World Economic Trends I
<The 2024 Spring/Summer Report>

ー Labor Market Changed by AI ー

(Summary)

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Contents

"World Economic Trends": This report surveys and analyzes the trends of the world economy since 2002. This is the 44th issue.

- As new general-purpose technology, AI has the potential to have a significant impact on the economy and society.
- AI automates some or a considerable portion of clerical tasks. Occupations for low recipient resistance to AI-automated services may see a decrease in employment in the future (substitution), while those for high resistance may increase productivity and quality (complementarity) (Figures 1 and 2).
- Developed countries have a higher proportion of employed people in occupations that will be heavily affected by AI and are likely to be more affected by both AI-based complementarity and substitution (Figure 3).
- Technological innovations will not only complement and substitute for existing occupations but also create new occupations and jobs in the medium to long term. Expectations are high for AI (Figure 4).

Figure 1. Task and occupational exposure to AI (image)

(1) Occupational characteristics	Large share of physical tasks	Large share of clerical tasks	
(2) AI introduction (task exposure)		Task substitution and complementarity	Task creation
(3) [Service recipient's resistance to automation]		[Low] →No human engagement is required / [High] →Human engagement is required	
(4) AI introduction (occupational exposure)	Low exposure	Occupation substitution / Occupation complementarity	Occupation creation
(Examples)	Sportspeople Police officers and firefighters Construction workers, etc.	Telephone answerers / Clerical workers / IT personnel, etc. / Healthcare personnel / Educators / Legal professionals, etc.	(New occupations using AI)

(Note) Adapted from Cazzaniga et al. (2024), etc.

Figure 2. AI exposure and complementarity by occupation (U.S.)

(←Importance of decision-making, large social impact of failure, etc.)
AI complementarity

Exposure to AI
(←Large share of physical tasks / large share of clerical tasks→)

Surgeons, Airline pilots, Truck drivers, Dancers, Dishwashers, Judges, Lawyers, Reporters, Economists, Administrative and government workers, Telemarketers

The higher the score below, the higher the human engagement and the complementarity of AI.
(1) Face-to-face communication
(2) Responsibility for results and others' health and safety
(3) Exposure to the outdoor environment and proximity to others
(4) Degree of freedom and frequency of decision-making
(5) Standardization and automation of operations (reverse evaluation)
(6) Education, experience, and training levels required for employment

Low exposure
High exposure, high complementarity
High exposure, low complementarity

(Note) Adapted from Cazzaniga et al. (2024). The red line represents the median AI exposure and complementarity.
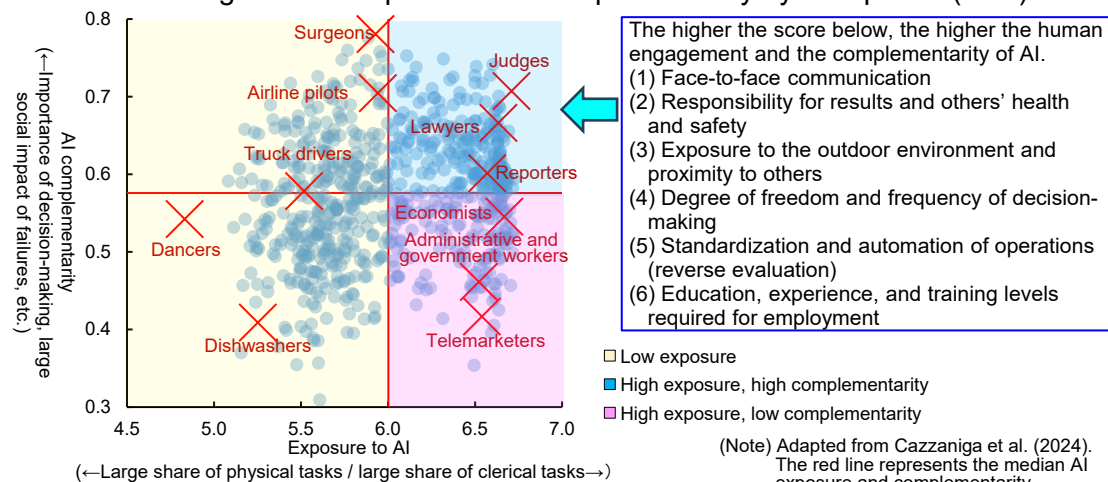
Figure 3. Employment shares by AI exposure and complementarity/substitution

Share of employment (%)
World / Developed countries / Emerging countries / Low-income countries

Low exposure
High exposure, high complementarity
High exposure, low complementarity

(Note) Adapted from Cazzaniga et al. (2024).
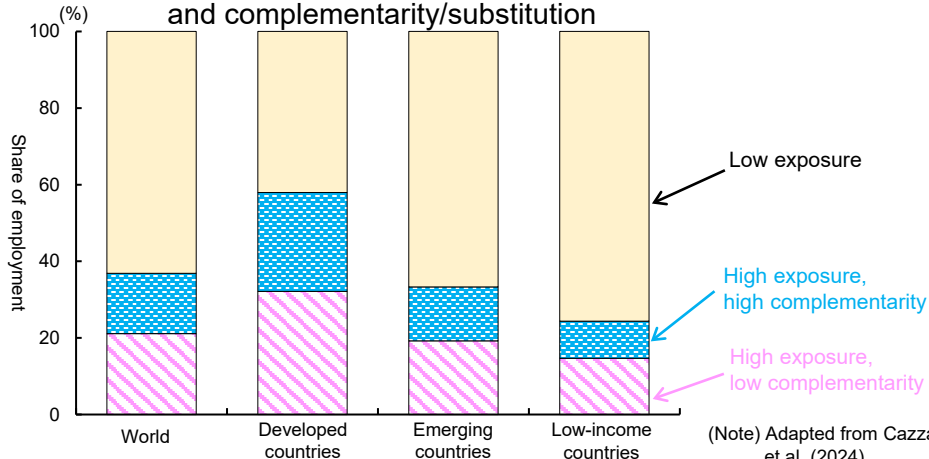
Figure 4. Employment growth in response to technological innovations by occupation (U.S., 1940-2018)

(10,000 people)

■ Employment for occupations that existed as of 1940
■ Employment for occupations that did not exist as of 1940

Agriculture, Healthcare, Cleaning service, Sales, Engineering, Transportation, Postal services, Construction, Mining production, Administration, Managers, Professionals

(Note) Adapted from Autor et al. (2022, 2024), and Goldman Sachs (2023).

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# ■ 1-2 Labor Market Changed by AI (2) (AI-Based Substitution and Complementarity by Worker Attribute)

➤ The U.K. is more likely to be exposed to AI than India. While professionals and managers are likely to benefit more from AI, clerical support workers are more likely to be substituted by AI (Figure 1). Occupations to which workers transition from those substituted by AI are likely to be substituted by AI, indicating it would be difficult for workers to respond flexibly to labor demand changes through AI (Figure 2).

➤ Many of the occupations that women and highly educated workers are engaged in are likely to be substituted by AI, while many of them will also benefit from AI (Figure 3).

Figure 1. Employment share by AI exposure and complementarity/substitution (by occupation)

(1) U.K.

(2) India
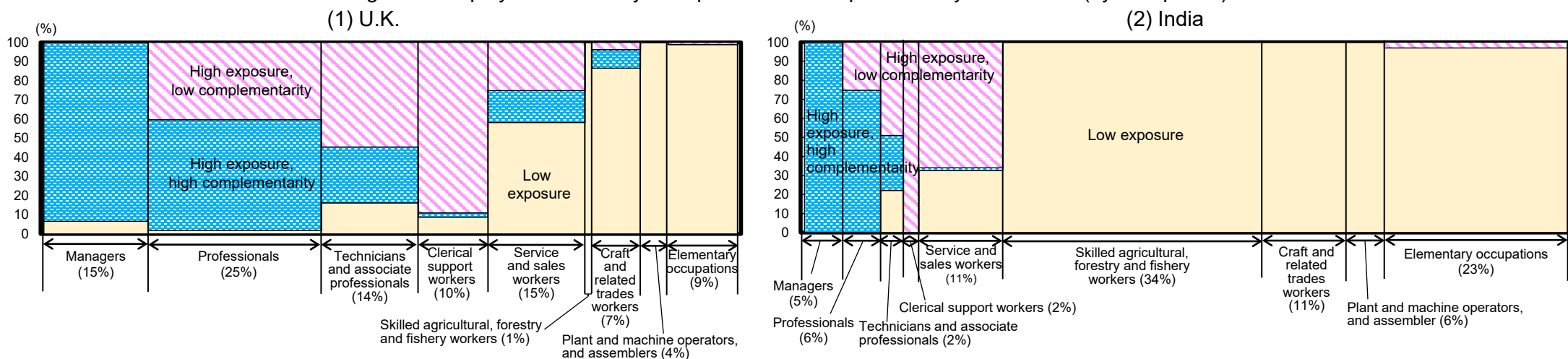
(Note) Adapted from Cazzaniga et al. (2024), and ILO STAT. In brackets are occupations' respective shares of total employment in 2022.

