SBI Japan Economics
- The Bank of Japan's monetary policy -

for Macro Hive podcast

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High hurdles for the BoJ's monetary policy normalization

1) Hurdles for monetary policy normalization remain high for the BoJ regardless of the prospective next Governor: a) a large part of the rise in prices having been transitory (energy, food, and JPY depreciation); b) misleading high expectations on wage growth (real hourly wages rising faster then productivity gains); c) hurdles for a virtuous circle in Japan's labor market (population aging, work style reforms, and negative incentives against labor supply); d) Japan's low potential growth (limited room for interest rate hikes).

2) Low risk of discontinuity in monetary policy for now under Mr Ueda as the next Governor

3) High hurdles even for the next adjustment in YCC (yield curve control), which need to clear the above four points (a, b, c, and d): not in 2023, but at the earliest in 2024

4) Choices for the YCC modification: a) allowing for a wider range in the 10y yield (e.g. from ±50bps to ±75bps), b) lowering the target duration (e.g. from 10y to 5y then to 2y; feasible as a transition to the short-term interest rate as an instrument). We expect option b) to be more likely.

5) Which to prioritize? normalization of monetary policy or the real economy: prioritizing monetary policy normalization leads to a monetary policy mistake through dynamic inconsistency. Failures in the past: in 1997, 2000, 2006 for the BoJ, in 2011 for the ECB, and in 2013 and 2018 for the Fed. Normalization under a narrowing window based on the "now or never" fails.

6) Prioritizing dysfunction of the JGB market also accompanies dynamic inconsistency. We need to choose dysfunction of the JGB market or normalization of the real economy.

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Long-run monetary policy goal and its path

7) Choices for discontinuous policy changes: a) give up the 2% inflation target; b) short-term interest rate hikes, and setting a cap on the BoJ's holding of JGBs or selling those securities; c) nominal GDP growth targeting (responses of inflation targeting to supply shocks are inconsistent). → option b) is ideal to be adopted in the latter or final phase of monetary policy normalization. Selling JGBs upon maturity without reinvesting result in a potential selling pressure on the scale of ¥50t–¥70t a year over the next five years.

8) Long-term issue on how to deal with JGB holding: annual net issuance of debt (fiscal deficit) to be financed by the financial markets; existing holdings to be reinvested (a flow-based neutral stance).

9) Areas where the government and the BoJ could ideally agree soon: a) loss compensation of JGBs held by the BoJ (although the possibility is low because of no need to mark-to-market), b) a higher proportion of the BoJ profit to be retained as an increase in the net worth of the BoJ, and a lower proportion to be returned to the national treasury; and c) the government commitment to adhere fiscal discipline to achieve the central government primary fiscal surplus.

10) Nominal GDP growth target responds to supply shocks in a more consistent manner than inflation target. Japan's nominal GDP was stagnant since the 1990s, but it resumed annualized 2% growth in 2013–2019 when the large-scale QE was introduced, although another stagnation phase has followed since the onset of the pandemic. Monetary policy influences nominal activity. Normalization of monetary policy can wait until the economy returns to a 2% nominal GDP growth path.

Avoid mixing fiscal and monetary policy

11) Continued fiscal profligacy does not always end up with the fiscal (or external debt) crisis. Japan has been steadily on a path of “perpetual decay” since the 1990s, through the diminishing marginal returns on economic policy (the fiscal stimulus is a decreasing function of the government debt).

12) Private nonfinancial sector (households and businesses) in developed countries has accumulated financial assets exceeding the government debt as a buffer against the government debt accumulation. Japan’s fiscal vulnerability index is in the middle of developed countries.

13) The government needs to ask the electorate about their preferred scale of the government (small, mid-sized, or large government) with the financing requirement to fulfill those services (the consumption tax rate of either 15%, 20%, or 25%).

14) Artificially raising the hurdle rate on the back of the philosophical survival of the fittest argument or the structural reformist argument depresses aggregate demand, widens the deflationary output gap, and is eventually ought to return to monetary accommodation (zombie companies and households also constitute a part of aggregate demand of the economy).

Will inflation continue to rise in Japan?

1. A large part of the increase in CPI in Japan has been attributable to one-off exogenous factors, including JPY depreciation and rises in energy and food prices. CPI goods inflation has been affected by the producer prices, the output gap, exchange rates and oil prices, but CPI service inflation has not been affected by these indicators.

2. Commodity prices (energy and food) are likely to face headwinds from both real demand (global recession) and speculative demand (monetary tightening). An expectation of the end of the rate hike in developed countries and the start of the rate hike in Japan are likely to lead to JPY appreciation. We expect Japan's YoY core CPI (excluding food and energy) to peak in 1Q 2023, followed by a declining trend to the 1% range.

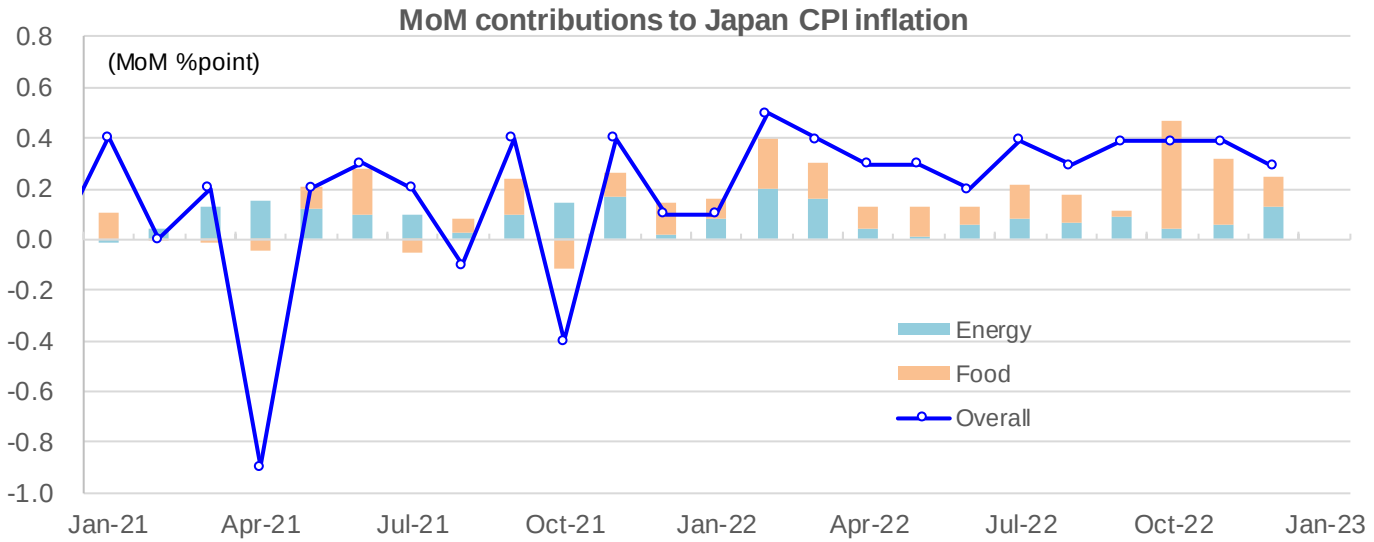
3. Both the tourism support measures since October 2022 and the subsidies to offset the increases in households' utility charges since January 2023 lower CPI (subsidies to businesses lower CPI, those to households are neutral to CPI). More interference of government into price mechanisms weakens the logic of inflation targeting in monetary policy and lowers efficiency in economic activity.

4. More important perspective is whether the price-setting behavior of Japanese businesses is about to change from this time onward in a way to attempt to raise prices every year.

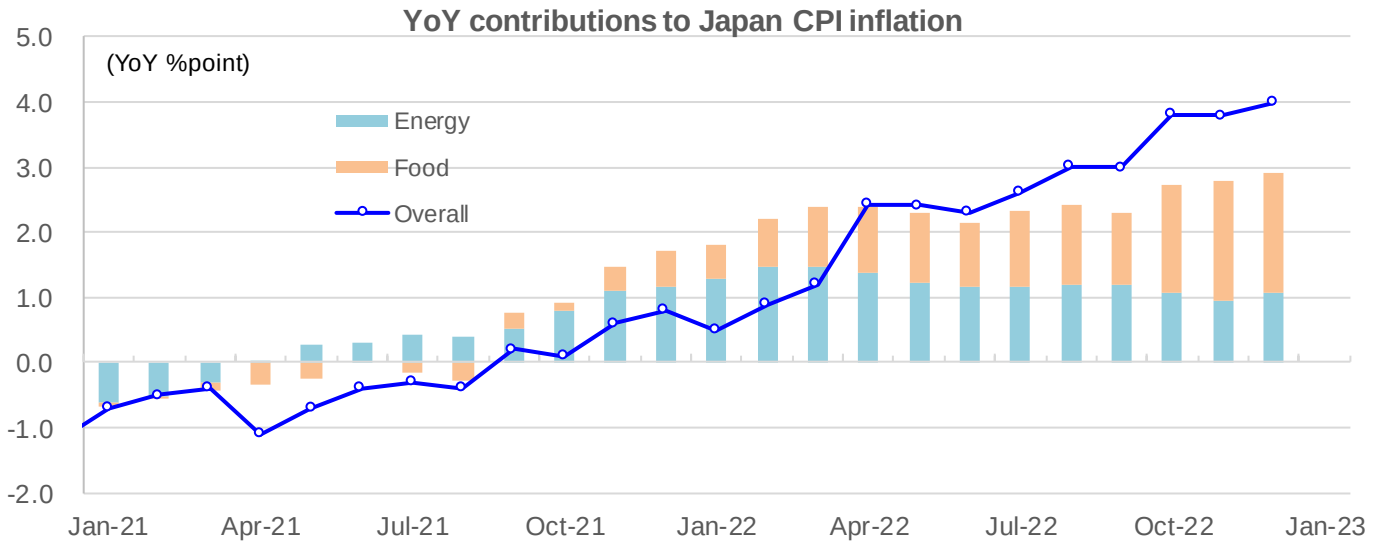
5. The labor market in the US has suffered a strong reshuffling across occupations by the pandemic where upward forces on wages have been intensified in industries with tougher labor shortage. Japan has not suffered such a strong reshuffling because of the employment retention policies, which limit upward forces on wages.

6. The "work style reforms" (departure from long working hours practice and raising minimum wages) without addressing the "annual income cliff" give negative incentives against labor supply, lowers the potential growth further, and prevents the virtuous cycle in the labor market from taking place.

A large part of a rise in CPI from energy, food and JPY depreciation

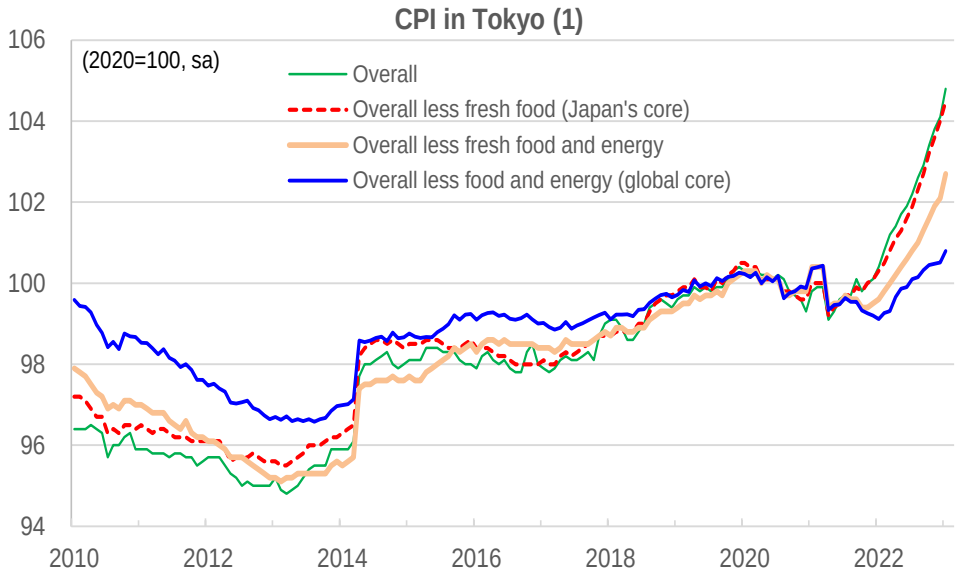


Sources: MIC, CEIC Database, SBI SECURITIES

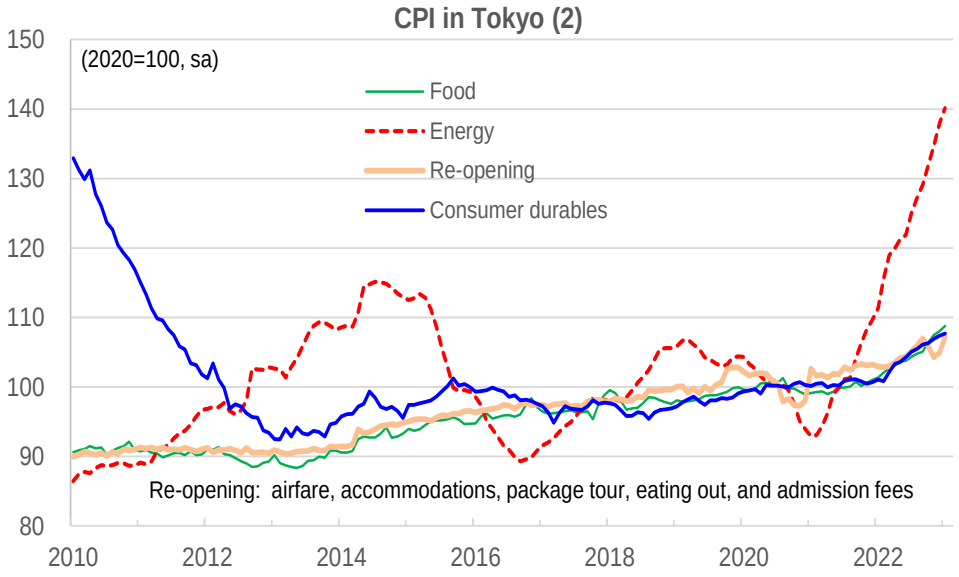


Sources: MIC, CEIC Database, SBI SECURITIES

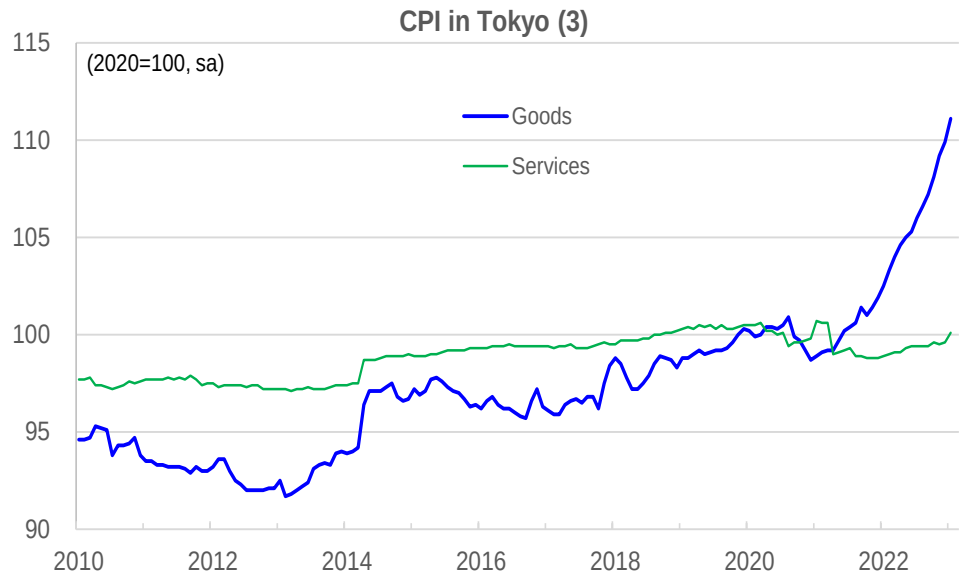
Tokyo CPI: Effects of price hikes on food and tourism support on CPI



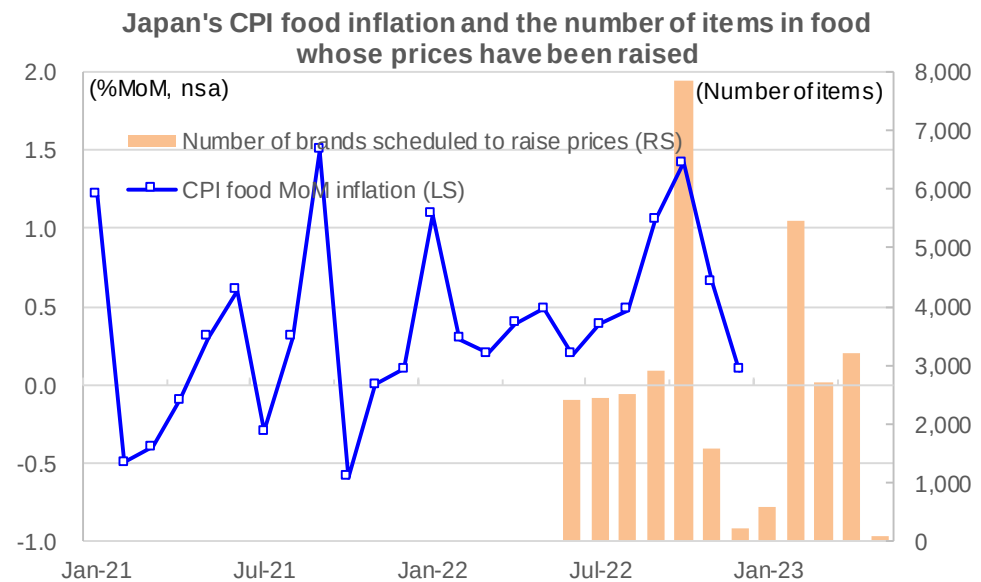
Note: Including the effect of the consumption tax. Sources: MIC, CEIC Database, SBI SECURITIES



Note: Including the effect of the consumption tax. Sources: MIC, CEIC Database, SBI SECURITIES

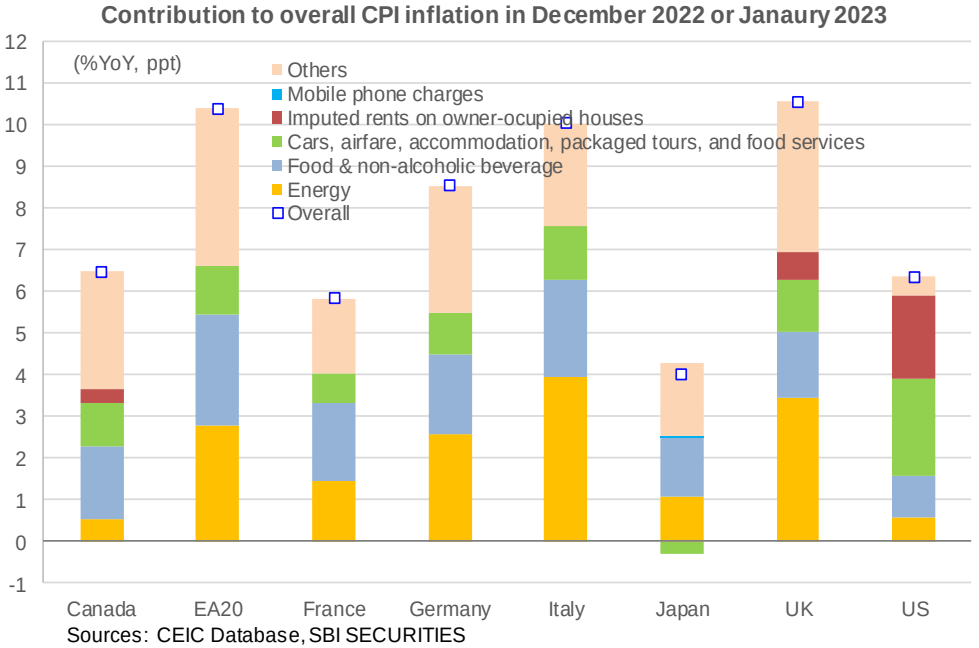


Note: Including the effect of the consumption tax. Sources: MIC, CEIC Database, SBI SECURITIES

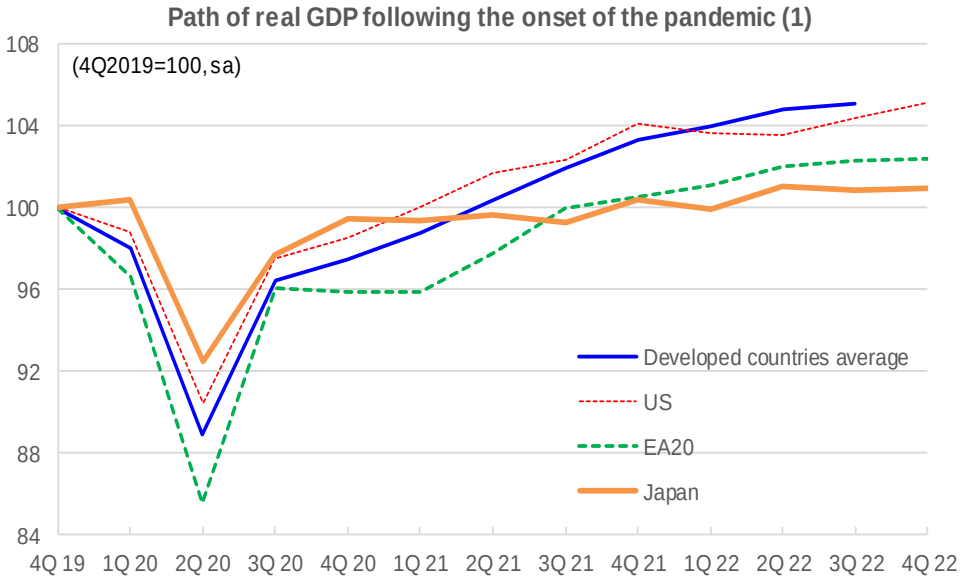


Sources: CEIC Database, Teikoku Data Bank, SBI SECURITIES

Contribution by major item on overall CPI inflation in G7 (1)



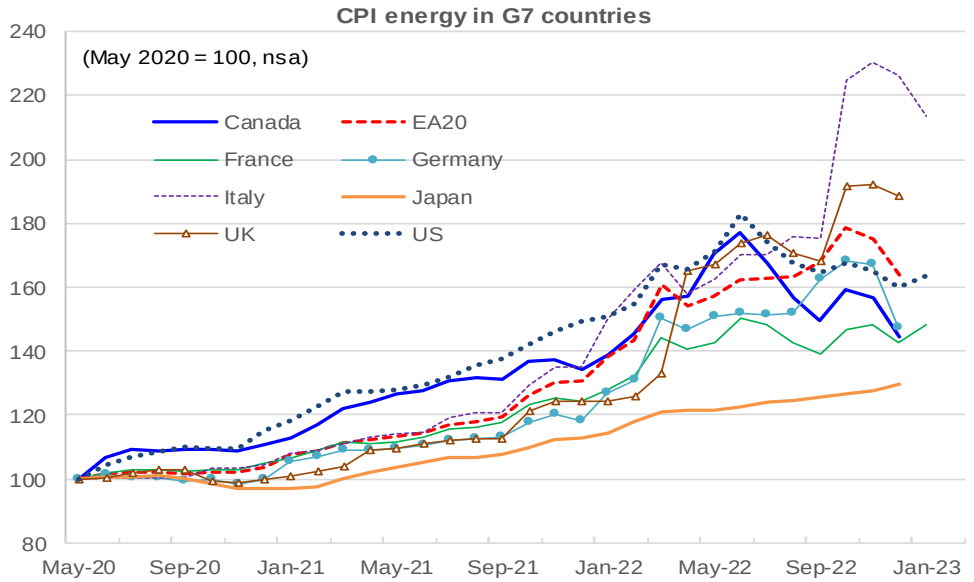
Sources: CEIC Database, SBI SECURITIES



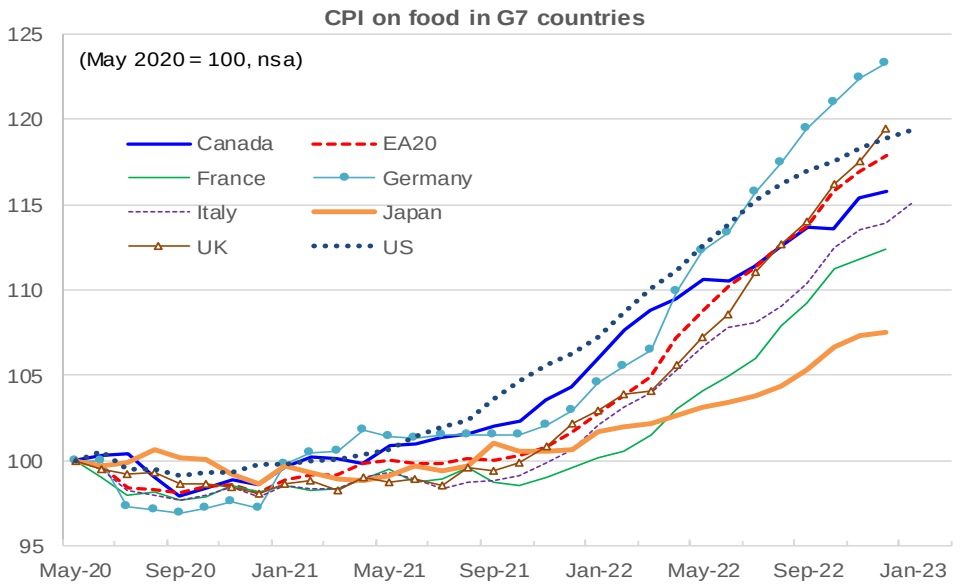
Note: Seasonally-adjusted real GD is indexed to 100 in 4Q 2019.
Sources: CEIC Database, SBI SECURITIES. P

- Contribution from energy prices to the rise in overall CPI inflation is higher in continental Europe than in the US.
- The US faces larger contributions from the rapid pace of the re-opening of the economy, the resulting inventory shortages and improvement in the output gap, and imputed rents of owner-occupied houses.
- Increases in energy and oil prices are a global negative supply shock.
- An economic re-opening acts as both a negative supply shock and a positive demand shock. The US has suffered additional disequilibrium in the labor market because of the re-shuffling of employment.
- The pace of the re-opening of the economy has been slower in Europe and Japan.

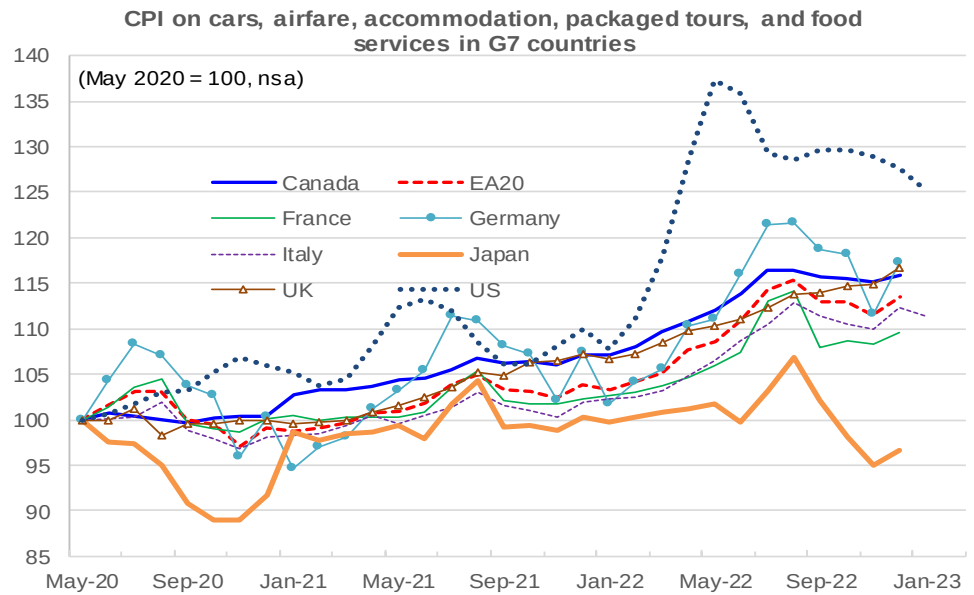
Contribution by major item on overall CPI inflation in G7 (2)



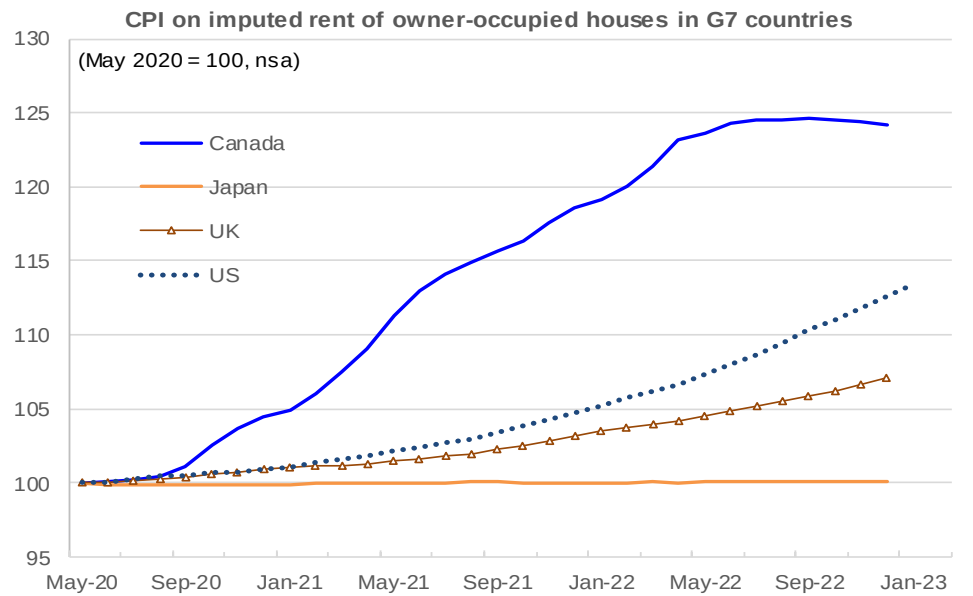
Sources: CEIC Database, SBI SECURITIES



Sources: CEIC Database, SBI SECURITIES



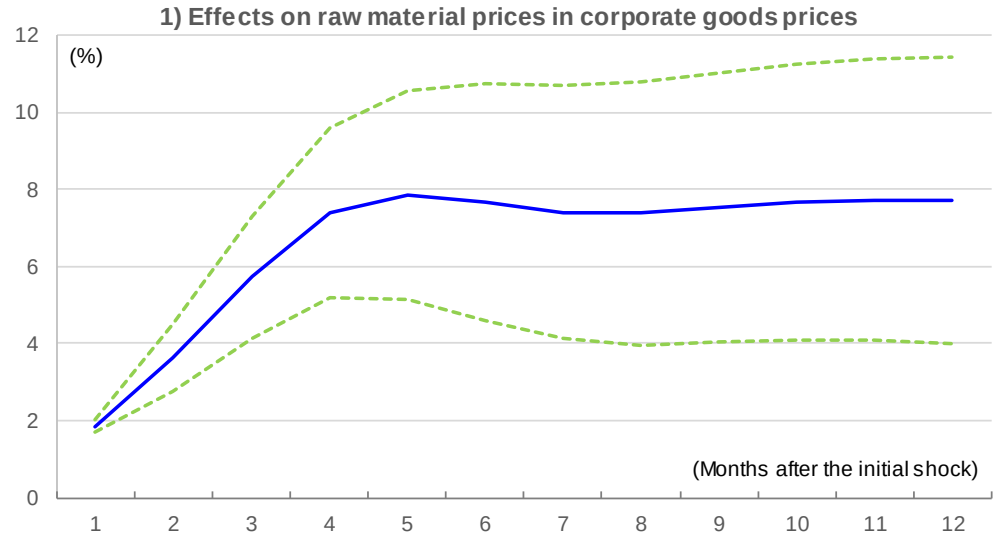
Sources: CEIC Database, SBI SECURITIES

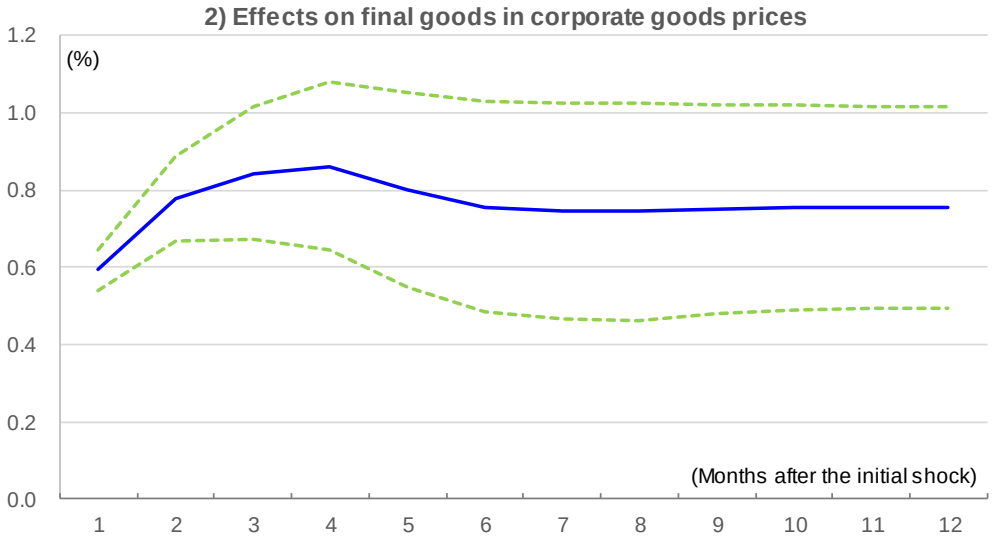


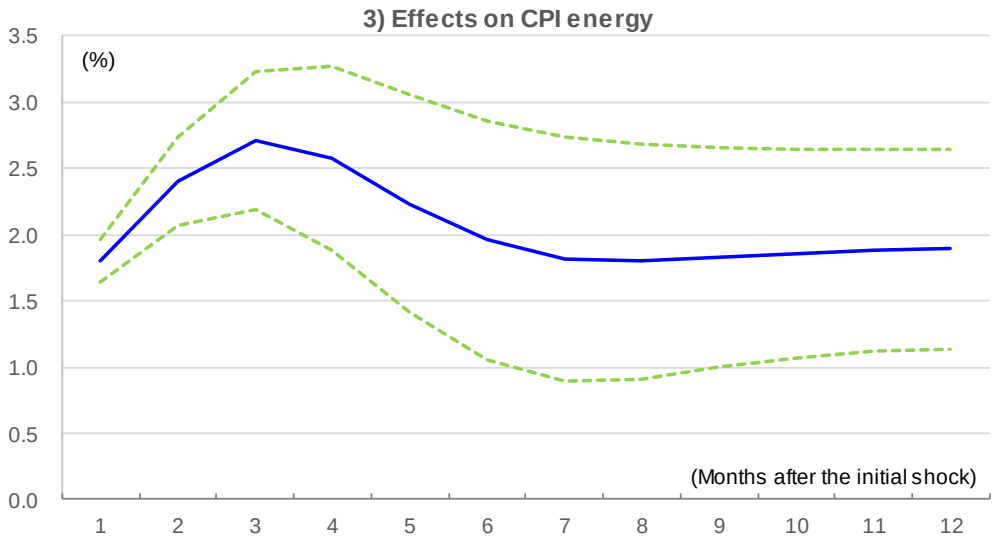
Sources: CEIC Database, SBI SECURITIES

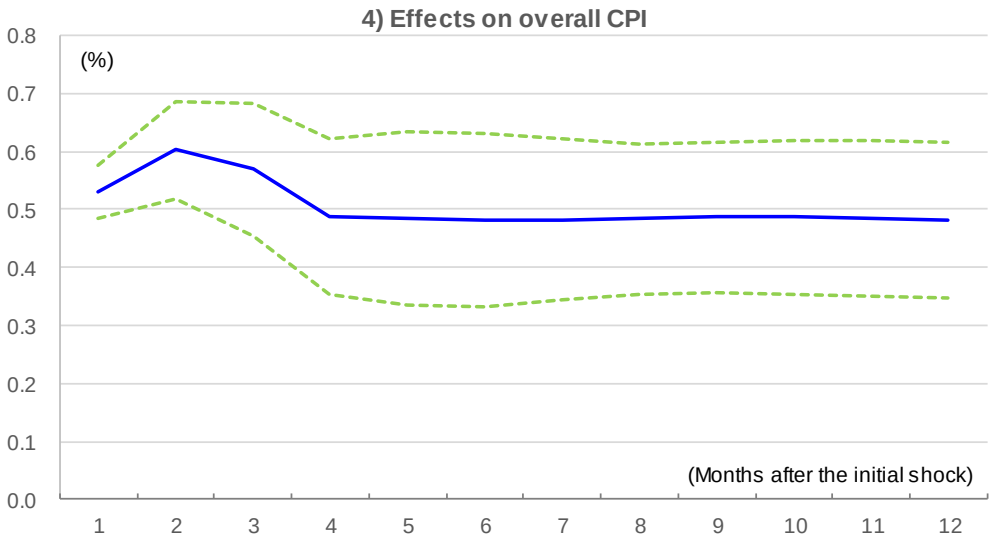
Effects of higher energy import prices on CGPI and CPI in Japan

Effects of a 10%rise in import price index of petroleum, coal, and natural gas on corporate goods prices and consumer prices in Japan









Notes: Results from two-variable vector autoregression including the import price index of petroleum, coal, and natural gas and one of the four price indices shown above.
The solid center line is the average response. The dotted lines indicate a confidence interval with ±2 standard errors.
Sample period: January 2000 - January 2021. Lag length is set to four. The first difference of natural log is used to all variables.
Sources: BoJ, CEIC Database, SBI SECURITIES.

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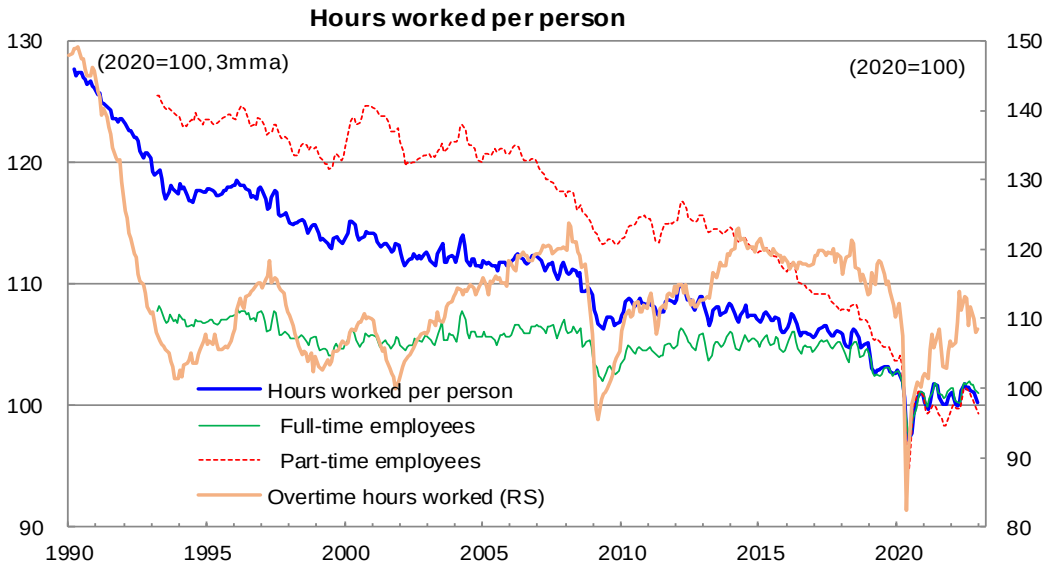
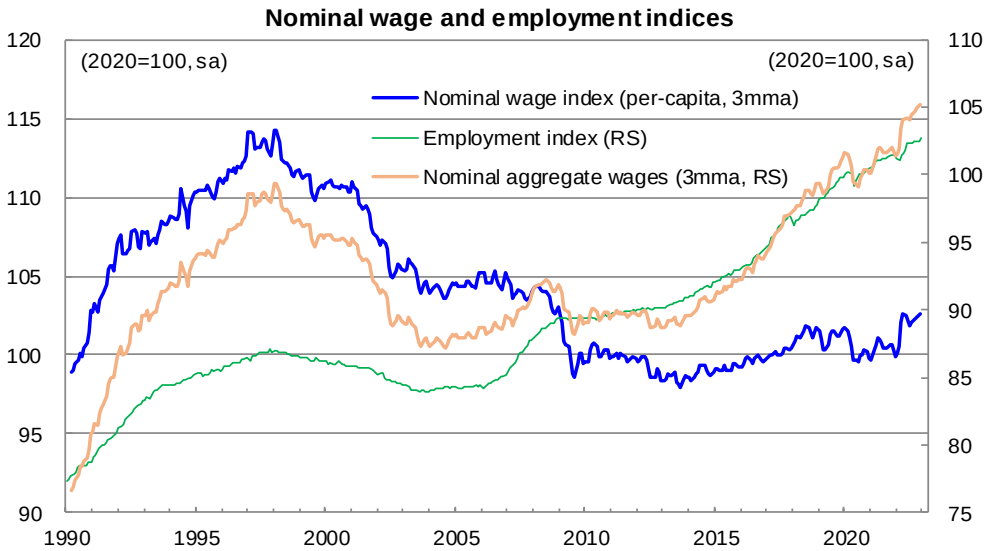
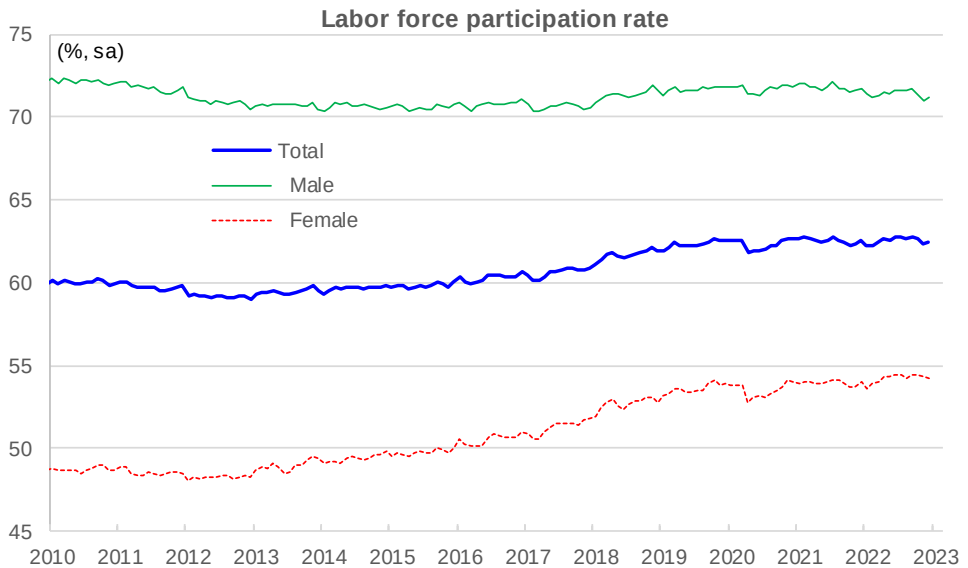
High hurdles for the virtuous circle of the labor market



Sources: CEIC Database, MHLW, MIC, SBI SECURITIES



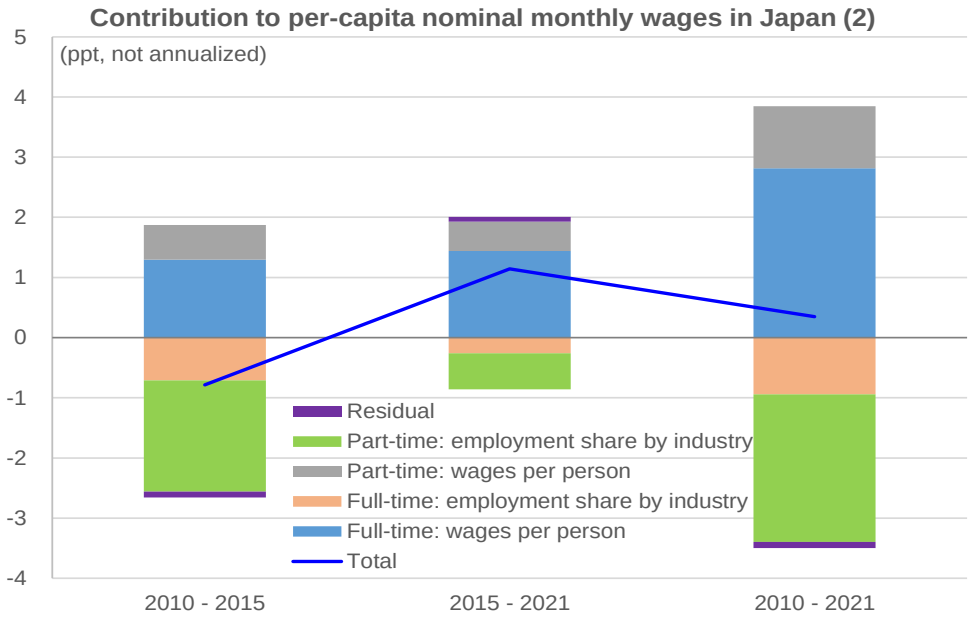
Note: Nominal aggregate wages = employees x nominal wage index
Sources: CEIC Database, MHLW, MIC, SBI SECURITIES



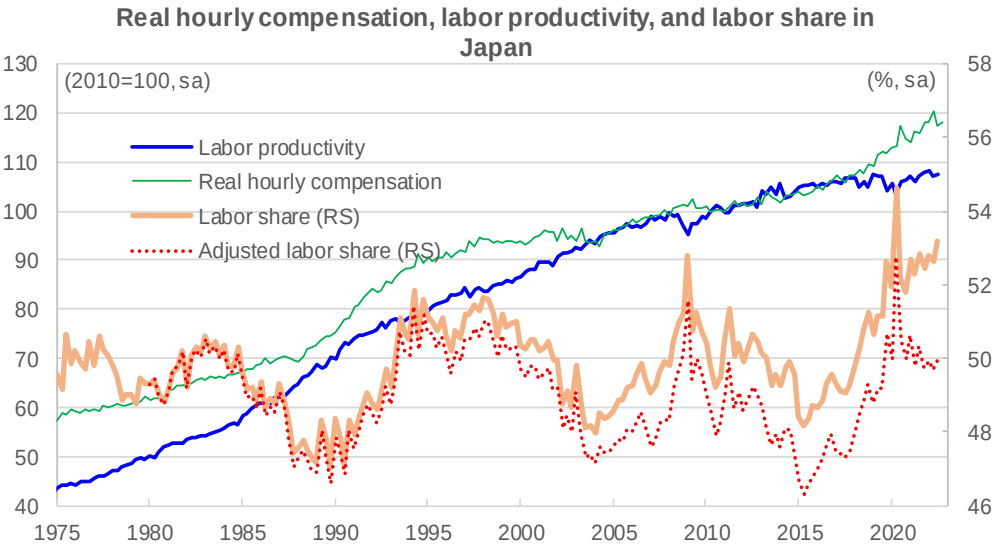
Note: Labor force participation rate = labor force / population age 15 and above
Sources: CEIC Database, MIC, SBI SECURITIES

Sources: CEIC Database, MHLW, MIC, SBI SECURITIES

Why have wages in Japan not risen?

