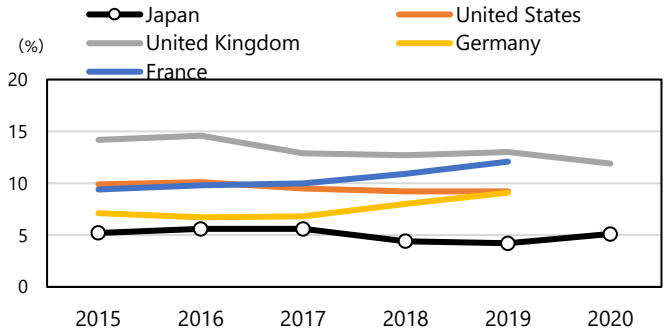
Unicorn values : share by counties



Note :Total value is 3.3 T $ (as of February 2022)

Source :CB Insights

Business entry rate



Source :White Paper on Small and Medium Enterprises in Japan 2022

The ecosystem of start-ups in Japan lacks in・・・

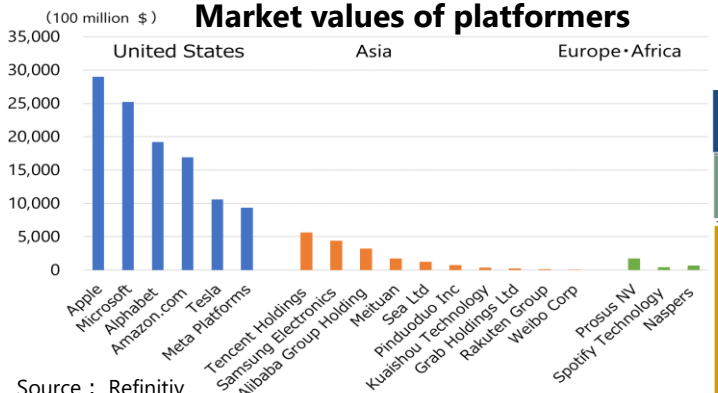
- **entrepreneurs**
- **human movement to the startups**
- **funds and human resources to support commercialization**
- **volume and liquidity in finance**
- **global expansion**

Creating new economic opportunities via Asia-wide startups

- **While the U.S. platformers overwhelm others in market values, new platformers have appeared one after another in emerging Asia. The Asian platformers gain markets not only by scale merit, but also by expanding various tailor-made business strategies according to the characteristics of market areas and customers.**

- **Digital economy in Southeast Asia will continue to grow significantly (1 trillion$ in 2030). To incorporate Asia's potential for growth, it is important for Japan to promote and assist ADX projects (e.g., efforts to solve the social challenges in Asia) and to increase investment in Asia by making full use of innovation in the private sector.**

Market values of platformers

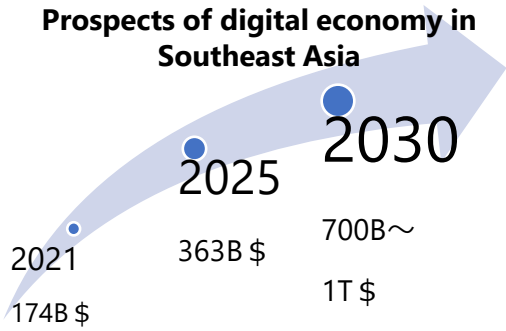


Source： Refinitiv

Variety of platformers

		Characteristics	Backgrounds, Economic rationalities	Platformers (examples)
Domestically - oriented		■ Concentrate on the business in their home countries (not necessarily denying the overseas business in the future)	■ Input resources intensively in the domestic markets where high potentials remained	Tencent、Meituan、Tokopedia、Ovo、Digit Insurance
Regionally - oriented		■ Promote the horizontal spread of their business in the same areas (not necessarily denying the global operations in the future)	■ High similarities in the business environments facilitate the horizontal spread of the domestic business operations.	Grab、Gojek
Globally - oriented	Pursuing market opportunities	■ Expand the business in the markets at least either with huge populations or with high income levels	■ Business expansion by utilization of the advantages of the platformers	Amazon, Alphabet, Meta, Apple, ByteDance
	Pursuing diasporas	■ Promote the horizontal spread of business in the overseas markets with large communities of diasporas (people and their descendants from the platformers' home countries)	■ Strong needs for the ties between the large populations of their home countries and the overseas emigrants' communities	Baidu, Alibaba, ANI Technologies、One97 Communications
	Pursuing new frontiers	■ Actively expand their business in the emerging markets with fewer competitors	■ Avoid exhaustive competitions in the major markets, and secure the coverage of the markets by capital tie-ups if needed	Didi Chuxing, Sea Group

Prospects of digital economy in Southeast Asia



Source：Google, TEMASEK, BAIN & Company "e-Conomy SEA 2021"

ASEAN-Japan Economic Cooperation in the Post-Pandemic Era

Two Initiatives for the Next Chapter of Japan's Economic Relations with ASEAN

1. Offer effective solutions to the **reality** faced by ASEAN countries
2. Create foundation for **sustainable** economic society, using private sectors' **innovation** to the maximum extent
3. "Co-create" the region's future through collaboration with local businesses and partnership between Japan and ASEAN countries

→ Strongly promote **new future-oriented investment ("Future Investment")**

Newly Announced

ASIA-Japan Investing for the Future Initiative "AJIF"