Figure 2. U.K. university graduate workers' occupational transitions by AI exposure and complementarity/substitution
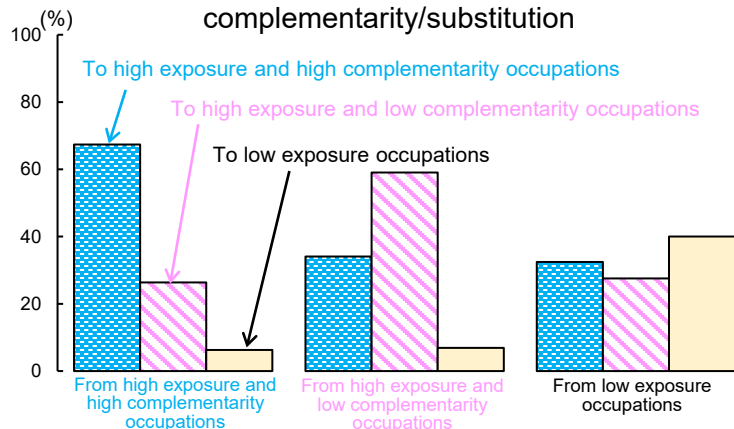
(Note) Adapted from Cazzaniga et al. (2024).

Figure 3. Share of employment in occupations with high AI exposure

(1) By gender
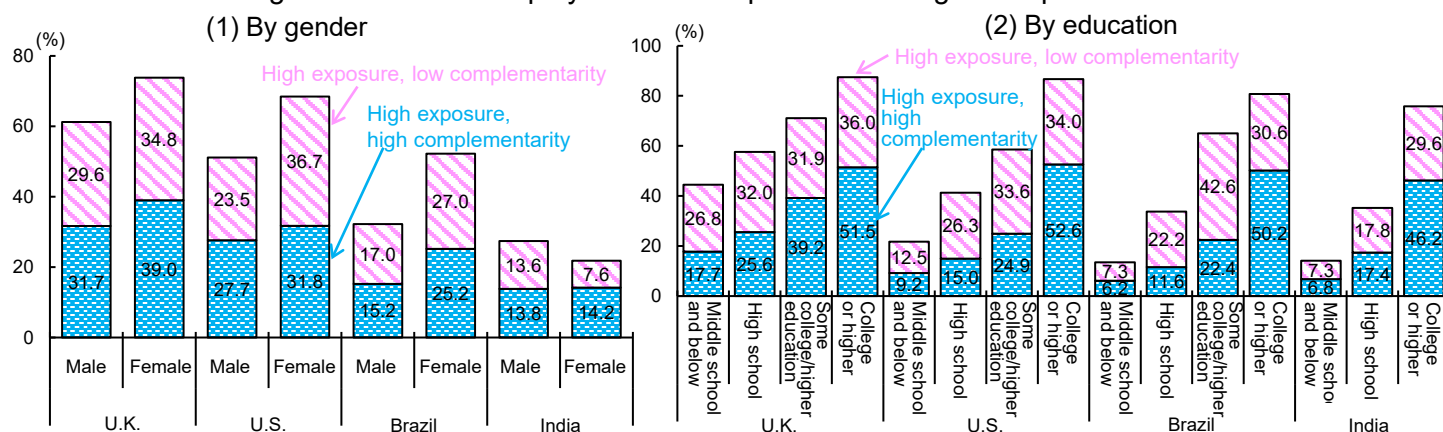
(2) By education

(Note) Adapted from Cazzaniga et al. (2024).
Due to statistical constraints, three categories – middle school and below, high school, and college or higher – are available for India.

2

# 1-3 Labor Market Changed by AI (3) (Reskilling and Education towards AI Use)

➢ Each country implements reskilling to lead workers to avoid AI substitution and benefit more from AI (Figure 1). As the ability to utilize IT declines with age, the need for reskilling may increase with age in the use of AI in occupations (Figure 2).

➢ In order to develop human resources who can make the most of AI, the ability to think things through is important. Although there are no significant differences in the ability to utilize IT between countries, Japan may have a significant shortage of autonomous learning capabilities (Figures 3 and 4). It is necessary to cultivate the ability to find and solve problems.

Figure 1. Reskilling policies in the U.S. and Europe to improve AI literacy

| Country	Details
All EU members	・ Free online courses on basic AI knowledge 　* The policy initiated in Finland has spread to all the other EU member states.
Spain	・ Training in AI and other digital skills ・ Digital transformation of government
Italy	・ Tax credits for AI-related corporate training costs 　(instructor and equipment costs)
U.S.	・ AI training programs for federal government employees

(Note) Adapted from materials released by each government.

Figure 2. Relationship between problem-solving ability using IT and age
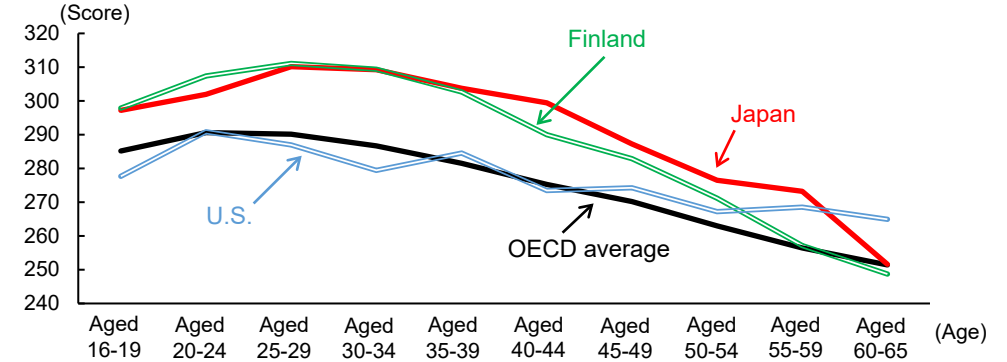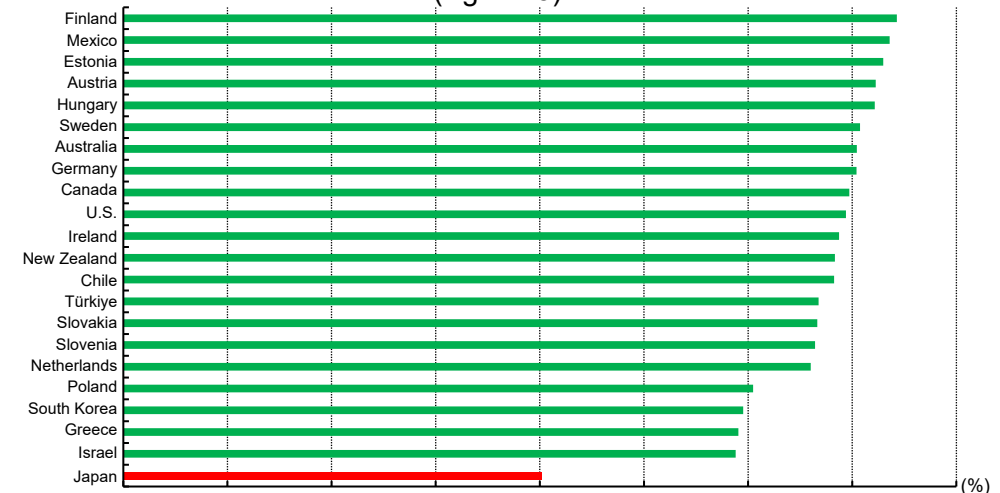

(Note) Adapted from OECD PIAAC 2012.

Figure 3. Distribution of average scores of problem-solving ability using IT (Aged 16-65)
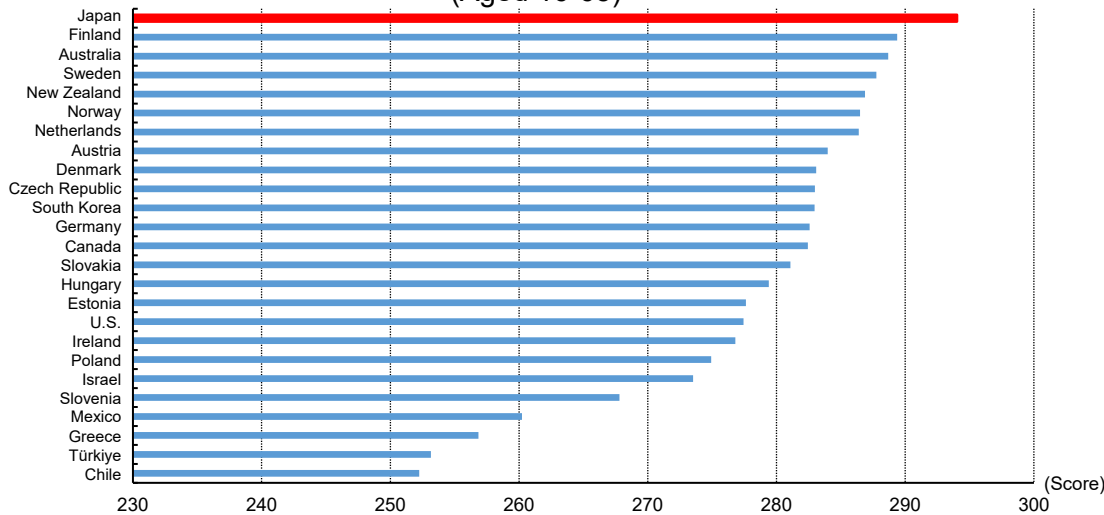
(Note) Adapted from OECD PIAAC 2012. The figure covers 25 OECD countries for which country-specific data are available.