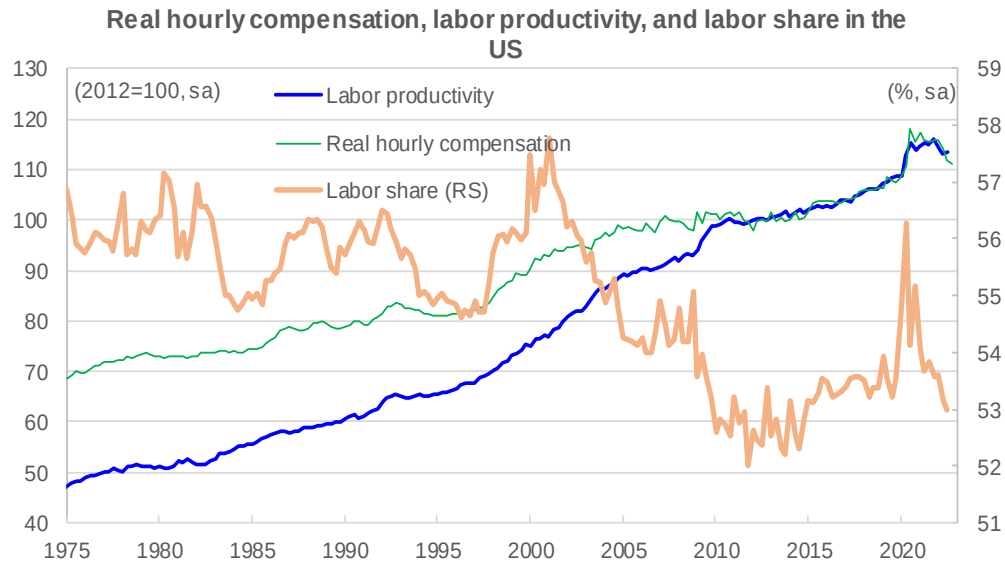


Sources: MHLW, SBI SECURITIES



Note: Labor's share = nominal compensation of employees / nominal GDP. Adjusted labor share = nominal compensation of employees / gross national income. Sources: CEIC Database, Cabinet Office, MHLW, SBI SECURITIES

- Nominal monthly wages in Japan has been suppressed by i) a shift of employment share to lower-wage industries and ii) a rise in the part-time employees' share.
- The two rounds of the shorter work hour shocks (1989 to early 1990s; 2018 onward) have pushed up the real hourly wages to the levels that are justified by a rise in labor productivity.
- This development in Japan is in contrast with the "great stagnation" of real hourly wages in the US since the 2000s which has lasted for 20 years.
- Asking for both higher wages and more employment is unrealistic. Prioritizing higher wages likely accompanies some sacrifice in employment.



Note: Labor's share = nominal compensation of employees / nominal GDP.
Sources: CEIC Database, US BLS, US BEA, SBI SECURITIES

Shorter work hours shock: negative incentives to labor supply lowers potential growth

- A combination of rising new job offers and no increase in employment, and a plateau in the labor force participation rate become the new normalcy under ongoing population aging.
- A rise in the aggregate wages for the overall economy under no prospect of an increase in employment requires a rise in per-capita wages.
- However, various negative incentives against labor supply prevent the labor input from rising, putting a brake on the virtuous circle in the labor market and making faster per-capita wage growth more difficult.
- Negative incentives against work: work style reforms (prohibition of long work hours, a rise in minimum wages, an annual income cliff at ¥1.06m, partial or full suspension of public pension benefits to workers eligible to receive them.
- Part-time employees: Because of the annual income cliff at ¥1.06m, a rise in minimum wages lowers their work hours without raising their annual wages.
- Permanent employees: a change in industrial structure increases the share of low-wage service industries; a decline in both scheduled and overtime hours under prohibition of long working hours leading to no rise in labor input.
- Employees eligible to receive public pension benefits: A high monthly salary cuts partially or fully their pension benefits, lowering incentives to work.
- Two rounds or shorter work hours shock (from 48 weekly work hours to 40 in 1H of the 1990s; work style reforms in 2018) are both negative supply shocks, lowering the economy's potential growth.
- Shorter work hours shock raises real hourly wages faster than labor productivity gains, leading to a rise in the labor share, which makes it difficult to ask for further wage increases.

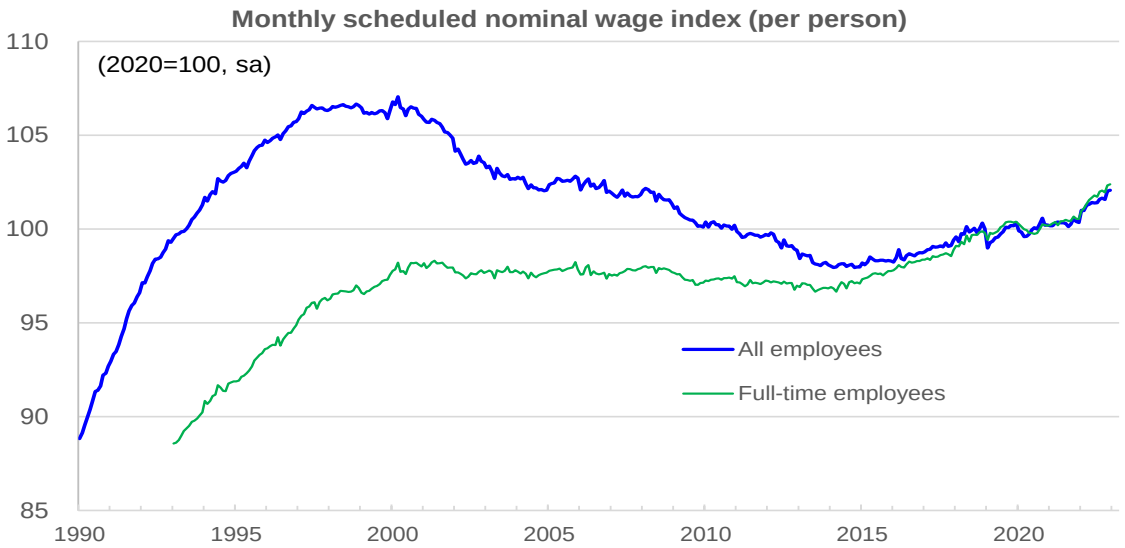
Work style reforms of 2018 act as the second shorter work hours shock (2)

Various walls (disincentives) on annual income against work

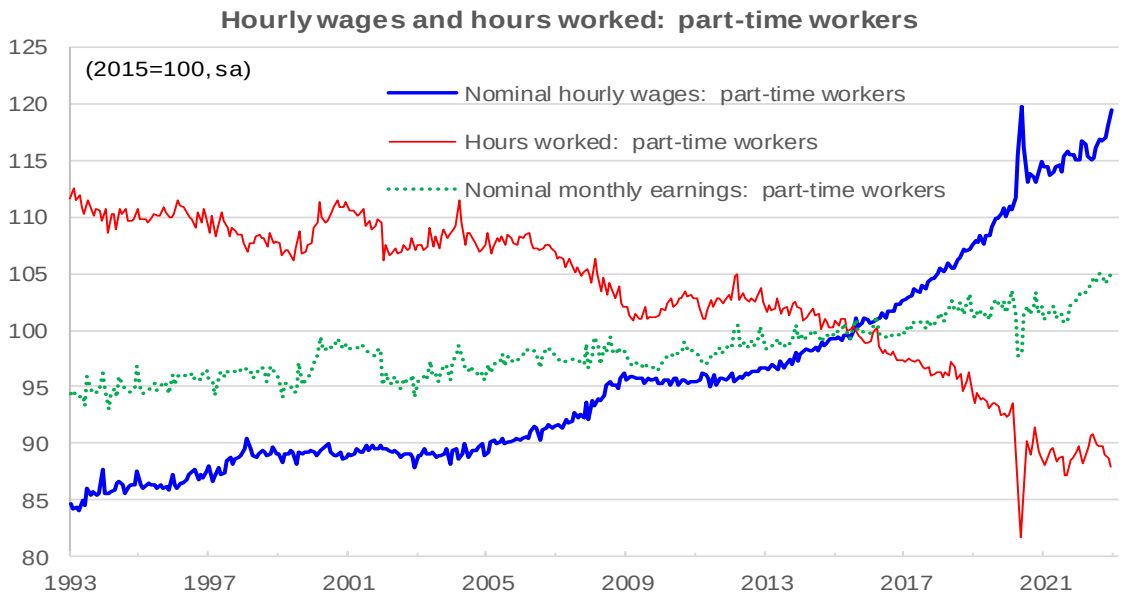
Threshold annual gross	Type of dependence	Will this trigger a disposable income cliff?	
¥1.03mn	Income tax	No	Spouse's annual gross salary up to ¥1.03mn is eligible for the household's primary income earner's spouse deduction. Income tax starts to kick-in on annual gross salary at ¥1.03 (though spouse's disposable income does not decline because of this). Spouse deduction is eligible up to main income earner's income at ¥10mn. The deduction begins to diminish at ¥9mn.
¥1.06mn	Social security tax	Yes	Individuals with annual gross salary of ¥1.06mn with certain conditions need to enroll in social security. (Certain conditions: weekly work hours above 20 hours, monthly gross salary at ¥88,000 or higher, one-year or longer work contract, 501 or more enrollment in social security at the employer, not a student) Disposable income declines above ¥1.06mn gross salary
¥1.30mn	Social security tax	Yes	All individuals with annual gross salary of ¥1.30mn need to enroll in social security. Disposable income declines above ¥1.30mn gross salary
¥1.50mn	Income tax	No	¥1.50mn is the upper bound of the spouse's annual gross salary at which the main income earner is eligible for full special spouse deduction. Beyond ¥1.03mn annual gross salary of the spouse, the main income earner is still eligible for the special spouse deduction up to ¥1.50mn of the spouse's annual gross salary. (For the spouse's annual gross salary between ¥1.50mn –¥2.01mn, some fraction of the special spouse deduction is eligible for the main income earner, which diminishes with the main income earner's income.) Special spouse deduction is eligible up to main income earner's income at ¥10mn. The deduction begins to diminish at ¥9mn.
¥ ???	Employer's rule	Yes	Aside from these walls, employers may offer special allowance for spouse if the spouse's annual gross salary is below a certain threshold (for example, below ¥1.03mn

Sources: MoF, SBI SECURITIES

Work style reforms of 2018 act as the second shorter work hours shock (1)



Notes: Business offices with 5 or more employees.
Sources: CEIC Database, MHLW, SBI SECURITIES



Notes: Business offices with 5 or more employees.
Sources: CEIC Database, MHLW, SBI SECURITIES

- Raising minimum hourly wages without eliminating various annual salary thresholds (cliffs; at ¥1.06m and ¥1.30m) justifies to limit labor supply just before reaching those thresholds.
- A decline in hours worked has become more noticeable after the introduction of the work style reforms in 2018 (because of the review of the long working hours practice for permanent workers, and of a continued rise in minimum wages for part-time workers).
- A decline in hours worked lowers the economy's potential growth.
- Lack of coordination between ministries (MoF in charge of taxes, MHLW in charge of social security system)
- The initial shorter work hours shock took place in 1989–1994 when weekly work hours were reduced from 48 hours to 40 hours.

Potential growth is an important determinant of long-run inflation

1) The short-run relationship between the output gap and inflation (the Phillips curve) is unstable.
2) Potential growth is a more important determinant of long-run inflation than the output gap.
3) *The decline in the potential growth lowers long-run inflation through a downward shift of the Phillips curve.*
4) A sustained rise in import prices acts as a disinflationary force through a decline in domestic purchasing power.
5) *Potential growth ≒ long-run growth of aggregate demand ≒ natural interest rate*

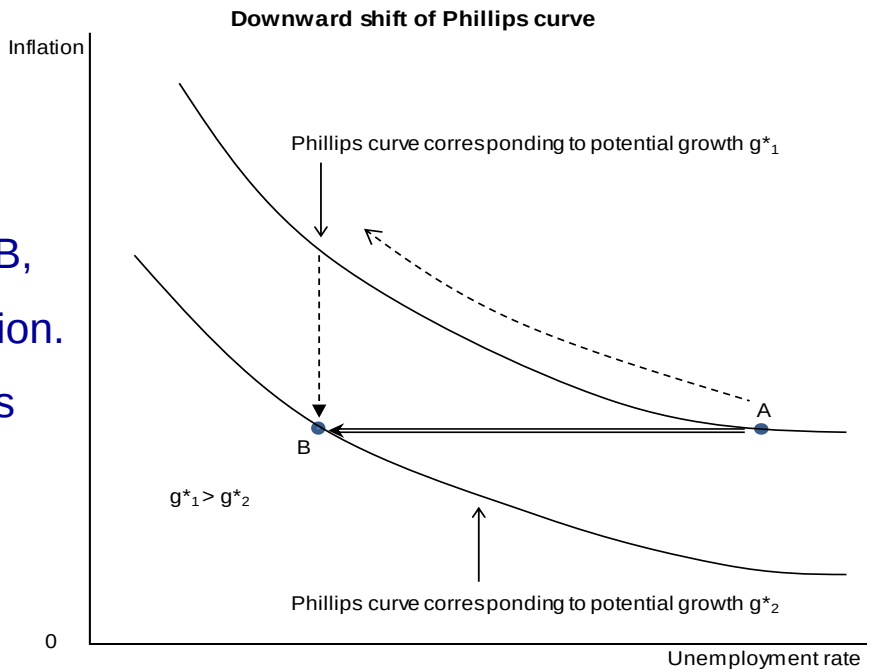
While the potential GDP and its growth determine the supply side of the economy (labor, capital, and technological progress), over the long-run, potential GDP roughly matches realized GDP where their growth rates are roughly the same.

Country A: zero output gap, 3% potential growth

Country B: zero output gap, 0% potential growth

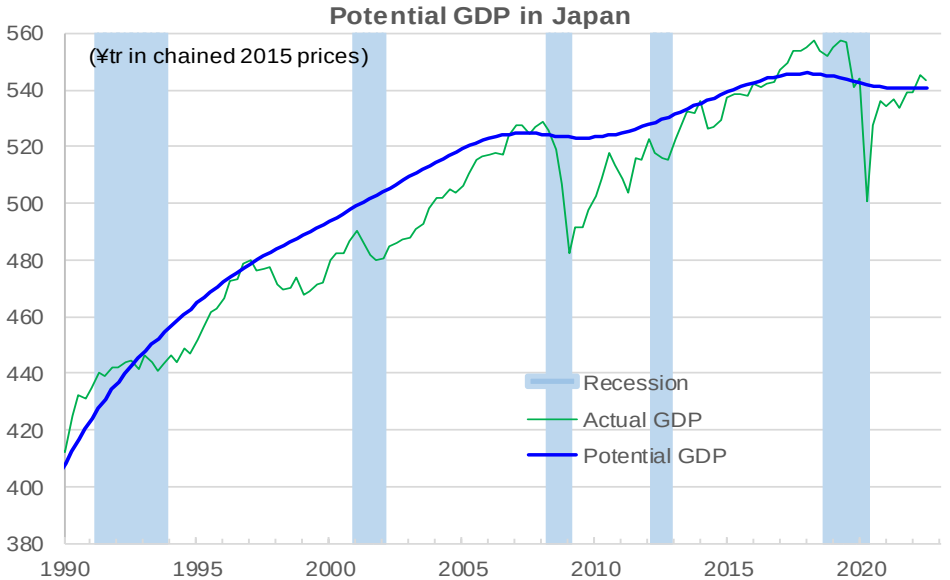
Inflation in country A tends to be higher than that in country B, because long-run growth of aggregate demand affects inflation.

The Phillips curve of a country with higher potential growth is located above that of a country with lower potential growth.

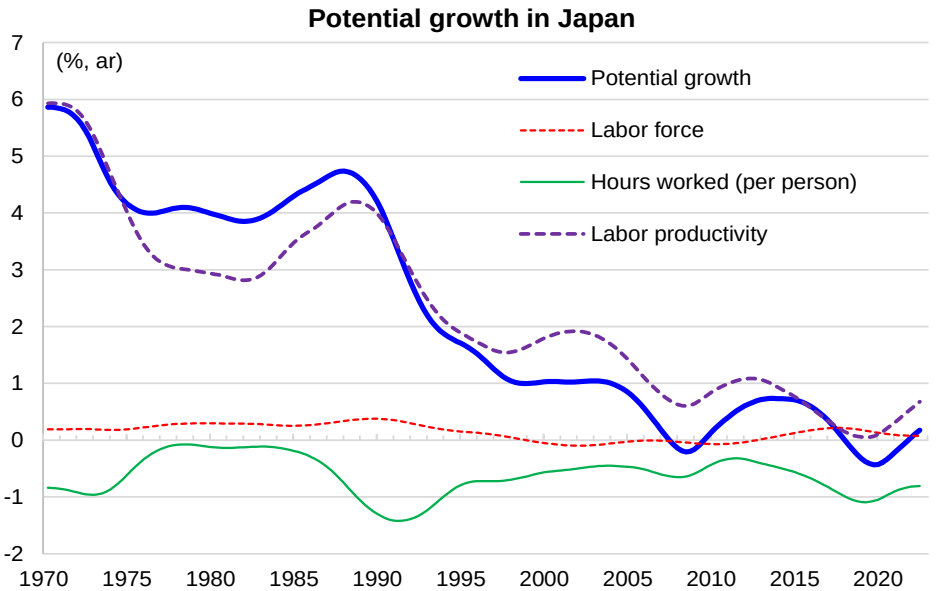


Source: SBI SECURITIES

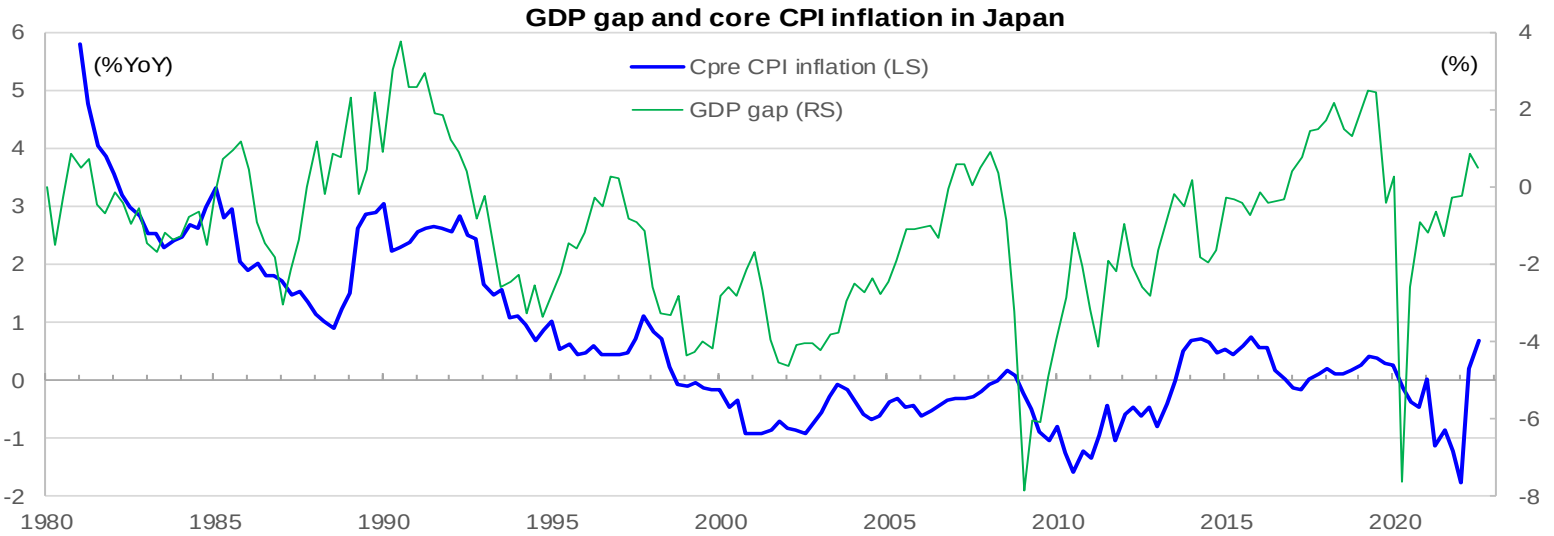
Japan's potential GDP and its growth rate



Notes: We assumed that actual and potential GDP were equal to each other in 1Q 1980. Potential growth = growth of workers + growth of hours worked (per person) + labor productivity growth. Sources: CEIC Database, Cabinet Office, MHLW, MIC, SBI SECURITIES.



Note: We assumed that potential GDP and actual GDP were equal in 1Q 1980. Potential growth = growth of workers + growth of hours worked (per person) + labor productivity growth
Sources: CEIC Database, Cabinet Office, MIC, MHLW, SBI SECURITIES



Note: The effect of the consumption tax on CPI inflation is adjusted except in 1989. Sources: CEIC Database, Cabinet Office, MIC, SBI SECURITIES

Estimation of core CPI inflation in Japan and the US

Long-term determinants of core CPI inflation in Japan and the US

Country	Japan		US	
Equation #	[1]	[2]	[3]	[4]
Dependent variable: 5-year average core CPI inflation (%)				
Explanatory variables	Coefficient / (p-value)		Coefficient / (p-value)	
5-year average GDP gap (4-quarter lead, %)	0.2854 **	0.2733 **	0.3609 *	0.3614 **
	(0.000)	(0.000)	(0.011)	(0.008)
5-year average potential growth (4-quarter lead, %)	0.4857 **	0.4832 **	0.5116 **	0.4886 **
	(0.000)	(0.000)	(0.000)	(0.000)
5-year average change in nominal trade-weighted exchange rate (%)	-0.0208 **	-0.0162 **	-0.1129 **	-0.1902 **
(Japan: 2-quarter lead; US: 4-quarter lead)	(0.000)	(0.000)	(0.000)	(0.000)
5-year average change in import prices (%)		-0.0172 **		-0.1288 **
(Japan: 2-quarter lead; US: no time lead)		(0.000)		(0.003)
Intercept	0.0063	0.0095	1.8774 **	2.0693 **
	(0.846)	(0.755)	(0.000)	(0.000)
Adjusted R-squared	0.969	0.973	0.460	0.492
S.E. of regression	0.164	0.153	0.624	0.605
S.D. dependent variable	0.933	0.933	0.849	0.849
D.W.	0.130	0.155	0.036	0.107
Number of observations	131	131	131	131
Sample period	1990Q1 - 2022Q3		1990Q1 - 2022Q3	

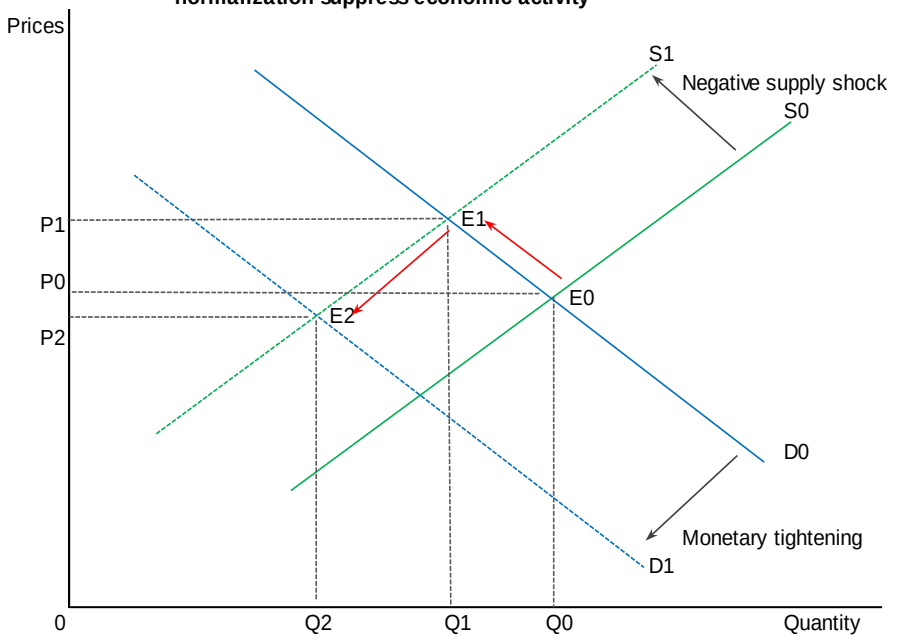
Notes: The effect of the consumption tax rate on inflation has been adjusted in Japan.
**… significant at the 1% level, * … at the 5% level.
Import prices are in foreign currency-denominated terms for Japan. P-values in parentheses.
Sources: CEIC Database, US BEA, US BLS, BoJ, Cabinet Office, MIC, MHLW, SBI SECURITIES

- We use 5-year average value or the 5-year average rate of change in both dependent and explanatory variables to abstract short-run disturbances and to estimate the long-run determinants of inflation.
- The parameter of the potential growth in both Japan and the US at around 0.50 is higher than that of the output gap at around 0.28–0.36.
- The parameter of import prices is negative in both Japan and the US. A sustained rise in import prices acts as a disinflationary force through a decline in domestic purchasing power.

What happens if nominal GDP targeting, not inflation targeting, were adopted?

- Monetary policy needs to respond to demand shocks but should wait for the supply shocks to pass.
- Demand shocks: prices and quantities move in the same direction.
- Supply shocks: prices and quantities move in the opposite direction
- **Inflation targets induces additional expectations for monetary policy actions that are not warranted.**
- **Problems with inflation target: prices send different signals from the demand shocks and from the supply shocks. This problem does not show up in nominal GDP growth target.**
- **Under nominal GDP level/growth target, monetary tightening (easing) is needed when nominal GDP level or growth continues to deviate upward (downward).**
- Monetary tightening in response to the supply shock further lowers quantity and bring down prices (from a shift in equilibrium in E1 to E1).

Negative supply shock and premature monetary policy normalization suppress economic activity



Source: SBI SECURITIES.

Nominal GDP growth targeting is preferable to inflation targeting

- The biggest accomplishment of the Japanese QE is the recovery in nominal growth (per person).

Nominal GDP growth targeting is superior to inflation targeting

No need for additional easing in response to positive supply shocks

- A decline in oil prices: improvement in the terms of trade and nominal trade balance raise nominal GDP.
- Currency appreciation: improvement in the terms of trade and a resulting rise in the purchasing power limit the deterioration in nominal trade balance.
- Deregulation: the decline in prices raises the demand for goods and services to limit the decline in nominal economic activity.

Additional monetary easing may be needed in response to negative supply shocks.

- A rise in oil prices: deterioration in the terms of trade and nominal trade balance could lower nominal GDP
- Currency depreciation: deterioration in the terms of trade and the decline in purchasing power could offset improvement in nominal trade balance.

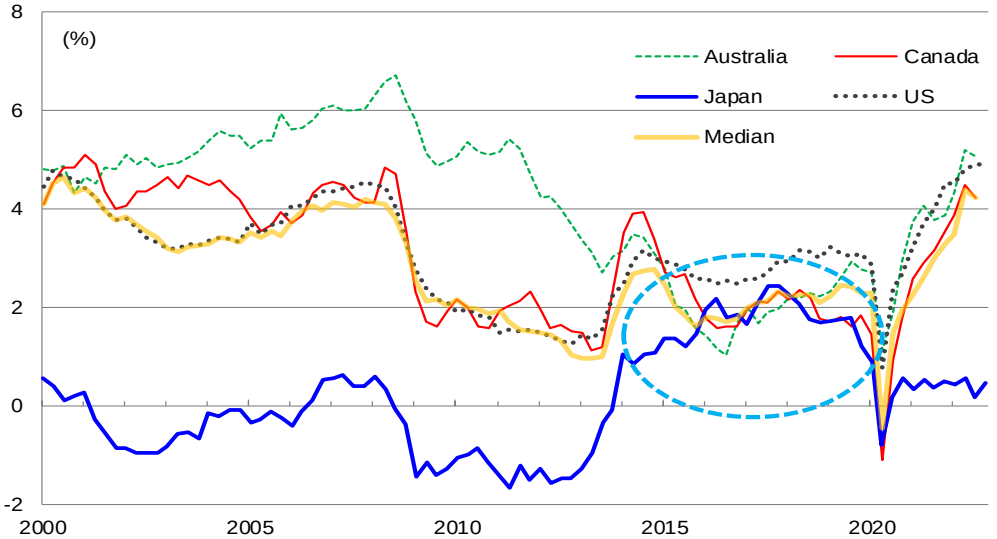
Monetary policy normalization is subservient to normalization of the real economy.

- Past attempts to artificially raise the natural interest rate all failed (in 2000 and 2006 for the BoJ, in 2011 for the ECB, in 2013 and 2017-2018 for the Fed).

We expect to see discussions to change inflation target to nominal income target to rise.

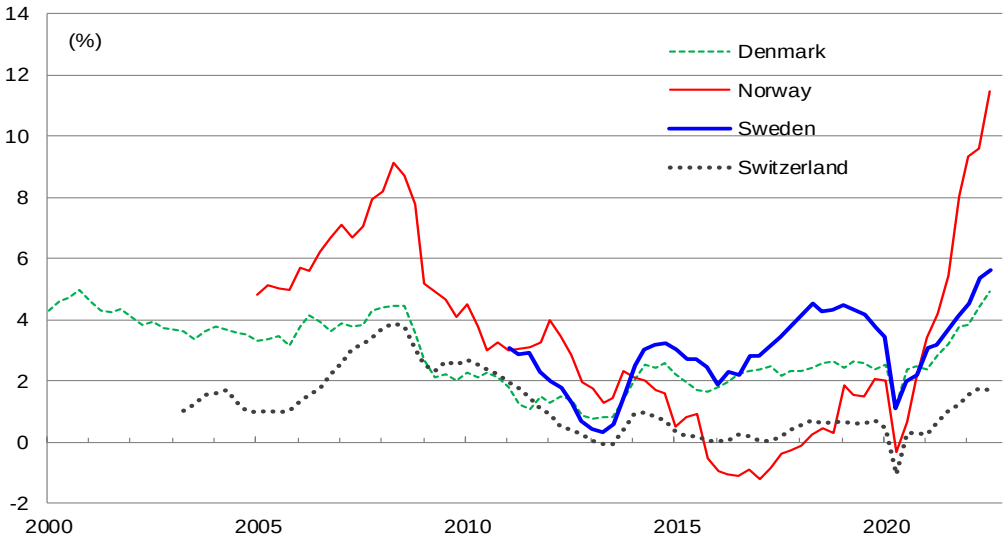
Monetary policy influences nominal economic activity over the long-run

Five-year annualized per-capita nominal GDP growth (1)



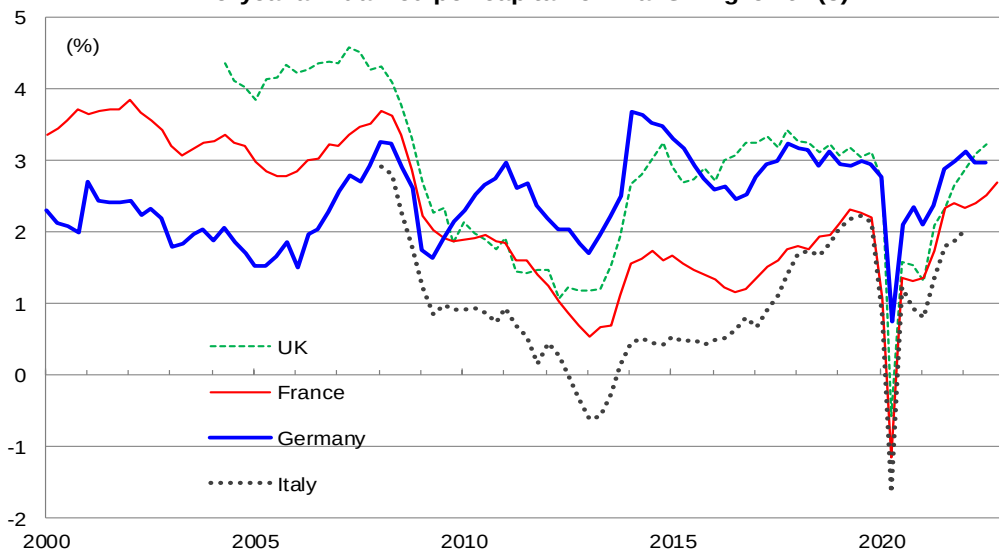
Note: Population of 15 years and above for Australia & Canada.
Sources: CEIC Database, SBI SECURITIES

Five-year annualized per-capita nominal GDP growth (2)



Note: Population of 15-74 years for Norway and Switzerland.
Sources: CEIC Database, SBI SECURITIES

Five-year annualized per-capita nominal GDP growth (3)



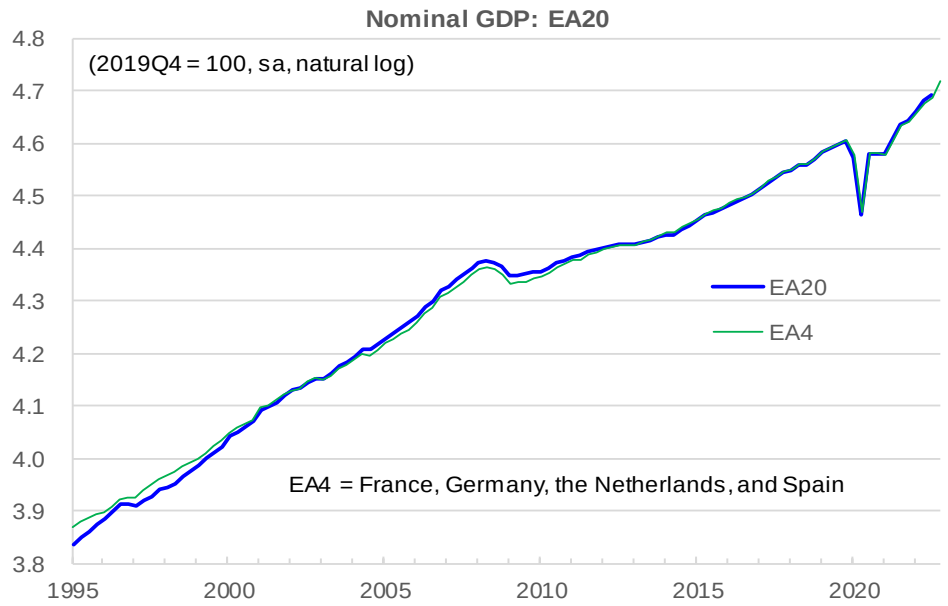
Note: Population of 15 years and above for the UK Sources: CEIC Database, SBI SECURITIES

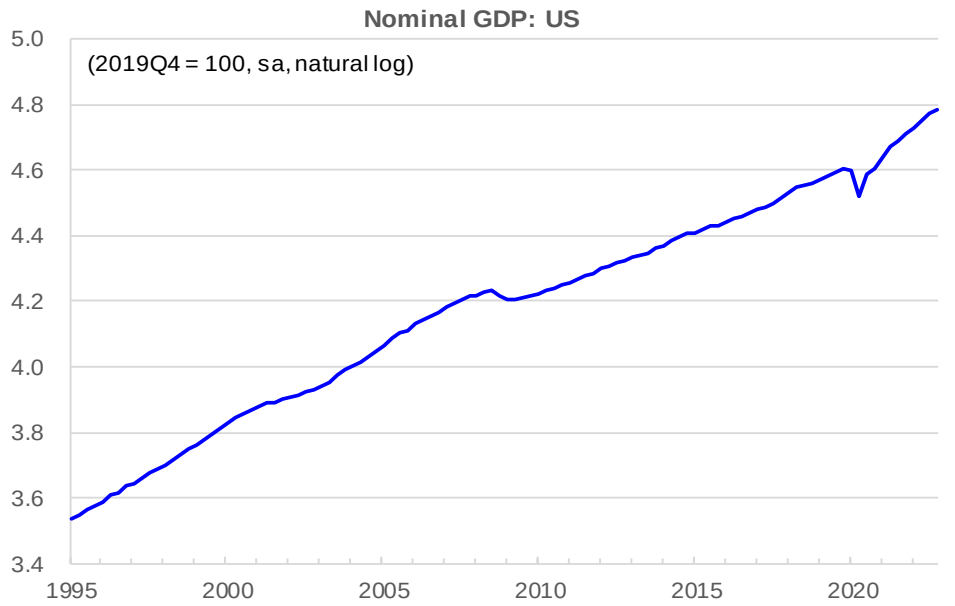
Nominal GDP growth (annaulized) in major developed countries

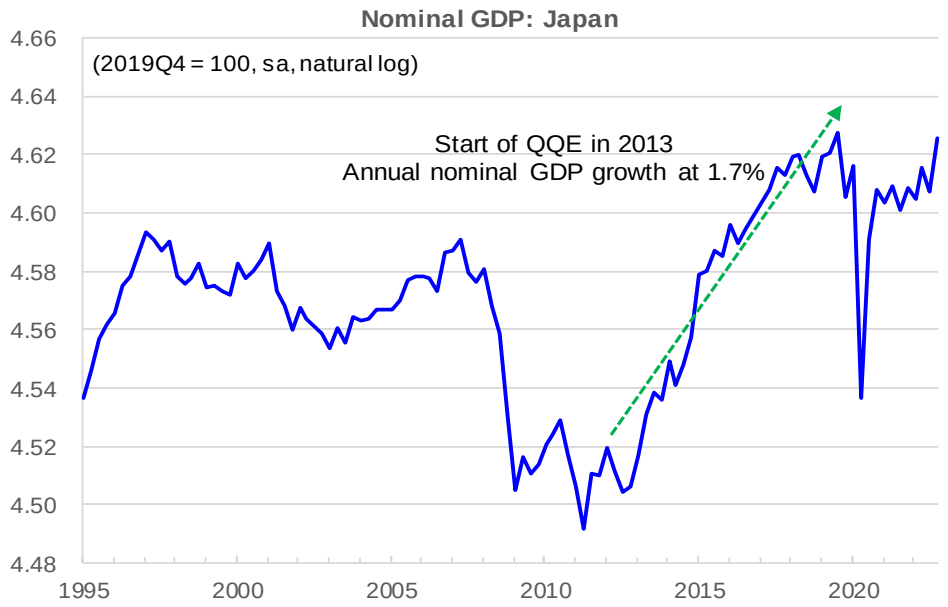
	1Q 1993 - 4Q 1999	1Q 2002 - 3Q 2008	1Q 2012 - 4Q 2019	1Q 2020 - 3Q 2022
Australia	5.7	7.9	3.9	7.4
Canada	4.9	5.8	3.3	5.7
Denmark	4.7	4.1	3.0	7.7
EA20	4.0	3.8	2.6	3.2
France	3.2	3.8	2.1	2.4
Germany	2.4	2.1	3.3	3.1
Italy	4.9	3.2	1.1	1.4
Japan	0.8	0.0	1.2	0.1
Netherlands	6.1	4.3	2.9	5.5
New Zealand	5.4	5.9	5.3	6.9
Norway	7.1	8.1	3.3	19.8
Spain	6.7	6.6	2.3	2.2
Sweden	6.3	5.2	4.2	7.7
Switzerland	2.3	4.1	1.7	3.0
UK	5.2	5.0	3.9	3.4
US	5.7	5.0	4.1	6.3

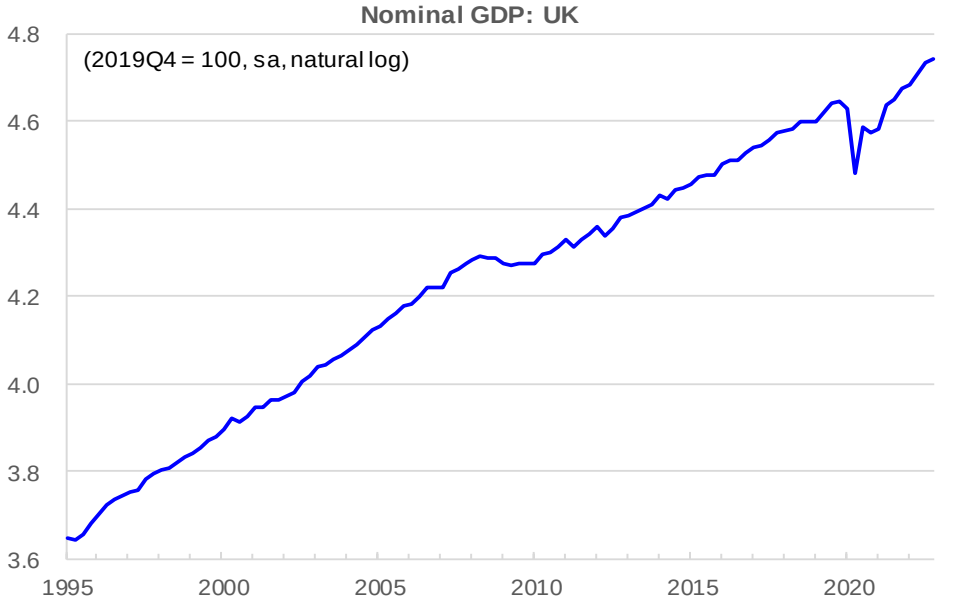
Sources: CEIC Database, SBI SECURITIES

Nominal GDP in major developed countries



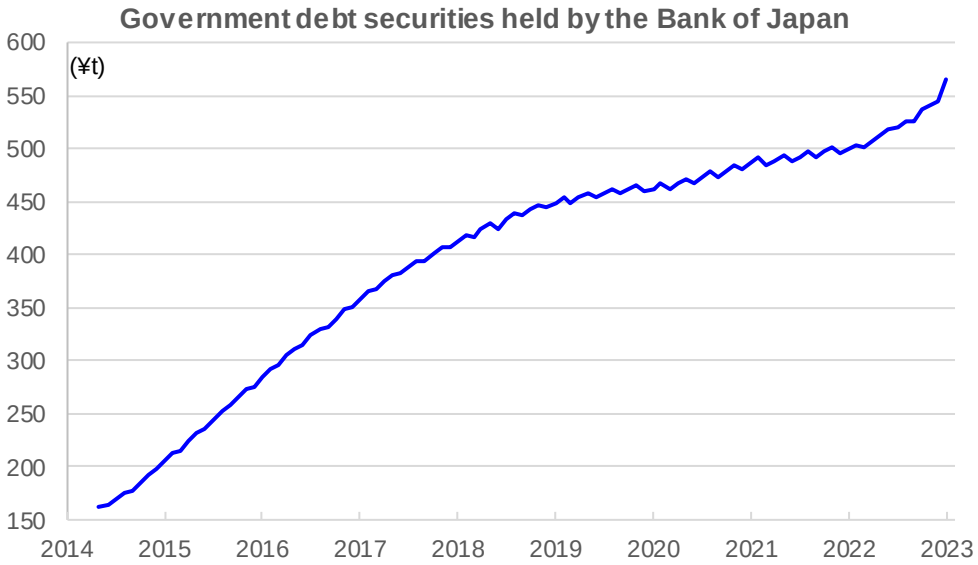




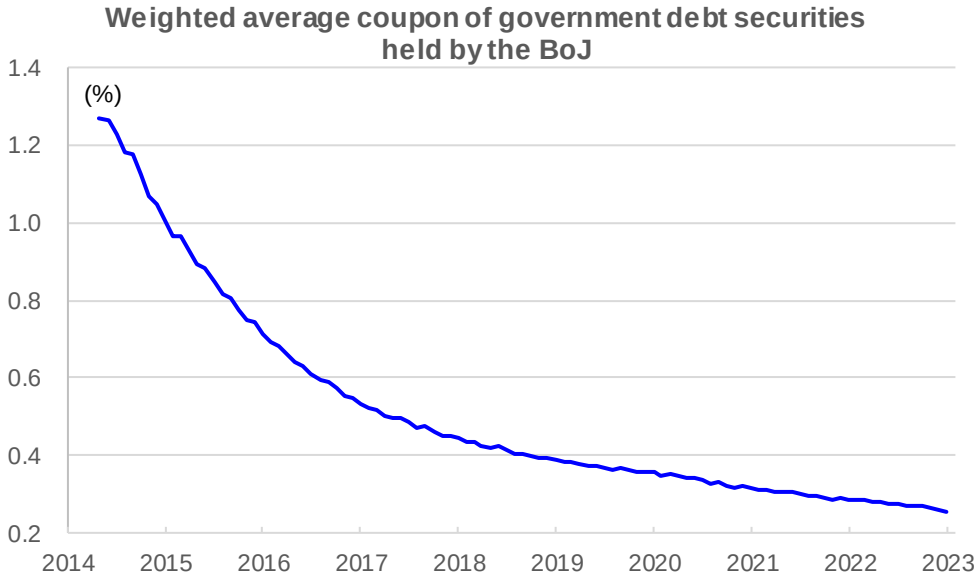


Notes: EA4 = France, Germany, the Netherlands, and Spain where the release of GDP statistics is earlier than others.
Sources: CEIC Database, SBI SECURITIES