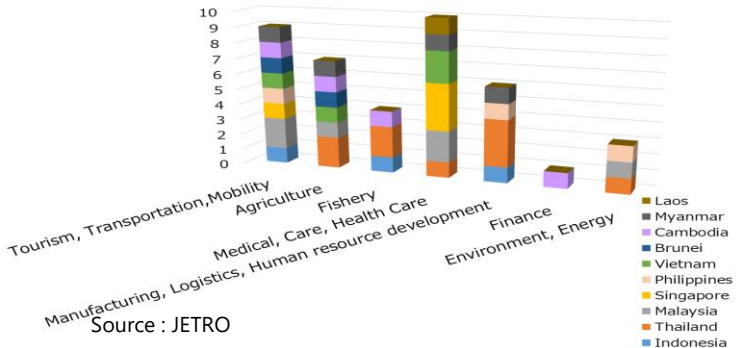
Announced in May 2021

Asia Energy Transition Initiative "AETI"

Three ideal images of the future which Japan and ASEAN co-creates

- **Improving Attractiveness of the region as a Hub of Global Supply Chain**
- **Creating Innovation to enhance Sustainability & solve Social Challenges**
- **Promoting Energy Transition**

Asia Digital Transformation (ADX) Projects in ASEAN countries



Source : JETRO

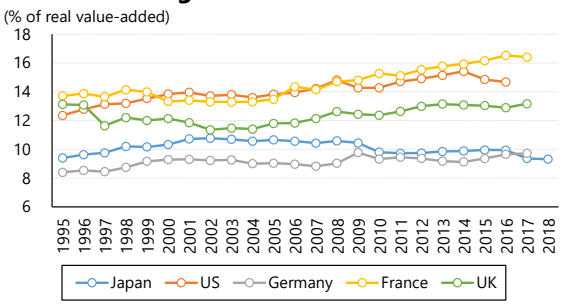
Ongoing Project by a Japanese company (e.g. medical field)

A Japanese trading company invests in companies of Asia and others, which holds and utilizes a total of over 400 million patients data to realize efficient and enhanced medical services.

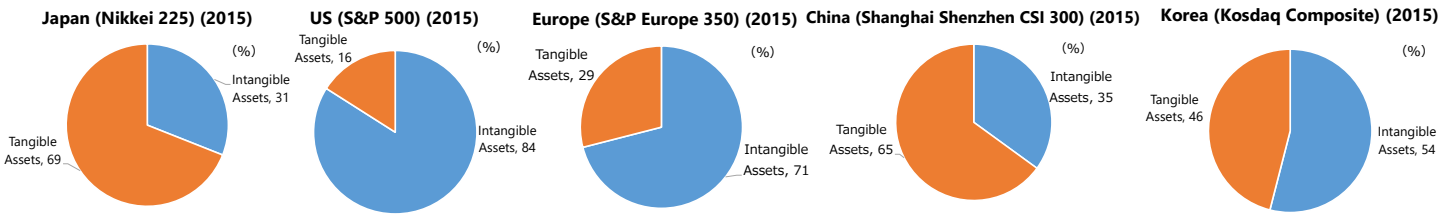
Japan's sluggish investment in intangibles and human capital

- **Japan's investment ratio in intangibles is lower than other advanced economies. In terms of corporate valuation, intangibles account for around 80% in the United States and 70% in Europe while only 30% in Japan.**
- **While Japan focuses on design and R&D, organizational and human capital account for lesser shares,** suggesting the need to consider proper allocation, leading to higher productivity.

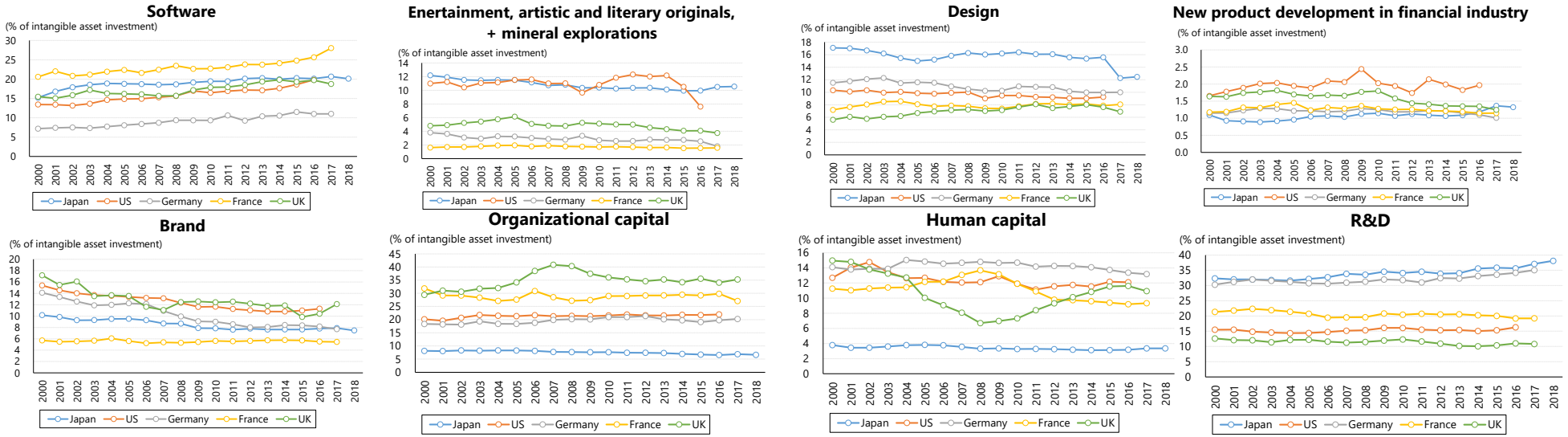
Intangible Asset Investment



Analytical breakdown of corporate valuations in selected countries



Components of intangible asset investment



Sources: RIETI, INTAN-Invest, Elsten & Hill (2017) "Intangible Asset Market Value Study?"
Note 1: Organizational capital includes expenditures on legal, accounting, head office, and management consulting services, and a part of executives' remuneration.
Note 2: Human capital includes expenditures for on- and off-the-job training.