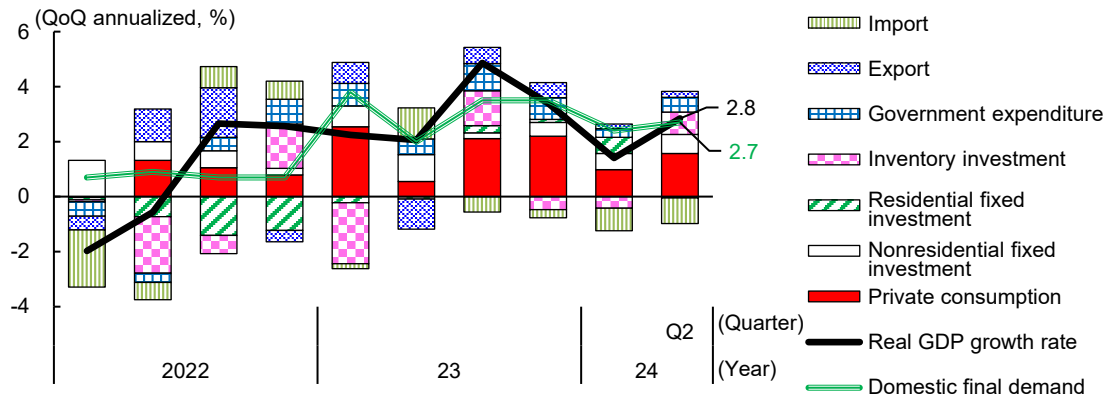Figure 4. Percentage of students who responded positively to autonomous learning (Aged 15)

(Note) Adapted from OECD PISA 2022. The figure covers 22 countries for which relevant data are available among those covered by Figure 3.

3

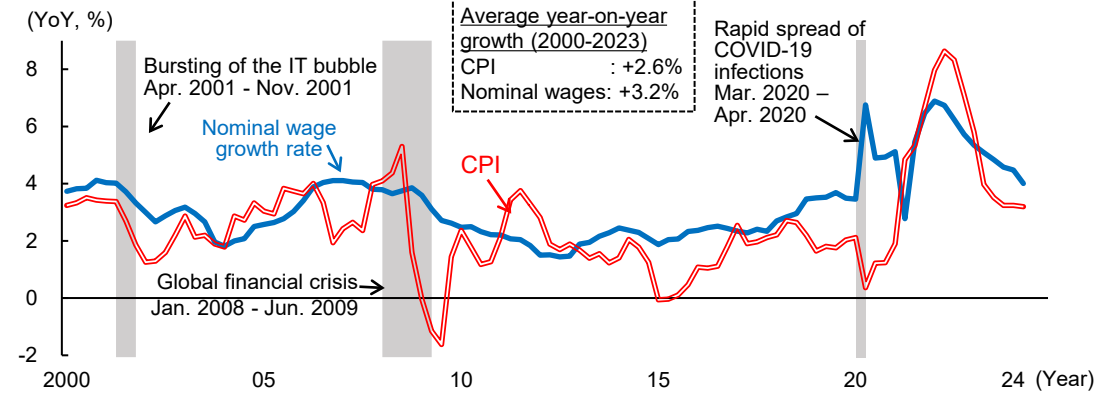# 2-1 World Economy (1) (Economic Trends in the U.S. [1])

- The U.S. economy has continued to expand (Figure 1). Private consumption has been on an upward trend due to a rise in real wages amid continued nominal wage growth outpacing inflation (since mid-2023) and the withdrawal of excess savings (Figure 2).
- Nonresidential fixed investment has been driven by plant construction and semiconductor manufacturing equipment investment responding to the Chips Act (Figure 3).
- A rise in the potential economic growth rate through the growing inflow of immigrants has supported the sustainability of economic expansion (Figure 4).

Figure 1. Real GDP growth rate

(QoQ annualized, %)

Legend:
- Import
- Export
- Government expenditure
- Inventory investment
- Residential fixed investment
- Nonresidential fixed investment
- Private consumption
- Real GDP growth rate
- Domestic final demand

2022   23   24   Q2 (Quarter) / (Year)

2.8
2.7

(Note) Adapted from U.S. Department of Commerce.

Figure 2. Inflation and nominal wage growth

(YoY, %)

Bursting of the IT bubble Apr. 2001 - Nov. 2001

Nominal wage growth rate

Average year-on-year growth (2000-2023)
CPI : +2.6%
Nominal wages: +3.2%

Rapid spread of COVID-19 infections Mar. 2020 – Apr. 2020

CPI

Global financial crisis Jan. 2008 - Jun. 2009
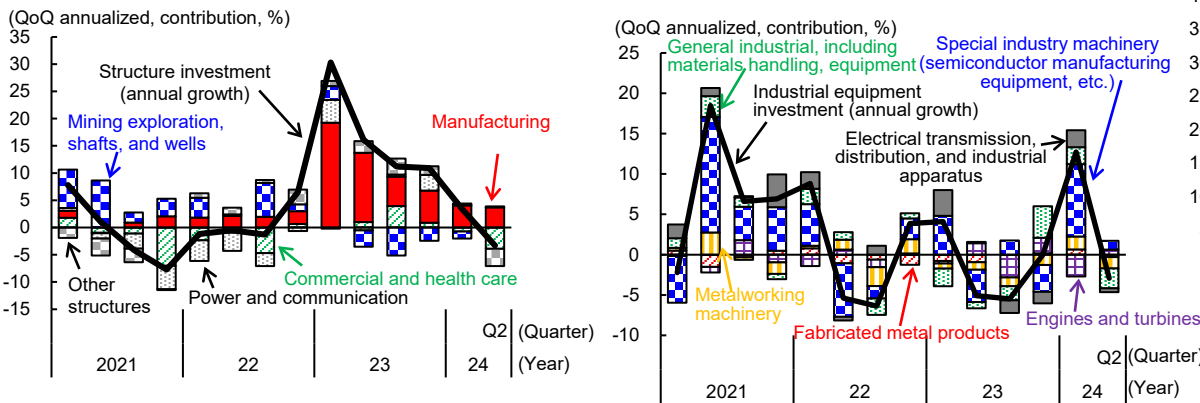
2000   05   10   15   20   24 (Year)

(Note) 1. Adapted from U.S. Department of Labor, and NBER.
2. The nominal wage growth rate is for the private sector excluding managers, based on hourly pay.

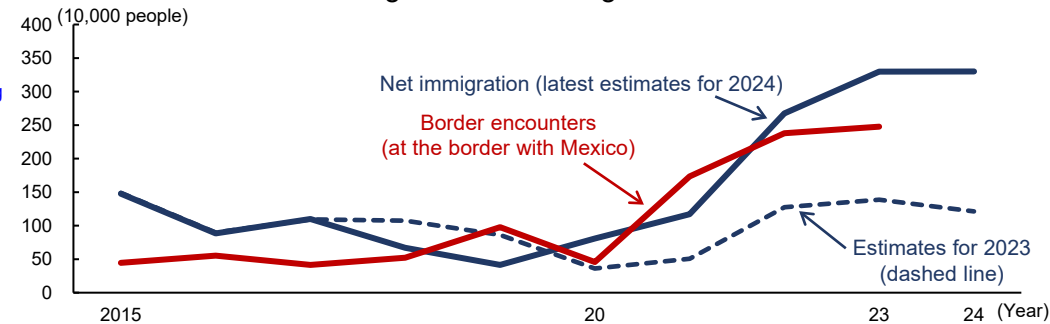## Figure 3. Nonresidential fixed investment
(left: Structure investment; right: Industrial equipment investment)

(QoQ annualized, contribution, %)

Structure investment (annual growth)

Mining exploration, shafts, and wells

Manufacturing

Commercial and health care

Other structures

Power and communication

2021   22   23   24   Q2 (Quarter) / (Year)

(QoQ annualized, contribution, %)

General industrial, including materials handling, equipment

Special industry machinery (semiconductor manufacturing equipment, etc.)

Industrial equipment investment (annual growth)

Electrical transmission, distribution, and industrial apparatus

Metalworking machinery

Fabricated metal products

Engines and turbines

2021   22   23   24   Q2 (Quarter) / (Year)

(Note) 1. Adapted from U.S. Department of Commerce.
2. The sum of component data does not necessarily equal the total investment due to statistical errors.

Figure 4. Net Immigration

(10,000 people)

Net immigration (latest estimates for 2024)

Border encounters (at the border with Mexico)

Estimates for 2023 (dashed line)

2015   20   23   24 (Year)

(Note) 1. Adapted from U.S. Congressional Budget Office, and U.S. Customs and Border Protection.
2. The forecast period in the latest estimates for 2024 is from 2021.
3. Border encounters are for each fiscal year (from October to September in the following year).
4. Border encounters include arrests by the U.S. Border Patrol and entry denials and expulsions by the Customs and Border Protection.
5. The border with Mexico is the Southwest Land Border.