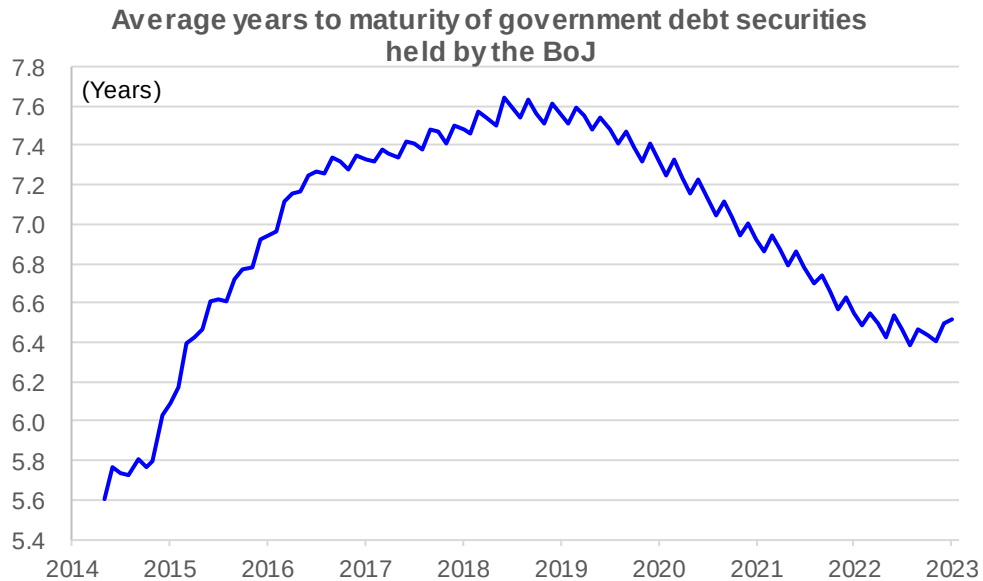
Weighted average coupon and average years to maturity for government debt securities held by the BoJ



Note: Excluding Treasury Discount Bills. Sources: BoJ, MoF, SBI SECURITIES



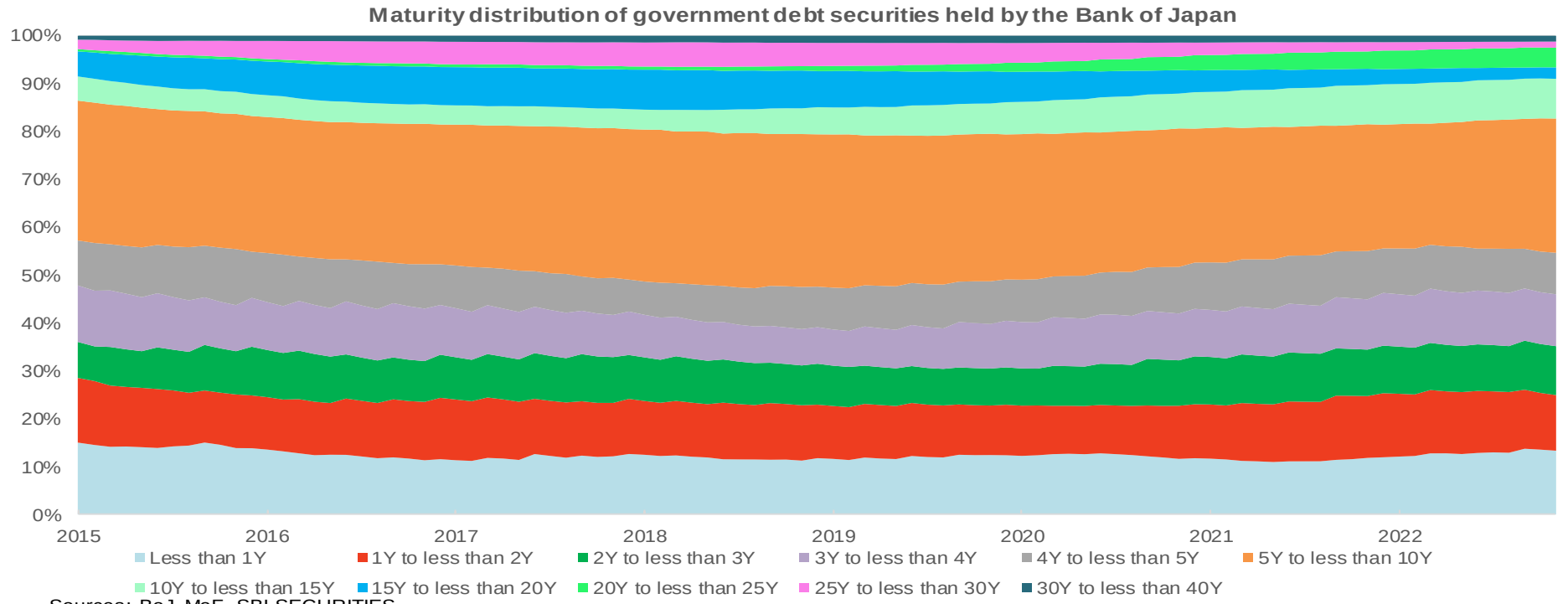
Note: Excluding Treasury Discount Bills. Sources: BoJ, MoF, SBI SECURITIES



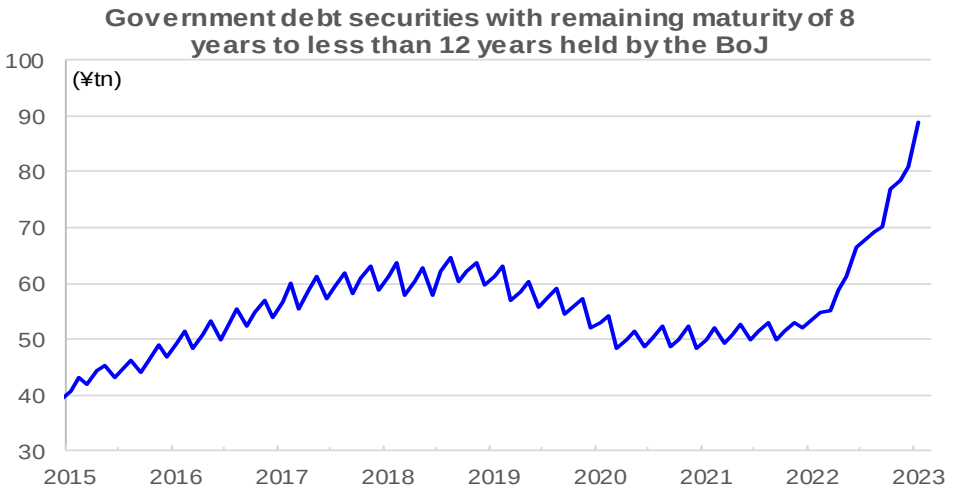
Note: Excluding Treasury Discount Bills. Sources: BoJ, MoF, SBI SECURITIES

The Bank of Japan has adopted a more intentional "behind-the-curve" monetary policy target in September 2016, well before the US Federal Reserve has adopted the average inflation targeting. It is designed to maintain the current accommodation until they expect CPI inflation to reach and sustain 2%, with the commitment to expand the monetary base until inflation reaches and sustains 2%. It is unlikely that the BoJ withdraws accommodation in response to a one-off rise in prices.

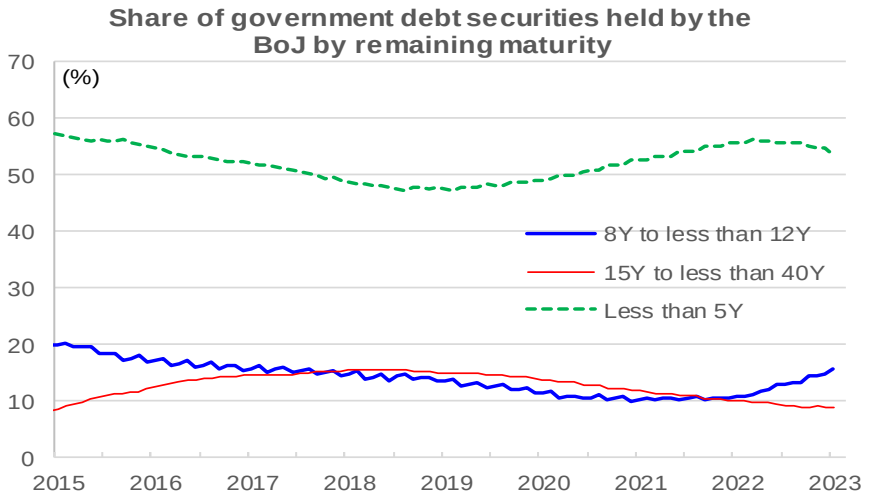
Maturity distribution of government debt securities held by the Bank of Japan



Sources: BoJ, MoF, SBI SECURITIES



Sources: BoJ, MoF, SBI SECURITIES



Sources: BoJ, MoF, SBI SECURITIES

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Government debt securities held by the Bank of Japan by the remaining years to maturity

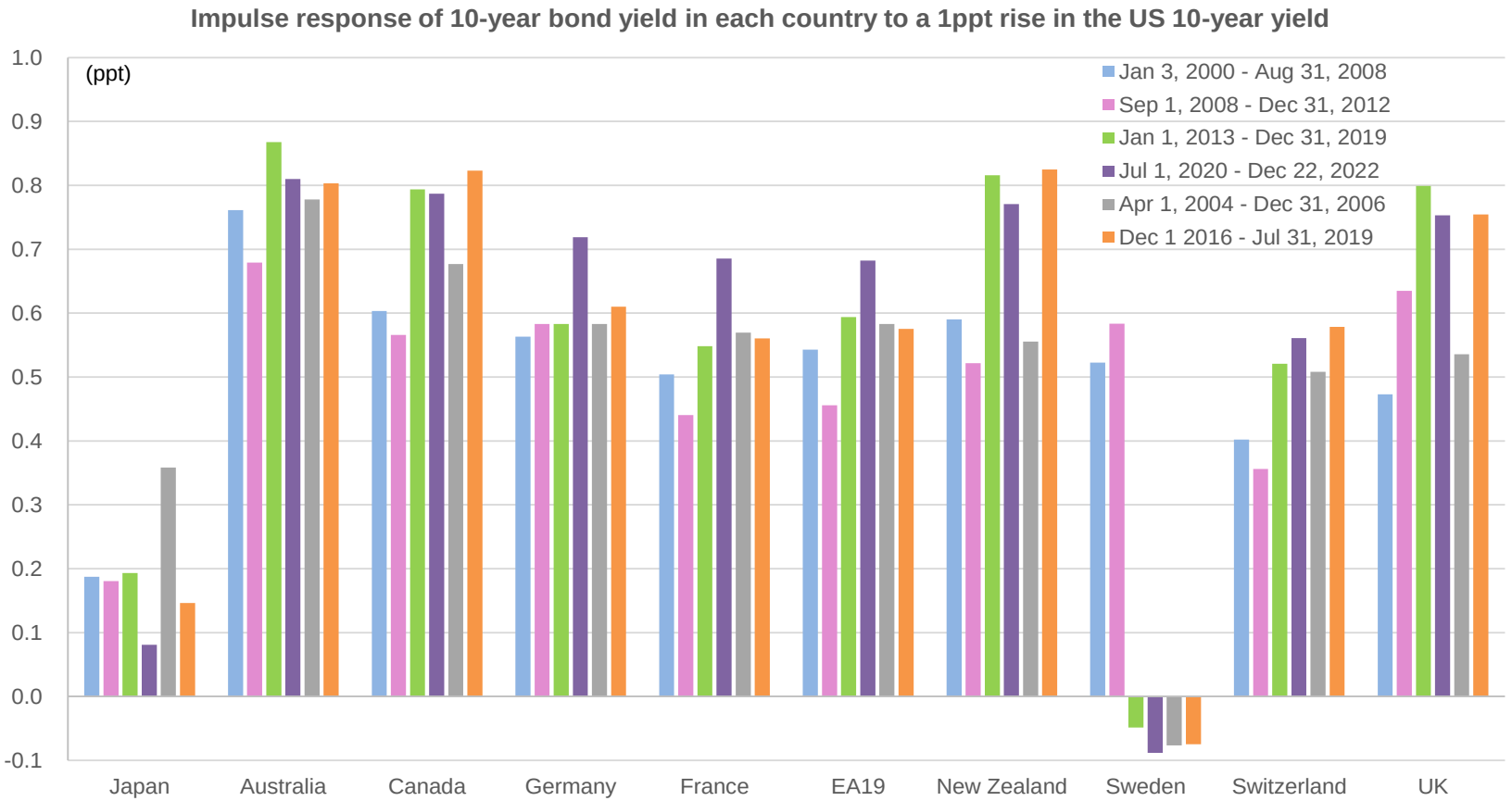
Government debt securities held by the Bank of Japan by duration (at the end of January 2023)

Remaining years to maturity (up to years)	(JPYtn)	(%)	Remaining years to maturity (up to years)	(JPYtn)	(%)
1	73.69	13.03	21	2.38	0.42
2	63.36	11.20	22	4.05	0.72
3	58.62	10.37	23	7.44	1.31
4	58.06	10.27	24	4.98	0.88
5	48.34	8.55	25	4.63	0.82
6	33.51	5.92	26	3.24	0.57
7	30.46	5.39	27	1.63	0.29
8	34.60	6.12	28	0.57	0.10
9	31.60	5.59	29	0.51	0.09
10	36.67	6.48	30	0.72	0.13
11	10.46	1.85	31	0.95	0.17
12	10.13	1.79	32	1.09	0.19
13	9.89	1.75	33	1.27	0.22
14	9.50	1.68	34	1.56	0.28
15	6.75	1.19	35	1.21	0.21
16	5.50	0.97	36	0.50	0.09
17	2.26	0.40	37	0.13	0.02
18	1.60	0.28	38	0.00	0.00
19	1.57	0.28	39	0.00	0.00
20	1.83	0.32	40	0.32	0.06
			Total	565.56	100.00

Note: Excluding Treasury Discount bills.
Sources: BoJ, SBI SECURITIES.

- If the entire JGB holdings by the BoJ is hypothetically sold to the market upon maturity without being reinvested, the scale of the sales is around ¥50t–¥70t a year over the next five years (¥302t as a total in five years).

Asymmetric response of 10-year yield under the global real interest rate



Notes: Two-variable vector autoregression (VAR) models. First difference specification is used. Lag length is set to five. Responses after 25 business days. Sources: CEIC Database, SBI SECURITIES.

- A change in US 10-year yield results in large changes in the 10-year yields of other developed countries, but the changes in the 10-year yields of the other countries result in a smaller change in the US 10-year yield.
- The effect from the US yield to the 10-year yield in Japan is small, reflecting Japan-specific monetary policy.
- Comparison of the 10-year yields among three major countries (Germany, Japan and the US) shows a smaller response of the Japanese yield to the change in the US yield.

Summary of the factors influencing the 10-year JGB yield

Factors influencing 10-year JGB yield

Explanatory variables		3-month rate (%)	US 10Y yield (%)	BoJ's holding of JGBs (% of GDP)	Core CPI inflation (%)	Total
Parameters						
Case 1	Japan only	0.529	0.217	-0.008	-0.177	
	OLS estimates	0.463	0.216	-0.009		
		0.561	0.185	-0.004	-0.031	
		0.553	0.185	-0.003		
	Average (1)	0.526	0.201	-0.006	n.a.	
Case 2	Japan only	n.a.	0.108	-0.019	n.a.	
	VAR estimates					
Case 3	Developed countries	0.303	---	n.a.	0.218	
	Panel estimates	0.550	---	-0.017	0.231	
		0.596	---	-0.014	0.159	
		0.684	---	-0.015	0.159	
	Average (2)	0.533	---	-0.015	0.192	
Case 4	Developed countries	n.a.	n.a.	-0.065	n.a.	
	VAR estimates					
Average of parameters (A; Case 1–4)		0.530	0.155	-0.026	0.192	
Assumed changes in explanatory variables (B)						
	(bps)	100	-100		250	
	(JPYtn)			0		
	(% of GDP)			0		
Effects on 10-year JGB yield (A x B, bps)		**53**	**-15**	**0**	**48**	**85**

Note: Parameters that are not statistically significant are excluded.
Sources: CEIC Database, BoJ, MIC, Federal Reserve, SBI SECURITIES.

- The coefficients of the explanatory variables are similar to those from the US results (US: 0.494 for the short-term interest rate, -0.047 for the ratio of the central bank's total asset to GDP, and +0.170 for core CPI inflation.
- Assuming no contraction in the BoJ's balance sheet for some time to come, contributions from other domestic factors to raise the 10-year JGB yield are unlikely to exceed +100bps.

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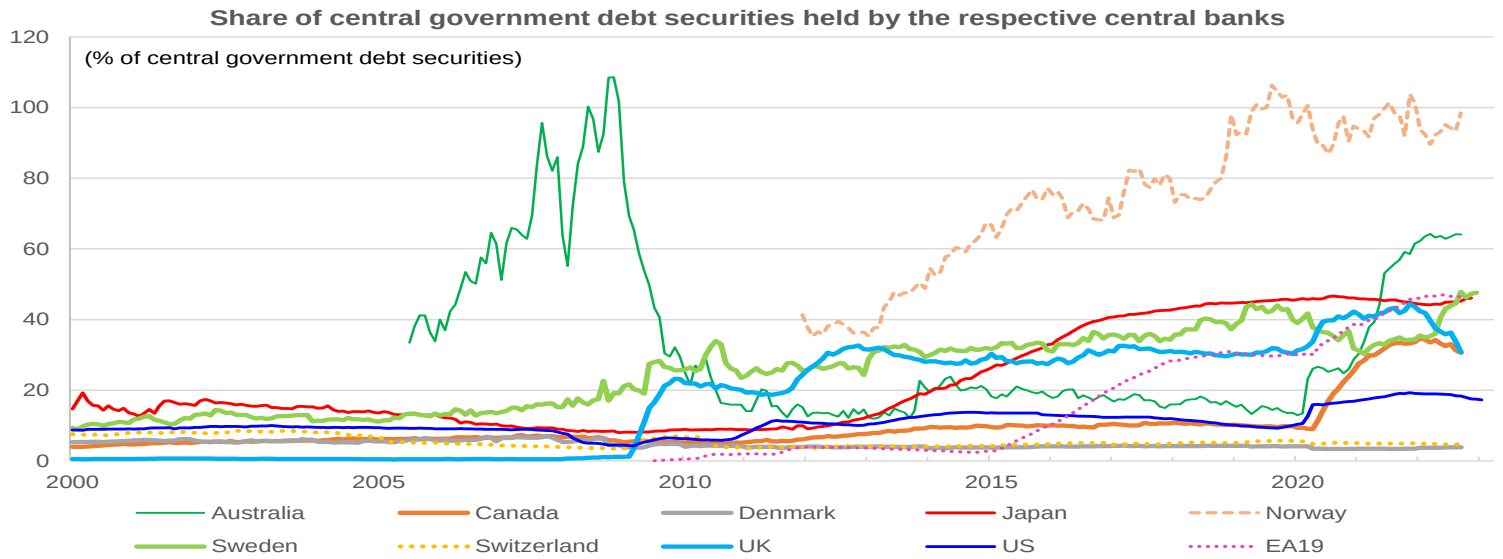
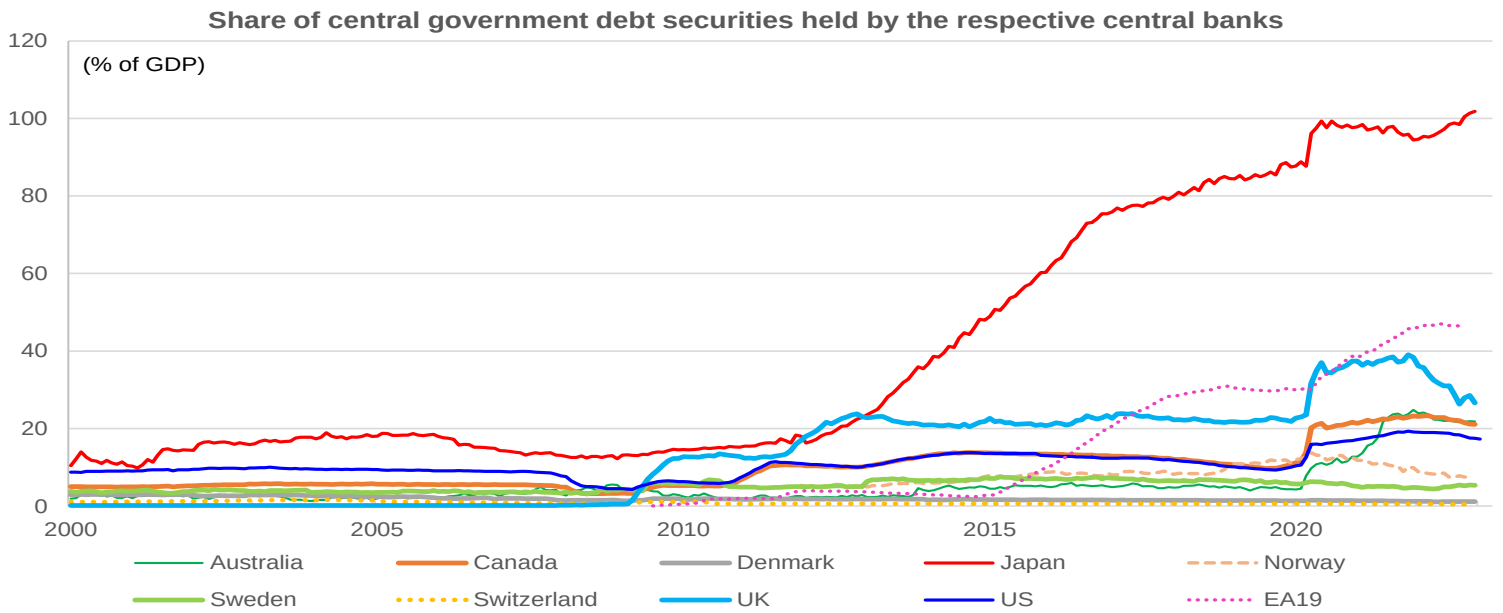
Share of central government debt securities held by the respective central banks



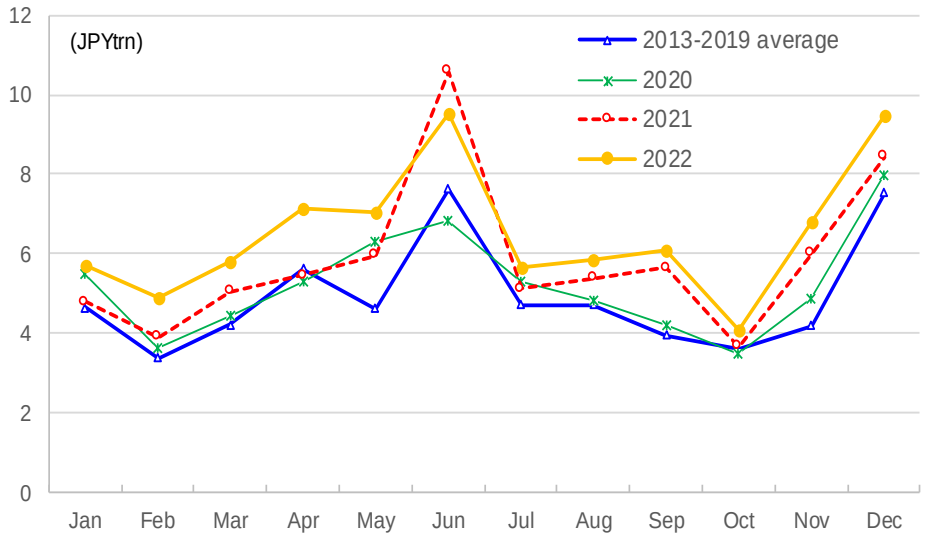
Sources: CEIC Database, SBI SECURITIES



Sources: CEIC Database, SBI SECURITIES

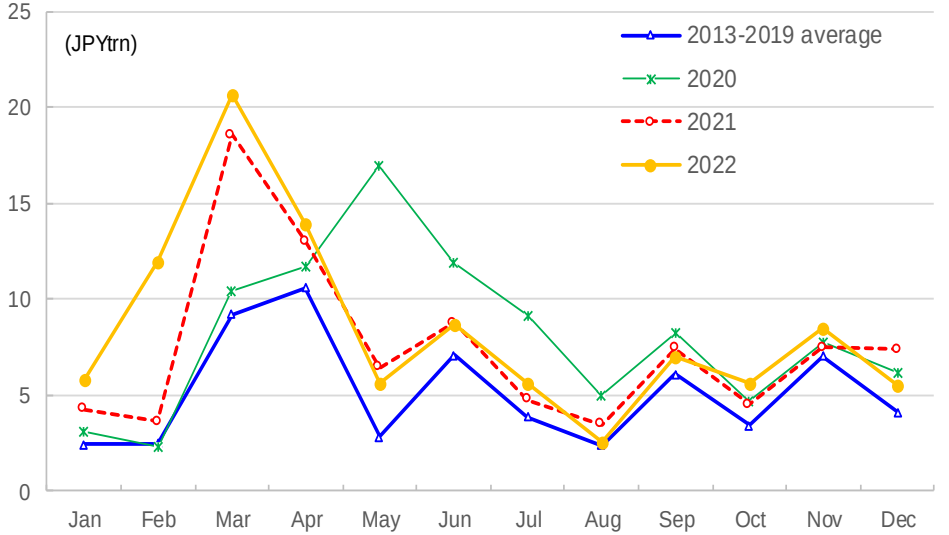
Central government general account balance (1)

1) General account revenues



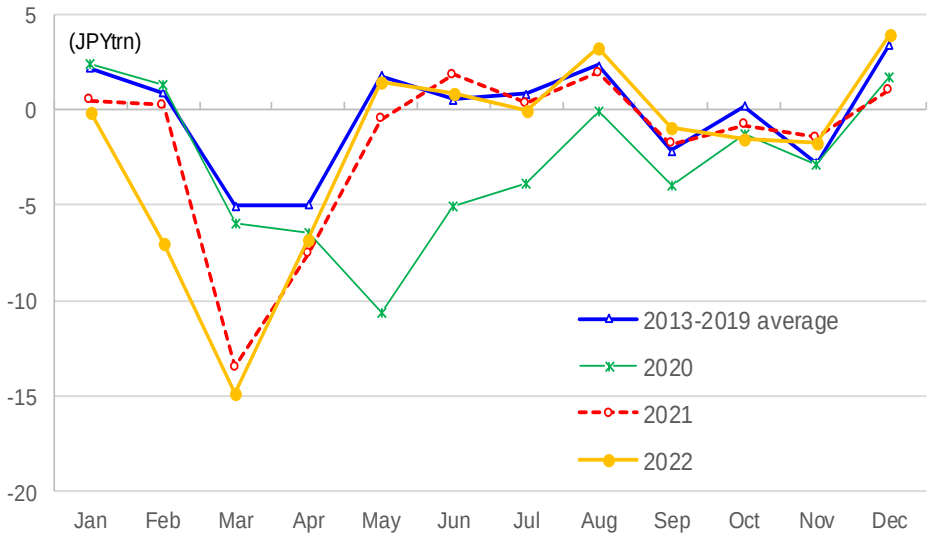
Sources: CEIC Database, Bank of Japan, SBI SECURITIES

2) General account expenditures



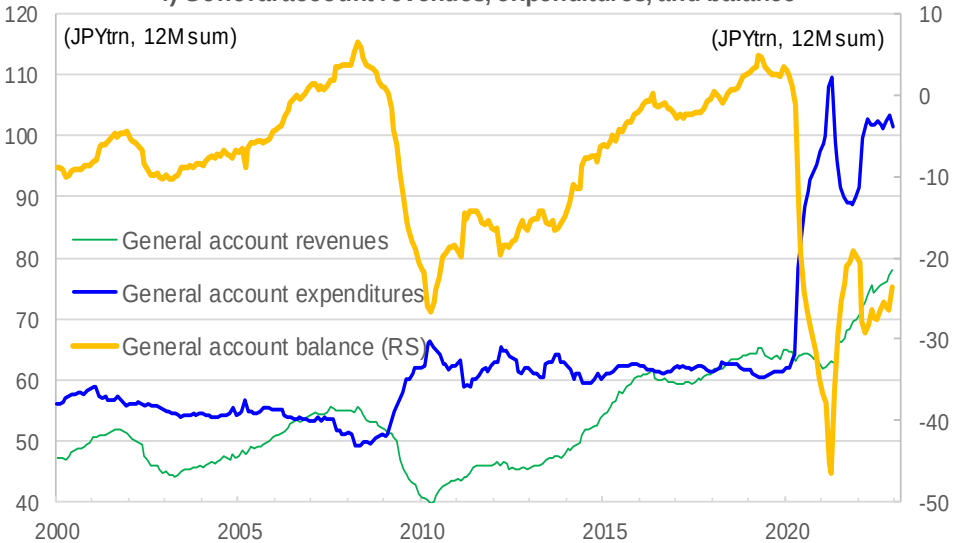
Sources: CEIC Database, Bank of Japan, SBI SECURITIES

3) General account fiscal balance



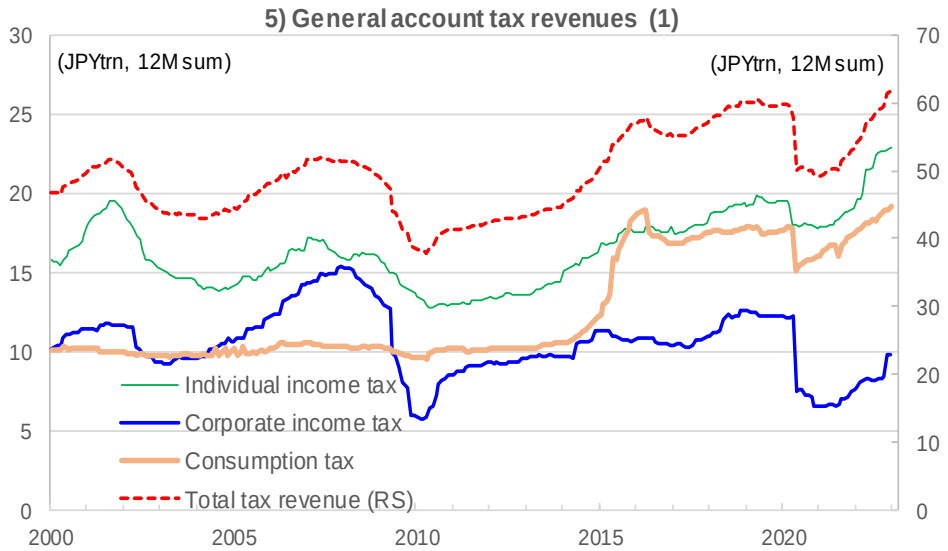
Sources: CEIC Database, Bank of Japan, SBI SECURITIES

4) General account revenues, expenditures, and balance

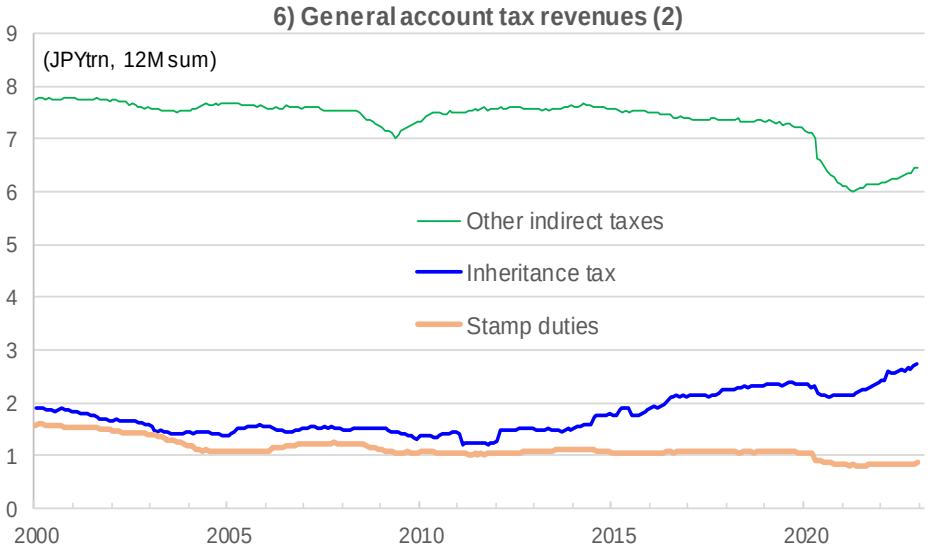


Sources: CEIC Database, Bank of Japan, SBI SECURITIES

Central government general account balance (2)



Sources: CEIC Database, BoJ, SBI SECURITIES



Sources: CEIC Database, BoJ, SBI SECURITIES

- The general account revenues of the central government for CY2022 have already been exceeding the average level for 2013–2019, due mainly to the recovery in various tax revenues (individual income tax, corporate income tax, consumption tax, and inheritance tax).
- We should monitor whether the general account expenditure of the central government comes down to pre-pandemic levels of the range at annual ¥60t – ¥65t.

Japan's addiction to supplementary budgets: a total of 52 rounds since 1990s

Supplementary budget since 1990s

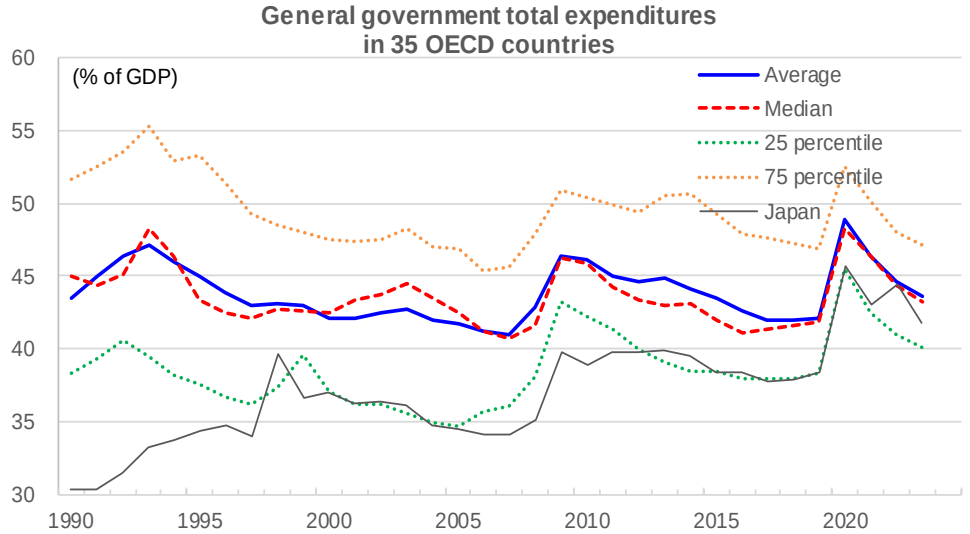
Fiscal year	(¥bn)
1990-1	2,281
1990-2	1,133
1991	266
1992	-728
1993-1	2,189
1993-2	709
1993-3	2,185
1994-1	-673
1994-2	1,022
1995-1	2,726
1995-2	5,325
1995-3	-1,004
1996	2,666
1997	1,143
1998-1	4,645
1998-2	5,677
1999-1	370
1999-2	6,789
2000	4,783
2000-1	1,061
2000-2	2,639
2002	2,459
2003	150
2004	4,768
2005	4,522
2006	3,772
2007	895
2008-1	1,064
2008-2	4,786
2009-1	13,926
2009-2	85
2010	4,429
2011-1	305
2011-2	1,999
2011-3	11,683
2011-4	1,112
2012	10,203
2013	5,465
2014	3,118
2015	3,321
2016-1	0
2016-2	3,287
2017	1,655
2018-1	936
2018-2	2,710
2019	3,195
2020-1	25,691
2020-2	31,911
2020-3	15,427
2021	35,990
2022-1	2,701
2022-2	28,922

Total (¥bn)	275,690
Average (¥bn)	5,302
Median (¥bn)	2,683
Total # of budgets	52
Total since 2020 (¥bn)	140,643

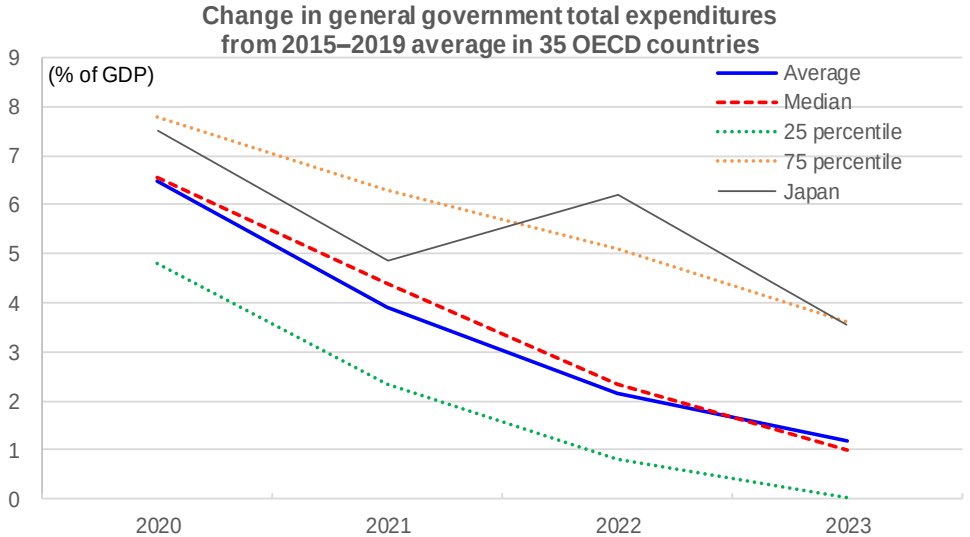
Sources: MoF, SBI SECURITIES.

- A total expenditure in the past six supplementary budgets since 2020 add up to ¥141t, accounting for 51% of the total 52 supplementary budgets (¥276t).
- 20% of the expenditures in the last six budgets were allocated to items not related to the pandemic or rising energy prices.
- *Fiscal stimulus accompanies a rise in private saving.*
- *A diminishing marginal return on economic policy* acts most clearly in Japan.
- Lack of fiscal discipline to secure financing for items needed for longer periods prioritizes ministry's influence on the society.
- Time horizon for politicians is up to the next election.
- *Need to consider tax hikes to secure long-run financing of essential spending items.*

Government spending-to-GDP ratio in Japan remains elevated following the onset of the pandemic



Note: OECD forecast for 2022–2023. Sources: OECD, SBI SECURITIES



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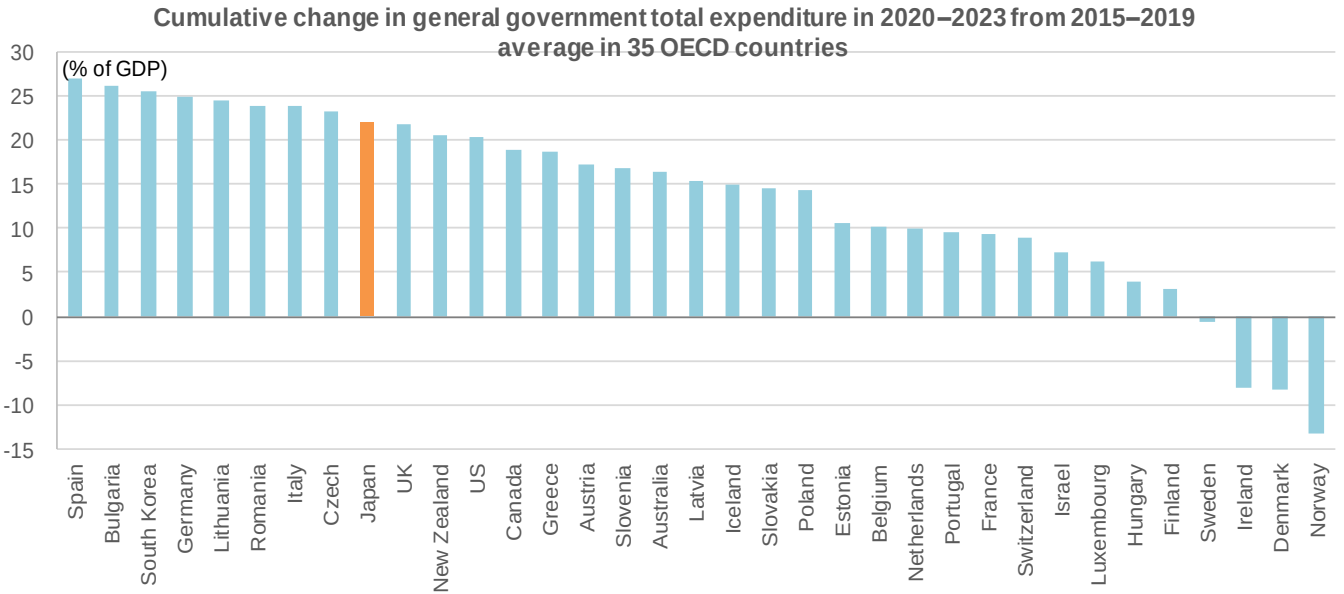
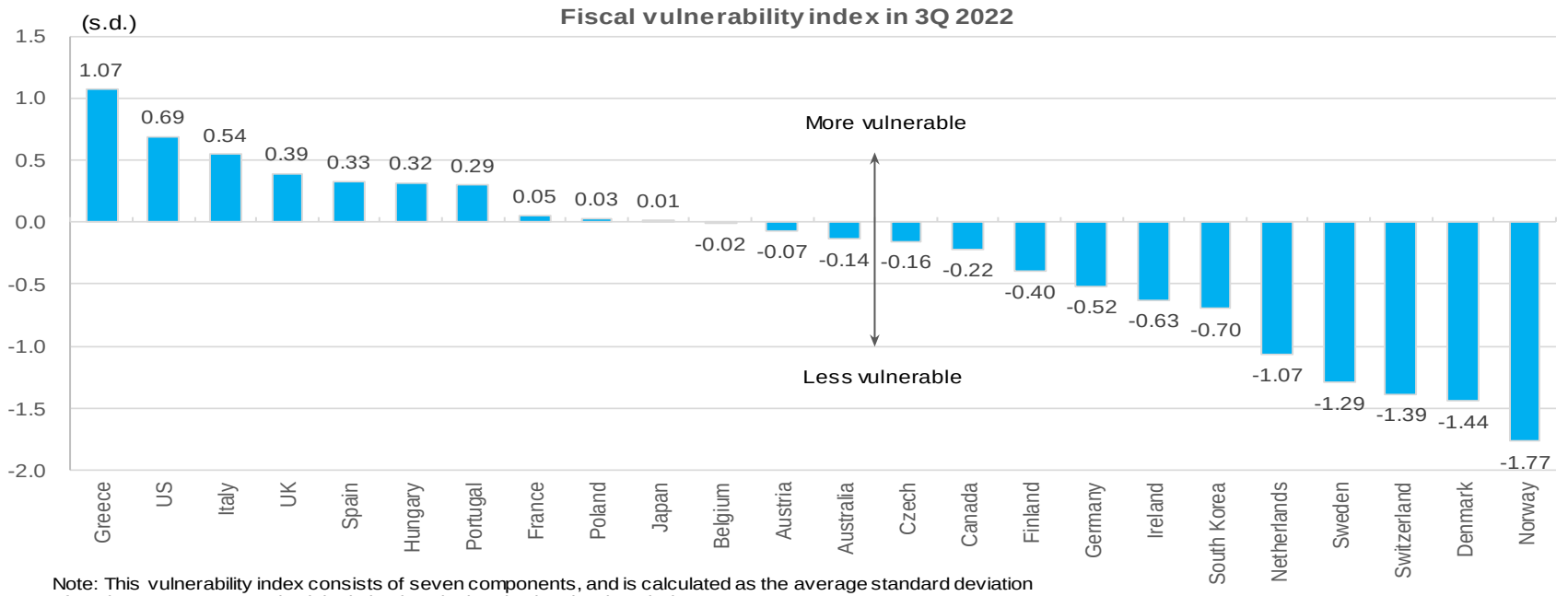


Note: OECD forecast for 2022–2023. Sources: OECD, SBI SECURITIES

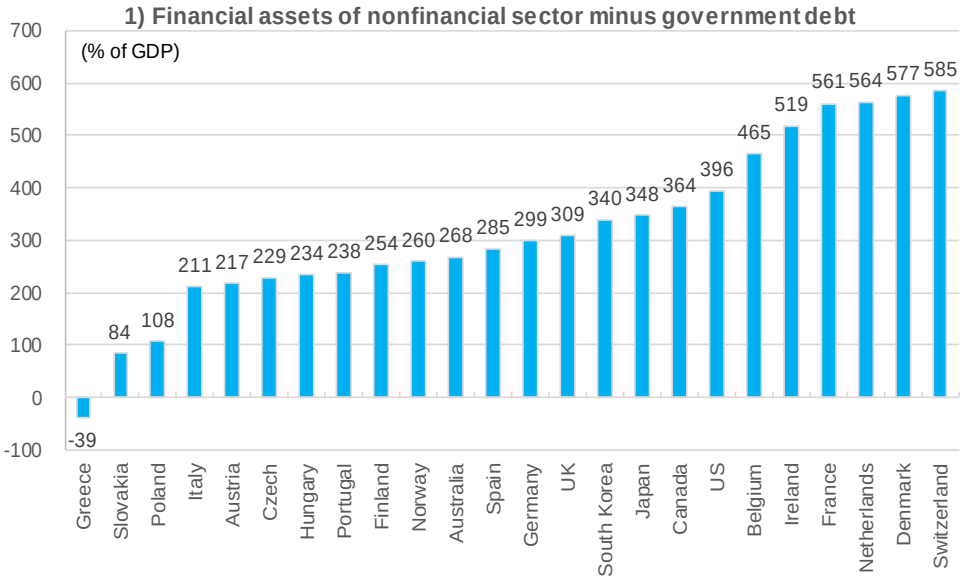
Fiscal vulnerability index (1)



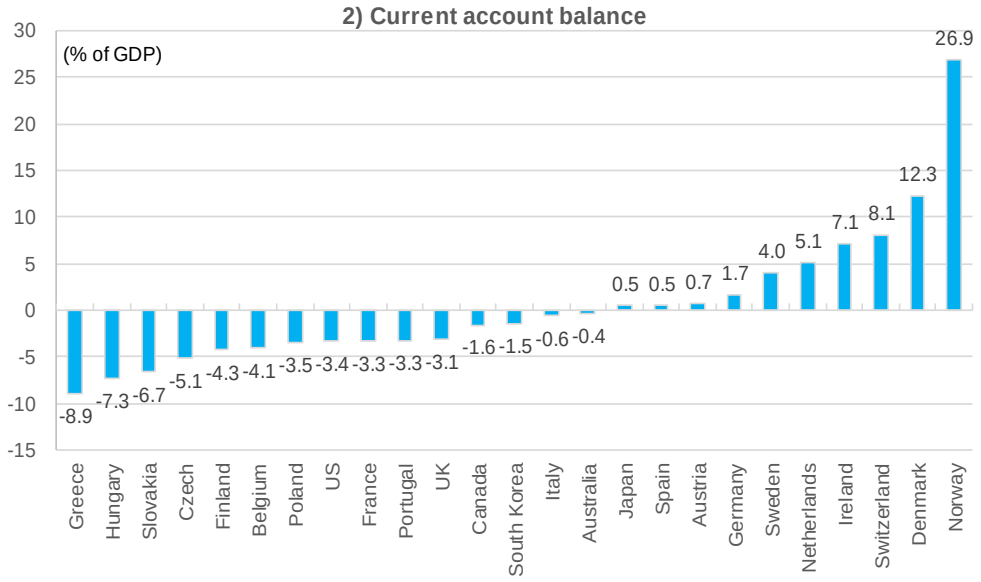
Note: This vulnerability index consists of seven components, and is calculated as the average standard deviation of each component. Standard deviation is calculated using the data during 1Q 2000 - 4Q 2019.
Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

- The fiscal vulnerability index consist of seven components (private nonfinancial sector financial assets minus general government gross debt, current account, net external assets, general government fiscal balance, general government net debt, nonresidents' holding of government debt, and general government interest payments).
- There exists duality in financial assets and liabilities such that one's debt is an asset of someone else.
- Japan is ranked the 10th highest among 24 developed countries.
- The ratio of government debt to GDP declines under nominal GDP growth > bond yields.
- A fiscal vulnerability index exceeding 0.8 is an early warning signal, beyond which financial markets are likely to induce adjustment forces on bond yields, currency, and asset prices.
- The financial markets' focus on Japan could rise when Japan alone maintains an expansionary fiscal policy while other developed countries have already turned to fiscal tightening.

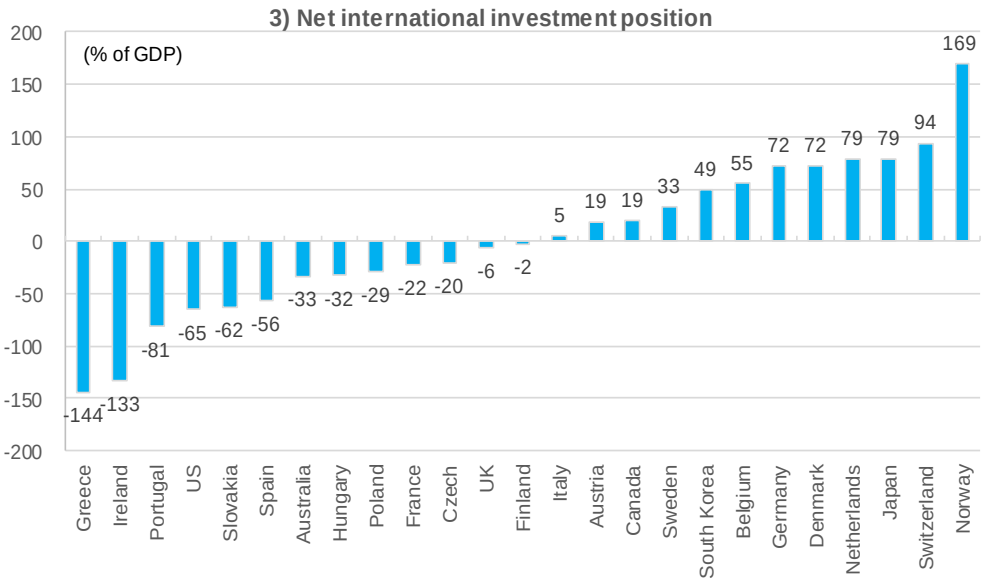
Fiscal vulnerability index (2)



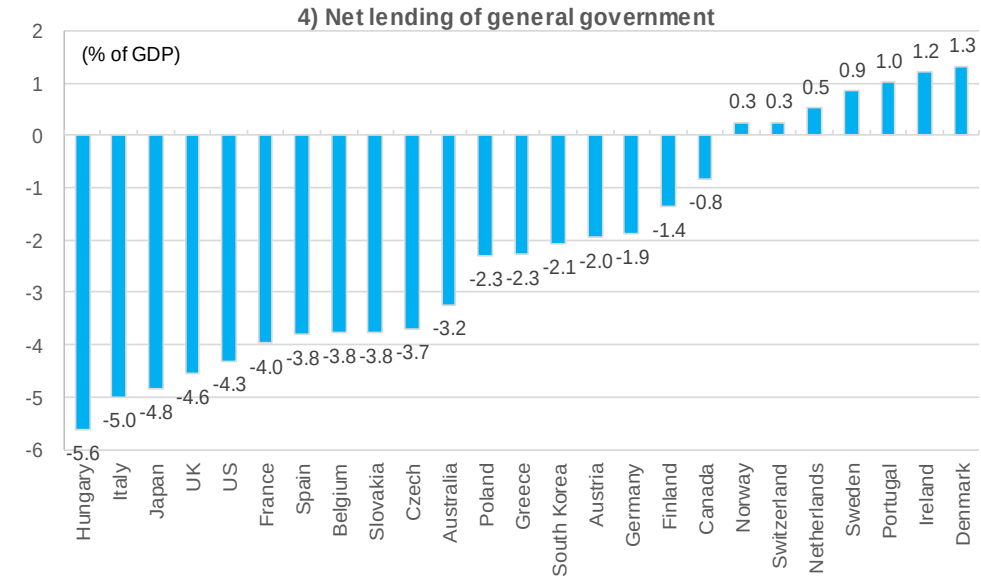
Note: Nonfinancial sector is the sum of nonfinancial businesses and households. Government debt is the gro
Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.



Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

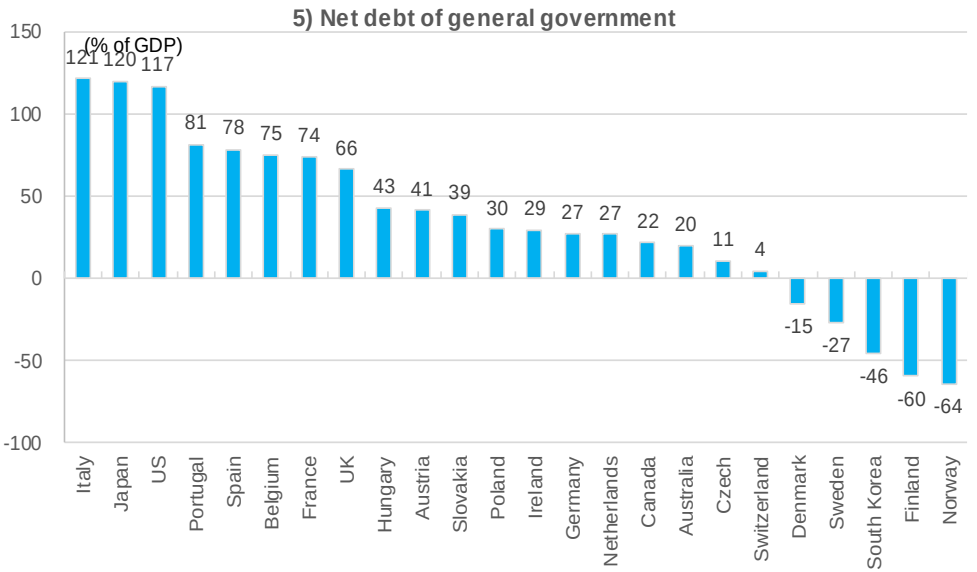


Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

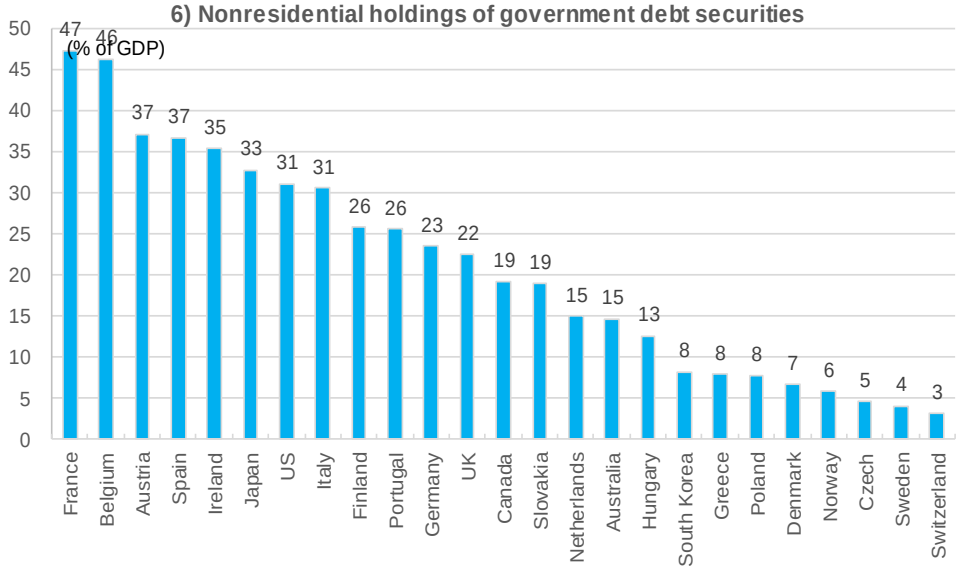


Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

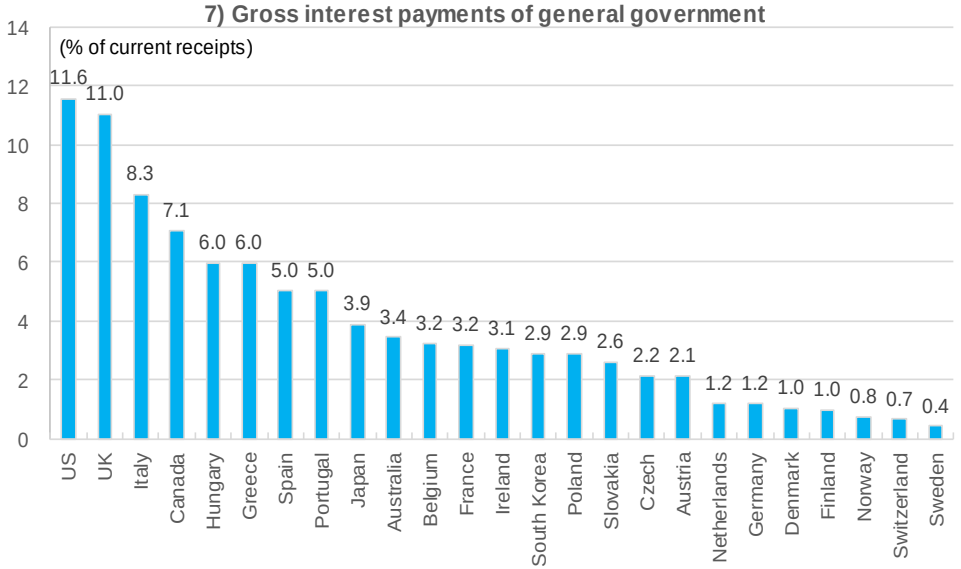
Fiscal vulnerability index (3)



Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.



Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.



Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

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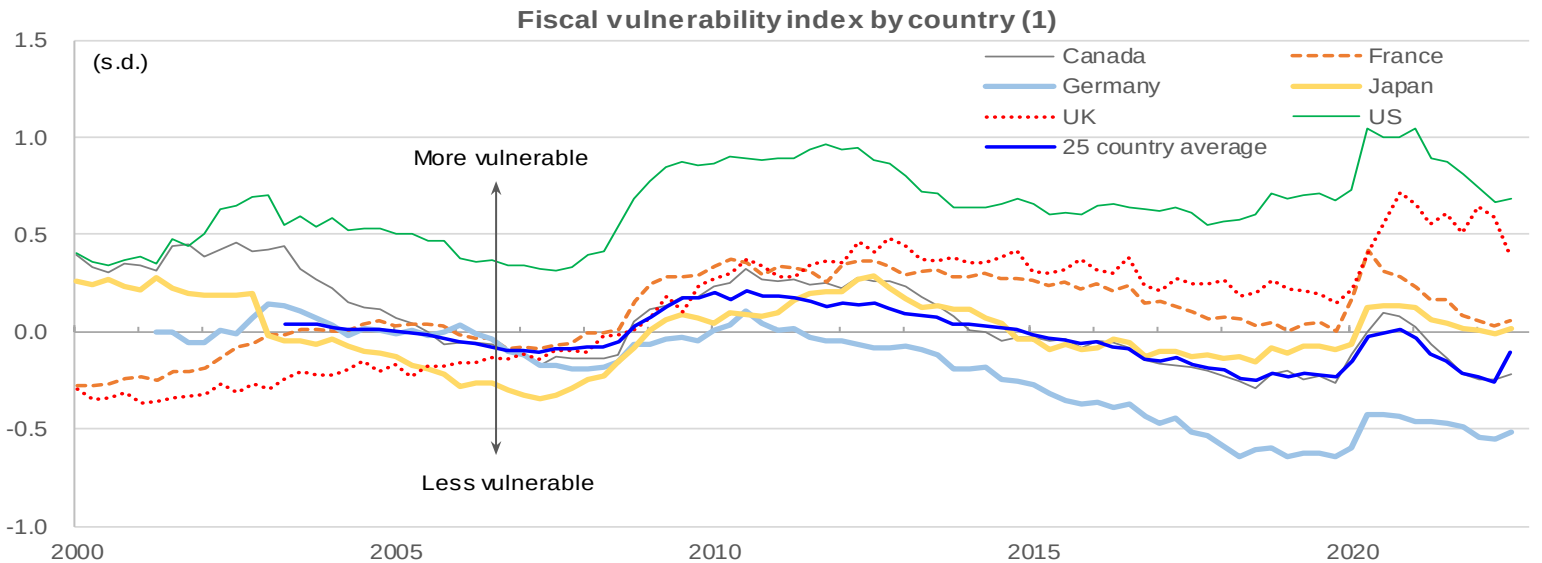
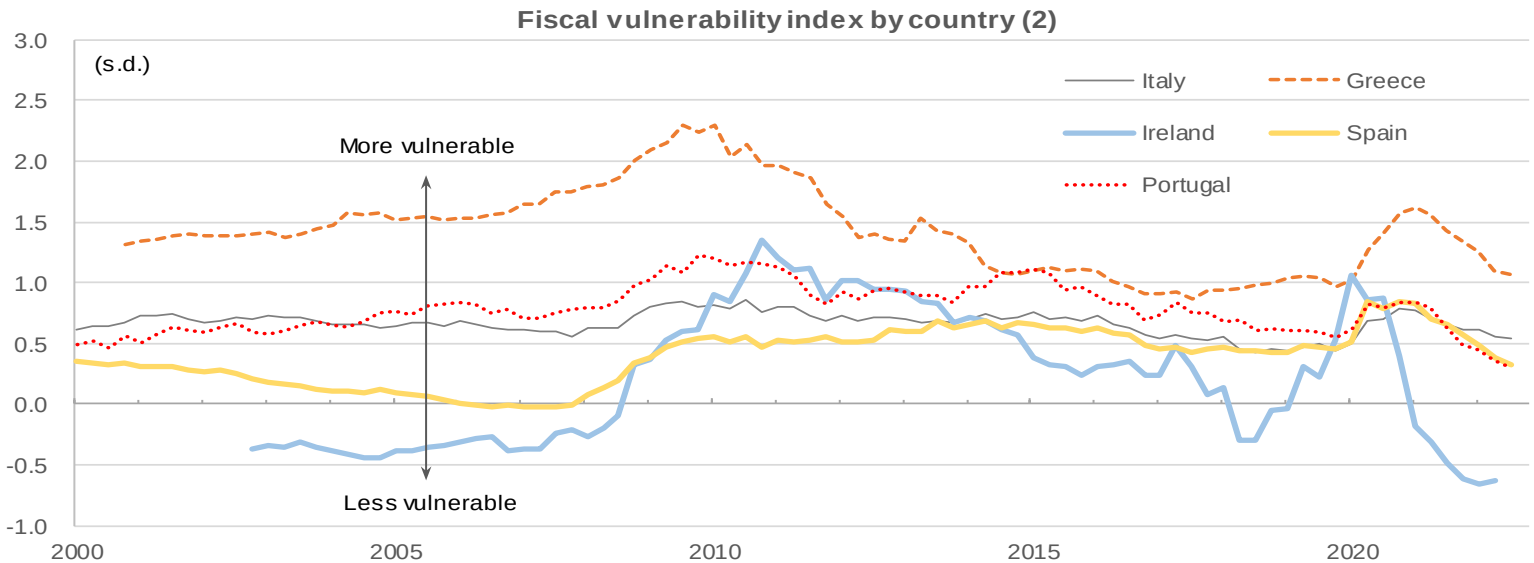
Fiscal vulnerability index (4)

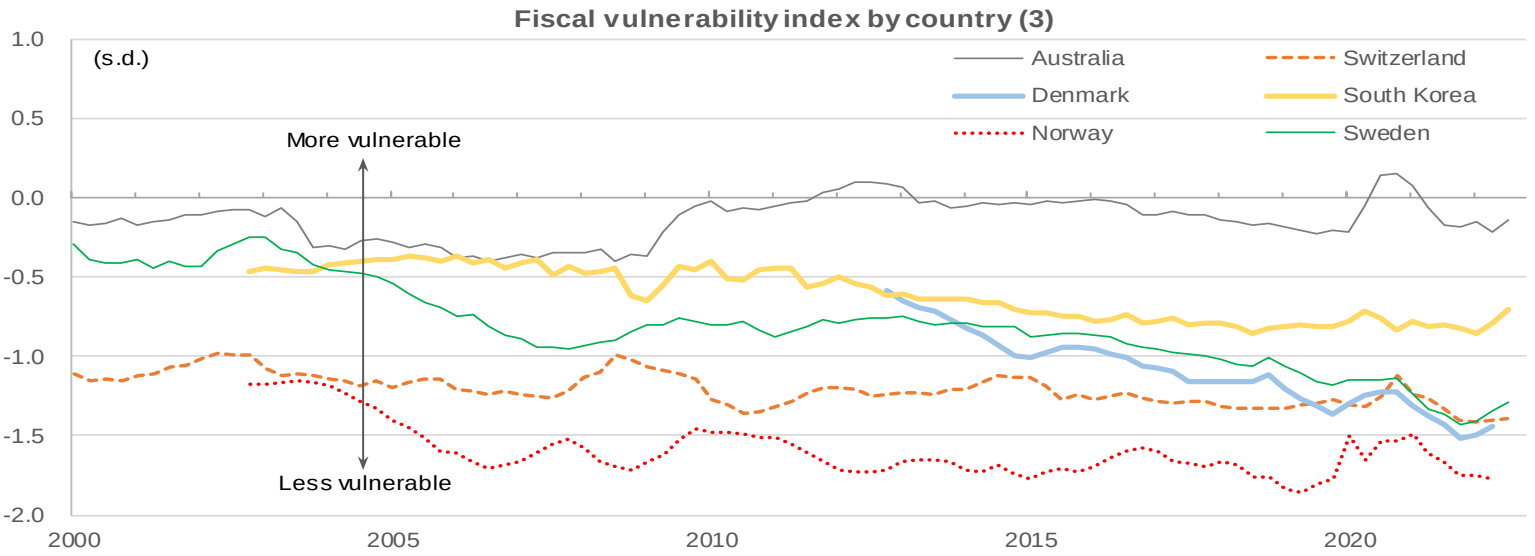


Note: This vulnerability index consists of seven components, and is calculated as the average standard deviation of each component. Standard deviation is calculated using the data during 1Q 2000 - 4Q 2019. Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

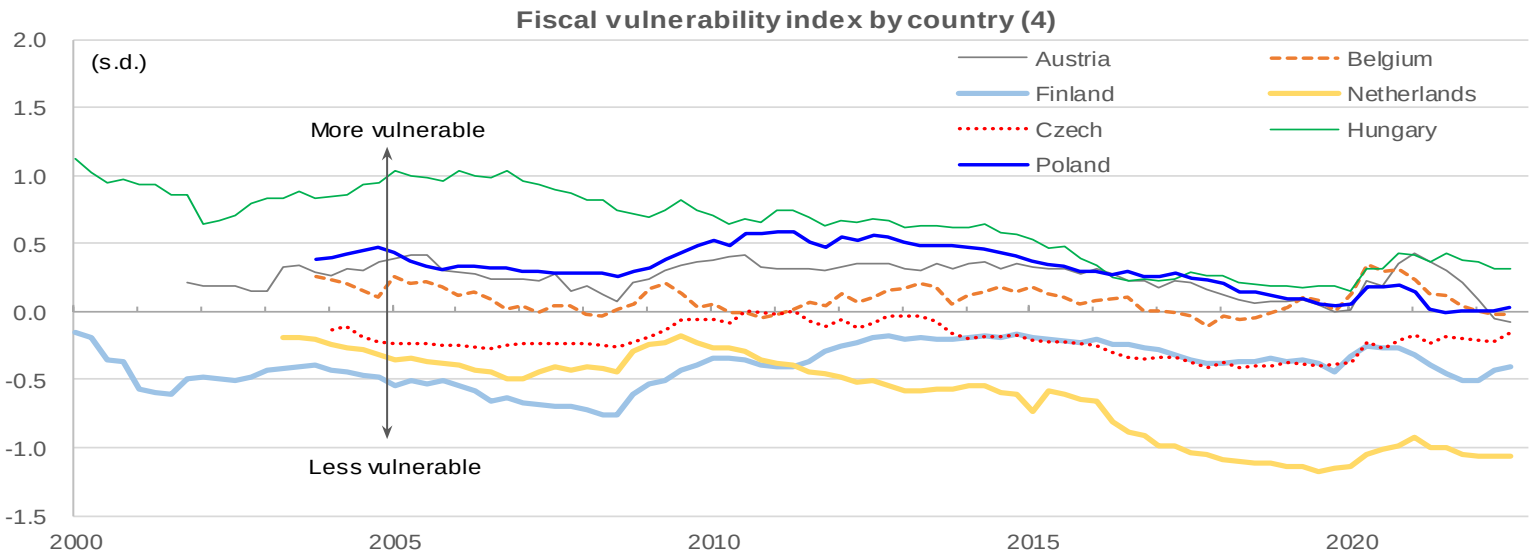


Note: This vulnerability index consists of seven components, and is calculated as the average standard deviation of each component.Standard deviation is calculated using the data during 1Q 2000 - 4Q 2019. Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

Fiscal vulnerability index (5)



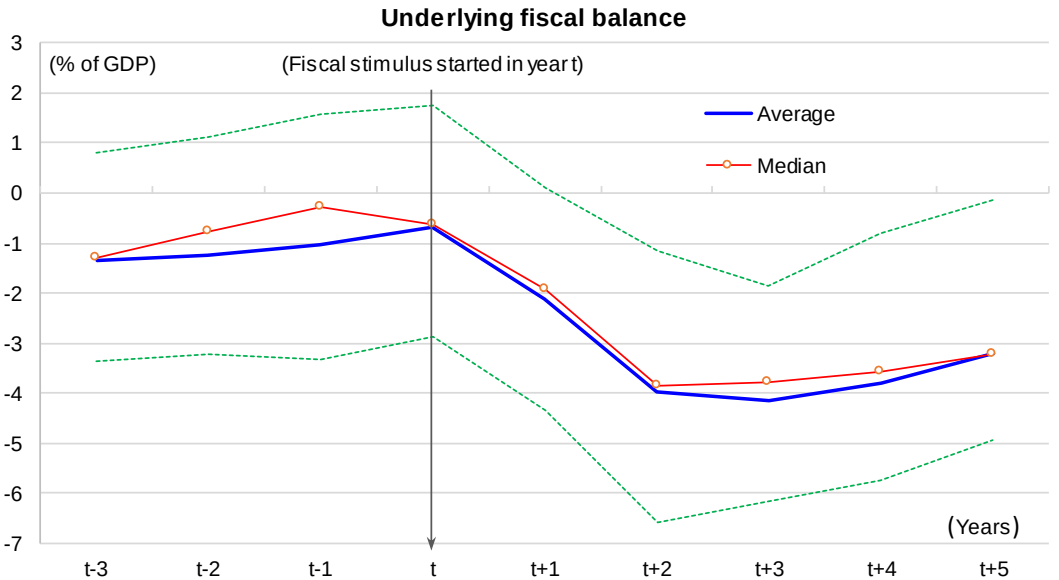
Note: This vulnerability index consists of seven components, and is calculated as the average standard deviation of each component. Standard deviation is calculated using the data during 1Q 2000 - 4Q 2019. Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.



Note: This vulnerability index consists of seven components, and is calculated as the average standard deviation of each component. Standard deviation is calculated using the data during 1Q 2000 - 4Q 2019. Sources: CEIC Database, Eurostat, OECD, World Bank, IMF, national sources, SBI SECURITIES.

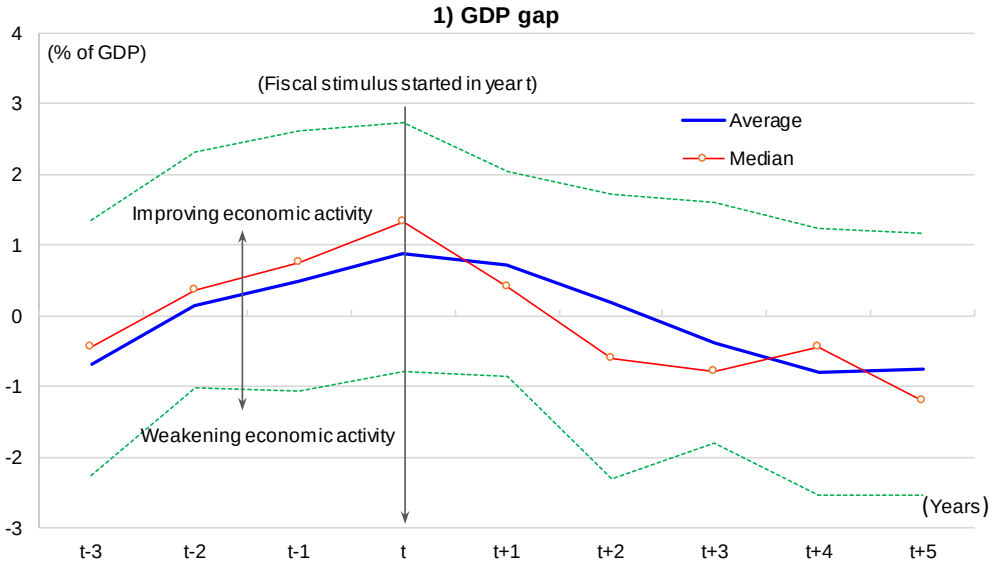
Does expansionary fiscal policy stimulate economic activity?

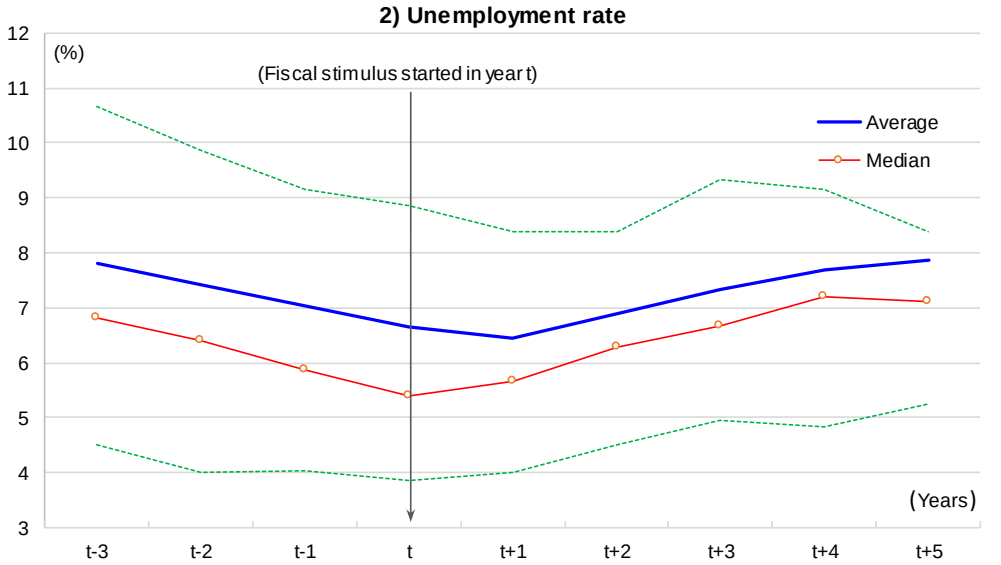
- We define the deployment of expansionary fiscal policy when the ratio of the underlying fiscal balance (cyclically adjusted fiscal balance excluding capital transfers) to GDP deteriorates by 2ppt. There are 48 such events in OECD countries, with the average deterioration at 3.3ppt in the first two years and 3.5ppt in the first three years.
- Despite the expansionary fiscal policy, the GDP gap continued worsening and the unemployment continued to rise, with the average deterioration in the GDP gap at 1.3ppt and the average rise in the unemployment rate at 0.7ppt in the first three years. It also accompanied a rise in the household saving rate and the improvement in the current account balance. These are symptoms of economic slowdown, despite accompanying monetary easing.
- The higher the level of government debt and per-capita income, the more restrictive the expansionary fiscal policy would ironically turn out to be.
- Together with monetary policy, it suggests the diminishing marginal returns of economic policy.
- Fiscal stimulus could turn out to be disappointing.

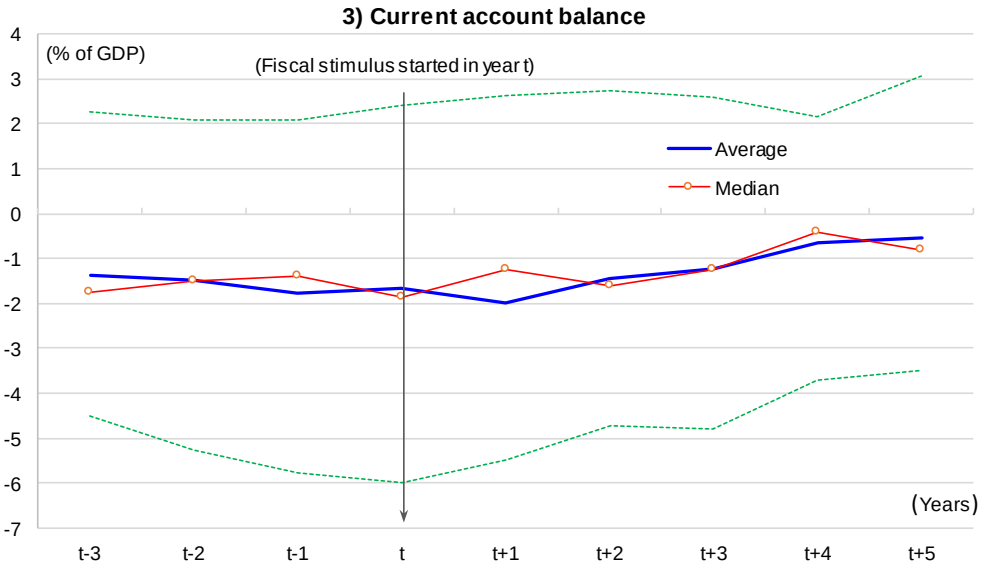


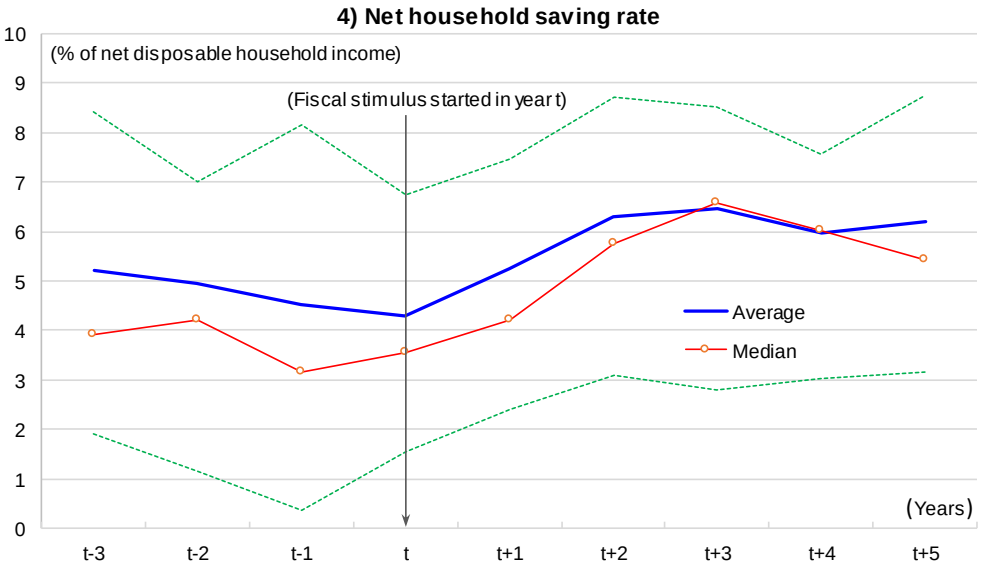
Notes: Fiscal stimulus was assumed to be adopted when the underlying fiscal balance deteriorated by at least 2% of GDP in two years. The underlying fiscal balance is a cyclically-adjusted fiscal balance excluding the one-off capital transfers. The dotted lines indicate the first and third quartiles. Obtained from 48 events of fiscal stimulus in OECD countries. Sources: OECD Economic Outlook, SBI SECURITIES.

Economic indicators when expansionary fiscal policy is deployed









Notes: Fiscal stimulus was assumed to be adopted when the underlying fiscal balance deteriorated by at least 2% of GDP in two years. The underlying fiscal balance is a cyclically-adjusted fiscal balance excluding the one-off capital transfers. The dotted lines indicate the first and third quartiles. Obtained from 48 events of fiscal stimulus in OECD countries. Sources: OECD Economic Outlook, SBI SECURITIES.

Fiscal stimulus on economic activity examined by panel data: No effects

Panel estimate of the effect of expansionary fiscal policy on GDP gap and unemployment rate: (1) full-sample estimate

Equation number	#1			#2		
Dependent variable (→)	GDP gap (% of potential GDP)			Unemployment rate (%)		
Explanatory variables (↓)	Parameter	t-statistic	p-value	Parameter	t-statistic	p-value
Underlying fiscal balance (% of potential GDP)	-0.048	-0.55	0.585	-0.022	-0.33	0.738
6-month interest rate [-1] (%)	-0.005	-0.14	0.887	0.127	3.44	0.001 **
Gross government debt/GDP [-1] (%)	-0.047	-3.85	0.000 **	0.046	3.95	0.000 **
Global real GDP growth (%)	0.528	8.58	0.000 **	-0.175	-3.67	0.000 **
Common intercept	0.729	0.72	0.471	4.480	4.53	0.000 **
Adjusted R-squared	0.233			0.737		
S.D. of dependent variable	2.938			4.966		
S.E. of regression	2.576			2.418		
Sample period	1985 - 2018			1980 - 2018		
Number of cross sections	26			26		
Number of observations	708			713		

Note: Panel estimate using a fixed-effect model. Corrected for serial correlation by White's method. Intercepts by cross section are omitted.
Underlying fiscal balance = cyclically adjusted fiscal balance minus one-off capital transfers
An expansionary fiscal policy is defined as minimum two percentage point deterioration in the underlying fiscal balance/GDP ratio in two years.
** denotes statistical significance at the 1% level; * at the 5% level. [-1] denotes one period earlier.
Sources: OECD, SBI SECURITIES.

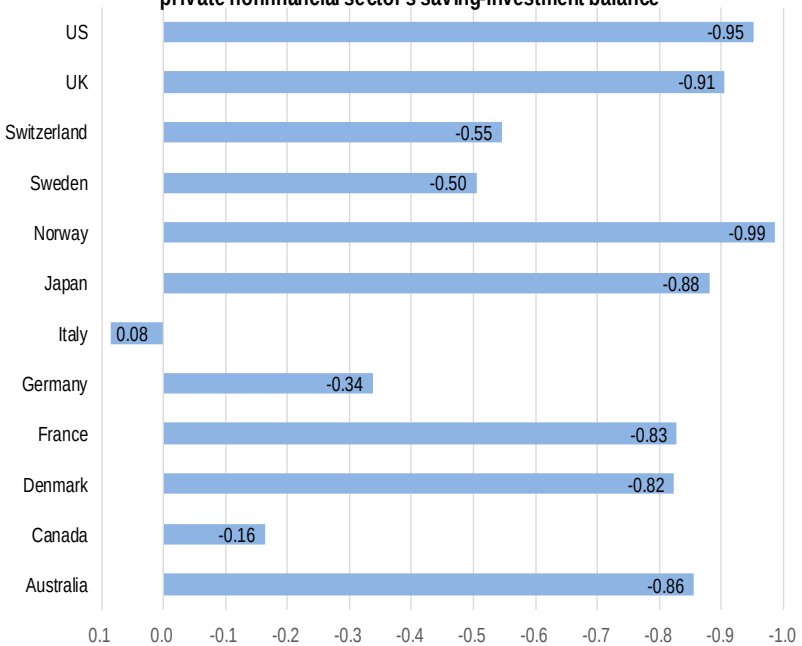
Panel estimate of the effect of expansionary fiscal policy on GDP gap and unemployment rate: (2) partial sample during 8-year periods involving expansionary fiscal policy

Equation number	#1			#2			#3			#4		
Dependent variable (→)	GDP gap (% of potential GDP)			GDP gap (% of potential GDP)			Unemployment rate (%)			Unemployment rate (%)		
Explanatory variables (↓)	Parameter	t-statistic	p-value	Parameter	t-statistic	p-value	Parameter	t-statistic	p-value	Parameter	t-statistic	p-value
Underlying fiscal balance (% of potential GDP)	0.144	2.30	0.022 *	0.325	3.13	0.002 **	-0.140	-4.29	0.000 **	-0.237	-4.63	0.000 **
6-month interest rate [-1] (%)	-0.235	-4.05	0.000 **	-0.224	-3.50	0.001 **	0.127	-4.29	0.000 **	0.081	1.96	0.051
Gross government debt/GDP [-1] (%)	-0.157	-9.40	0.000 **	-0.143	-7.92	0.000 **	0.046	3.95	0.000 **	0.090	8.93	0.000 **
Middle income country dummy												
*Underlying fiscal balance (% of potential GDP)				-0.815	-5.11	0.000 **				0.463	4.13	0.000 **
Common intercept	11.757	10.45	0.000 **	10.361	8.27	0.000 **	0.226	0.37	0.712	1.048	1.34	0.182
Adjusted R-squared	0.471			0.535			0.885			0.870		
S.D. of dependent variable	3.888			4.035			12.837			8.600		
S.E. of regression	2.796			2.701			1.941			1.883		
Sample period	8 years (between t-2 and t+5)			8 years (between t-2 and t+5)			8 years (between t-2 and t+5)			8 years (between t-2 and t+5)		
Number of cross sections	43			43			43			43		
Number of observations	330			330			330			330		

Note: Panel estimate using a fixed-effect model. Corrected for serial correlation by White's method. Intercepts by cross section are omitted.
Underlying fiscal balance = cyclically adjusted fiscal balance minus one-off capital transfers
Sample period is an eight-year period: from two years before the start of the fiscal stimulus to five years after the stimulus.
An expansionary fiscal policy is defined as minimum two percentage point deterioration in the underlying fiscal balance/GDP ratio in two years.
** denotes statistical significance at the 1% level; * at the 5% level. [-1] denotes one period earlier.
A dummy variable of one has been assigned to middle income countries: Czech, Greece, Hungary, Korea, Poland, Portugal, Slovakia; other countries have been given a value of zero.
Sources: OECD, SBI SECURITIES.

Saving-investment identity

Correlation coefficient between general government fiscal balance and private nonfinancial sector's saving-investment balance



Notes: Both indicators are measured as percentage of GDP. Sample period is 1Q 2000 - 3Q 2019 (4Q 2002 - 3Q 2019 for Norway). Private nonfinancial sector's saving-investment balance is obtained as the current account balance minus general government fiscal balance. Sources: CEIC Database, SBI SECURITIES

Relationship between private saving-investment balance and fiscal balance

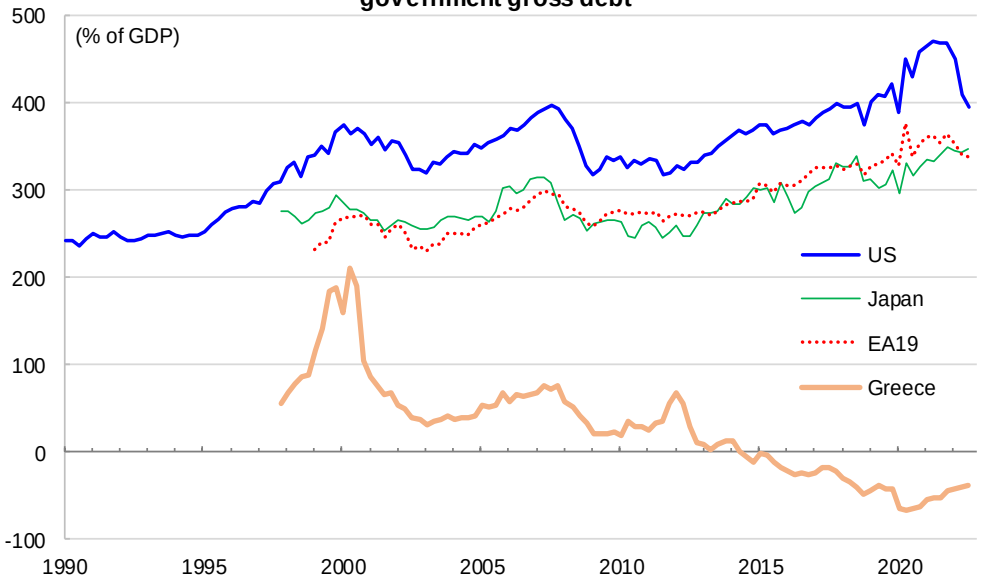
Specification:		1) Level			2) First difference		
Dependent variable:		Private saving-investment balance (% of GDP)			Δ Private saving-investment balance (% of GDP)		
Explanatory variables	Expected sign	Parameter	t-statistic	p-value	Parameter	t-statistic	p-value
General government fiscal balance (% of GDP)	(-)	-0.937	-59.89	0.000 **			
General government gross debt (% of GDP)	(+)	-0.001	-0.61	0.541			
Δ General government fiscal balance (% of GDP)	(-)				-0.985	-53.60	0.000 **
Δ General government gross debt (% of GDP)	(+)				0.022	2.07	0.039 *
Common intercept		1.514	11.26	0.000 **	0.007	0.37	0.709
Adj. R-squared		0.945			0.720		
S.E. of regression		2.087			1.180		
S.D. of dependent variable		8.741			2.229		
Sample period		1991Q1 - 2018Q4			1991Q1 - 2018Q4		
Number of cross sections		12			12		
Number of observations		1,142			1,136		

Notes: 12 countries included are Australia, Canada, Denmark, France, Germany, Italy, Japan Norway, Sweden, Switzerland, UK and US.
Private non-financial sector's saving investment balance is defined as current account balance minus general government fiscal balance.
Panel estimates using the fixed-effect model. ** significant at the 1% level, * at the 5% level.
Sources: CEIC Database, SBI SECURITIES

- Saving-investment identity: (S-I) + (T-G) = (X-M); S-I ... private sector saving-investment balance, T-G ... fiscal balance, X-M ... current account balance.
- Correlation coefficient between the fiscal balance and the private saving-investment balance stands at around -0.8 for many developed countries, very close to -1.0. An expansionary fiscal policy induces private saving to largely offset the stimulus (Ricardian equivalence).
- The higher the government debt-to-GDP ratio, the more private saving is induced to further dilute the stimulus effect: Fiscal multiplier is a decreasing function of the government debt.