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# 2-2 World Economy (2) (Economic Trends in the U.S. [2])

- The housing vacancy rate is at its lowest level since 2000, indicating the tight housing supply-demand balance (Figure 1). This is potentially because housing supply has failed to meet the increase in the number of households since the global financial crisis. (Figure 2).
- Housing prices have risen faster than annual household income due to a demand increase accompanying a shift of the Millennial Generation (born in the 1980s and 1990s) to the group of first-time home buyers and supply constraints under land use regulations (Figures 3 and 4). In the future, there is a possibility of housing supply expanding in response to land use regulation reform.

Figure 1. Vacancy rate (rental and owner-occupied properties)
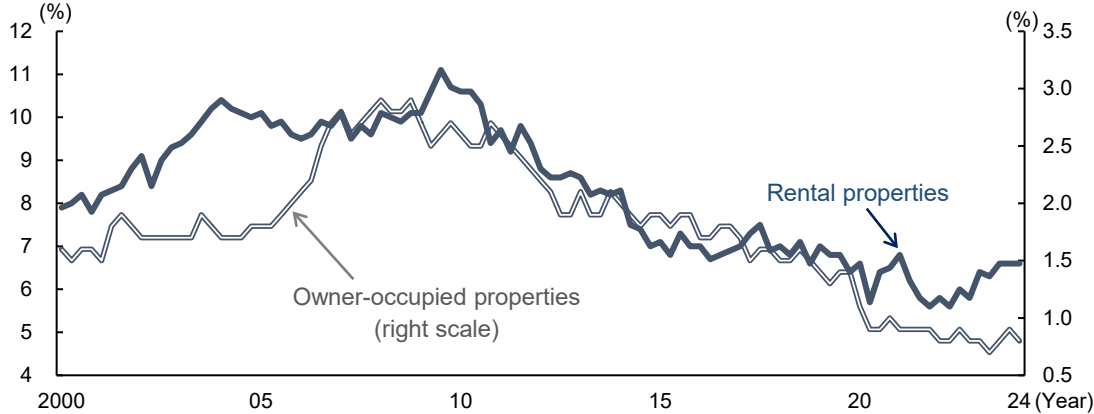
(Note) 1. Adapted from U.S. Department of Commerce.
2. The vacancy rate is the ratio of vacant properties to all rental (owner-occupied) properties.

## Figure 2. Relationship between housing starts and growth in the number of households
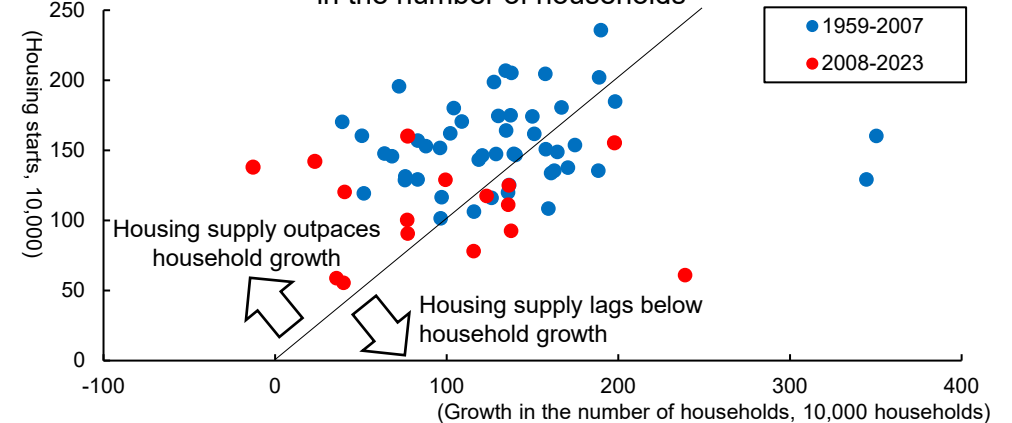
(Note) 1. Adapted from U.S. Department of Commerce.
2. On the auxiliary line, an increase in the number of households is equal to housing starts.

Figure 3. Population by age group and homeownership rate
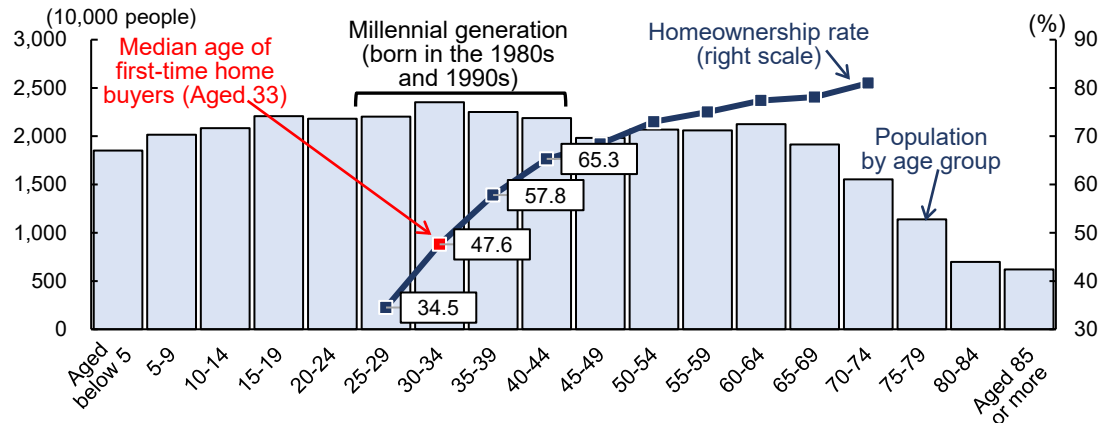
(Note) 1. Adapted from U.S. Department of Commerce, and Zhao (2023).
2. Population by age group was estimated for 2023. The homeownership rate is for the January-March quarter of 2024.
3. The homeownership rate is 23.0% for people aged below 25 and 77.8% for those aged 70 or more.

Figure 4. Housing prices and annual household income
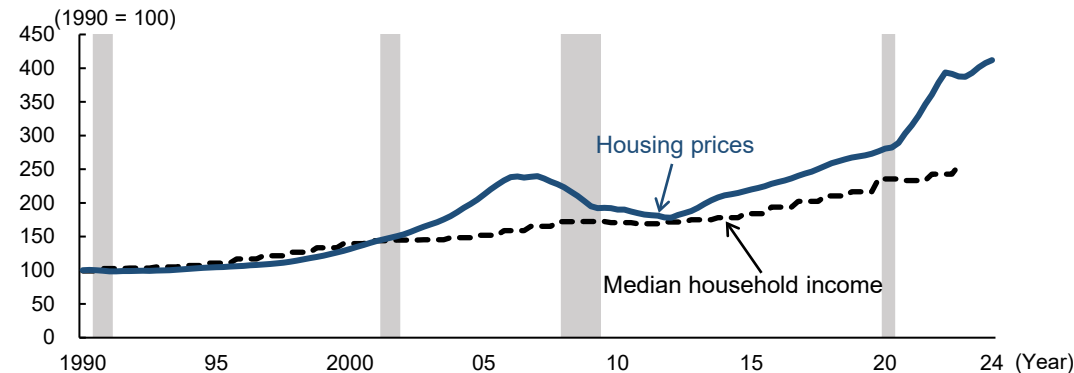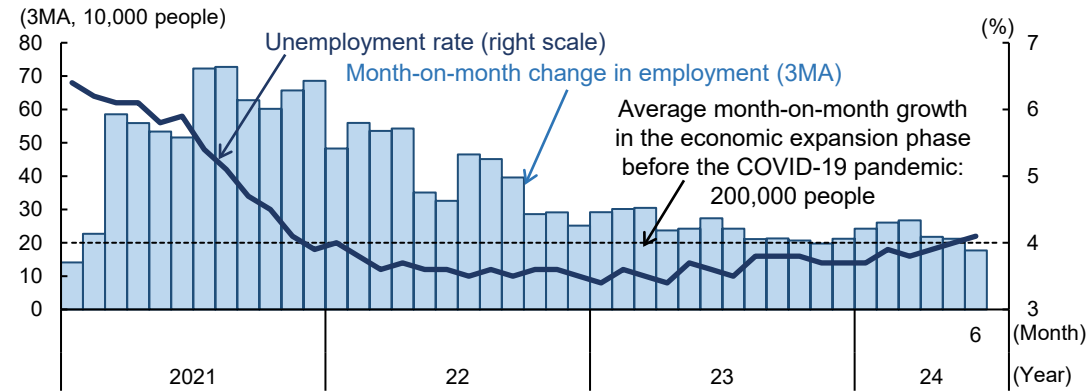

(Note) 1. Adapted from S&P Global, U.S. Department of Commerce, and NBER.
2. Housing prices are quarterly averages. The latest is for the January-March quarter of 2024.
3. Median household income represents an annual level. The latest is for 2022.
4. Shadowed parts represent recession periods.