Hurdles to infinitely issue local currency-denominated government debt

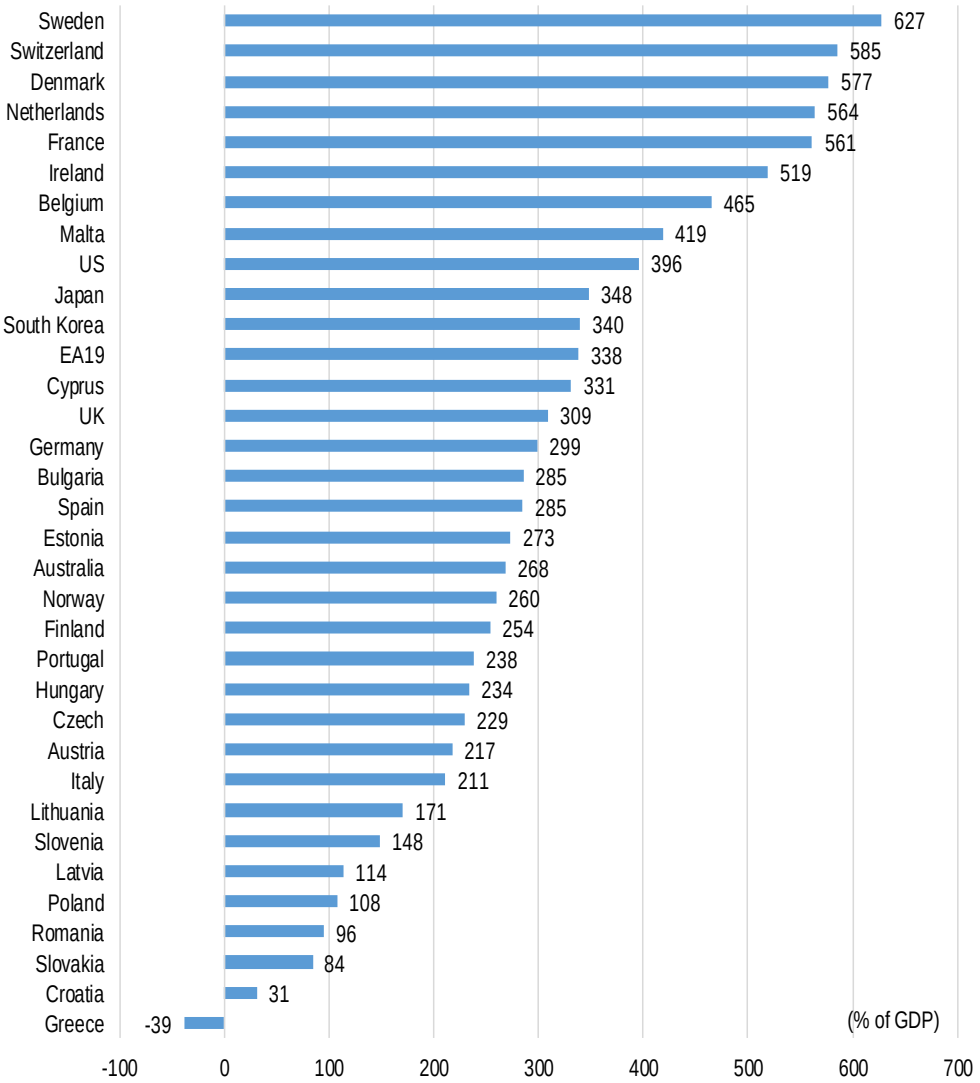
Gross financial assets of private nonfinancial sector minus general government gross debt



Sources: CEIC Database, EuroStat, US BEA, BoJ, SBI SECURITIES

- The above indicator measures the private sector's buffer against government debt accumulation.
- The higher the per-capita income, the higher this indicator. (US > Japan > EA19)
- Greece did not have enough buffers against government debt, and faced a more severe shock during the Euro crisis.
- Under globally simultaneous fiscal stimulus, its financing depends not on foreign capital inflows but domestic savings. Developed country currencies appreciate against EM currencies.

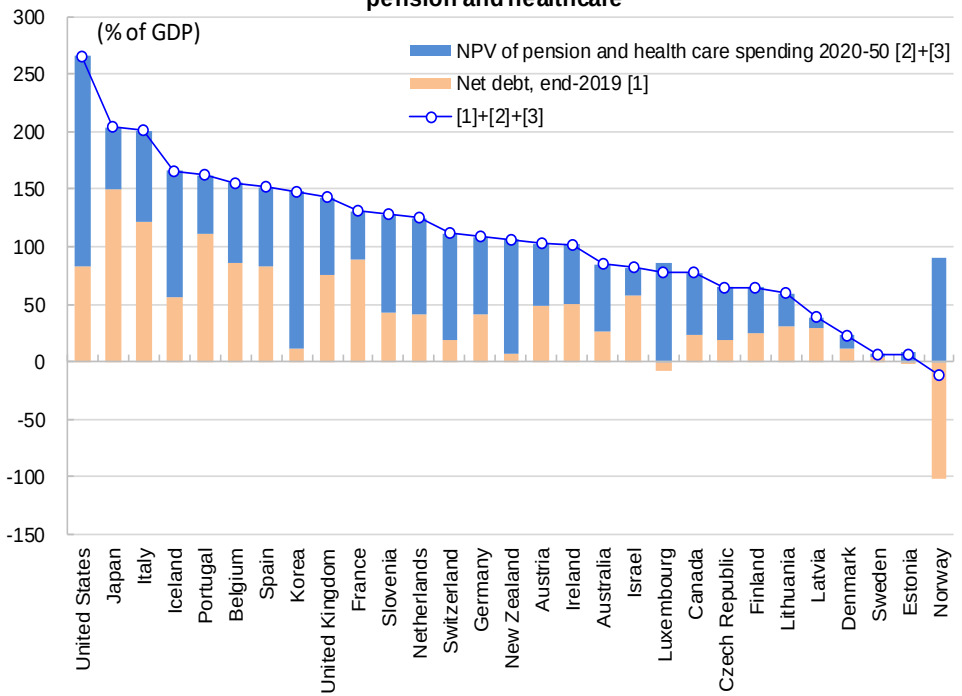
Gross financial assets of private nonfinancial sector minus general government gross debt



Note: At the end of September 2022
Sources: CEIC Database, Eurostat, BoJ, Federal Reserve, SBI SECURITIES

Japan's additional social security spending (NPV) smaller than in other countries

General government liabilities including NPV of future rise in spending on pension and healthcare



Sources: IMF, SBI SECURITIES

- Additional future government spending (NPV basis) on public pensions, healthcare and elderly care is smaller than in other developed countries (21nd highest among 29 countries), because of:
- i) progress of population aging so far ahead of others, which limits the future rise in spending
- ii) an introduction of macroeconomic sliding indexation to the public pensions

General government liabilities including NPV of future rise in spending on pension and healthcare

(% of GDP)	Net debt, end-2019 [1]	Net present value of pension spending change, 2020-50 [2]	net present value of health care spending change, 2020-50 [3]	[2]+[3]	[1]+[2]+[3]
Australia	26.24	20.51	38.21	58.72	84.96
Austria	47.90	16.15	38.43	54.58	102.48
Belgium	85.22	20.33	50.14	70.46	155.68
Canada	23.38	12.54	41.63	54.16	77.54
Cyprus	48.08	23.14	…	n.a.	n.a.
Czech Republic	18.28	20.83	25.37	46.19	64.47
Denmark	11.91	-23.09	34.09	11.00	22.91
Estonia	-2.15	-14.30	22.17	7.87	5.72
Finland	24.55	8.37	31.33	39.70	64.25
France	89.35	0.40	41.38	41.78	131.13
Germany	41.37	32.13	35.32	67.44	108.82
Hong Kong	…	46.30	…	n.a.	n.a.
Iceland	55.43	52.16	58.59	110.75	166.18
Ireland	49.41	29.91	22.23	52.14	101.54
Israel	57.20	12.25	12.12	24.37	81.57
Italy	122.08	49.11	29.67	78.78	200.86
Japan	150.43	-2.80	56.46	53.66	204.08
Korea	11.80	62.29	73.81	136.10	147.90
Latvia	28.51	-13.96	23.91	9.95	38.46
Lithuania	30.37	-1.28	30.13	28.85	59.23
Luxembourg	-8.42	47.47	38.56	86.03	77.60
Malta	30.76	-8.25	…	n.a.	22.51
Netherlands	41.64	22.14	60.94	83.08	124.72
New Zealand	6.96	44.80	54.76	99.56	106.52
Norway	-101.89	18.33	71.49	89.83	-12.06
Portugal	110.66	17.54	34.25	51.79	162.45
Singapore	…	32.48	…	n.a.	n.a.
Slovak Republic	…	-8.27	19.27	10.99	n.a.
Slovenia	42.73	54.50	30.39	84.89	127.62
Spain	82.20	24.30	44.95	69.26	151.46
Sweden	3.54	-15.95	18.96	3.01	6.54
Switzerland	19.42	12.63	79.41	92.04	111.46
United Kingdom	75.29	14.10	53.51	67.61	142.90
United States	83.01	30.34	152.29	182.63	265.64

Sources: IMF "Fiscal Monitor" April 2021, Statistical Table A8 and Table A23, SBI SECURITIES

Slow economic recovery in Japan

1) Japan' real GDP growth forecast: +1.5% in 2022, +1.2% in 2023, +1.0% in 2024.

2) The effects of the delayed re-opening of the economy on service industries are likely to dissipate over time.

3) Further population aging prevents additional rise in the labor force participation rate while employment mismatch continues to expand beneath the surface. The new steady state: a rise in new job offers and a decline in employment, and very low levels of the ratio of placements to applications.

4) Prolonged reallocation shocks widen disparity in activity in industries hit by the pandemic (airlines, railways, tourism, accommodation, entertainment, and food services) and those wit gains from the pandemic. The former tends to be labor-intensive and their ability to create jobs is likely to weaken.

5) Labor-replacing investment could rise even in labor-intensive industries. The relationship between capital and labor is irreversibly transformed from complements to substitutes.

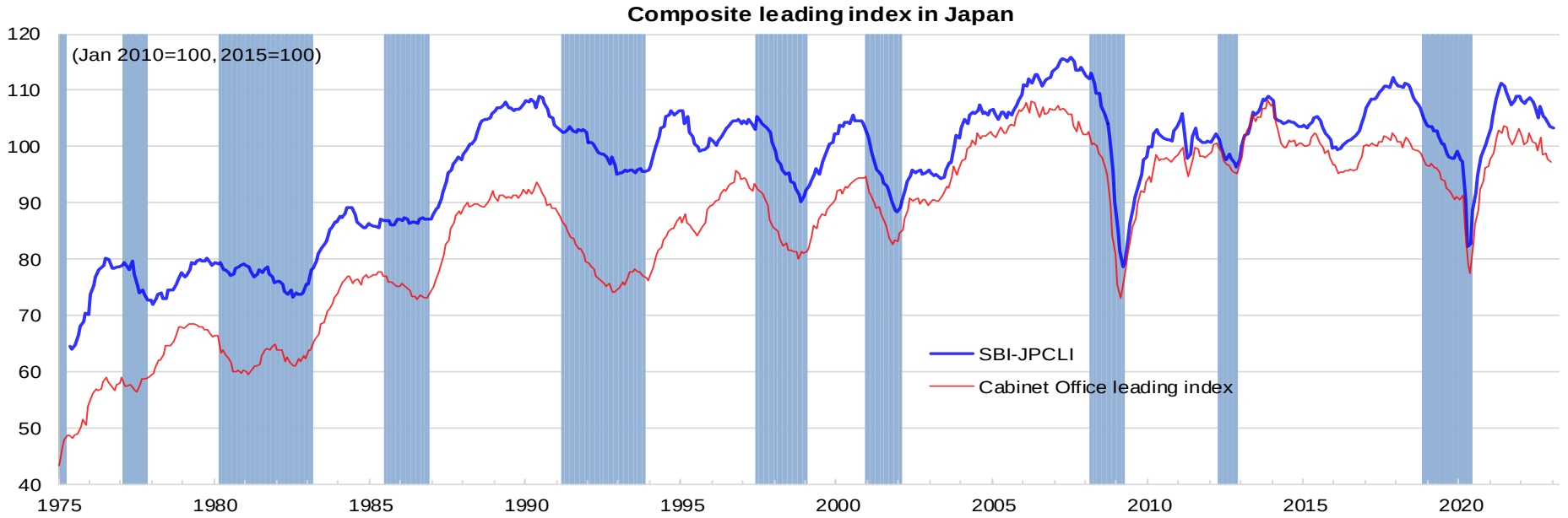
6) Trade deficit is likely to expand to ¥20t–¥25t a year. However, the primary income surplus is likely to continue to expand at ¥30t or higher, resulting in the current account surplus at around ¥5t.

7) Industrial structures and behavioral patterns are unlikely to return to the pre-pandemic normalcy. These changes, triggered by the reallocation shock, are considered to be permanent.

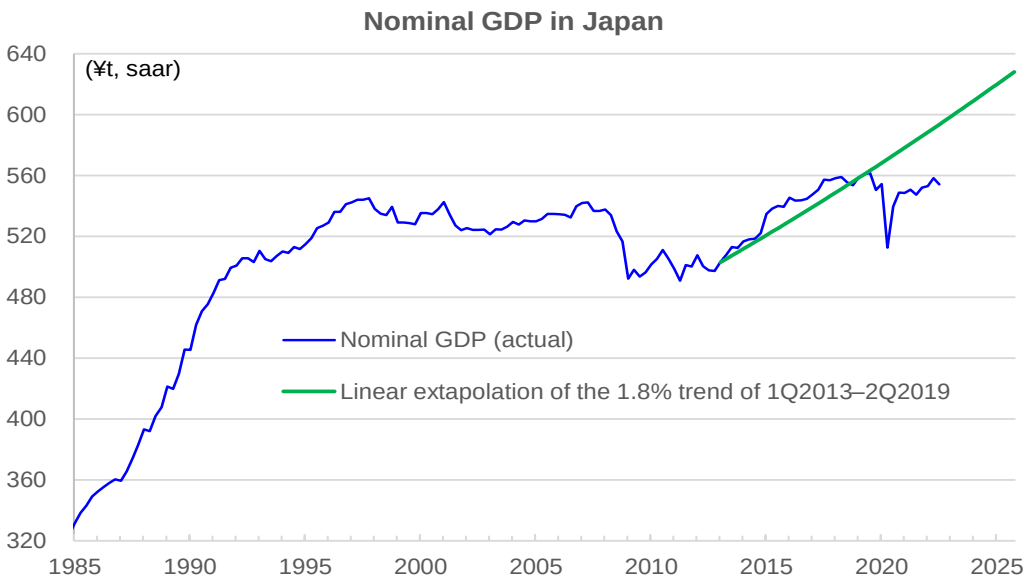
8) "Shorter work hours shock" (negative incentives against labor supply) prevents a virtuous circle in the labor market from happening, and lowers labor input and the economy's potential growth further.

9) A period of higher inflation is short-lived. We do not expect monetary policy normalization in Japan.

SBI's business cycle leading index (SBI-JPCLI)



Sources: CEIC Database, BoJ, Cabinet Office, MoF, MIC, METI, MHLW, MLIT, Japan Exchange, JFC, OECD, CRB, SBI SECURITIES



Sources: CEIC Database, Cabinet Office, SBI SECURITIES

Re-opening in Japan: Tourism support and lifting entry restrictions

1) An increase in tourism demand from domestic travel support measures for Japanese residents is likely to be larger than that from lifting entry restrictions.

2) A rise in tourism spending by households is largely offset by a decline in other spending, so that the net increase in overall spending is smaller than the increase in tourism spending.

3) The household saving rate in Japan has not fallen to pre-pandemic levels, unlike in other developed countries. This may act as an additional support for private consumption in the near term.

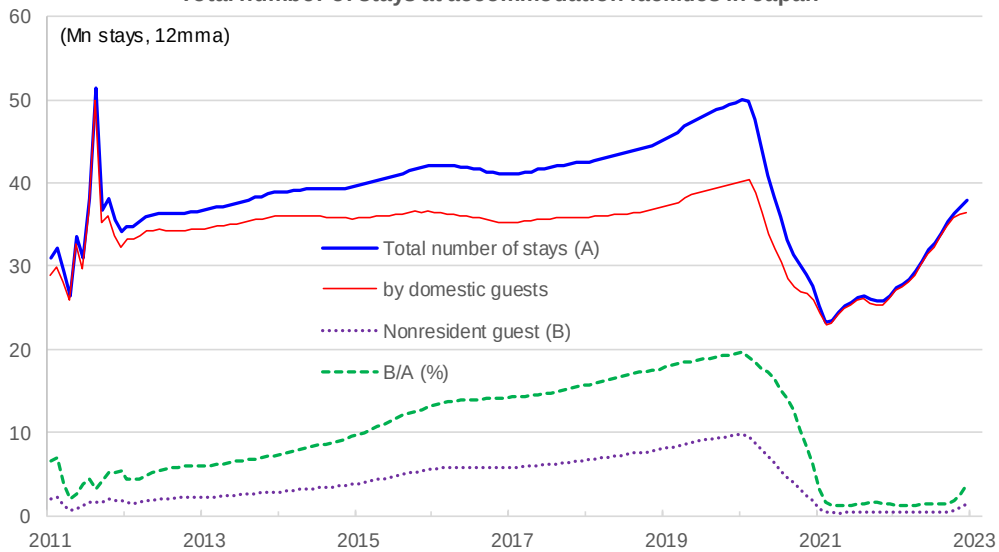
4) Contributions from the re-opening of the economy to economic growth is higher in the following order: 2Q (Apr–Jun) > 4Q (Oct–Dec) > 3Q (Jul–Sep).

5) A rise in foreign visitors into Japan by lifting entry restrictions leads to higher service exports, but this is more or less offset by a rise in Japanese departures, so that the net positive effect on service balance seems to be moderate, at best.

6) The improvement in the tourism-related service balance during the five year period of 2015–2019 was JPY600bn a year, or 0.11% of GDP.

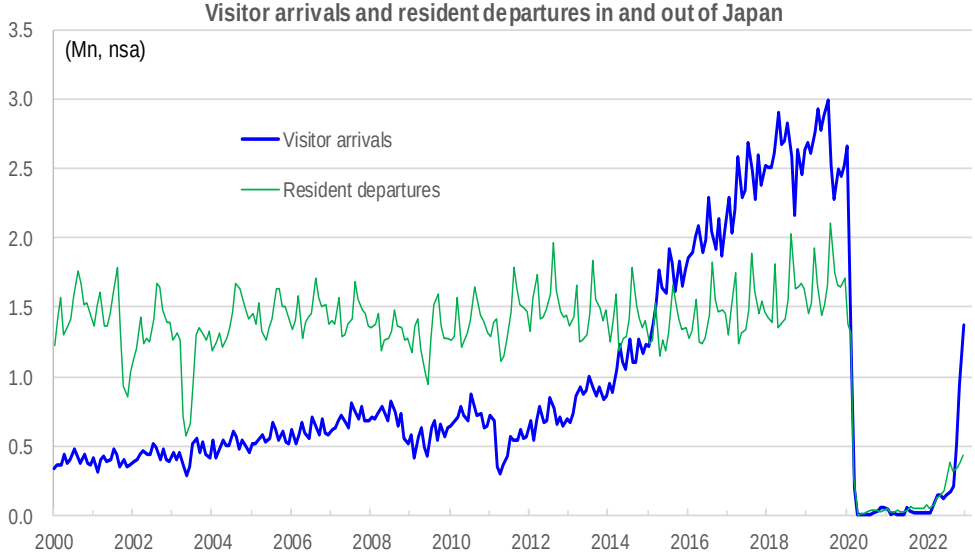
Tourism-related statistics in Japan

Total number of stays at accommodation facilities in Japan



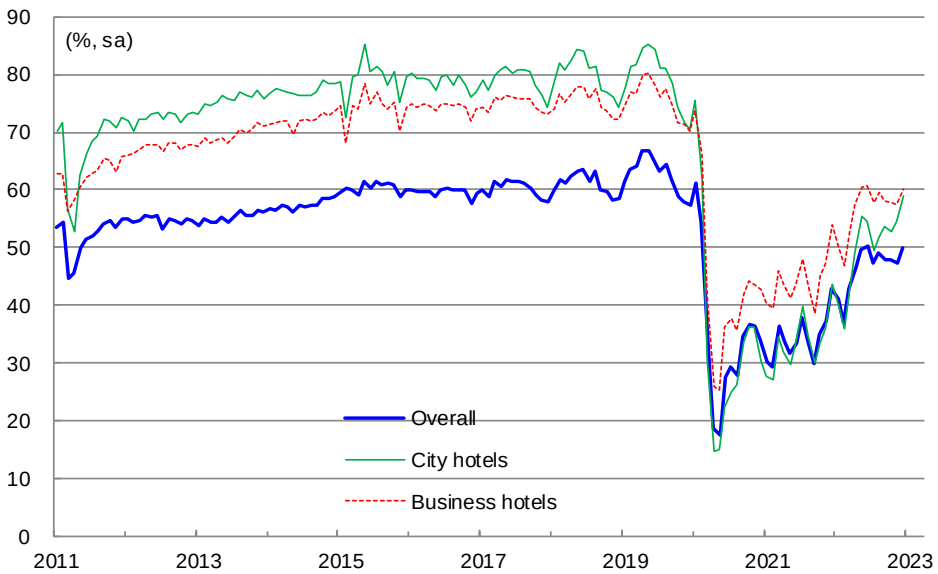
Sources: CEIC Database, JTA, SBI SECURITIES

Visitor arrivals and resident departures in and out of Japan



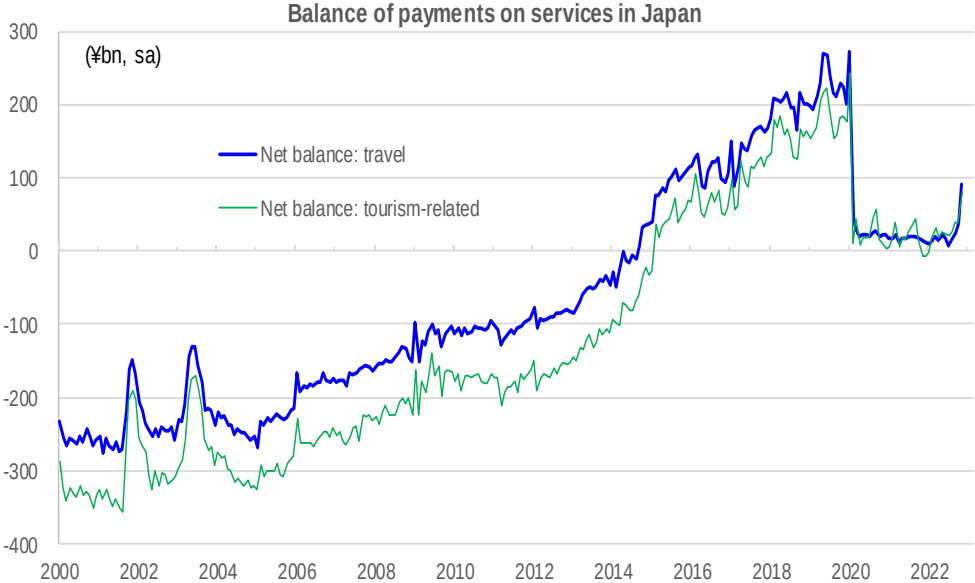
Sources: CEIC Database, JTA, SBI SECURITIES

Japan: Occupancy rate of hotel room in Japan



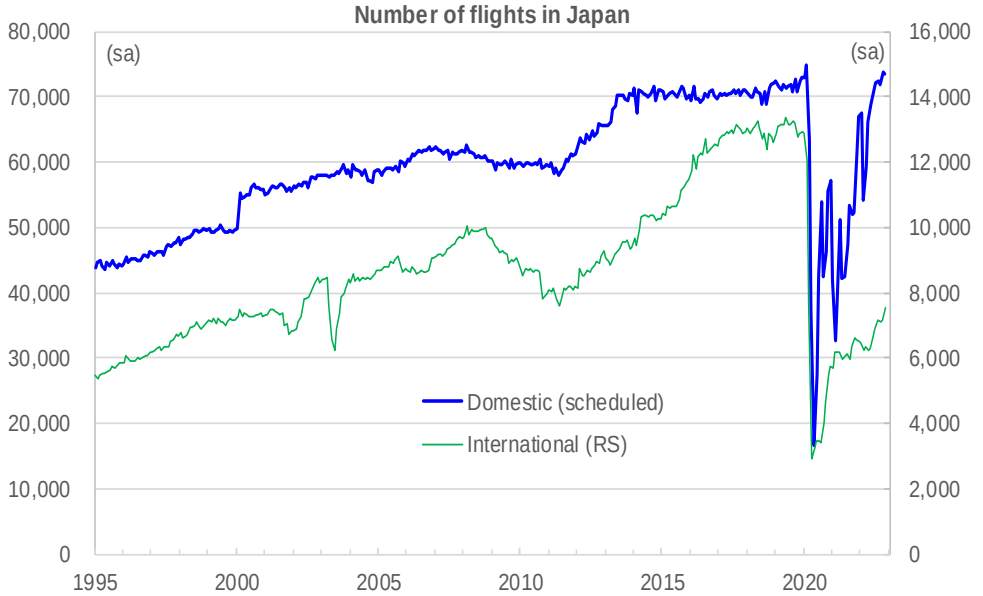
Sources: CEIC Database, MLIT, SBI SECURITIES

Balance of payments on services in Japan

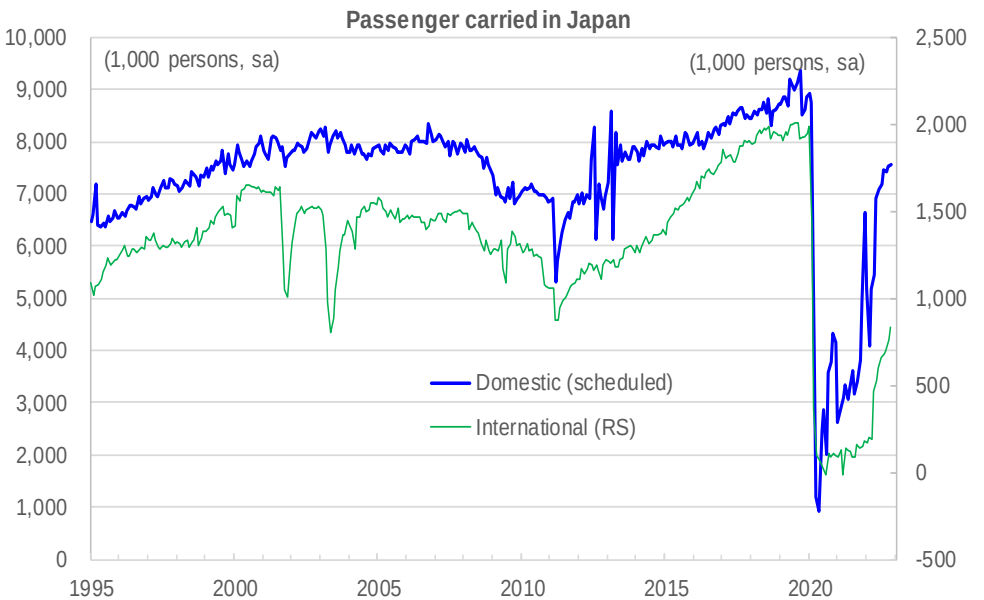


Sources: CEIC Database, BoJ, SBI SECURITIES

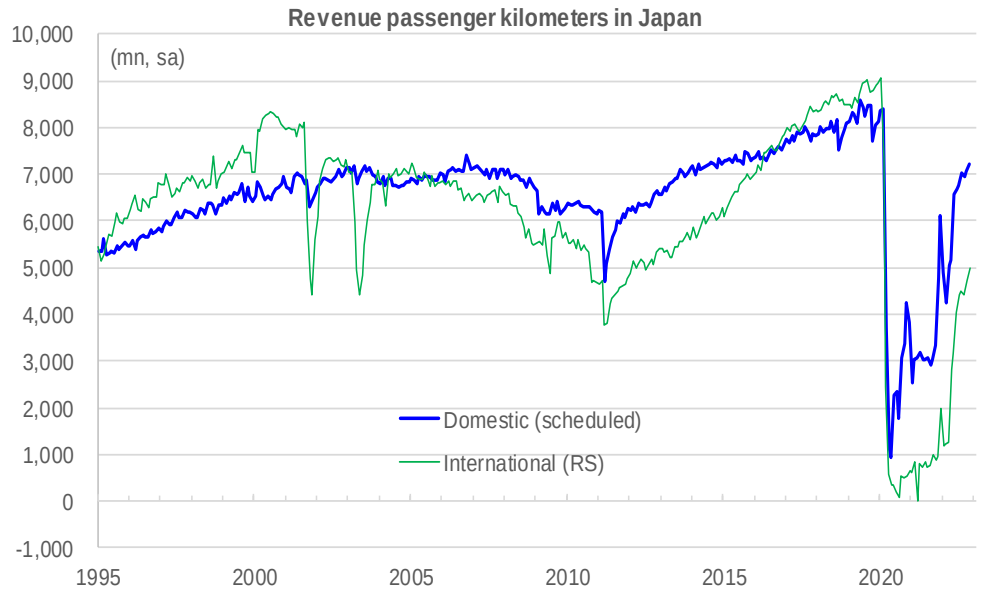
Air transportation statistics in Japan



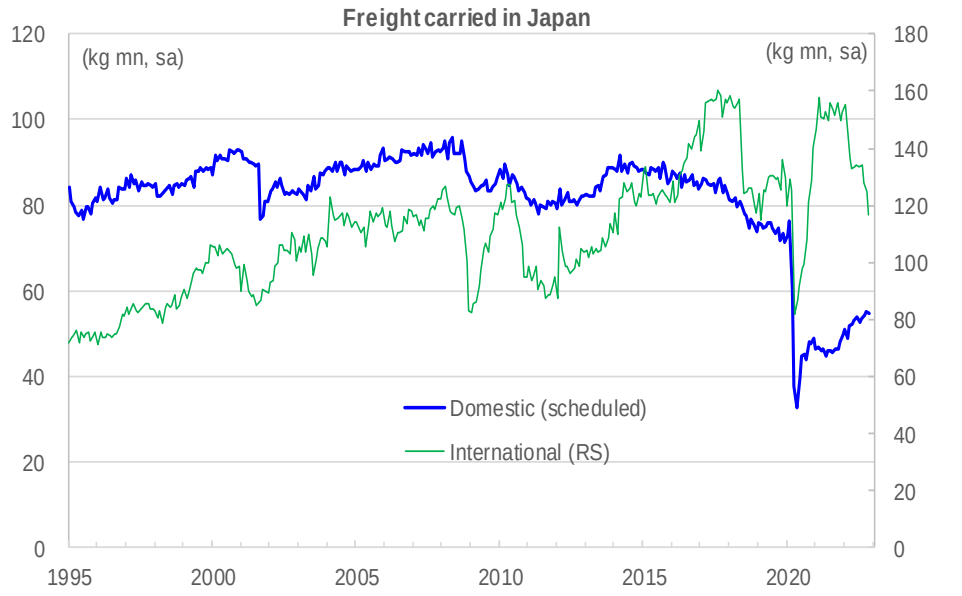
Sources: MLIT, CEIC Database, SBI SECURITIES



Sources: MLIT, CEIC Database, SBI SECURITIES

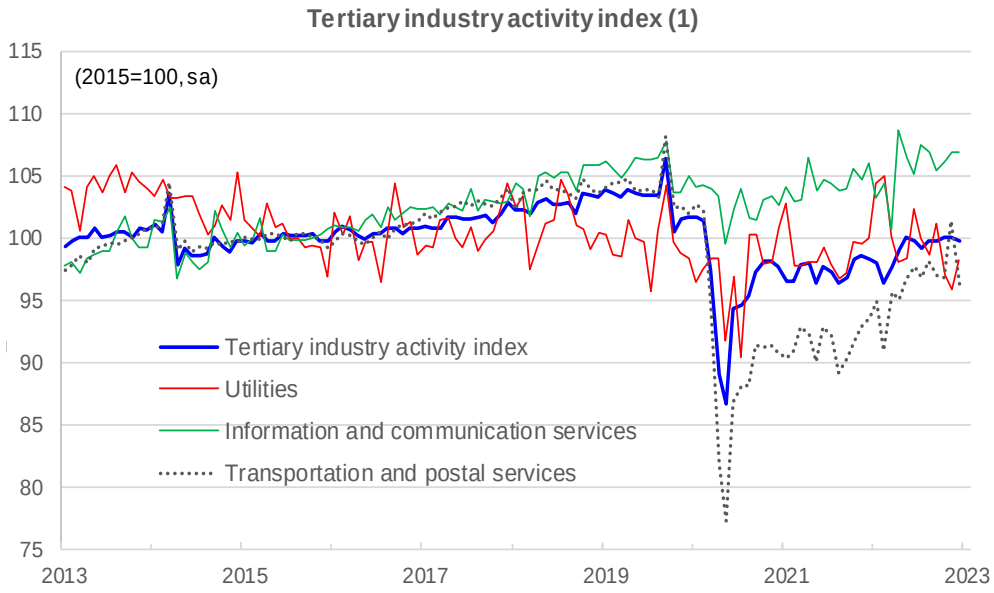


Sources: MLIT, CEIC Database, SBI SECURITIES

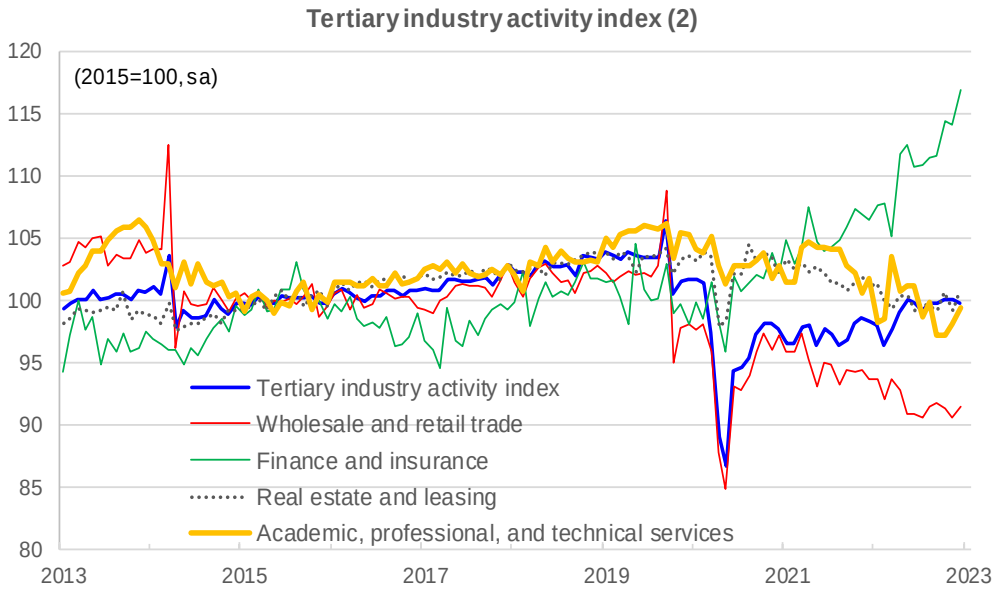


Sources: MLIT, CEIC Database, SBI SECURITIES

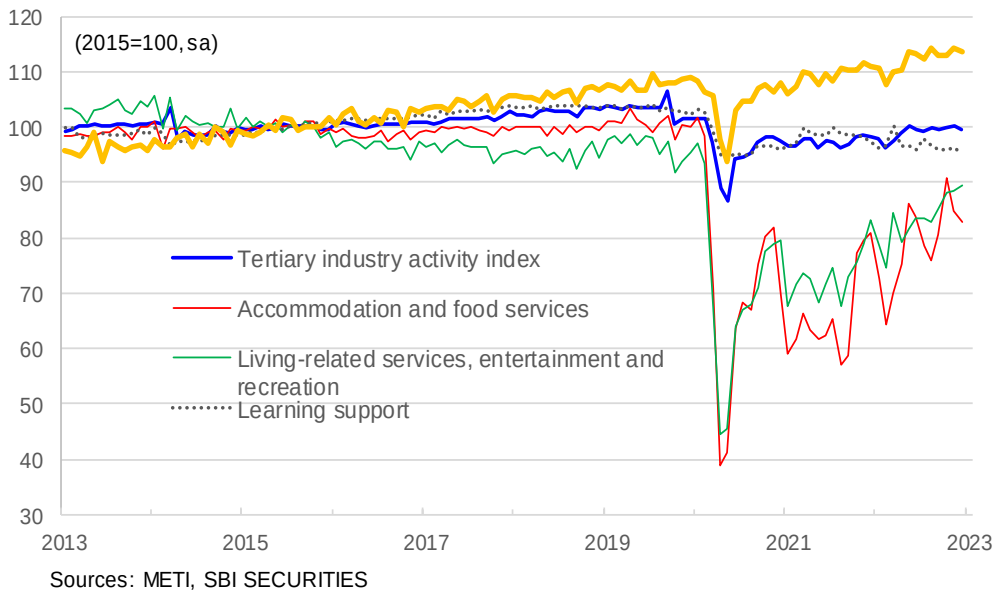
Japan's tertiary industry activity index



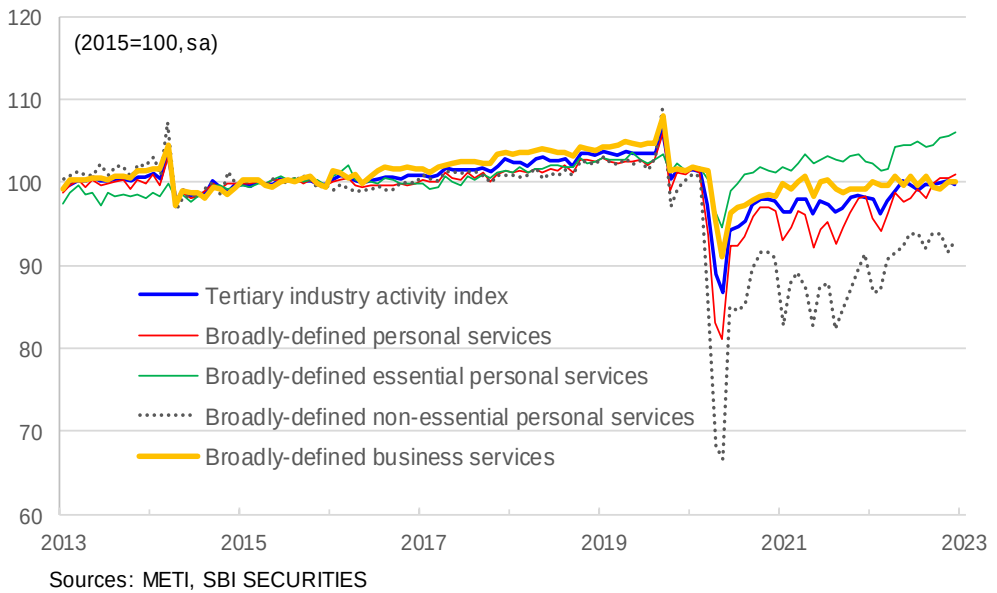
Sources: METI, SBI SECURITIES



Sources: METI, SBI SECURITIES

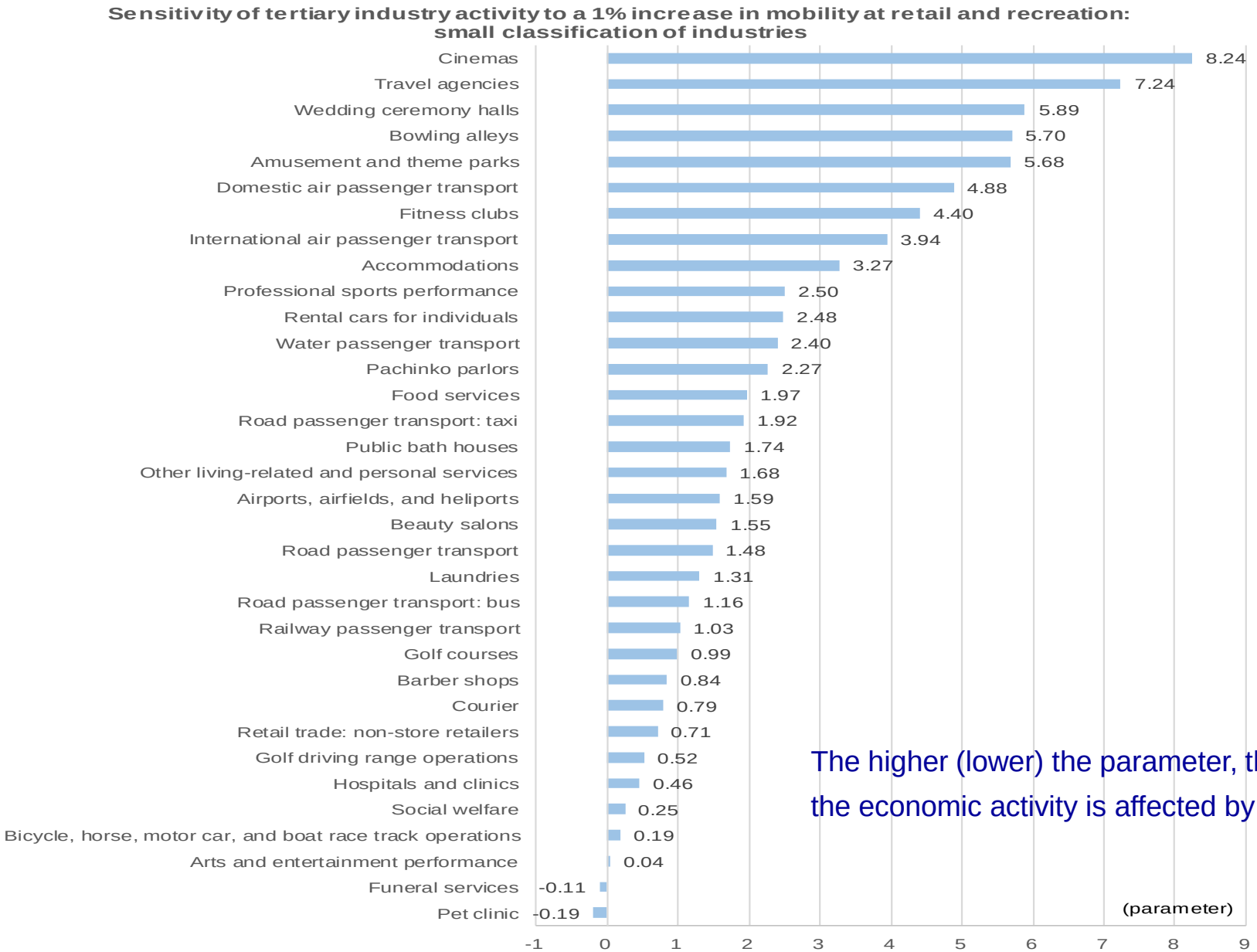


Sources: METI, SBI SECURITIES



Sources: METI, SBI SECURITIES

Parameter (elasticity) of tertiary industry activity index with respect to mobility in retail and recreational outlets



The higher (lower) the parameter, the more (less) the economic activity is affected by the pandemic.

Note: Sample period is April 2020 – June 2022. Sources: Google mobility data, CEIC Database, METI, SBI SECURITIES

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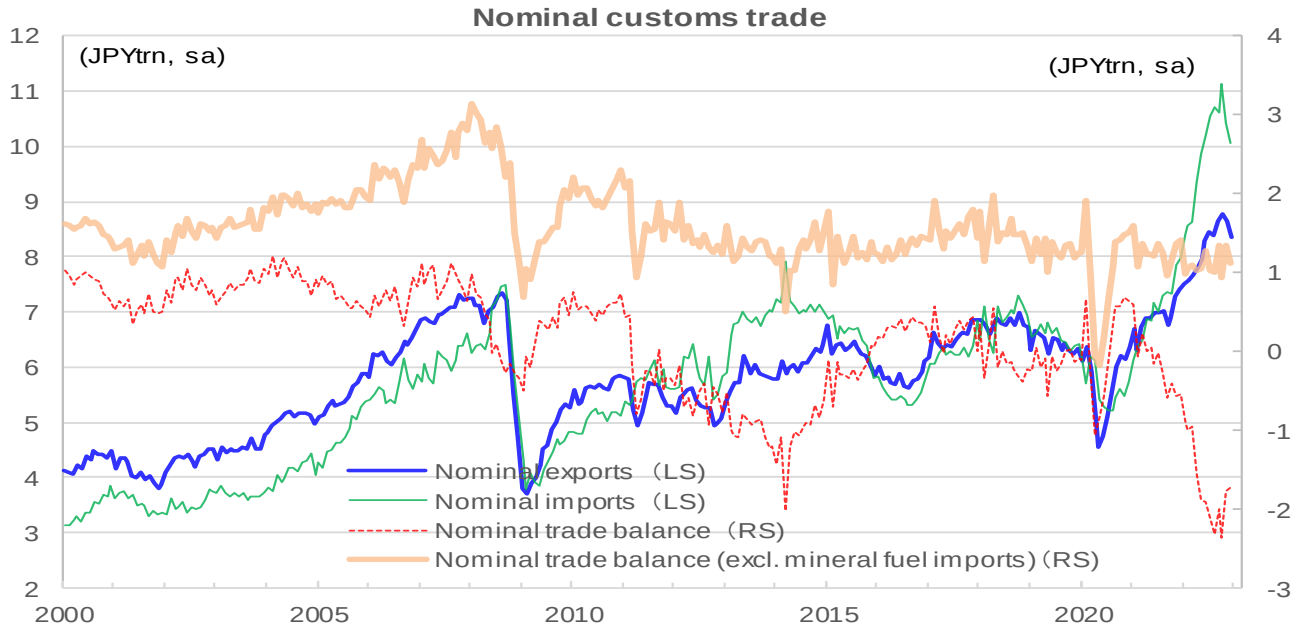
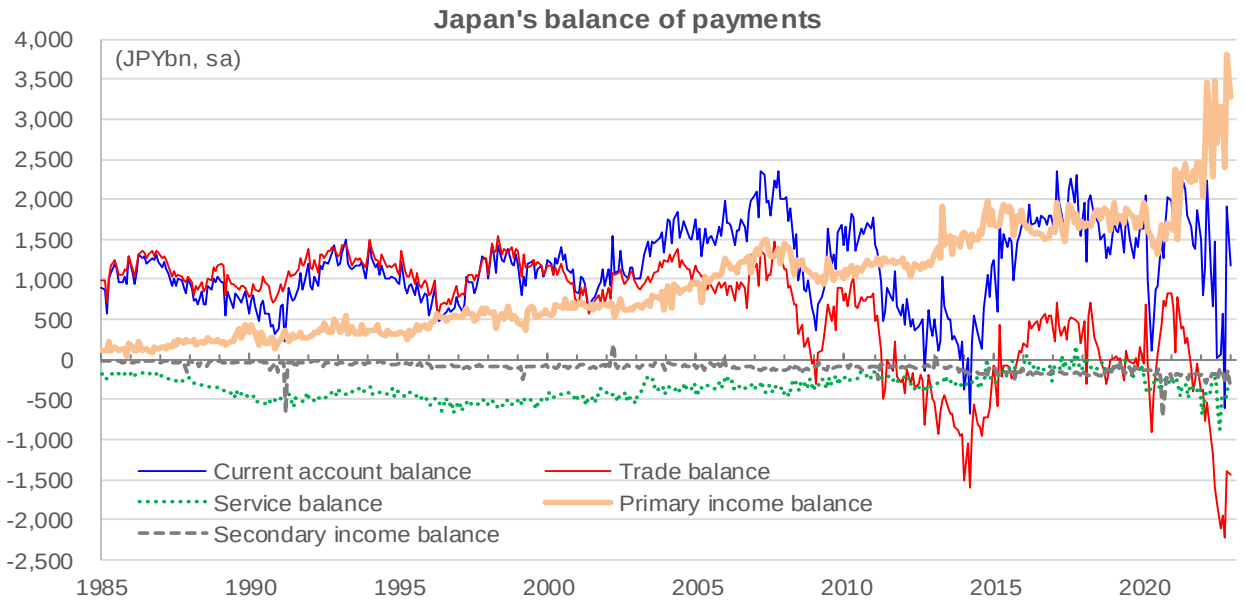
Japan's current account deficit is likely to be short-lived



Sources: CEIC Database, MoF, SBI SECURITIES



Sources: CEIC Database, BoJ, SBI SECURITIES

- A large part of the rapid expansion of Japan's trade deficit has come from a rise in mineral fuel import values (a rise in oil prices and JPY depreciation) and the supply-chain disruptions including the Chinese lockdowns. Japan's current account deficit is likely to continue for a few months in June onward. This could act to weaken JPY, in addition to the US-Japan interest rate differentials.
- Japan's mineral fuel imports are likely to come to a plateau or start declining, due to the weakness in both real and speculative demand for commodities, which should limit Japan's current account deficit to be short-lived. However, its current account surplus is likely to return to subdued levels of ¥200b–¥500b a month.

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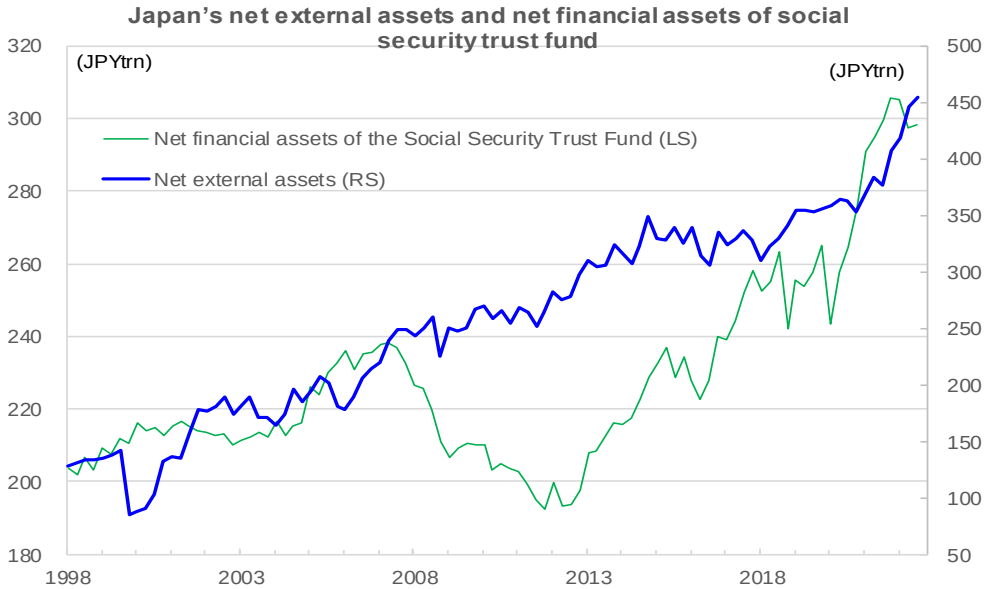
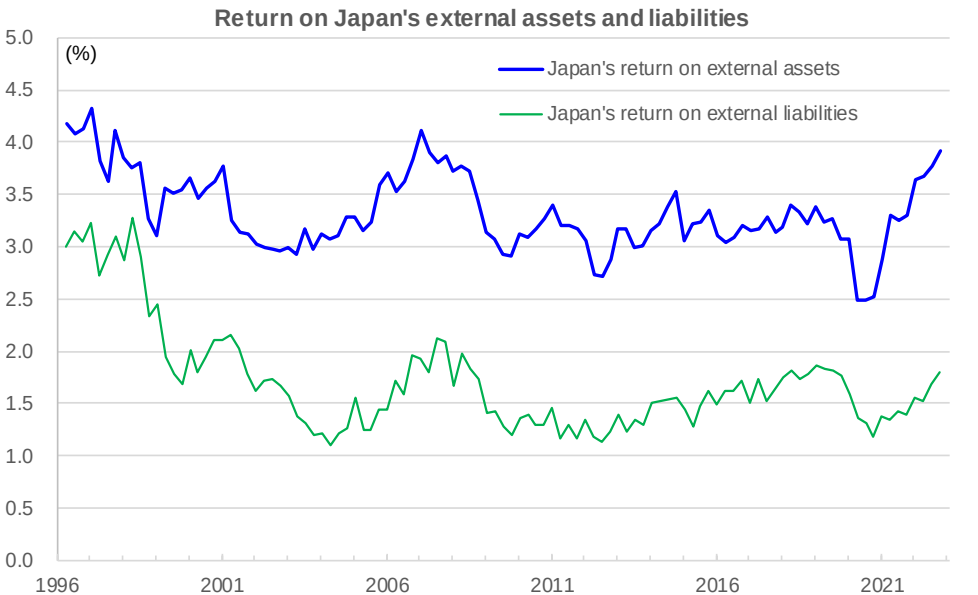
Is JPY depreciation not desirable? (1)

1) The profit share of overseas activities in consolidated Japanese businesses has been rising due to their globalization, which reinforces the positive effect of JPY depreciation to the consolidated corporate profit.
2) The net financial assets of the social security trust funds and the public pension funds (such as GPIF) has been rising substantially following the QQE in 2013: from JPY192.4t (end-2011) to JPY298.2t (at the end of September 2022).
3) Japan's net foreign assets have continued to rise: JPY263.9t (end-2011) to JPY455.0t (at the end of September 2022).
4) For the net creditor nation, depreciation of its currency and a rise in foreign interest rates further reinforce the situation of "the return on Japan's foreign assets > the return on non-residents' holding of Japanese assets". This leads to a further expansion of Japan's primary income surplus which offsets at least a part of Japan's expanding trade deficit.
5) Are people who are critical of JPY depreciation and rising prices now and who were critical of JPY appreciation and falling prices in the early 2010s consistent in their logic?
6) Normalization of the BoJ's monetary policy can wait until the BoJ becomes convinced that demand-driven inflationary forces sustain inflation at around 2%.
7) Monetary policy normalization which precedes normalization of real economy cannot be sustained.
8) The rise in fiscal sustainability comes first in other developed countries due to their monetary tightening ahead of Japan.
9) Japan has been conducting the most appropriate monetary policy among developed countries so that it could build up various buffers and prepare for the rise in demand for safe assets (Japanese yen) once monetary tightening in other developed countries turns out to be a mistake.

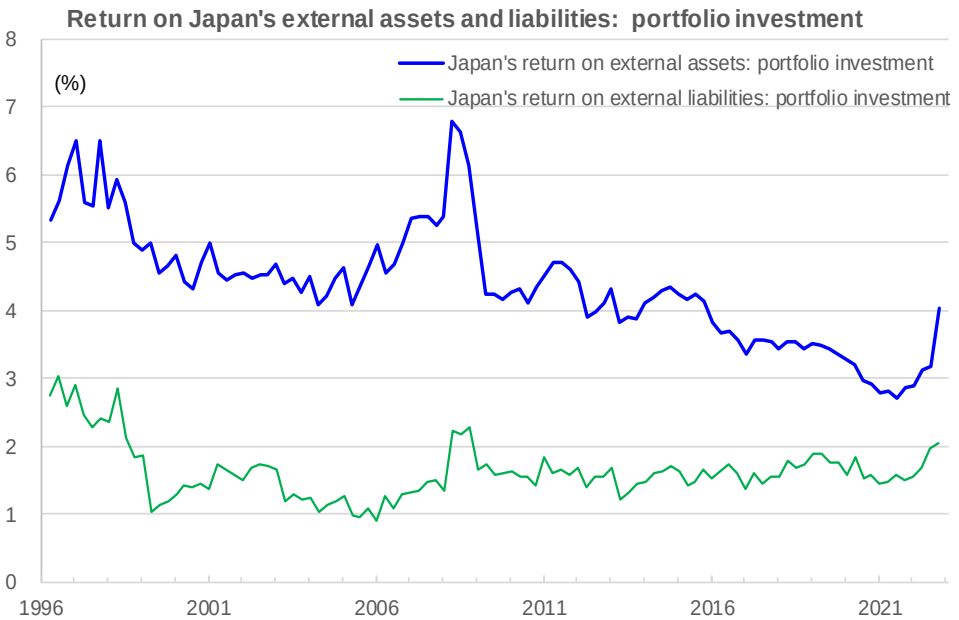
Is JPY depreciation not desirable? (2)



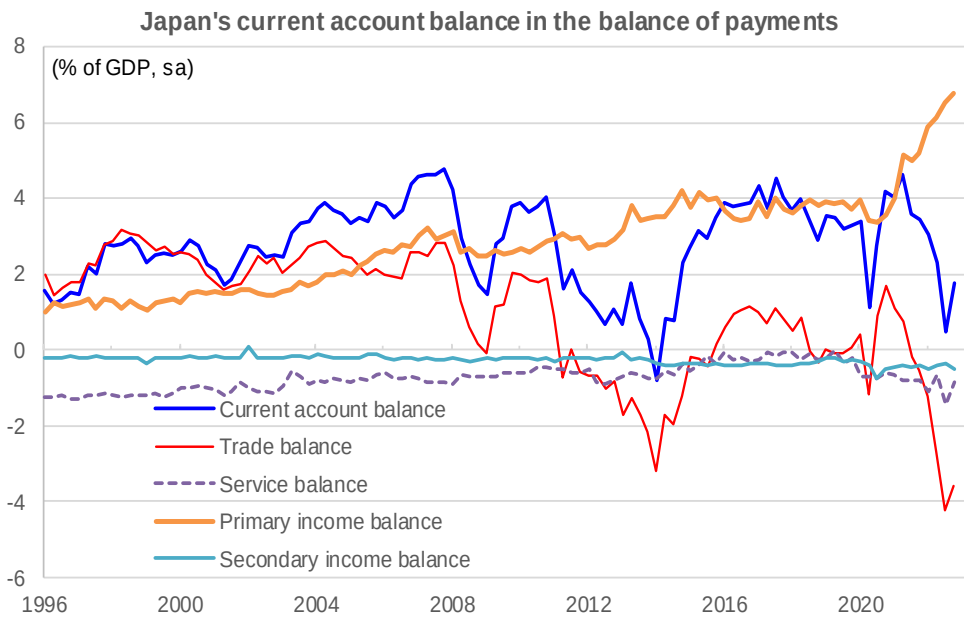
Sources: BoJ, Cabinet Office, SBI Securities.



Sources: CEIC Database, BoJ, SBI SECURITIES

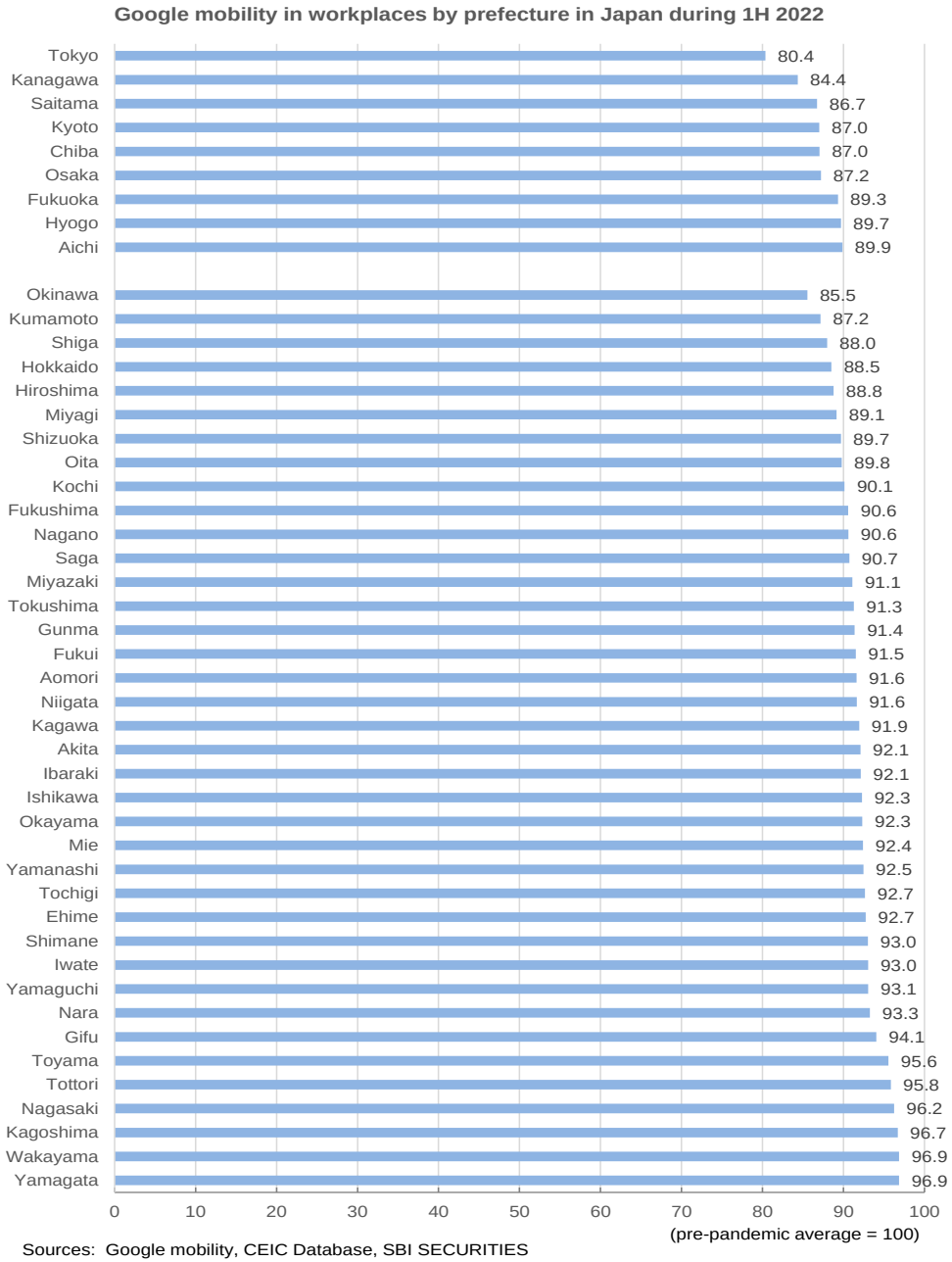


Sources: CEIC Database, BoJ, SBI SECURITIES

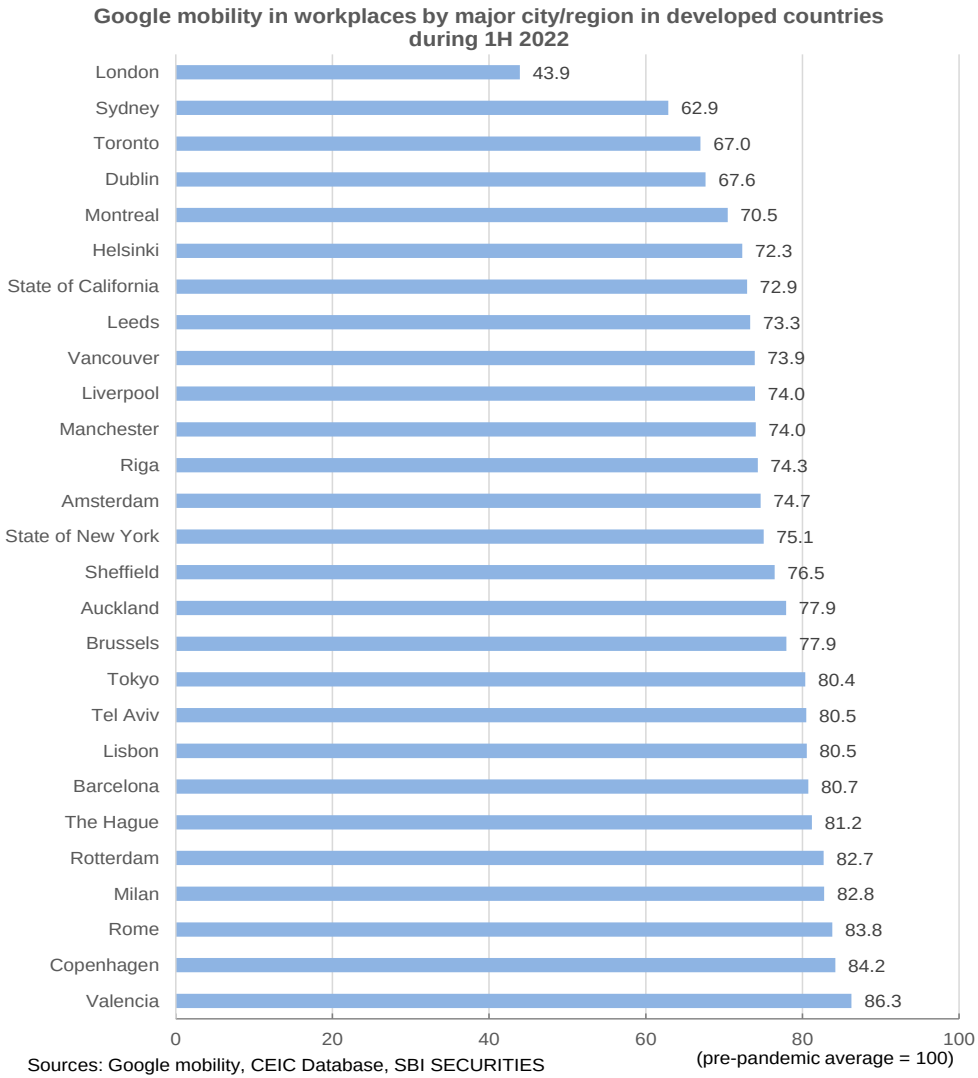


Sources: CEIC Database, BoJ, SBI SECURITIES

Penetration of remote work in Japan is lower than in other developed countries, especially in rural areas



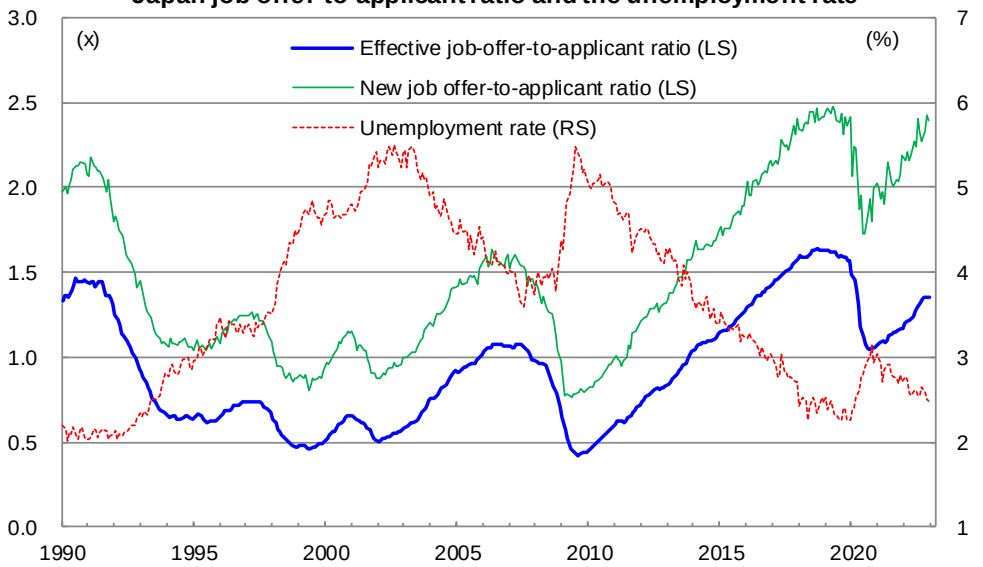
Sources: Google mobility, CEIC Database, SBI SECURITIES



Sources: Google mobility, CEIC Database, SBI SECURITIES

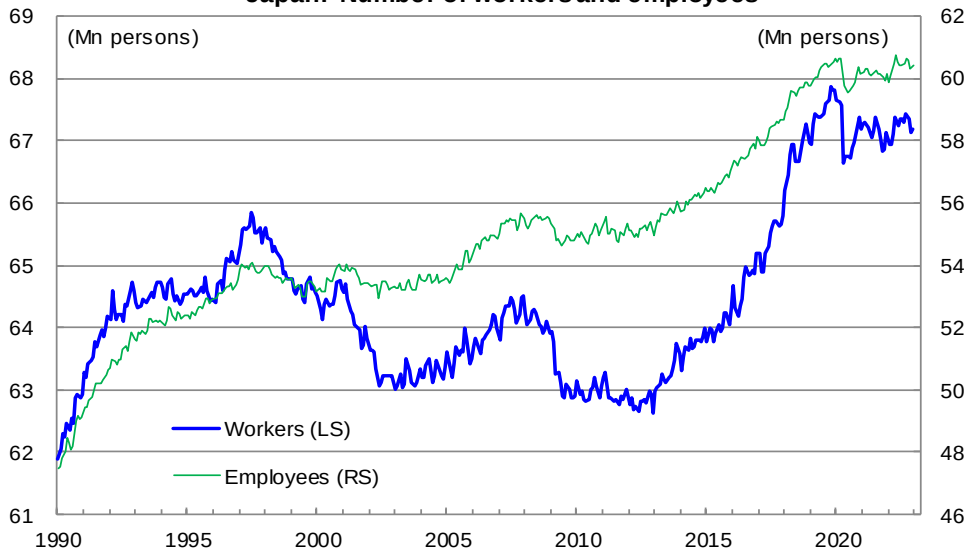
Main economic indicators in Japan (1)

Japan job offer-to-applicant ratio and the unemployment rate



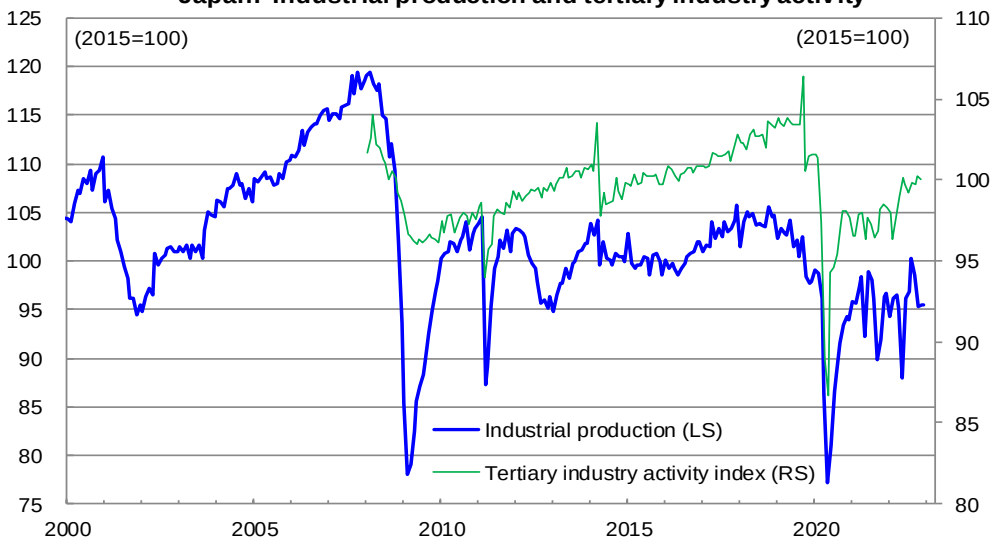
Sources: CEIC Database, MHLW, MIC, SBI SECURITIES

Japan: Number of workers and employees



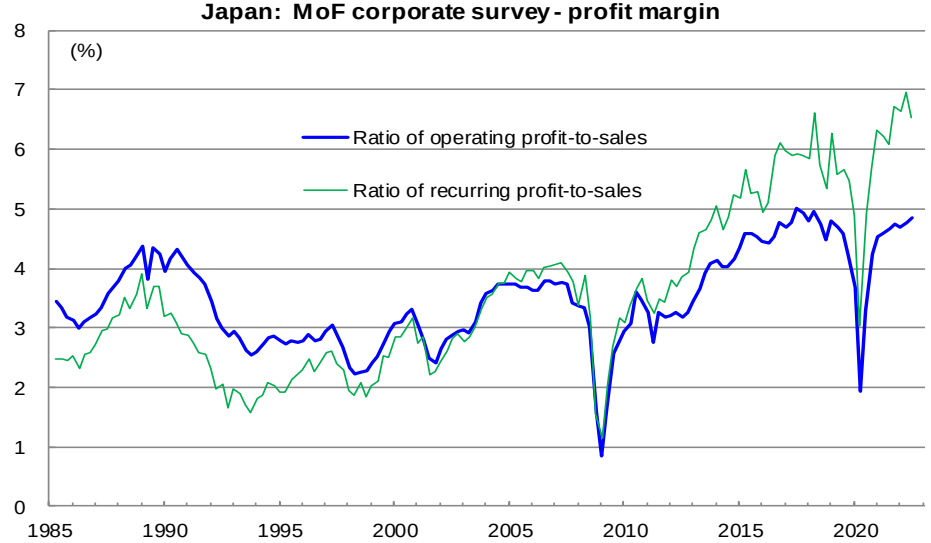
Sources: CEIC Database, MIC, SBI SECURITIES

Japan: Industrial production and tertiary industry activity



Sources: CEIC Database, METI, SBI SECURITIES

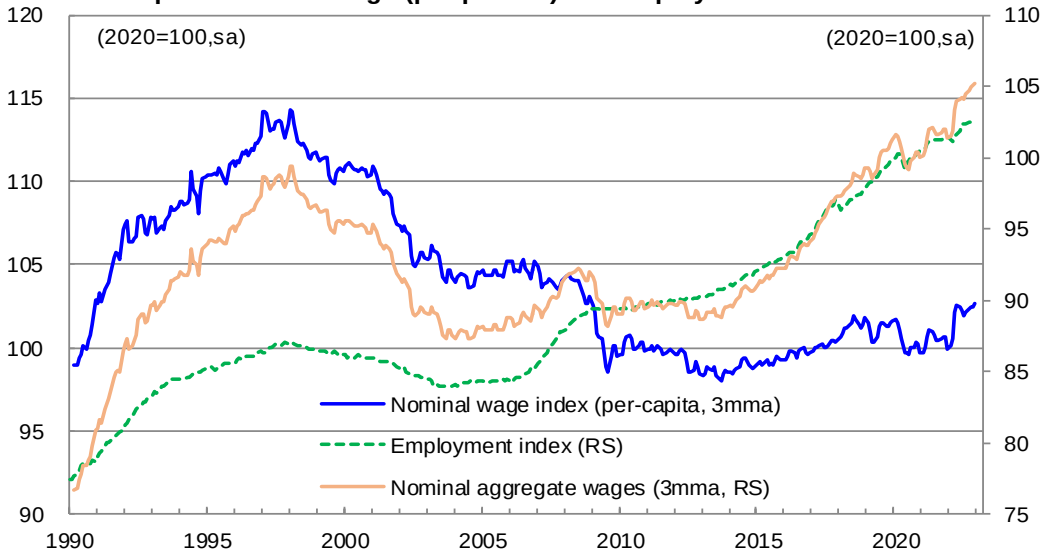
Japan: MoF corporate survey - profit margin



Note: All-size all-industry. Sources: CEIC Database, MoF, SBI SECURITIES

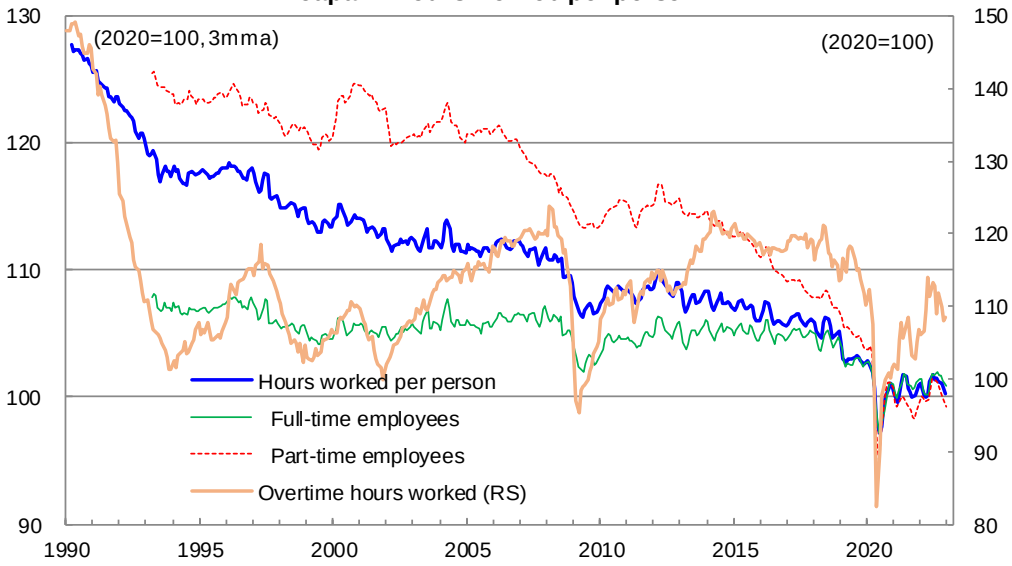
Main economic indicators in Japan (2)

Japan: Nominal wage (per person) and employment indices



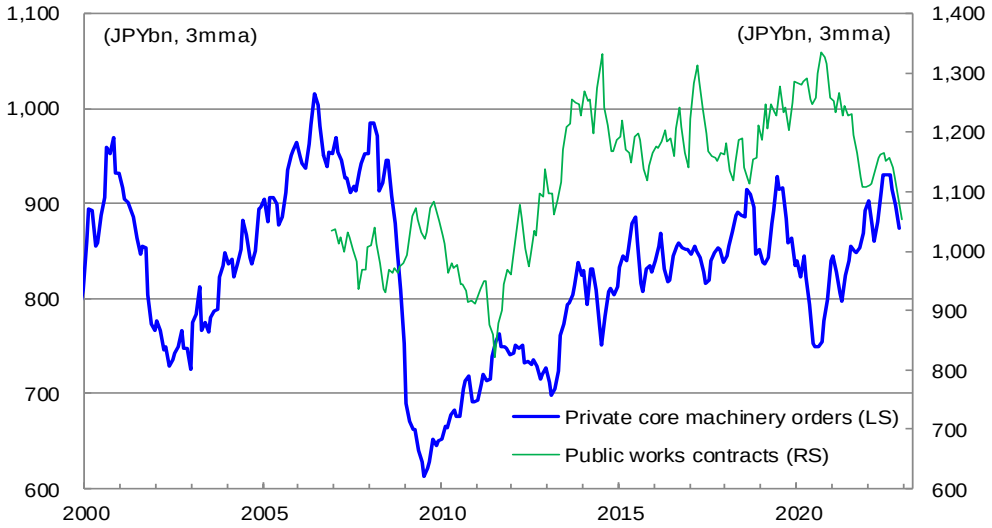
Note: Nominal aggregate wages = employees x nominal wage index
Sources: CEIC Database, MHLW, MIC, SBI SECURITIES

Japan: Hours worked per person



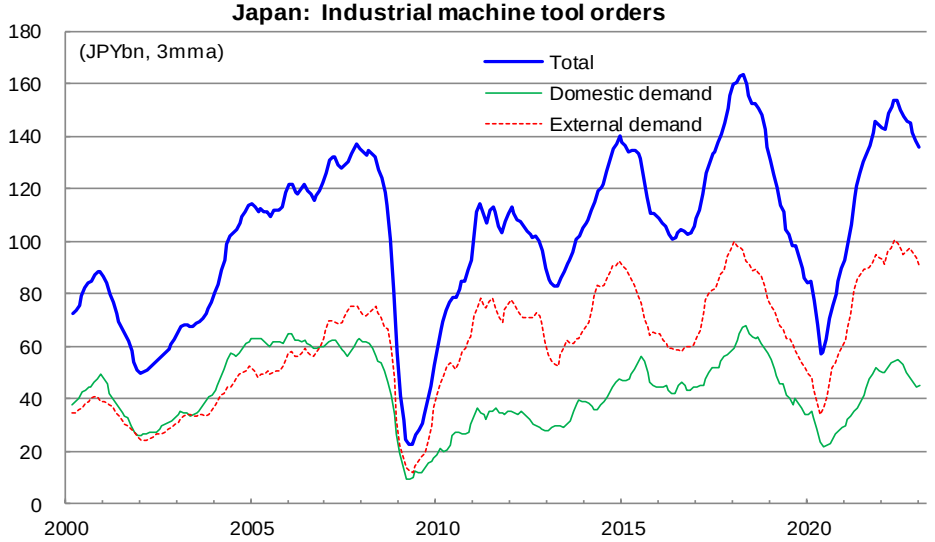
Sources: CEIC Database, MHLW, MIC, SBI SECURITIES

Japan: Private machinery orders and public works contracts



Sources: CEIC Database, Cabinet Office, JMTBA, SBI SECURITIES

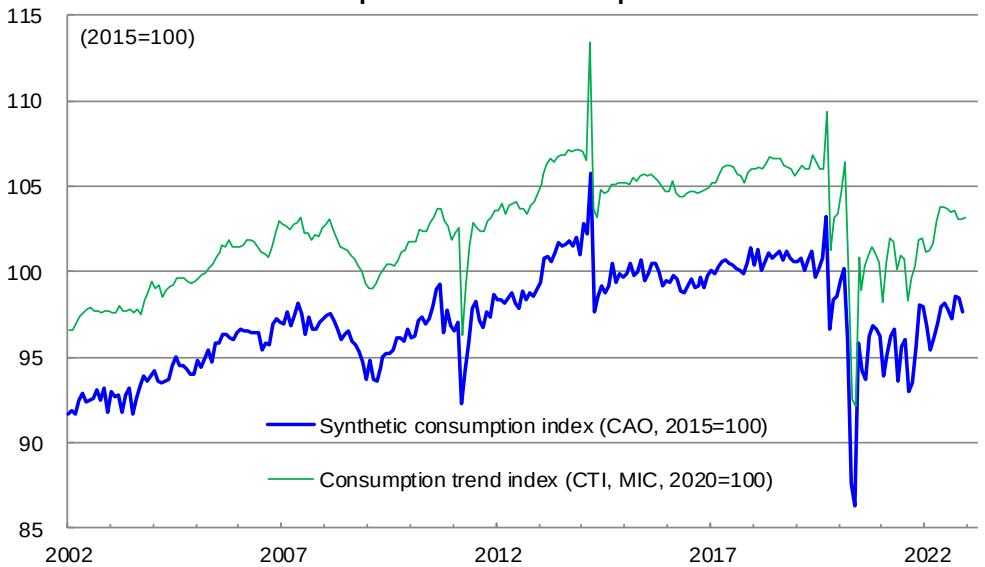
Japan: Industrial machine tool orders



Sources: CEIC Database, JMTBA, SBI SECURITIES

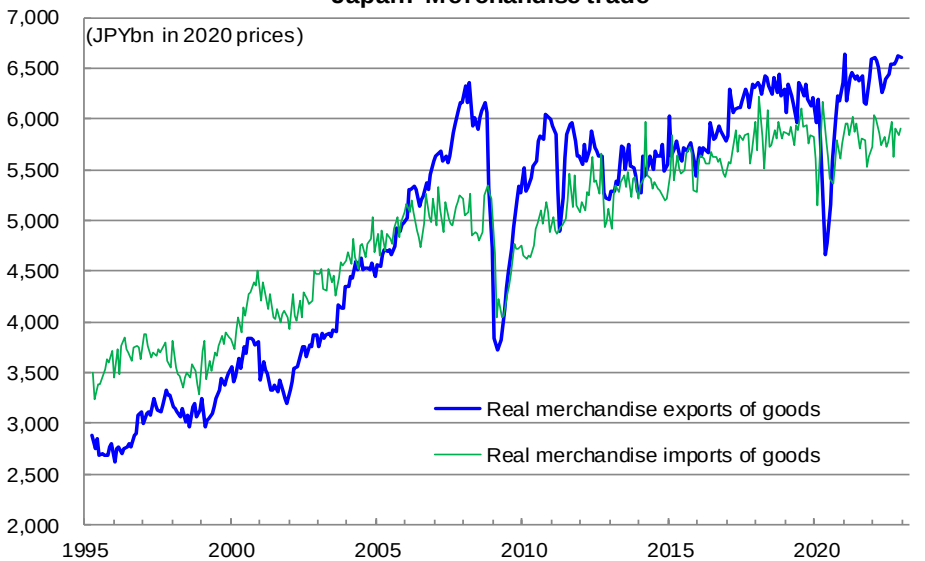
Main economic indicators in Japan (3)

Japan: Private consumption



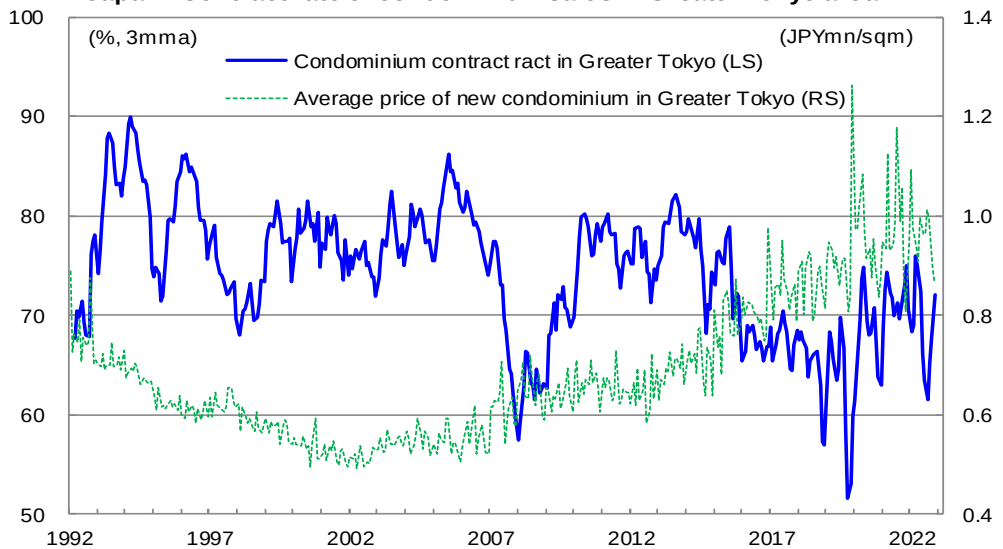
Sources: CEIC Database, Cabinet Office, MIC, SBI SECURITIES

Japan: Merchandise trade



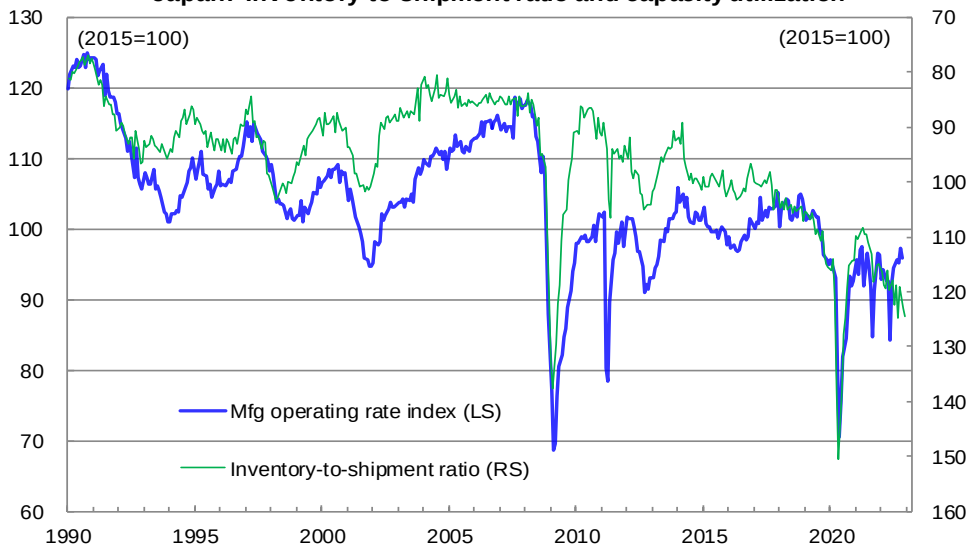
Sources: CEIC Database, BoJ, MoF, SBI SECURITIES

Japan: Contract rate of condominium sales in Greater Tokyo area



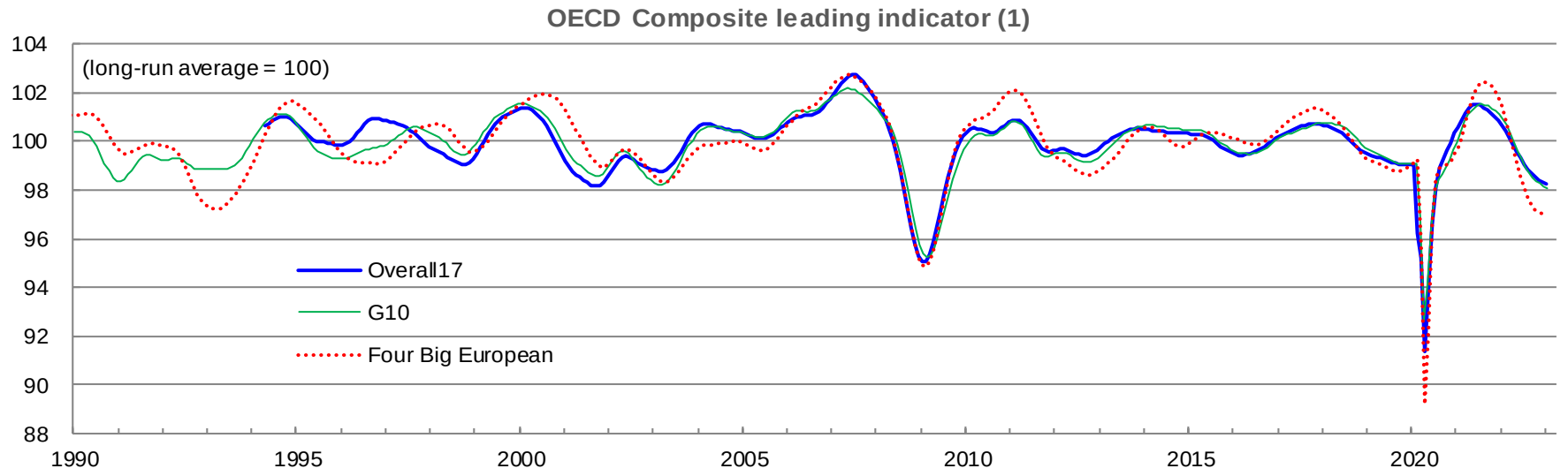
Sources: CEIC Database, MLIT, JREI, SBI SECURITIES

Japan: Inventory-to-shipment ratio and capacity utilization

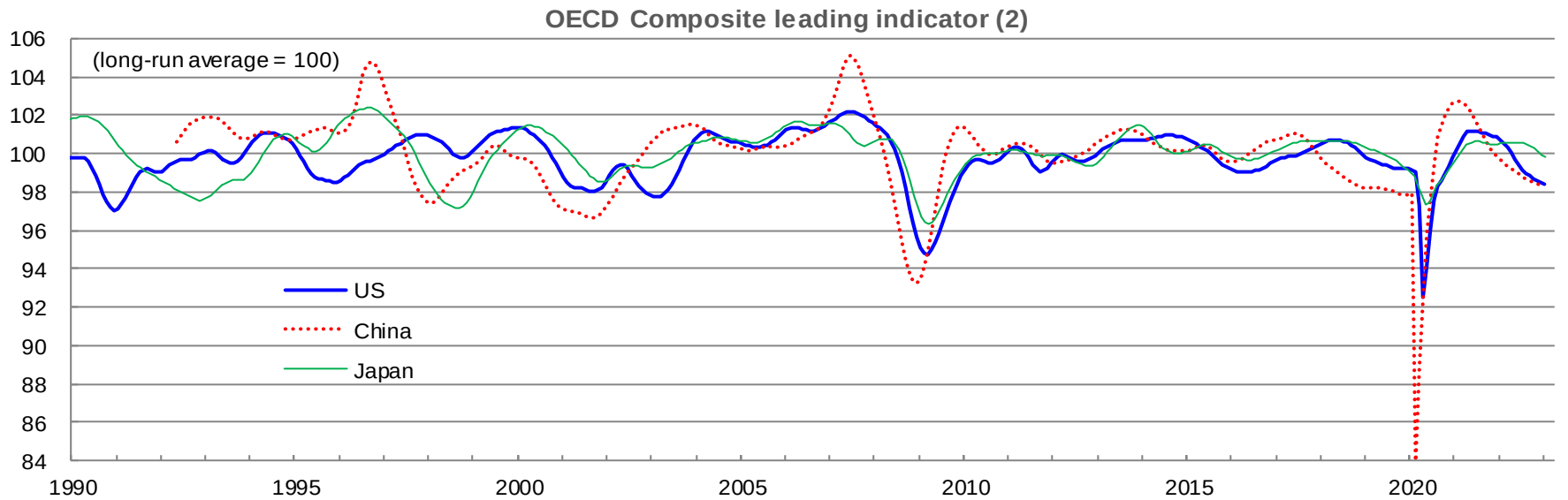


Sources: CEIC Database, METI, SBI SECURITIES

Various leading indicators continue falling (1)