5

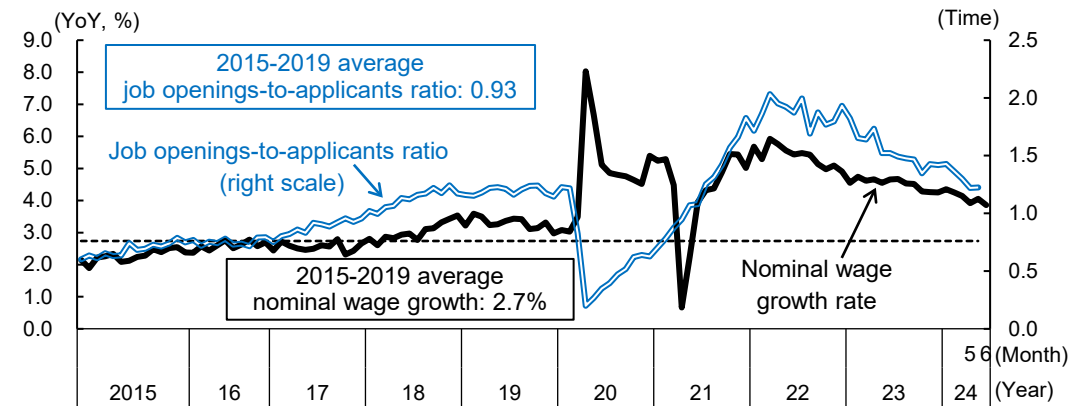# 2-3 World Economy (3) (Economic Trends in the U.S. [3])

➢ The month-on-month growth in employment has slowed from the pace in 2022, but has been higher than the historical average (Figure 1). With labor market conditions being still tight, nominal wage growth has remained above the historical average (Figure 2).

➢ As inflation has stopped declining on the back of strong domestic demand and wage growth, the June Federal Open Market Committee projection indicates inflation remaining above 2% in 2024, raising concerns that the policy interest rate may remain high (Figures 3 and 4).

Figure 1. Month-on-month change in the employment and unemployment rate

Unemployment rate (right scale)
Month-on-month change in employment (3MA)
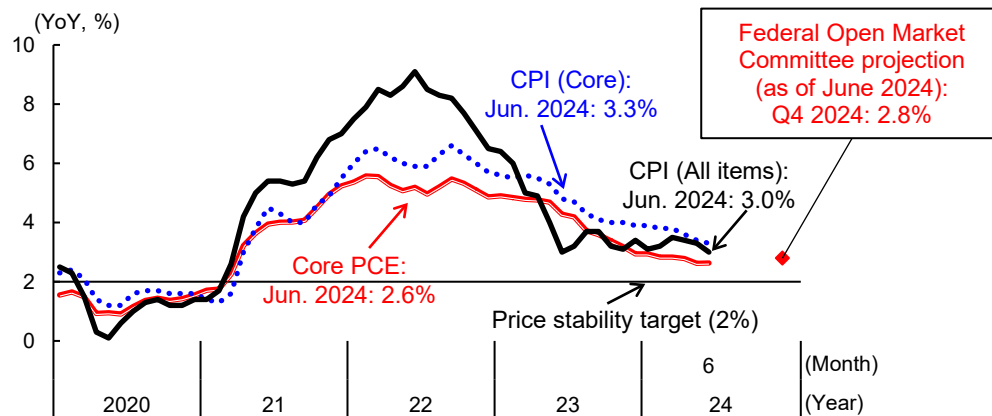Average month-on-month growth in the economic expansion phase before the COVID-19 pandemic: 200,000 people

(Note) 1. Adapted from the U.S. Department of Labor.
2. The economic expansion phase before the COVID-19 pandemic was from May 2014, when employment returned to the level seen before the global financial crisis, to February 2020.

Figure 2. Job openings-to-applicants ratio and nominal wage growth

2015-2019 average job openings-to-applicants ratio: 0.93
Job openings-to-applicants ratio (right scale)
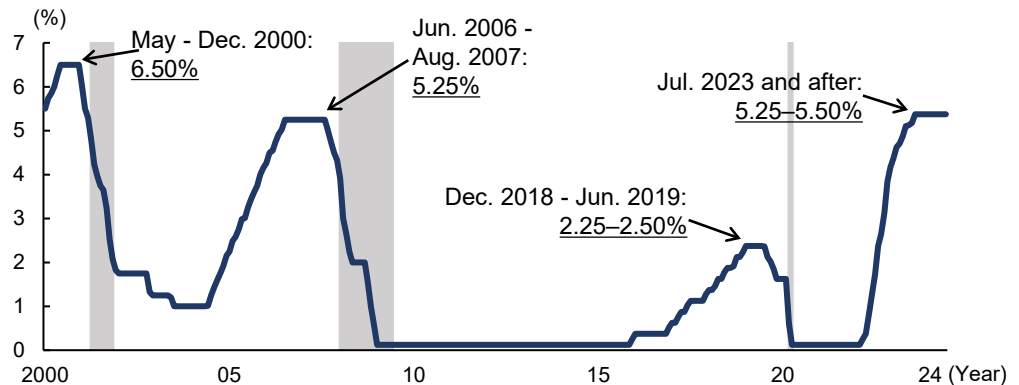2015-2019 average nominal wage growth: 2.7%
Nominal wage growth rate

(Note) 1. Adapted from U.S. Department of Labor.
2. The job openings-to-applicants ratio is the number of job openings per unemployed person as prepared by the Cabinet Office.

Figure 3. Inflation rate (year-on-year)

CPI (Core): Jun. 2024: 3.3%
Federal Open Market Committee projection (as of June 2024): Q4 2024: 2.8%
CPI (All items): Jun. 2024: 3.0%
Core PCE: Jun. 2024: 2.6%
Price stability target (2%)

(Note) Adapted from U.S. Department of Labor, U.S. Department of Commerce, and FRB.

Figure 4. Changes in policy interest rate

May - Dec. 2000: 6.50%
Jun. 2006 - Aug. 2007: 5.25%
Jul. 2023 and after: 5.25–5.50%
Dec. 2018 - Jun. 2019: 2.25–2.50%

(Note) 1. Adapted from FRB and NBER.
2. Since December 2008, the policy interest rate has been at the median target level.
3. Shadowed parts represent recession periods.

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# 2-4 World Economy (4) (Economic Trends in Europe)

- In the Euro area and the U.K., real GDP growth became positive in the January-March quarter of 2024, indicating that the economy was generally recovering (Figure 1). A factor behind the recovery was a real wage recovery (Figure 2).
- Against the backdrop of a decline in import prices reflecting energy and food price drops (Figure 3), the consumer price inflation rate in the Euro area has remained in the 2–3% range since October 2023. The consumer price inflation rate in the U.K. has been on a downward trend (Figure 4).
- The European Central Bank (ECB) cut its policy interest rate in June 2024 in response to a decline in consumer price inflation (Figure 5).

Figure 1. Changes in real GDP in Europe

U.K. Q1 2024: 104.9
Euro area: Q1 2024: 104.4
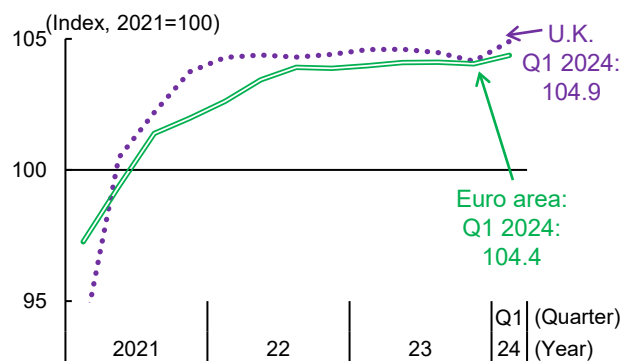
(Note) 1. Adapted from Eurostat, and U.K. Office for National Statistics.
2. Seasonally adjusted.

Figure 2. Changes in real wage in Europe

U.K. Q1 2024: 2.0%
Euro area Q1 2024: 2.6%
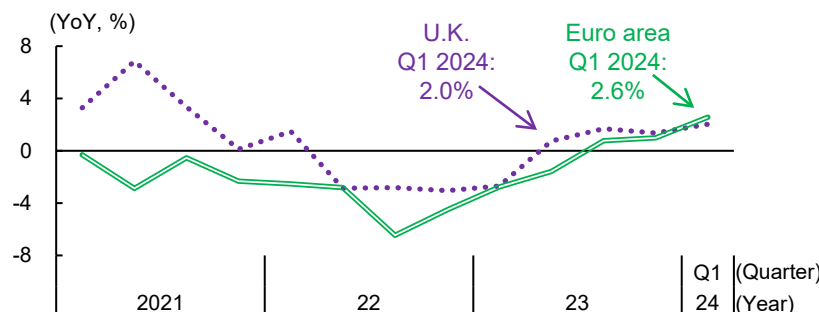
(Note) 1. Adapted from Eurostat, ECB, and U.K. Office for National Statistics.
2. For the Euro area, real wages are calculated by adjusting nominal hourly wages for the inflation of consumer prices (excluding owner's equivalent rent). For the U.K., real wages are calculated by adjusting average weekly nominal wages for the inflation of consumer prices (including owner's equivalent rent).
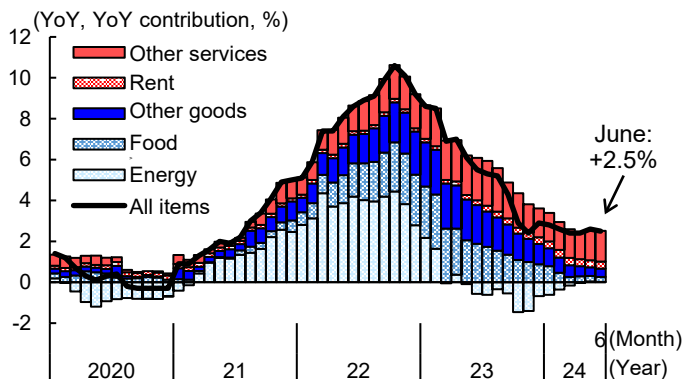
Figure 3. Changes in import price in Europe