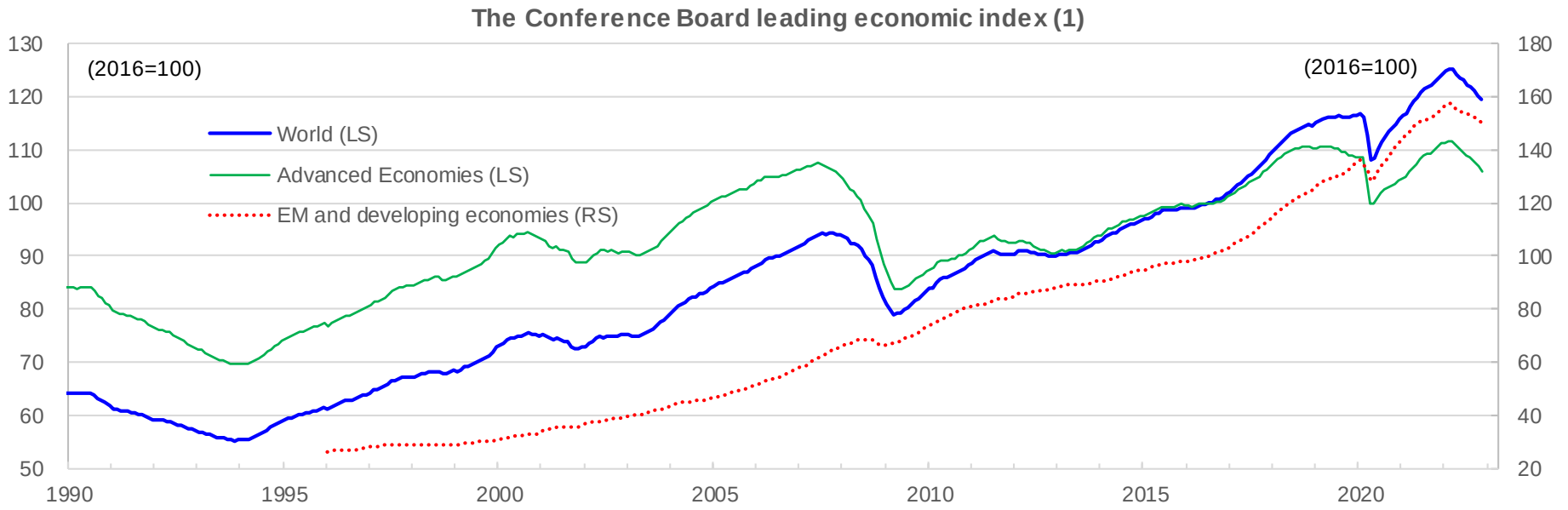


Note: Overall 17 = G10 (Australia, Canada, France, Germany, Italy, Japan, South Korea, Spain, the UK, and the US,) Brazil, China, India, Indonesia, and South Africa Sources: OECD, CEIC Database, SBI SECURITIES

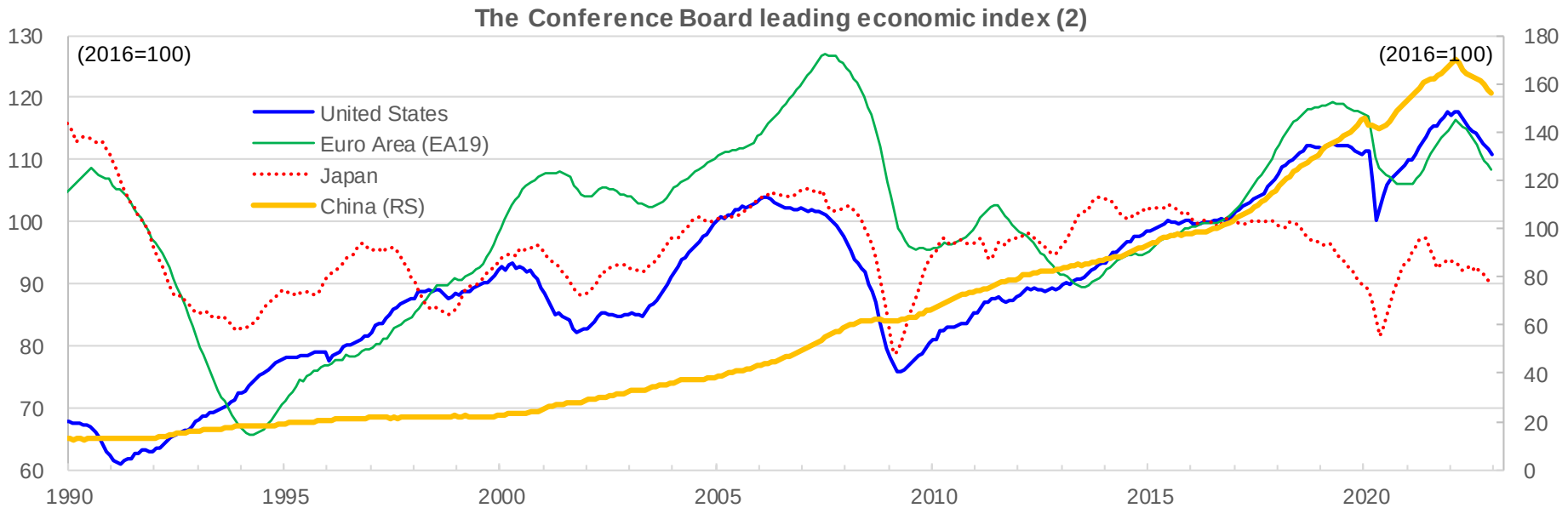


Sources: OECD, CEIC Database, SBI SECURITIES

Various leading indicators continue falling (2)

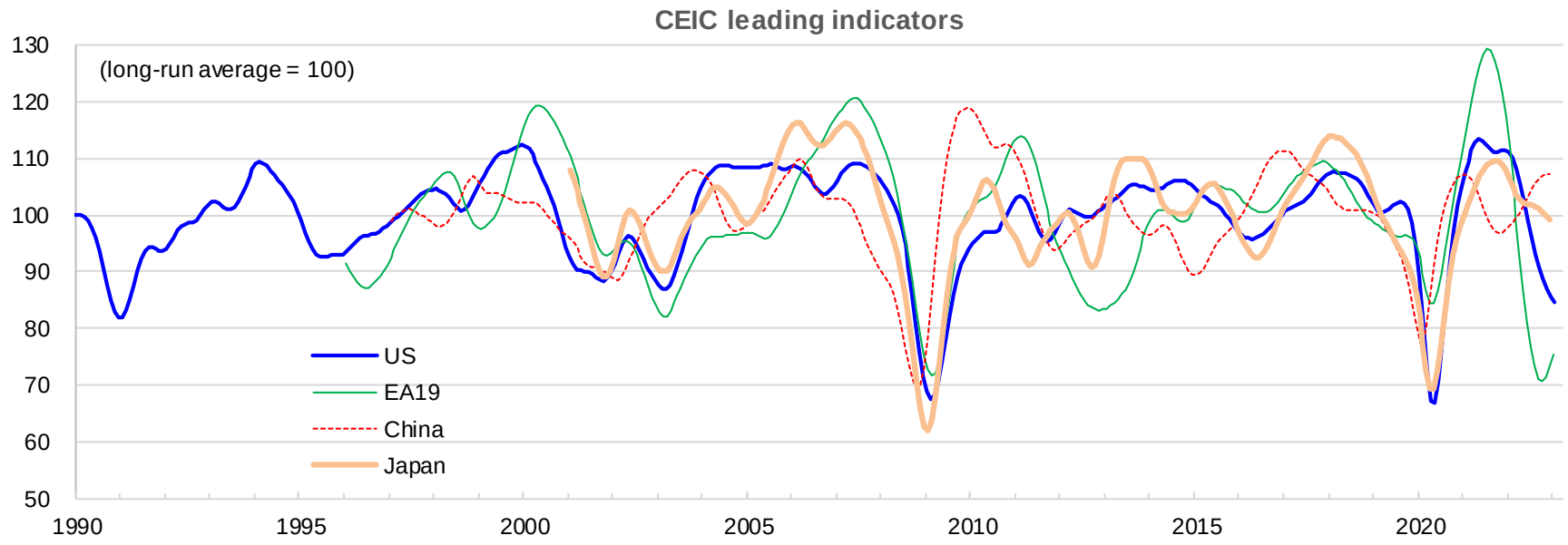


Sources: The Conference Board, CEIC Database, SBI SECURITIES

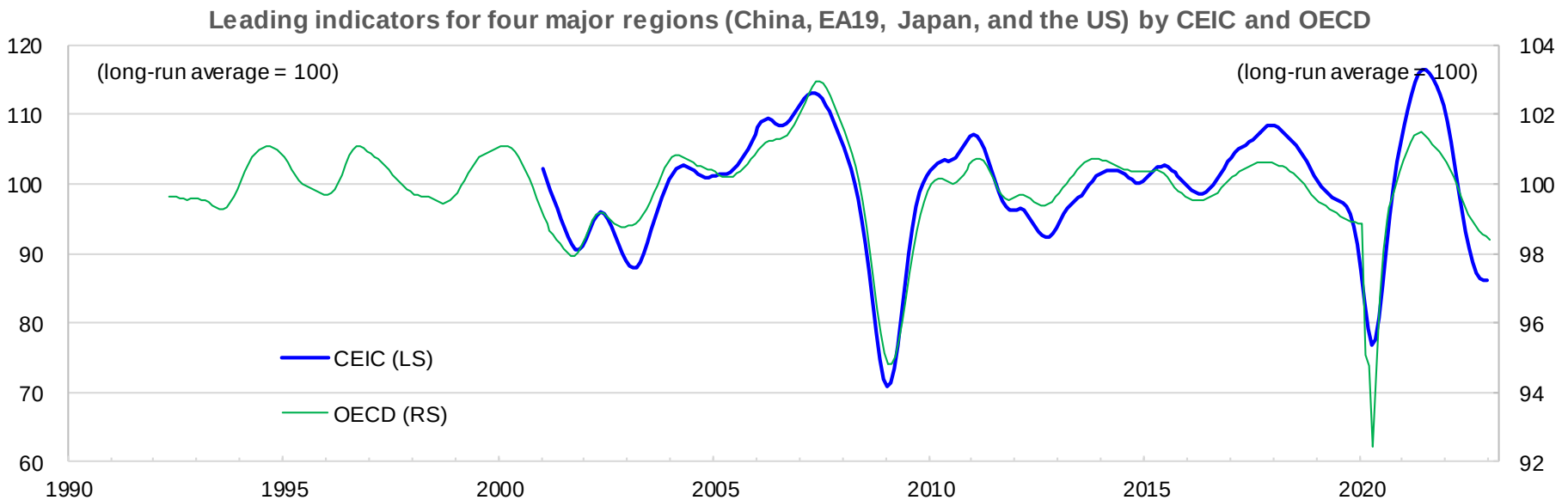


Sources: The Conference Board, CEIC Database, SBI SECURITIES

Various leading indicators continue falling (3)

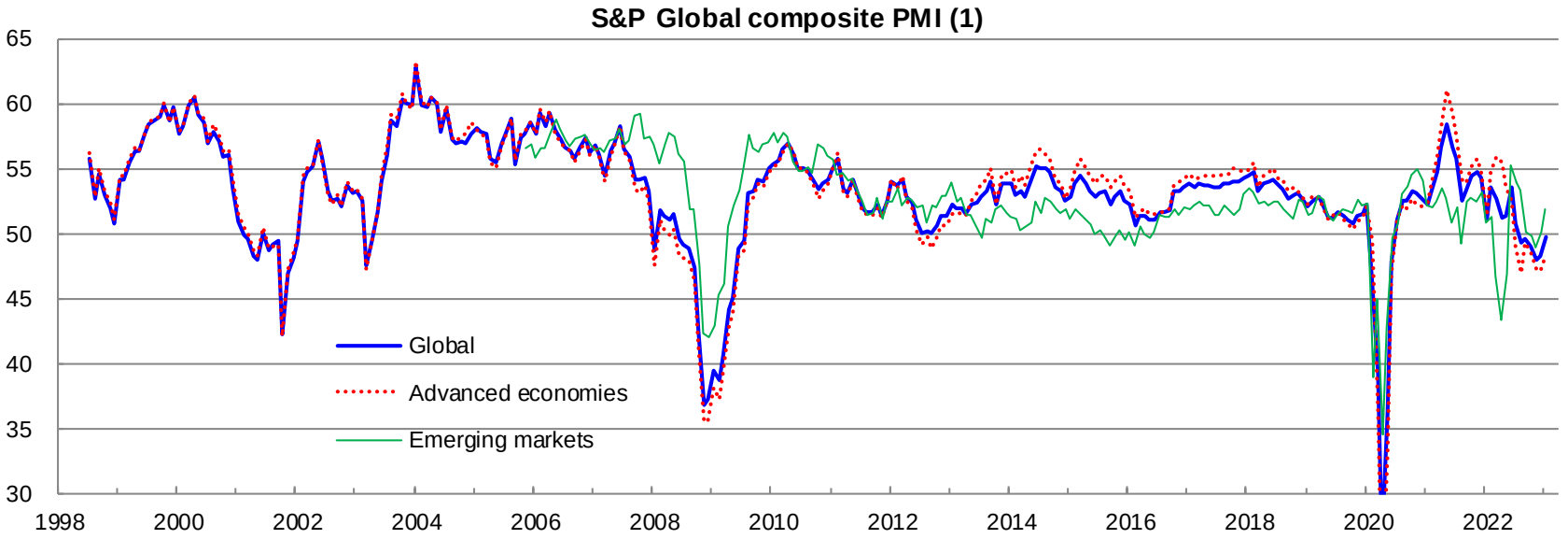


Note: Smoothed series. Sources: CEIC Database, SBI SECURITIES

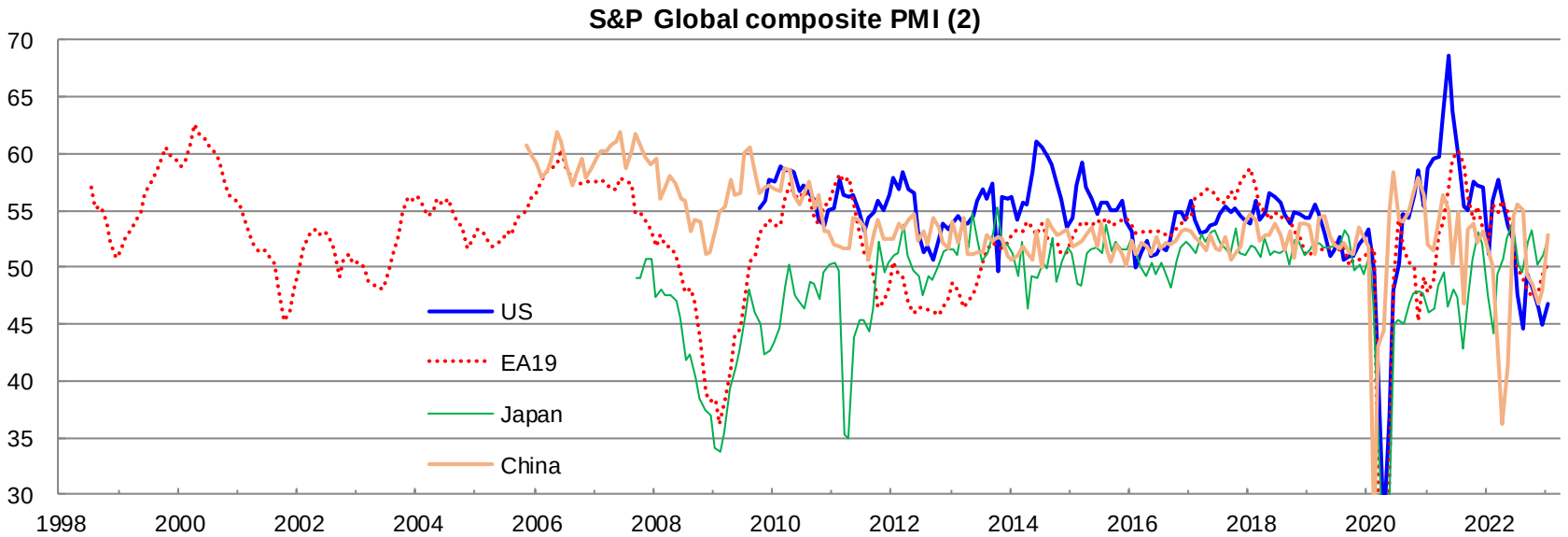


Note: Weighted average using nominal GDP in 2015. G4 consists of China, EA19, Japan and the US. Sources: CEIC Database, OECD, SBI SECURITIES

Various leading indicators continue falling (4)

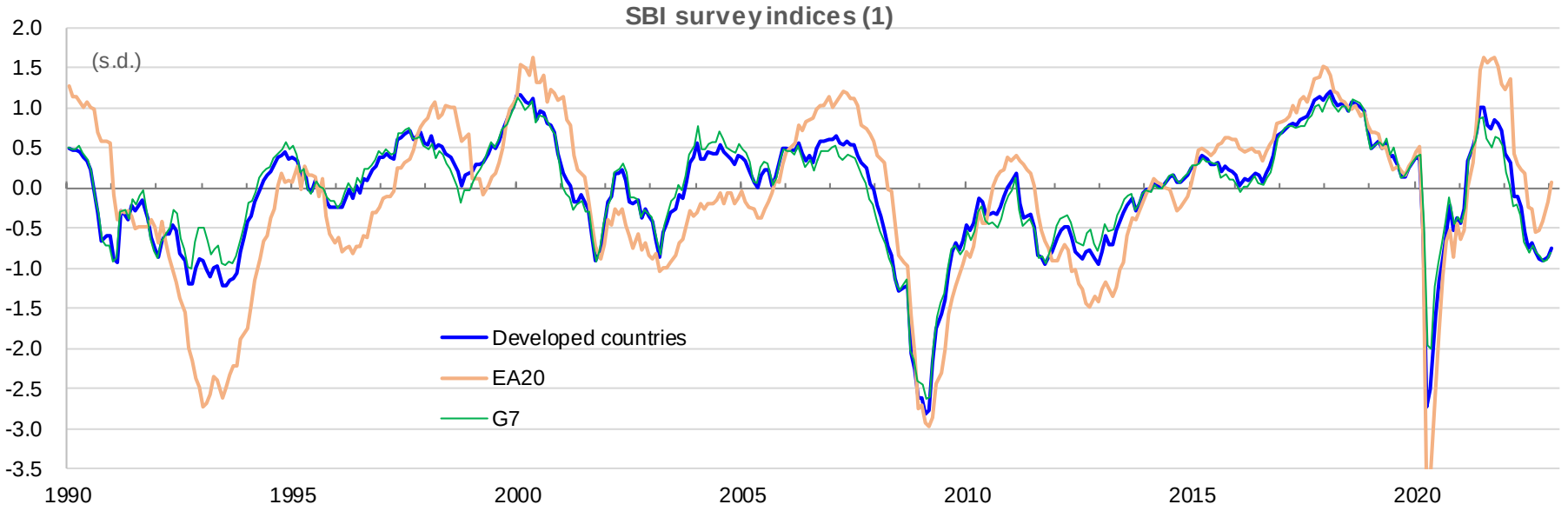


Sources: CEIC Database, OECD, S&P Global, The Conference Board, SBI SECURITIES

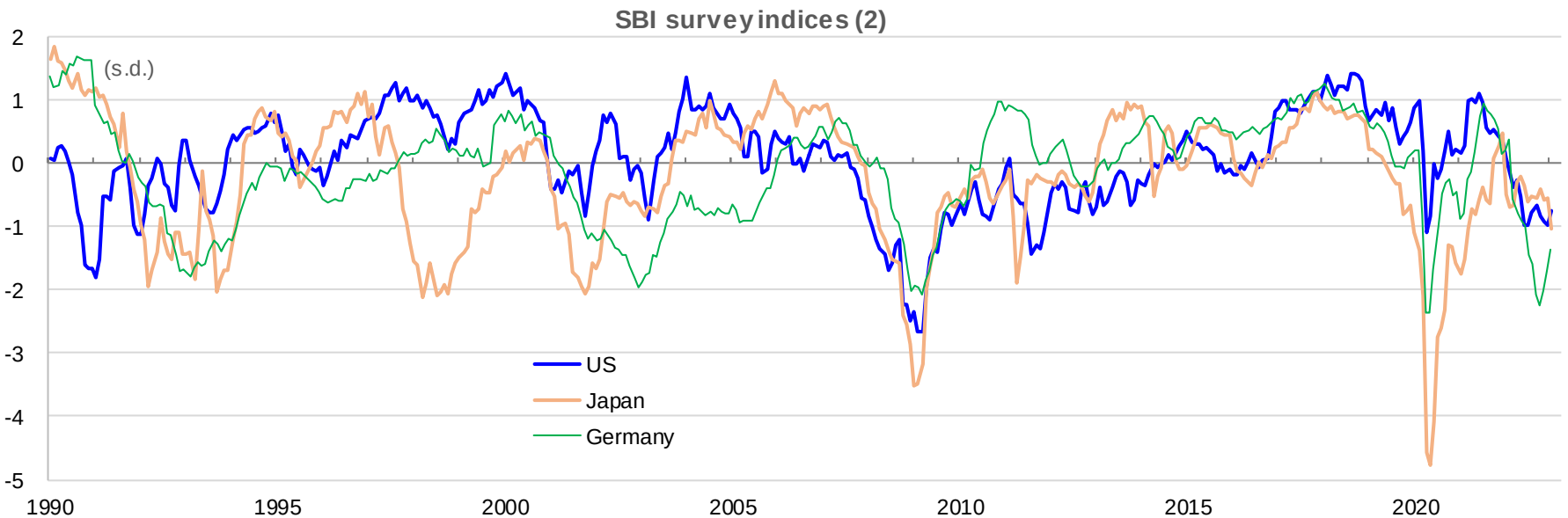


Sources: CEIC Database, OECD, S&P Global, The Conference Board, SBI SECURITIES

Various leading indicators continue falling (5)



Sources: CEIC Database, national sources, SBI SECURITIES



Sources: CEIC Database, national sources, SBI SECURITIES

Cumulative decline in various leading indicators in past recessions

Cumulative decline in various leading indicators in recessions

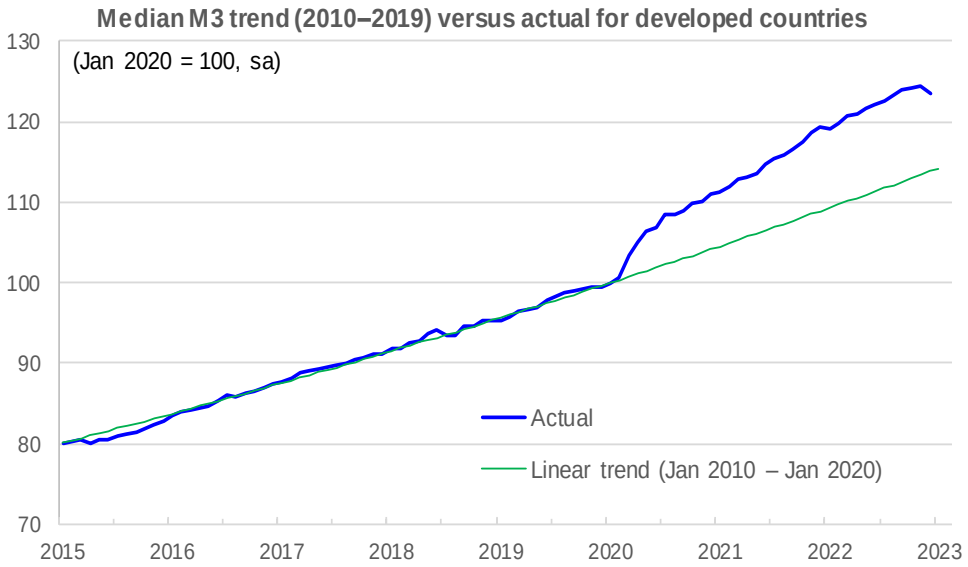
(%, s.d., points; peak to trough)

	2000–2001	2008–2009	2022–
OECD composite leading indicator (%)			
G10	-3.3	-6.8	-3.4
G7	-3.1	-6.9	-3.4
Four big European	-3.5	-7.7	-5.3
US	-3.6	-7.3	-2.7
China	-3.7	-11.2	-4.3
Japan	-2.9	-5.3	-0.9
The Conference Board leading economic index (%)			
Global	-3.8	-16.2	-4.7
Developed countries	-6.0	-22.0	-5.0
EA19	-3.7	-24.9	-6.7
US	-12.1	-27.2	-6.0
China	-5.5	5.1	-8.0
Japan	-8.4	-25.4	-7.1
CEIC leading indicator (smoothed, %)			
EA19	-22.3	-40.7	-45.4
US	-21.4	-38.2	-25.5
China	-17.1	-36.8	-9.7
Japan	n.a.	-46.8	-9.5
S&P Global composite PMI (pts)			
Global	-18.2	-22.5	-10.4
Developed countries	-18.5	-24.1	-14.2
EA19	-17.3	-24.2	-12.9
US	n.a.	n.a.	-24.1
China	n.a.	-15.8	-18.1
Japan	n.a.	-21.2	-7.5
SBI survey index (s.d.)			
Developed countries	-2.06	-3.47	-1.90
EU27	-2.75	-4.08	-2.46
EA19	-2.67	-4.18	-2.18
Europe 9	-2.02	-3.16	-2.30
G7	-2.05	-3.40	-1.79
US	-2.30	-4.04	-2.09
Japan	-2.46	-4.80	-1.52

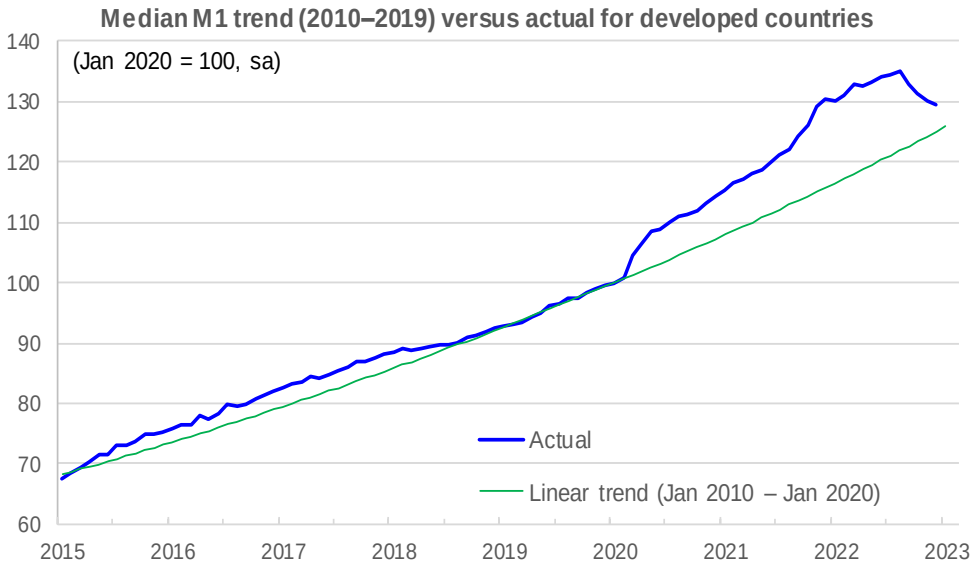
Note: Four big European = France, Germany, Italy, and the UK.
Europe 9 = Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, and the UK.
G10 = G7 (Canada, France, Germany, Italy, Japan, UK, US), Australia, South Korea, Spain.
Sources: CEIC Database, OECD, S&P Global, The Conference Board, SBI SECURITIES

- The cumulative decline in the current ongoing recession is beginning to exceed the decline in the recession following the bursting of the IT bubble in 2000.

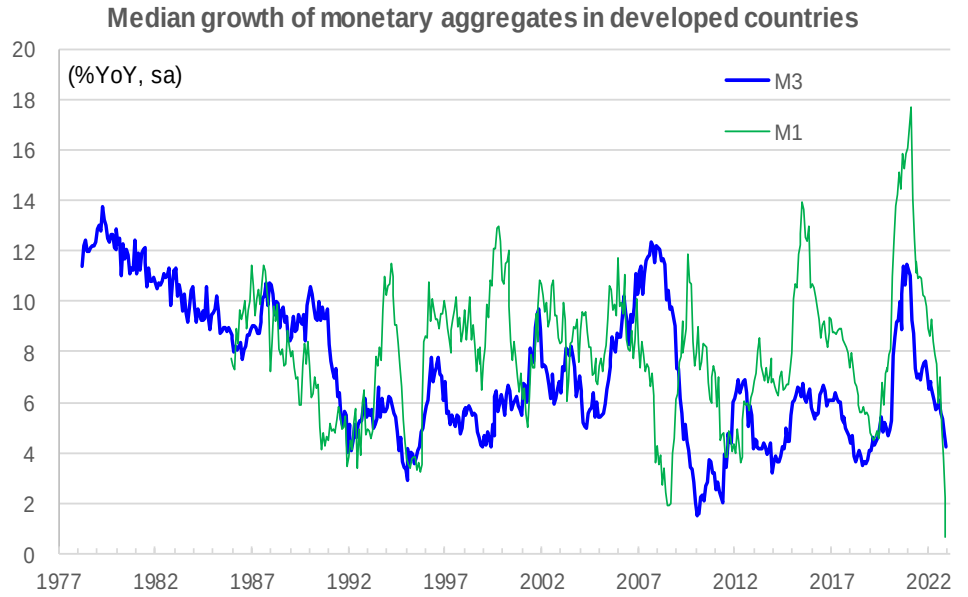
An upward deviation of money from the trend is ending following monetary tightening



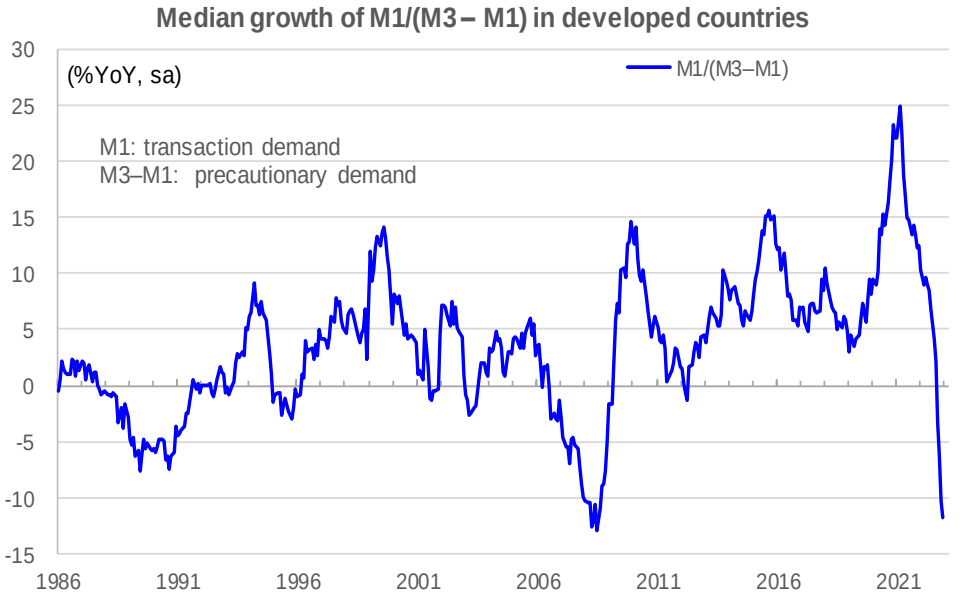
Sources: CEIC Database, national sources, SBI SECURITIES



Sources: CEIC Database, national sources, SBI SECURITIES

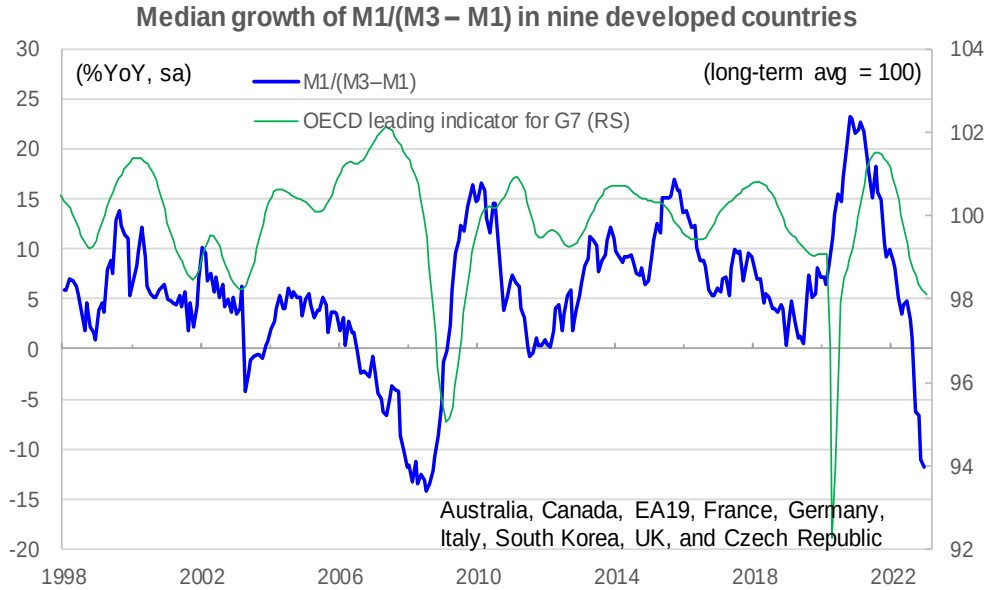


Sources: CEIC Database, national sources, SBI SECURITIES

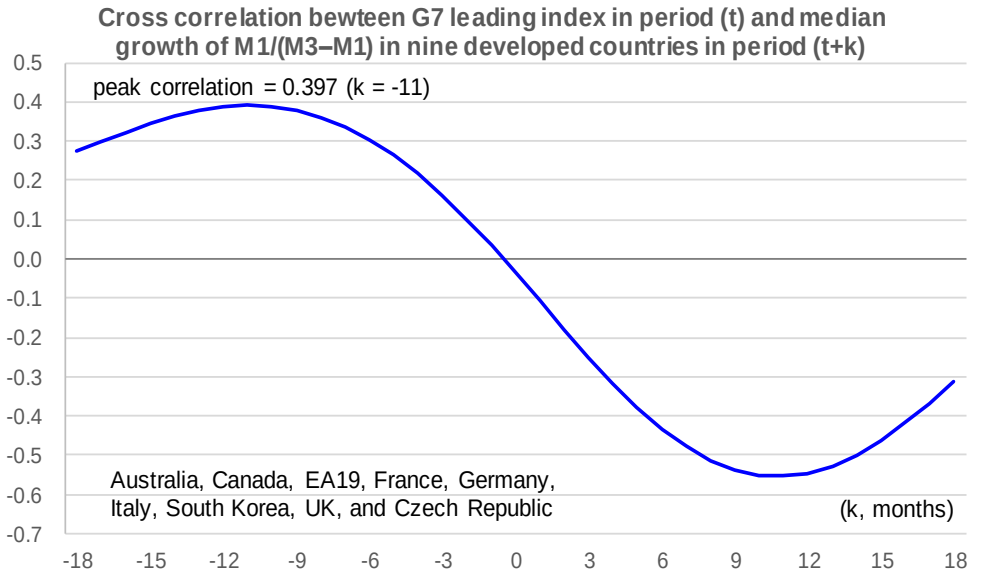


Sources: CEIC Database, national sources, SBI SECURITIES

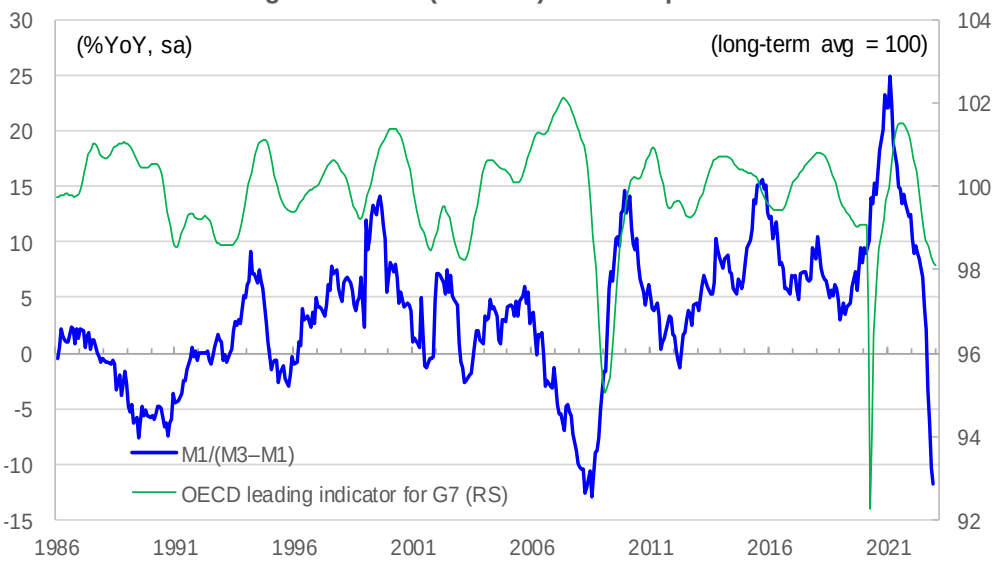
The YoY growth of M1/(M3–M1) precedes OECD leading indicators by 11–12 months



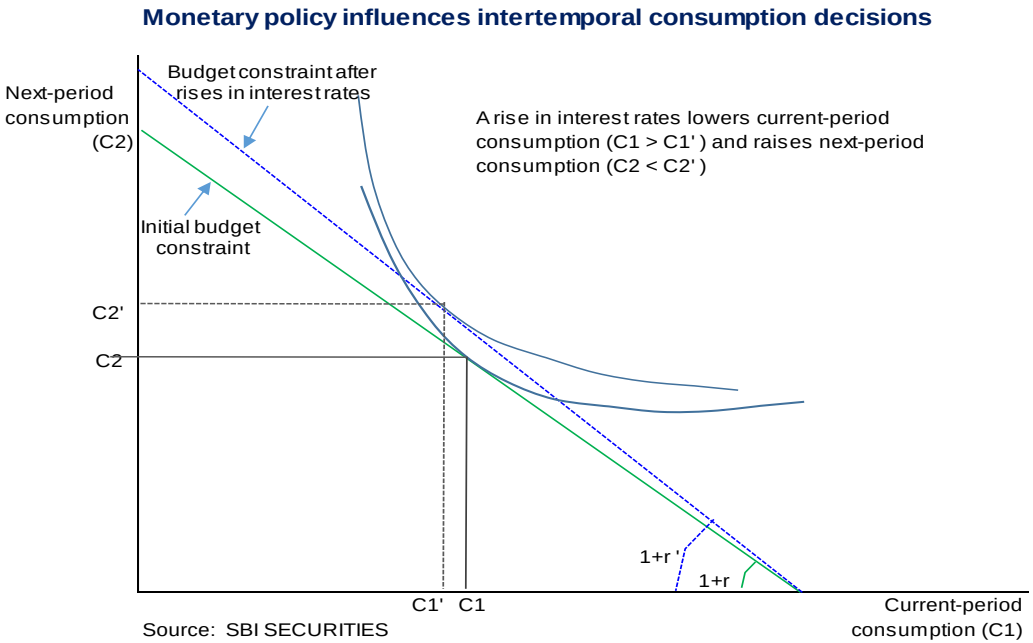
Sources: CEIC Database, national sources, SBI SECURITIES



Sources: CEIC Database, national sources, SBI SECURITIES

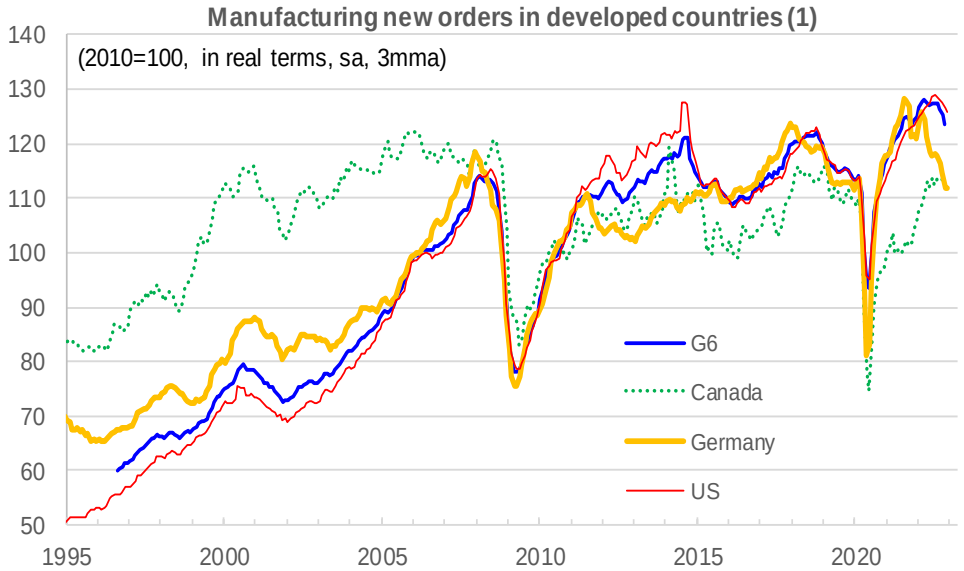


Sources: CEIC Database, national sources, SBI SECURITIES

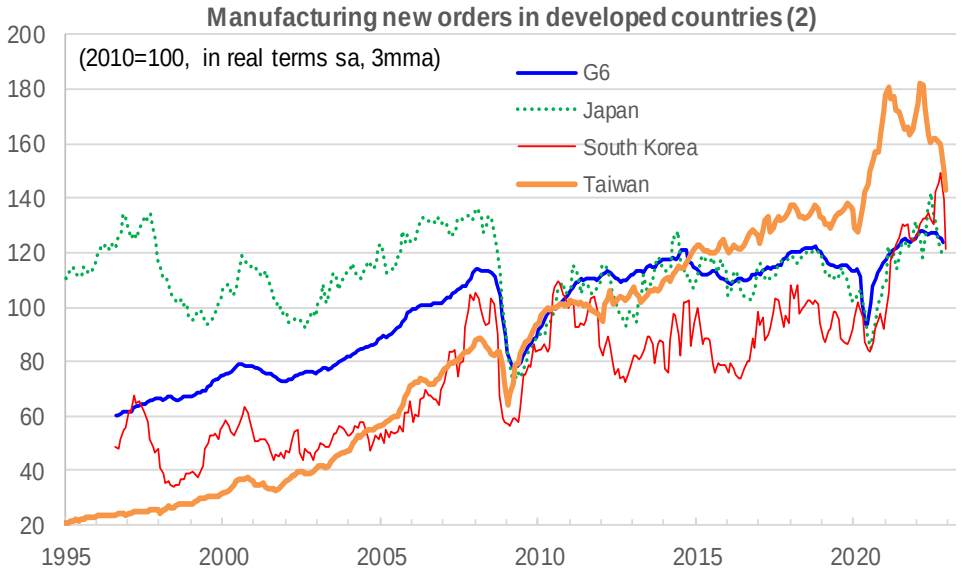


Source: SBI SECURITIES

Manufacturing new orders in developed countries



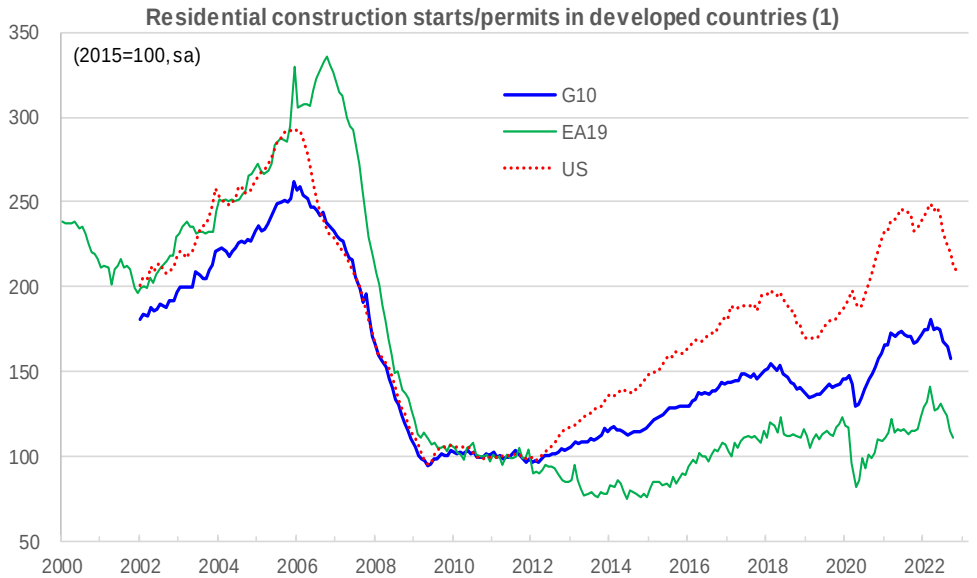
Note: G6 = Canada, Germany, Japan, South Korea, Taiwan, and the US. Average orders for 2015–2019 are used to calculate the weight for each country. Manufacturing new orders (Canada, Germany, and the US), total machinery orders (Japan), total machinery orders less vessels (South Korea), external orders (Taiwan). Sources: CEIC Database, SBI SECURITIES.



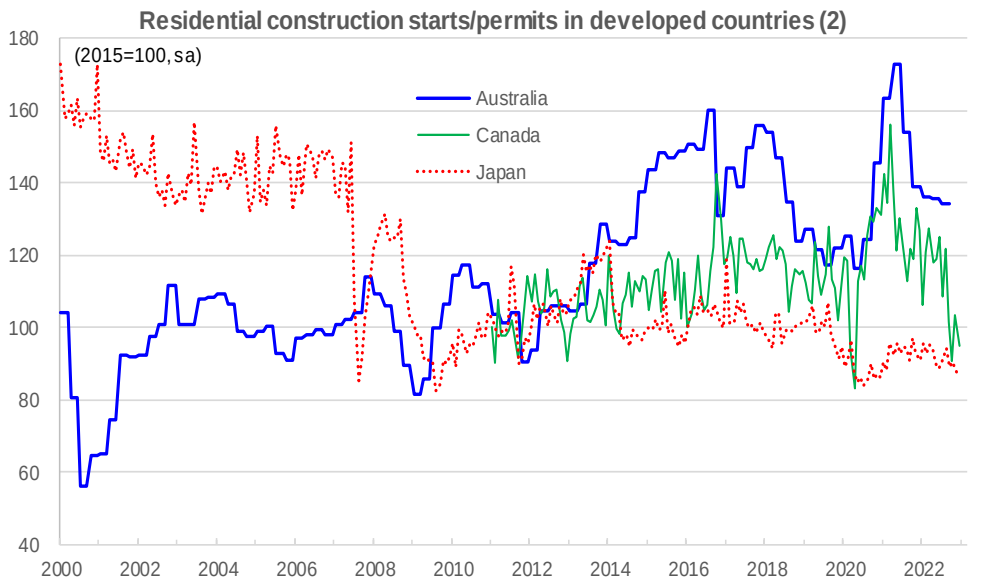
Note: G6 = Canada, Germany, Japan, South Korea, Taiwan, and the US. Average orders for 2015–2019 are used to calculate the weight for each country. Manufacturing new orders (Canada, Germany, and the US), total machinery orders (Japan), total machinery orders less vessels (South Korea), external orders (Taiwan). Sources: CEIC Database, SBI SECURITIES.