U.K. Q1 2024: -2.1%
Euro area Q1 2024: -3.0%
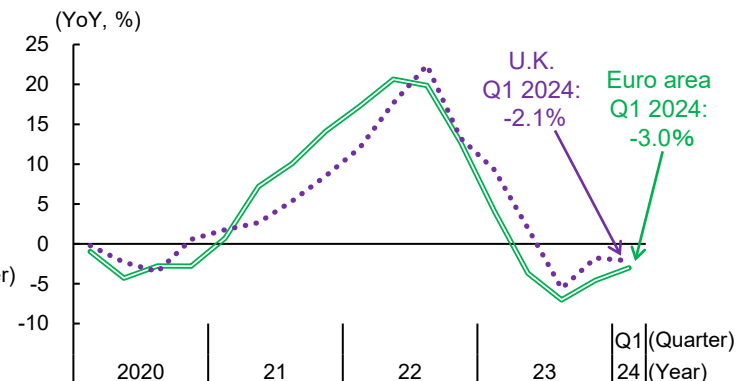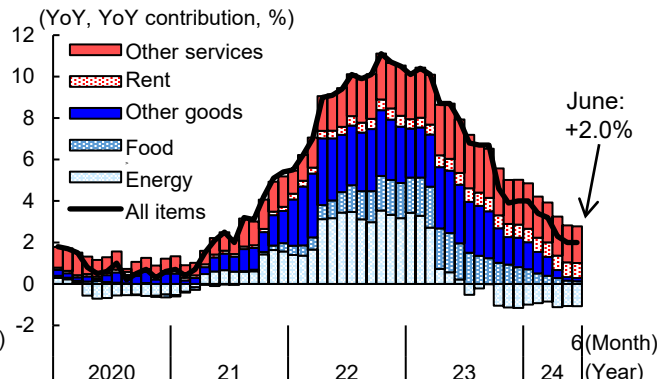
(Note) Adapted from OECD Data Explorer.

Figure 4. Changes in consumer price inflation
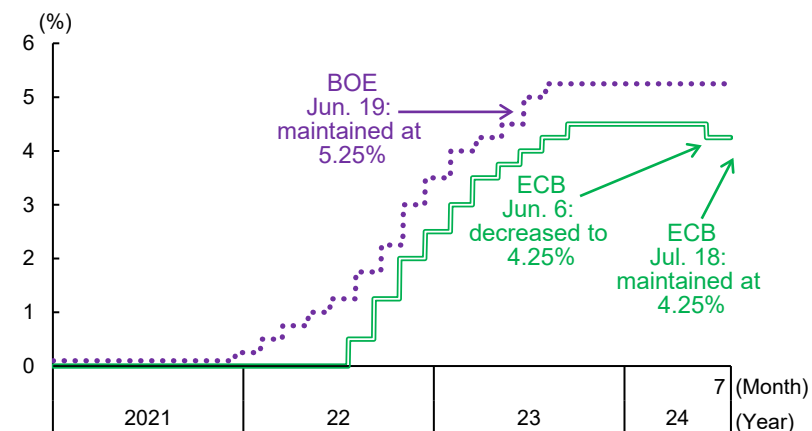
(1) Euro area

June: +2.5%

(Note) 1. Adapted from Eurostat.
2. Rent does not include the owner's equivalent rent.

(2) U.K.

June: +2.0%

(Note) 1. Adapted from U.K. Office for National Statistics.
2. Rent does not include the owners' equivalent rent.

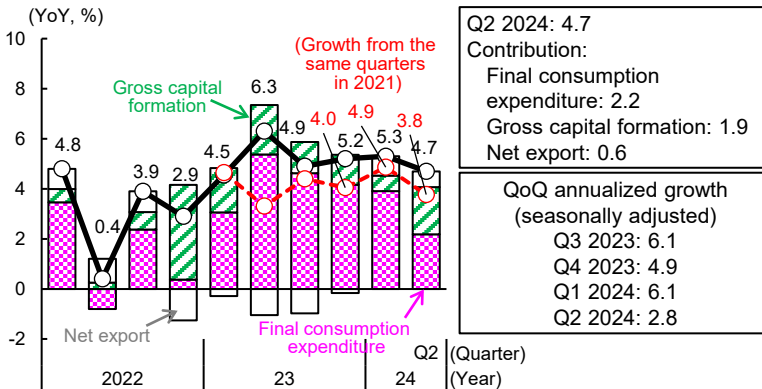## Figure 5. Changes in policy interest rates in Europe

BOE Jun. 19: maintained at 5.25%
ECB Jun. 6: decreased to 4.25%
ECB Jul. 18: maintained at 4.25%

(Note) Adapted from BOE and ECB.

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2-5 World Economy (5) (Economic Trends in China [1])

➢ Although investment and vehicle sales increased due to policy effects in China, the increase failed to develop a virtuous cycle of domestic demand, leaving the economy at a standstill (Figures 1, 2, and 3). Against the backdrop of the stagnation in the real estate market, households' employment and income sentiment indexes have declined (Figure 4). Prices declined for five consecutive quarters (Figure 5).

➢ The policy of buying housing stock (for conversion to public housing for low-income people from May 2024) may reduce the size of the new housing market while providing support to real estate companies in the short term (Figure 6). The Chinese economy has shifted from high growth to a process of medium- to long-term structural adjustment.

Figure 1. Real GDP growth rate

Q2 2024: 4.7
Contribution:
Final consumption expenditure: 2.2
Gross capital formation: 1.9
Net export: 0.6

QoQ annualized growth (seasonally adjusted)
Q3 2023: 6.1
Q4 2023: 4.9
Q1 2024: 6.1
Q2 2024: 2.8

(Note) 1. Adapted from National Bureau of Statistics of China.
2. Growth from the same quarters in 2021 (annualized growth rates estimated to eliminate the impact of COVID-19 infections in 2022) and annualized quarter-on-quarter growth rates were estimated by the Cabinet Office.

## Figure 2. Fixed asset investment
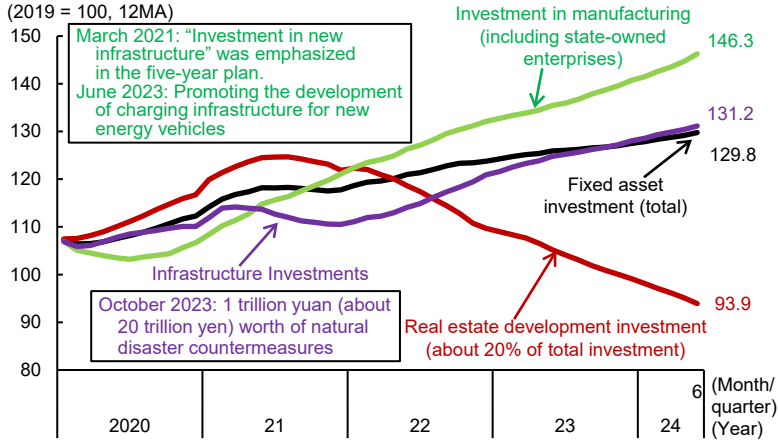
(Note) Estimated by the Cabinet Office from data released by the National Bureau of Statistics of China.

## Figure 3. Vehicle sales volume and value
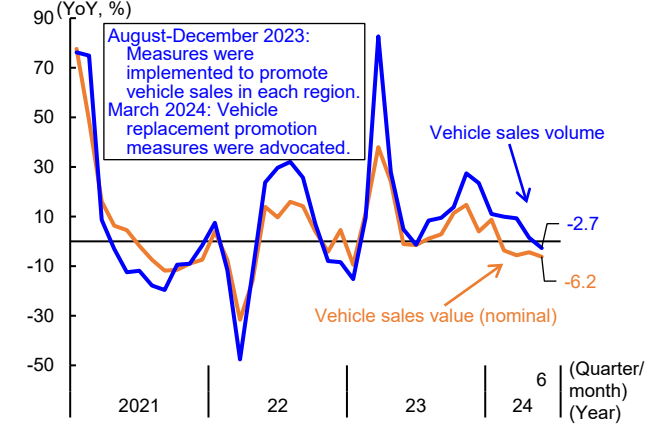
(Note) Adapted from National Bureau of Statistics of China, and China Association of Automobile Manufacturers.
Vehicle sales value is a component of retail sales of social commercial goods retail sales

Figure 4. Household employment and income sentiment indexes
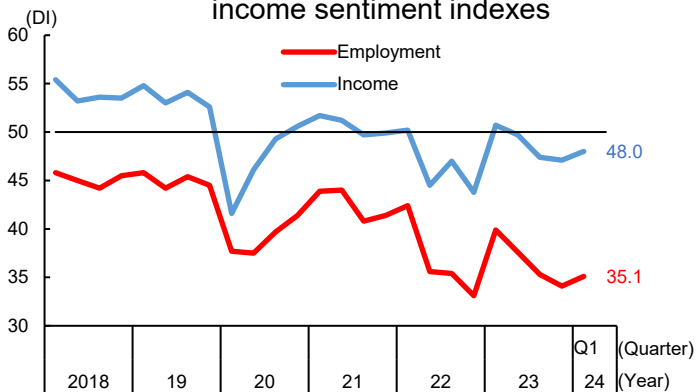

(Note) Adapted from a questionnaire poll of urban depositors by the People's Bank of China. The poll covered 20,000 citizens in 50 cities. Calculated from responses to three-choice questions ("increasing, unchanged, or decreasing" for income, and "good, ordinary, or severe" for employment).

Figure 5. Inflation rate
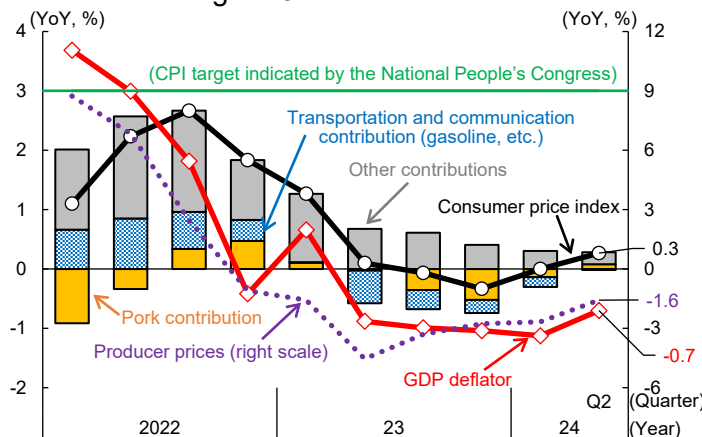
(Note) 1. Adapted from National Bureau of Statistics of China.
2. The GDP deflator was estimated by the Cabinet Office.

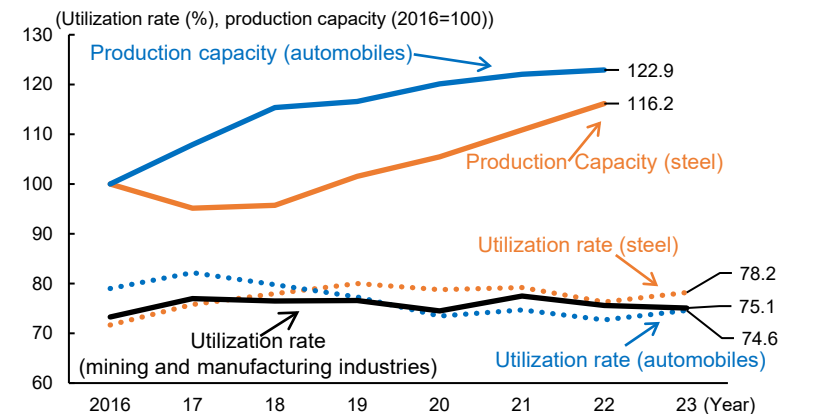## Figure 6. Real estate stock size (new buildings)
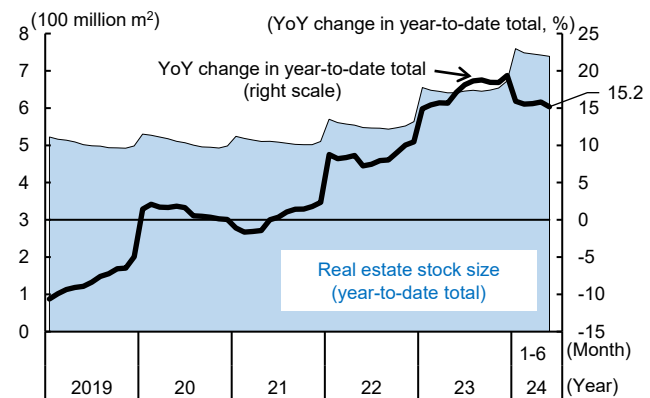
(Note) Adapted from National Bureau of Statistics of China.
The figure covers residential and office buildings and commercial properties that have been completed and left unsold, excluding land.

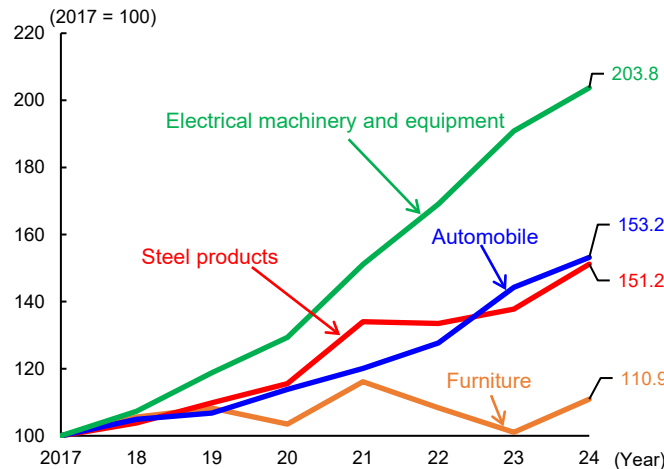# 2-6 World Economy (6) (Economic Trends in China [2])

- In China, production increases at a high pace as companies continue to expand their production capacity. Inventories have remained high amid stagnant domestic demand even since 2023, when the impact of the COVID-19 pandemic dissipated. Those of some goods have increased further (Figures 1, 2, and 3). Steel and automobile export volume has increased steadily while export prices have turned down (Figure 4). These data suggest a trend of so-called "oversupply."
- Subsidies received by listed companies in China are on the rise, leading the WTO to doubt their transparency. Trade frictions are rising (Figure 5).

Figure 1. Production capacity and utilization rate at companies

(Utilization rate (%), production capacity (2016=100))

Production capacity (automobiles) 122.9
Production Capacity (steel) 116.2
Utilization rate (steel) 78.2
Utilization rate 75.1
(mining and manufacturing industries)
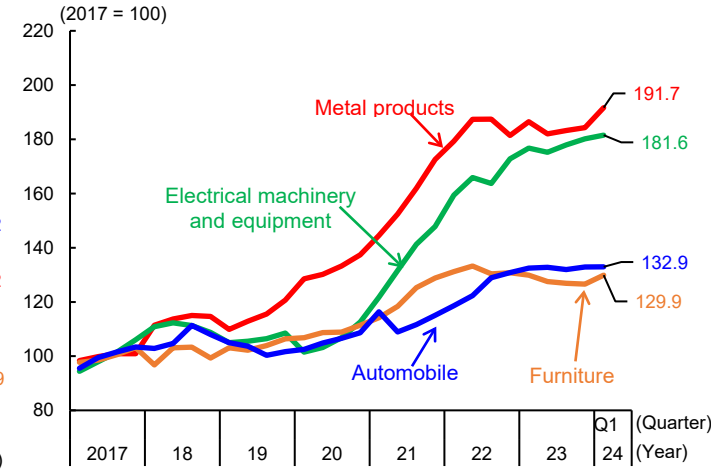Utilization rate (automobiles) 74.6

(Note) Adapted from National Bureau of Statistics of China. The utilization rate is the ratio of actual production to production capacity. Production capacity is production volume of products that can be sustained for a long period of time under the condition that the supply of labor, raw materials, etc. is guaranteed, with production facilities and transportation being normal.
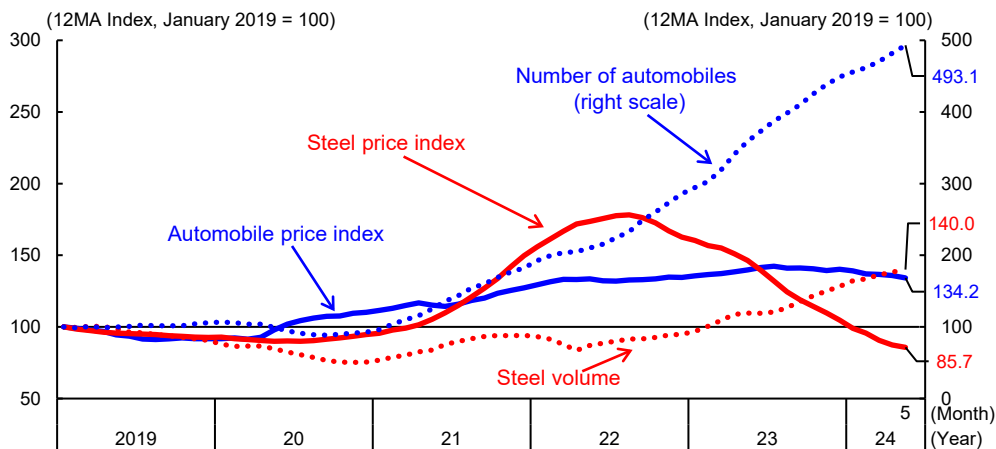
Figure 2. Production index

(2017 = 100)

Electrical machinery and equipment 203.8
Automobile 153.2
Steel products 151.2
Furniture 110.9

(Note) Adapted from National Bureau of Statistics of China.

Figure 3. Inventory index

(2017 = 100)

Metal products 191.7
Electrical machinery and equipment 181.6
Automobile 132.9
Furniture 129.9

(Note) Adapted from National Bureau of Statistics of China.

Figure 4. Export volume and price index

(12MA Index, January 2019 = 100) (12MA Index, January 2019 = 100)

Number of automobiles (right scale) 493.1
Steel price index 140.0
Automobile price index 134.2
Steel volume 85.7

(Note) Adapted from General Administration of Customs of the People's Republic of China.

Figure 5. Subsidies received by listed companies in China

(Yuan, 100 million) (Yuan, 100 million)

Listed companies in Mainland China 3,414
Top companies in sales of new energy vehicles (right scale) 105.9
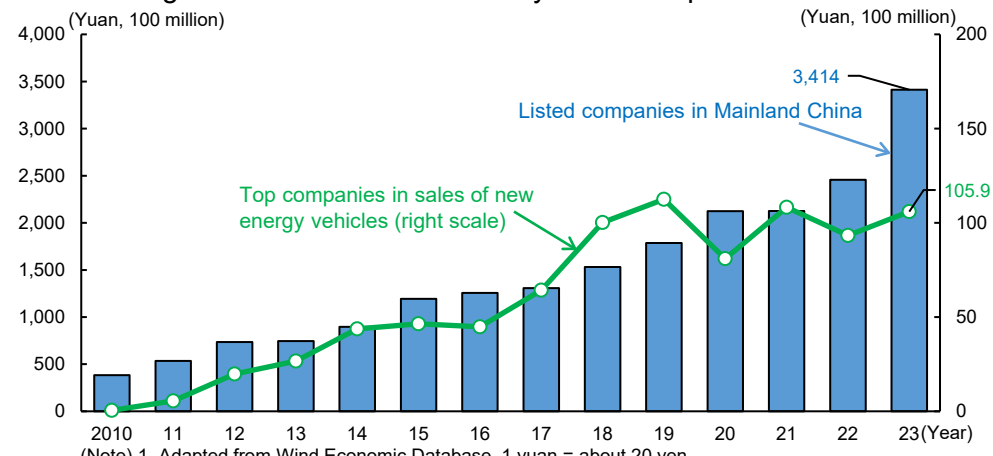
(Note) 1. Adapted from Wind Economic Database. 1 yuan = about 20 yen.
2. Based on securities reports of companies listed on the mainland Chinese market (excluding those listed on the Hong Kong market).

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2-7 World Economy (7) (Upside/Downside Risks for World Economy)

➢ Countries such as the U.S. and India will continue to experience robust economic growth (Figure 1). Prices can be increased through commodity price hikes amid demand growth.

➢ Interest rates are expected to remain high in Europe and the U.S., as indicated by a decrease in the forecast numbers of rate cuts by major central banks in 2024 (Figure 2). Economic activities may be excessively constrained due to an increase in interest payments on housing loans and a capital cost rise. In countries whose currencies will depreciate against the dollar due to their widening interest rate gaps with the U.S., imported inflation pressure may increase (Figure 3).

➢ China's local government financing vehicles are increasing offshore bond issues amid fundraising difficulties. Their future trends should be closely watched (Figure 4).

➢ Depending on the outcome of the U.S. presidential election, U.S. immigration and trade policies could change, affecting the world economy as a whole.
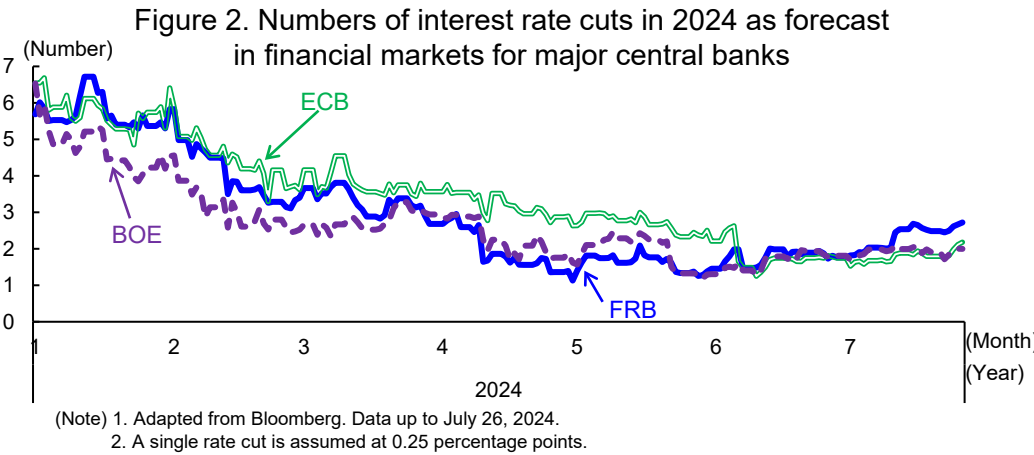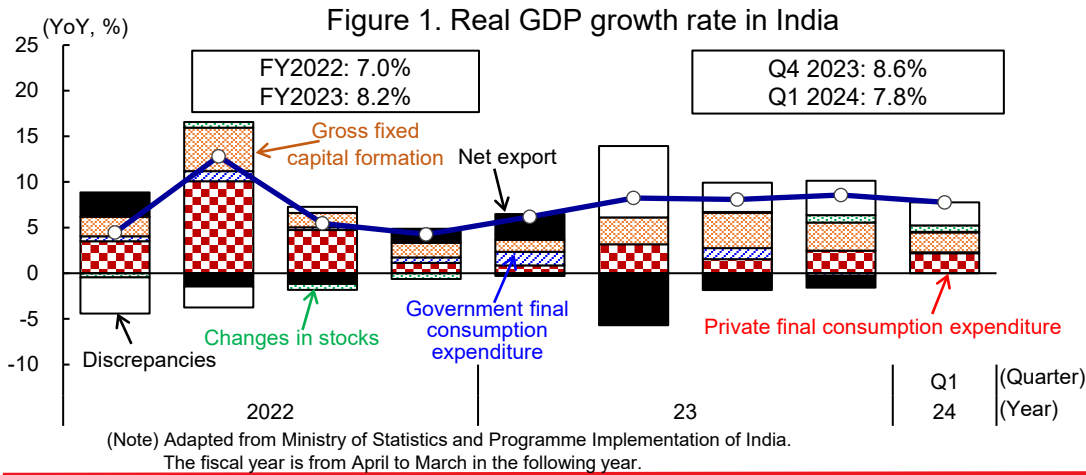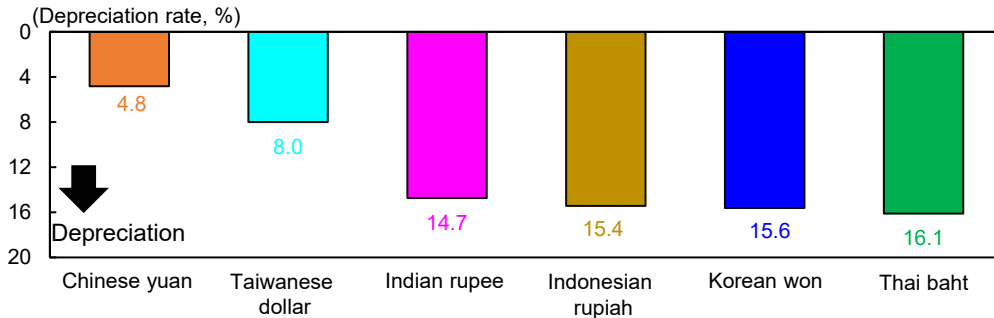
Figure 1. Real GDP growth rate in India

FY2022: 7.0%
FY2023: 8.2%

Q4 2023: 8.6%
Q1 2024: 7.8%

Gross fixed capital formation
Net export
Government final consumption expenditure
Changes in stocks
Private final consumption expenditure
Discrepancies

(Note) Adapted from Ministry of Statistics and Programme Implementation of India. The fiscal year is from April to March in the following year.

Figure 2. Numbers of interest rate cuts in 2024 as forecast in financial markets for major central banks

ECB
BOE
FRB

(Note) 1. Adapted from Bloomberg. Data up to July 26, 2024.
2. A single rate cut is assumed at 0.25 percentage points.

Figure 3. Asian currencies' exchange rates with the U.S. dollar

(Depreciation rate, %)

Depreciation

Chinese yuan	Taiwanese dollar	Indian rupee	Indonesian rupiah	Korean won	Thai baht
4.8	8.0	14.7	15.4	15.6	16.1

(Note) 1. Adapted from Bloomberg.
2. Average rates of depreciation from averages for January 2020 to July 1-26, 2024

Figure 4. Offshore bond issues by China's local government financing vehicles

(USD, 100 million)

2019 20 21 22 23 24 (Year)

(Note) Adapted from Wind Economic Database. Data for 2024 are as of June 30.

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