- Manufacturing orders, housing starts, nonresidential construction starts, and the vacancy rate in developed countries have started weakening, by varying degrees.

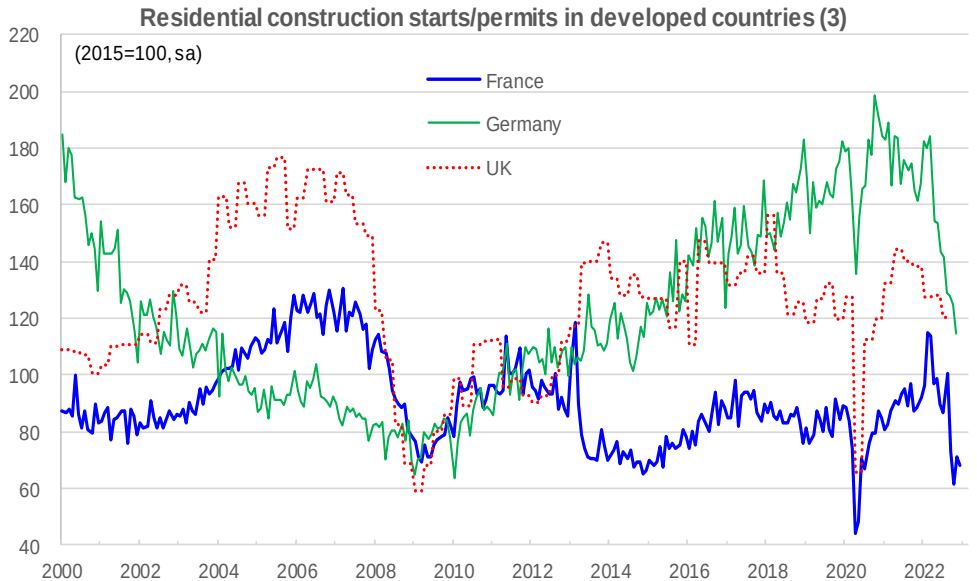
Residential construction starts/permits in developed countries



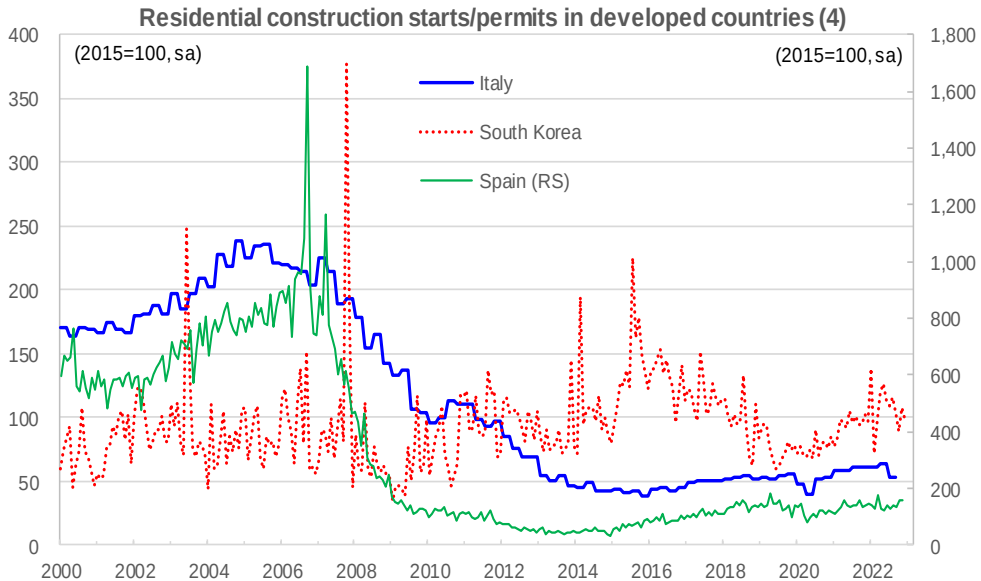
Notes: In constant prices or floor space terms. G10 = Australia, Canada, Japan, EA19, South Korea, the UK, and the US. Sources: CEIC Database, national sources, SBI SECURITIES.



Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

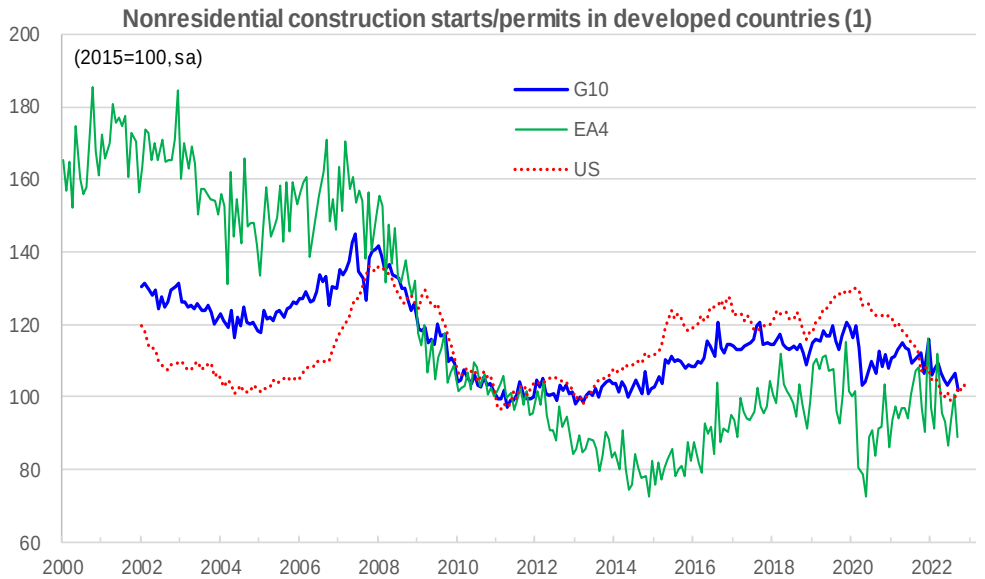


Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

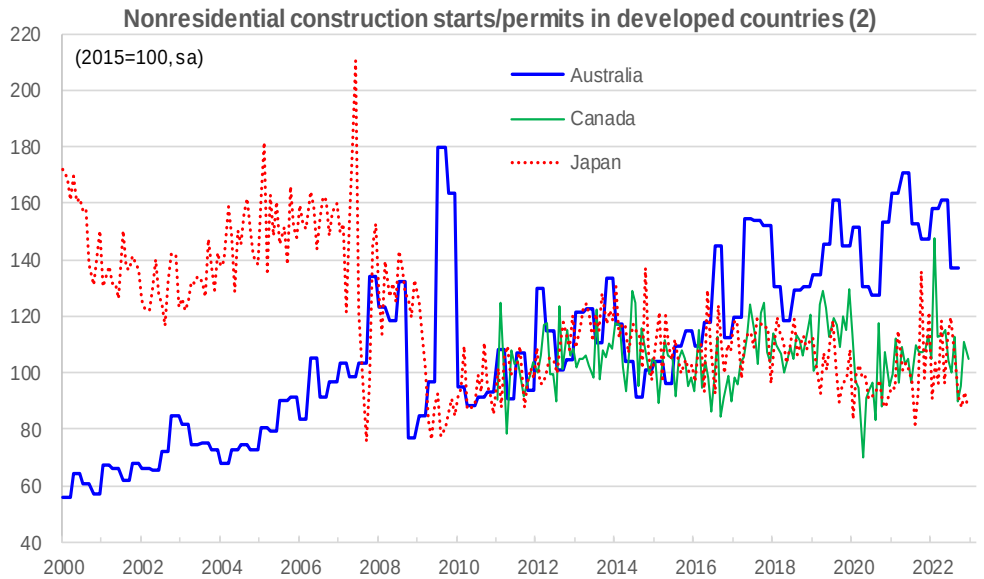


Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

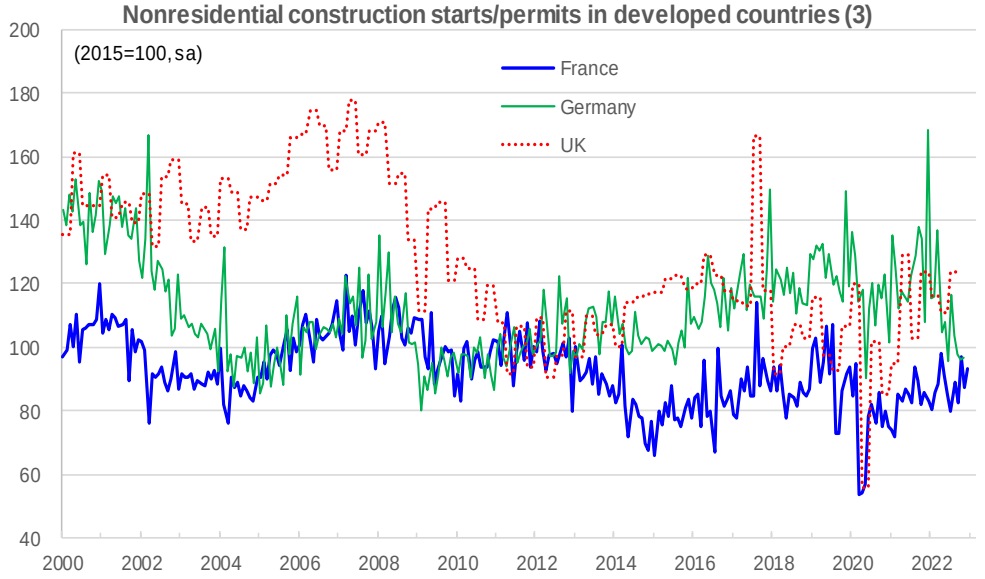
Nonresidential construction starts/permits in developed countries



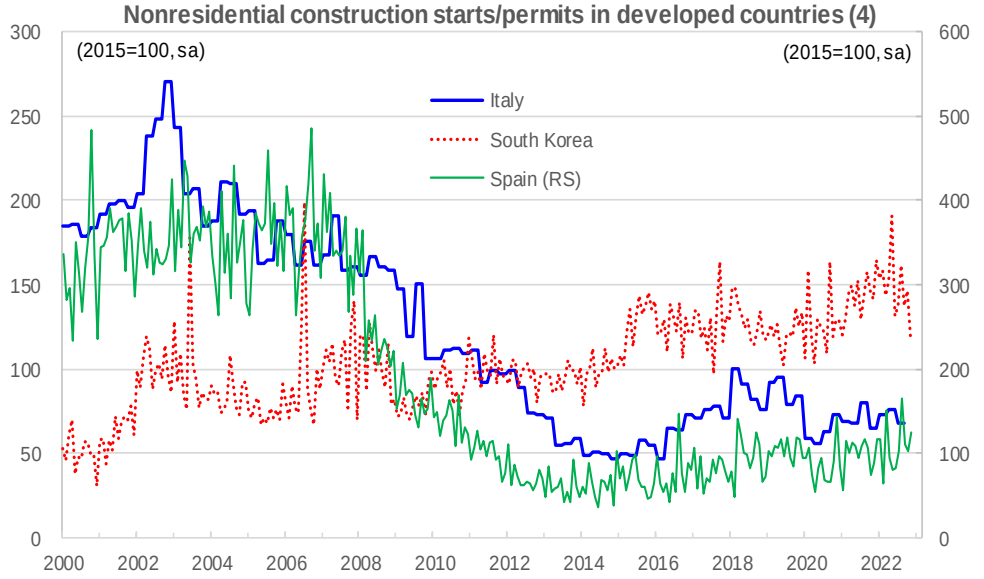
Notes: In constant prices or floor space terms. G10 = Australia, Canada, France, Germany, Italy, Japan, South Korea, Spain, the UK, and the US. Sources: CEIC Database, national sources, SBI SECURITIES.



Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

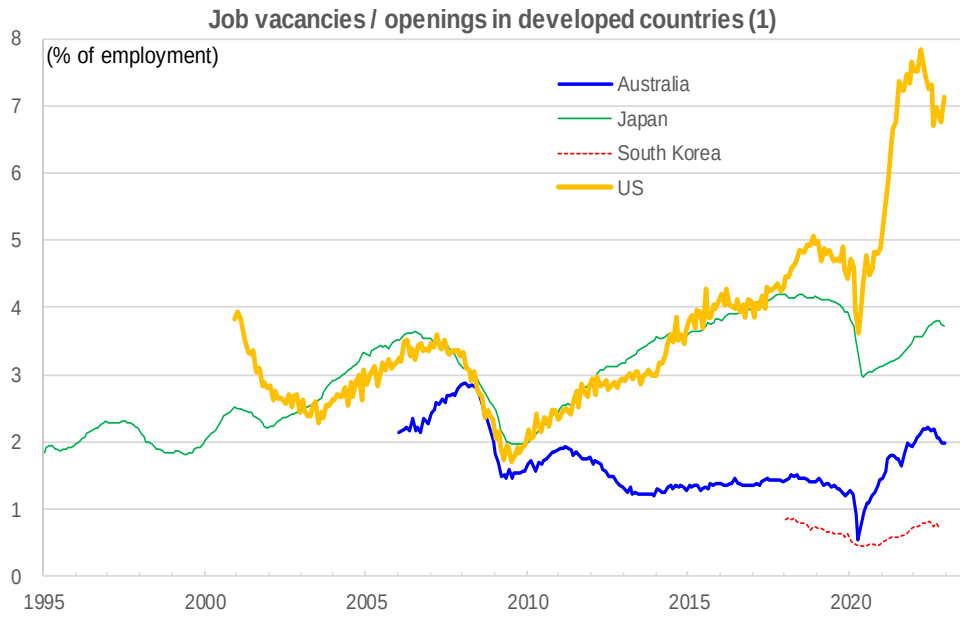


Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

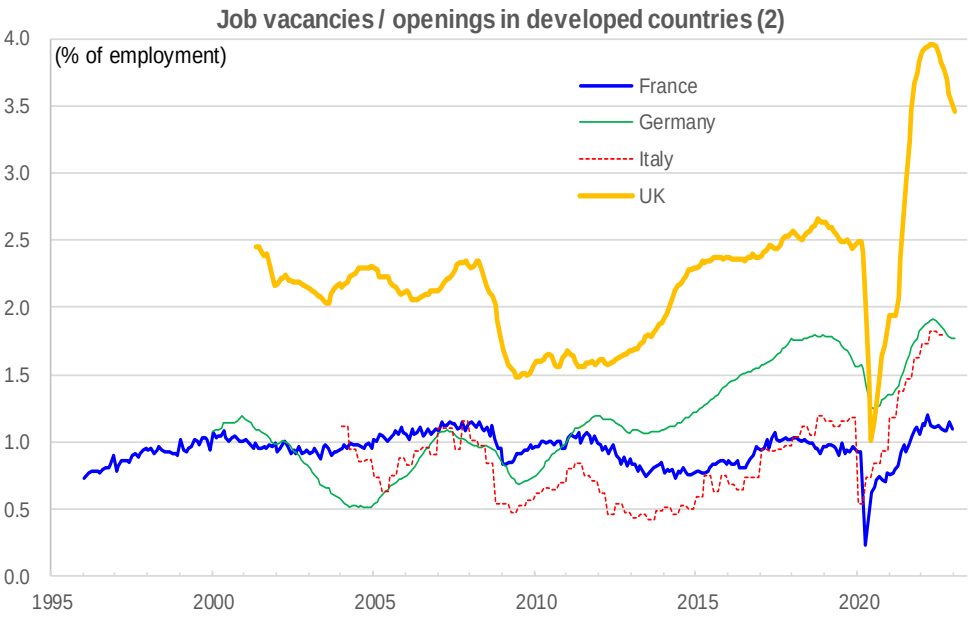


Note: In constant prices or floor space terms.
Sources: CEIC Database, national sources, SBI SECURITIES.

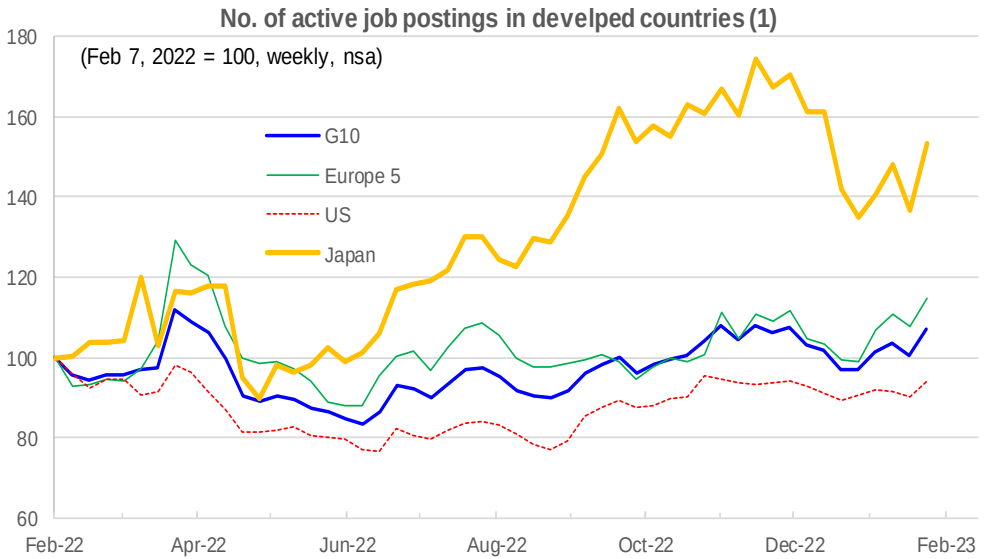
Vacancy rate and the number of job openings in developed countries



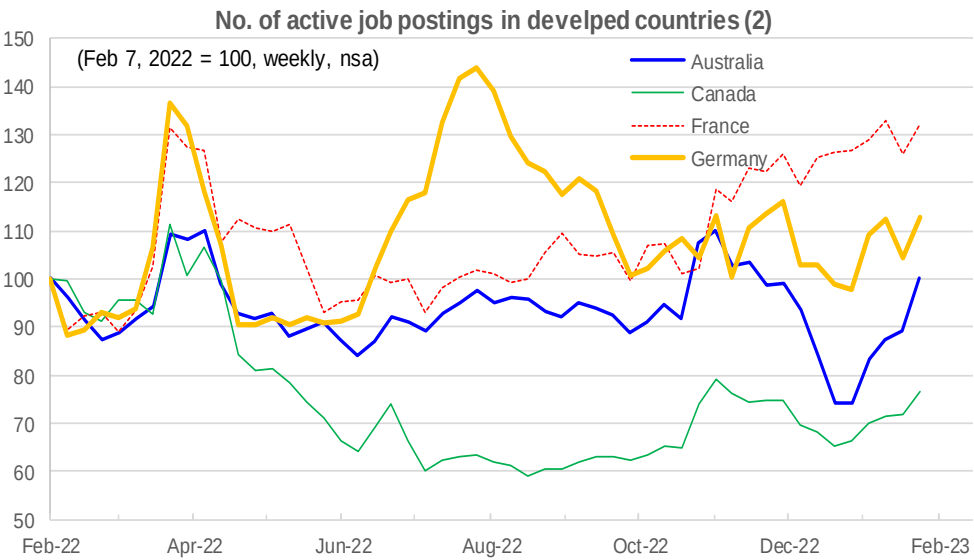
Sources: CEIC Database, SBI SECURITIES



Sources: CEIC Database, SBI SECURITIES

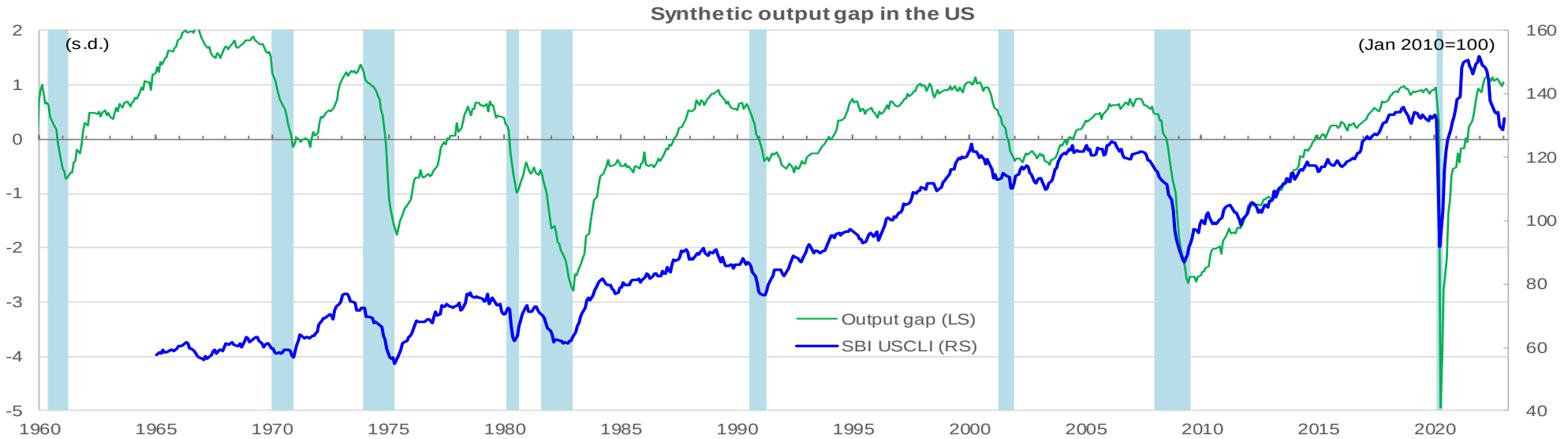


Sources: CEIC Database, Revelio Labs, Inc., SBI SECURITIES

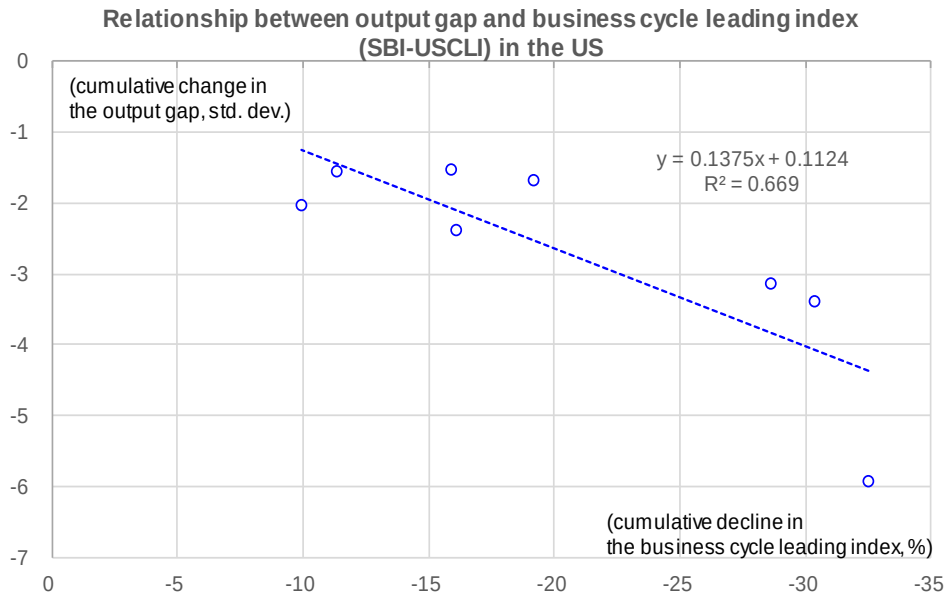


Sources: CEIC Database, Revelio Labs, Inc., SBI SECURITIES

Relationship between output gap and business cycle leading index



Note: The output gap = -0.67 x normalized unemployment rate + 0.33 x normalized manufacturing capacity utilization rate.
Sources: Federal Reserve, US BLS, CEIC Database, SBI SECURITIES



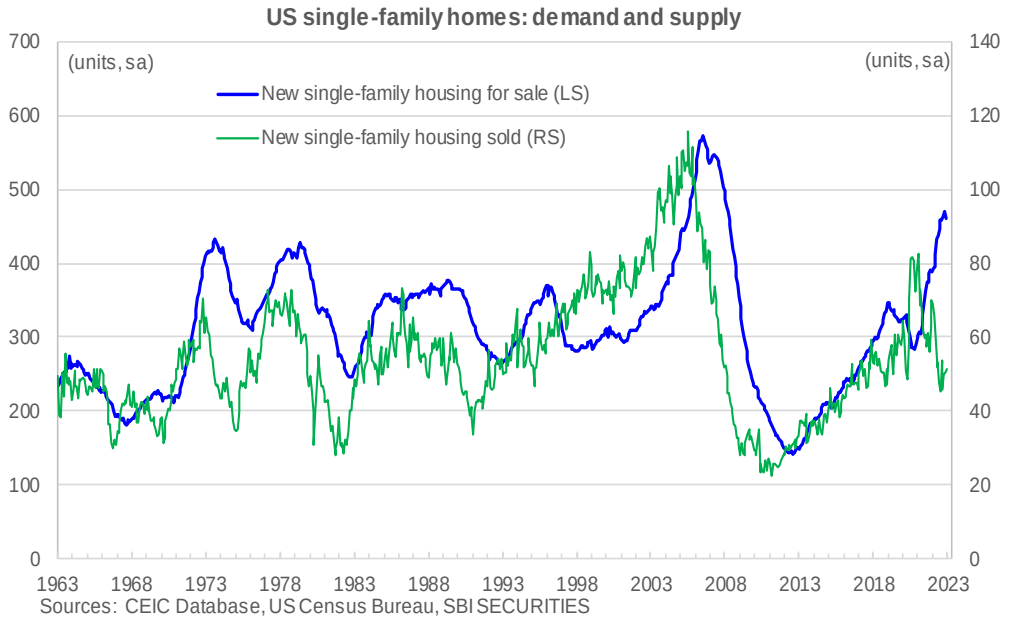
Note: The output gap = -0.67 x normalized unemployment rate + 0.33 x normalized manufacturing capacity utilization rate. Sources: Federal Reserve, US BLS, CEIC Database, SBI SECURITIES

Comparison of the change in the output gap and the business cycle leading index in the US

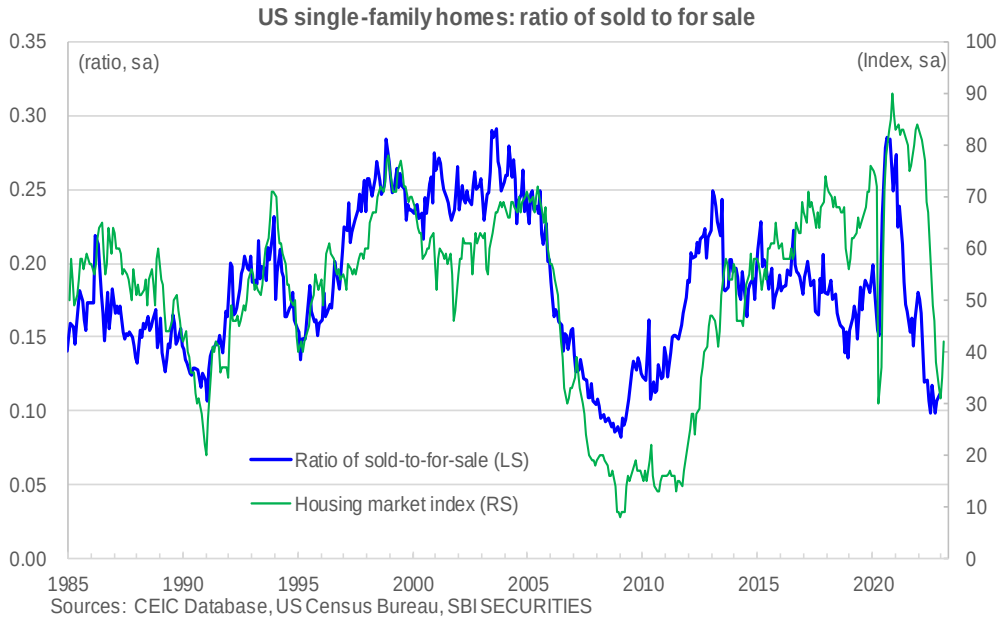
Peak	Trough	Duration (peak to trough) (months)	Change in the output gap (s.d.) (s.d.)	Change in the leading index (SBI-USCLI) (%)
November 1948	October 1949	11	-2.77	n.a.
July 1953	May 1954	10	-2.46	n.a.
August 1957	April 1958	8	-2.74	n.a.
April 1960	February 1961	10	-1.74	n.a.
December 1969	November 1970	11	-2.04	-9.9
November 1973	March 1975	16	-3.14	-28.6
January 1980	July 1980	6	-1.68	-19.2
July 1981	November 1982	16	-2.37	-16.1
July 1990	March 1991	8	-1.52	-15.9
March 2001	November 2001	8	-1.55	-11.3
December 2007	June 2009	18	-3.40	-30.3
February 2020	April 2020	2	-5.93	-32.5
Ongoing	Ongoing	--	-0.16	-15.4
Average			-2.42	-19.9

Note: 1 s.d. (unemployment rate) = 1.59%; 1 s.d. (capacity utilization rate) = 4.14%
Output gap = -0.67 x normalized unemployment rate + 0.33 x normalized manufacturing capacity utilization rate.
Sources: Federal Reserve, US BLS, CEIC Database, SBI SECURITIES

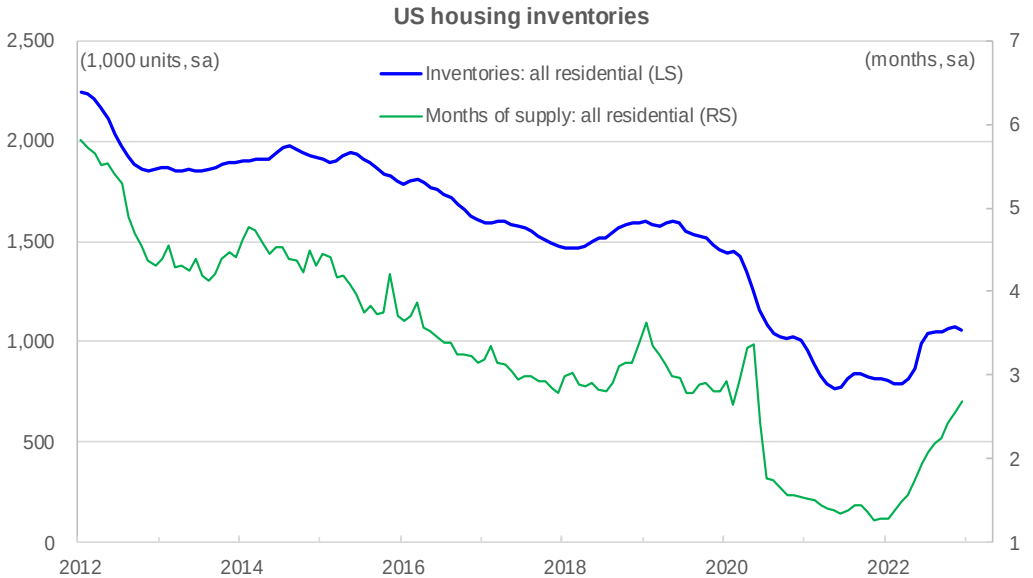
Green shoots for the US economy? (1)



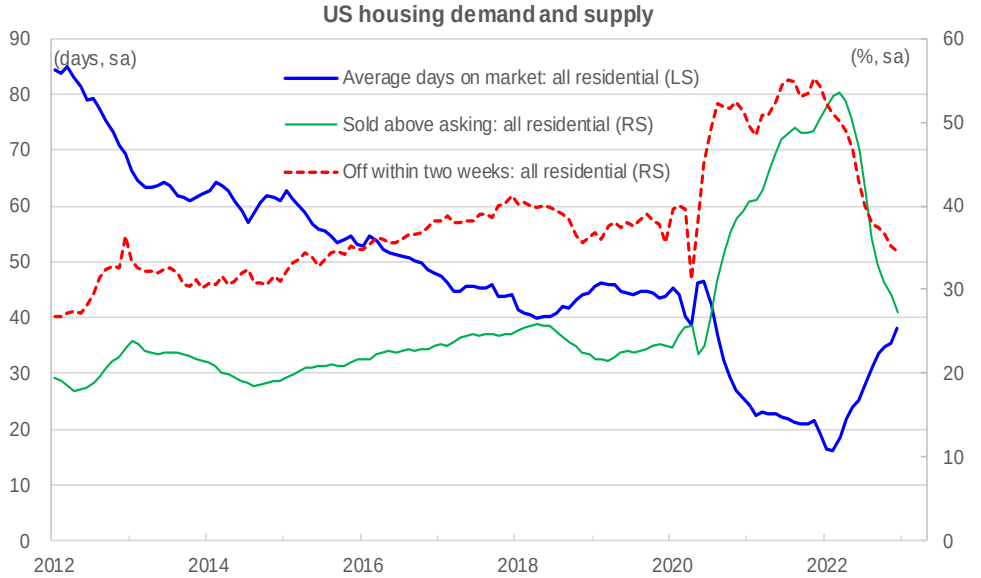
Sources: CEIC Database, US Census Bureau, SBI SECURITIES



Sources: CEIC Database, US Census Bureau, SBI SECURITIES



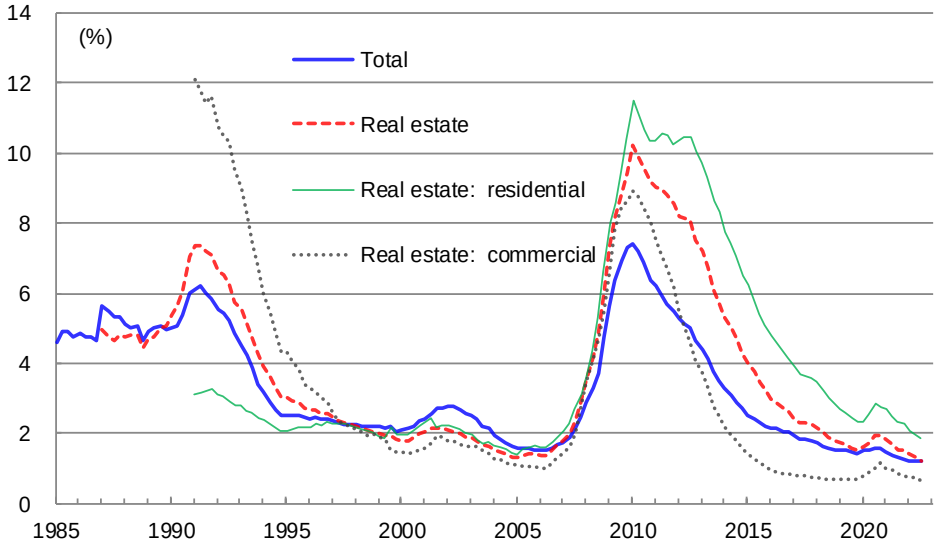
Sources: CEIC Database, Redfin, SBI SECURITIES



Sources: CEIC Database, Redfin, SBI SECURITIES

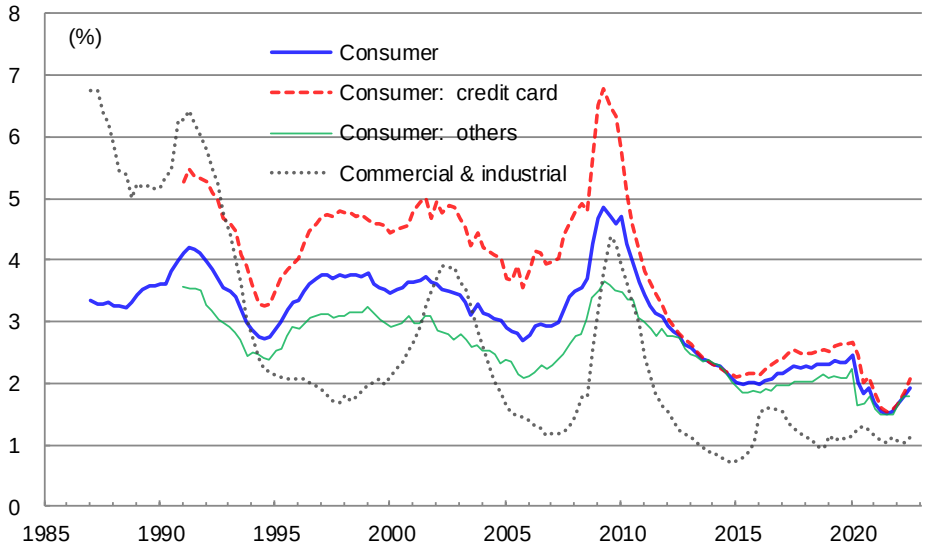
Green shoots for the US economy? (2)

Loan delinquency rate in the US (1)



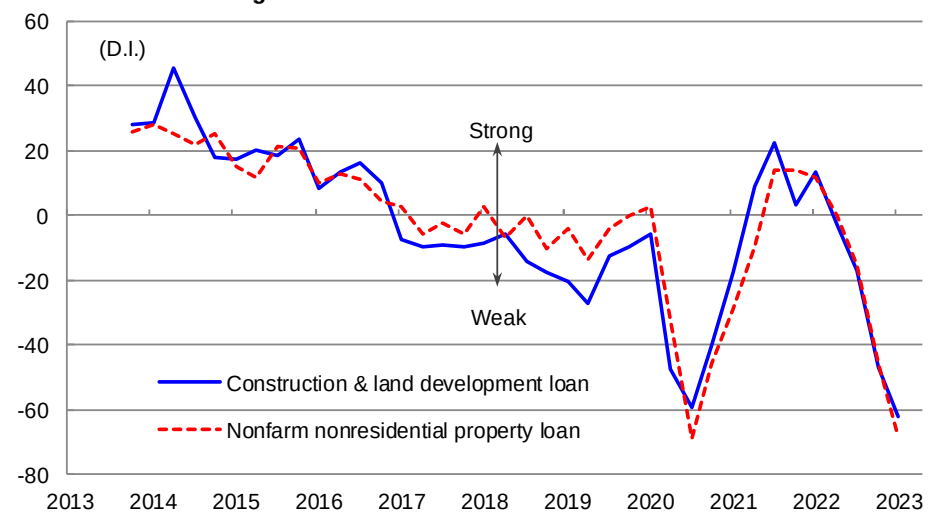
Sources: Federal Reserve, CEIC Database, SBI SECURITIES

Loan delinquency rate in the US (2)



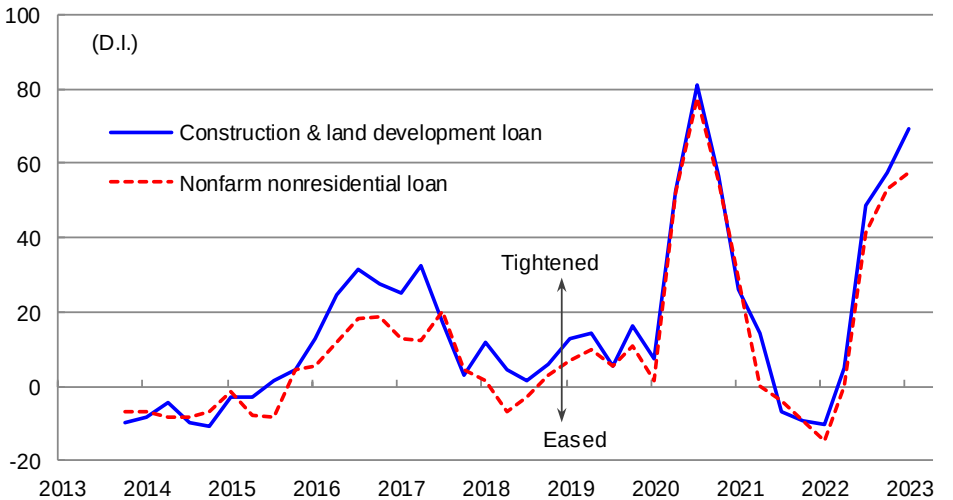
Sources: Federal Reserve, CEIC Database, SBI SECURITIES

Judgment on loan demand for real estate loan



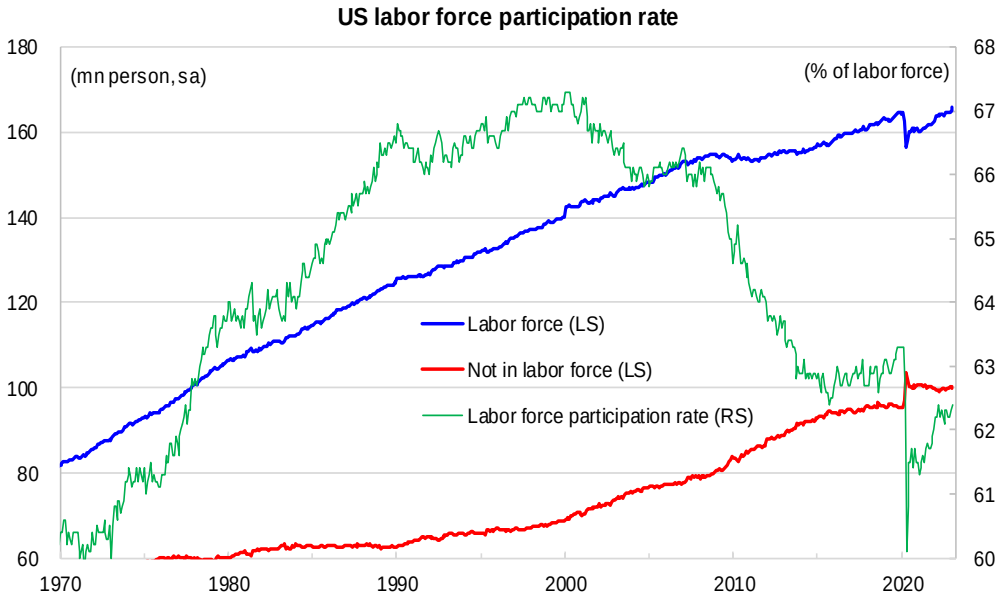
Sources: Federal Reserve, CEIC Database, SBI SECURITIES

Tightening lending standard for real estate loans in the US

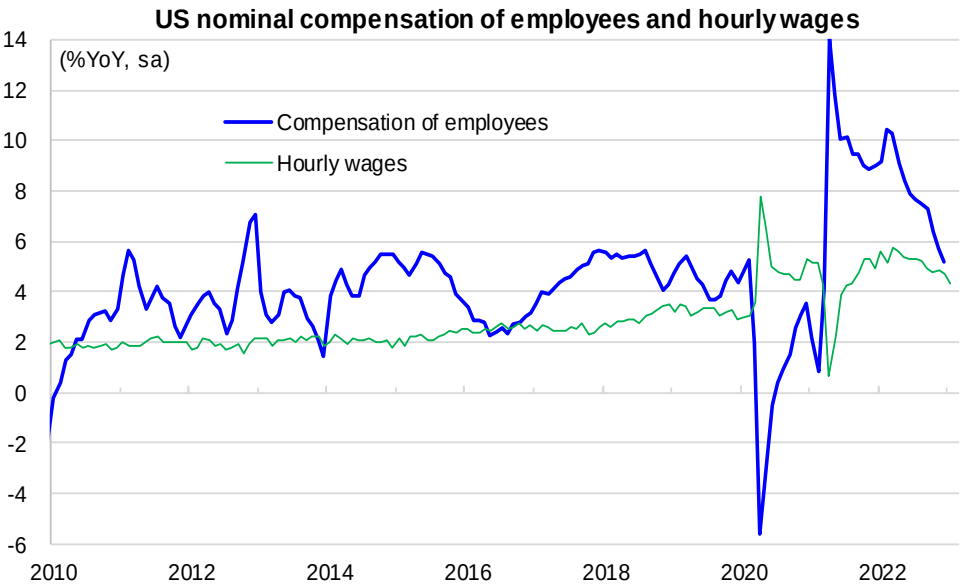


Sources: Federal Reserve, CEIC Database, SBI SECURITIES

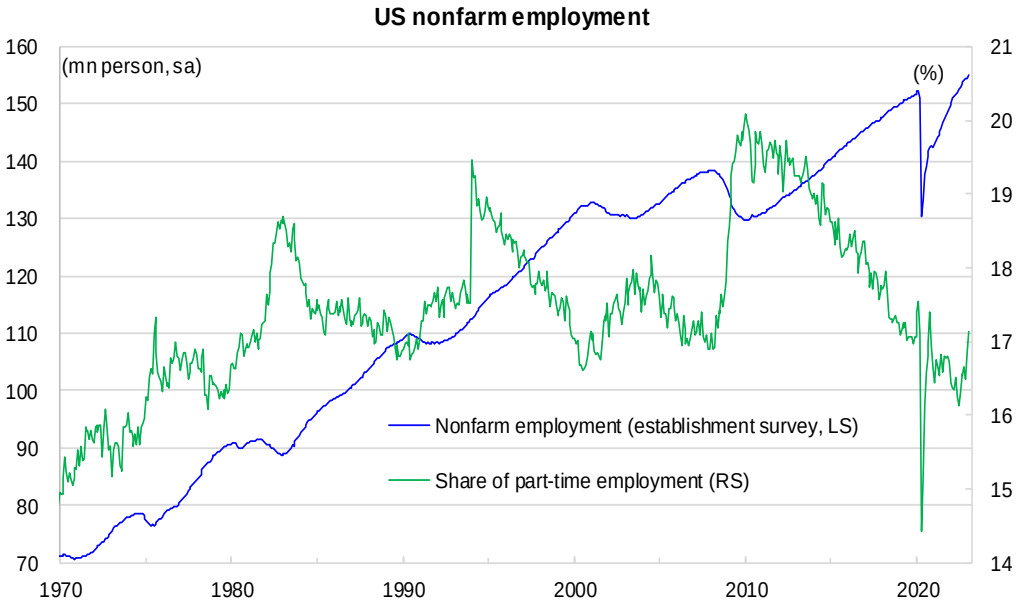
US labor market continue to ease



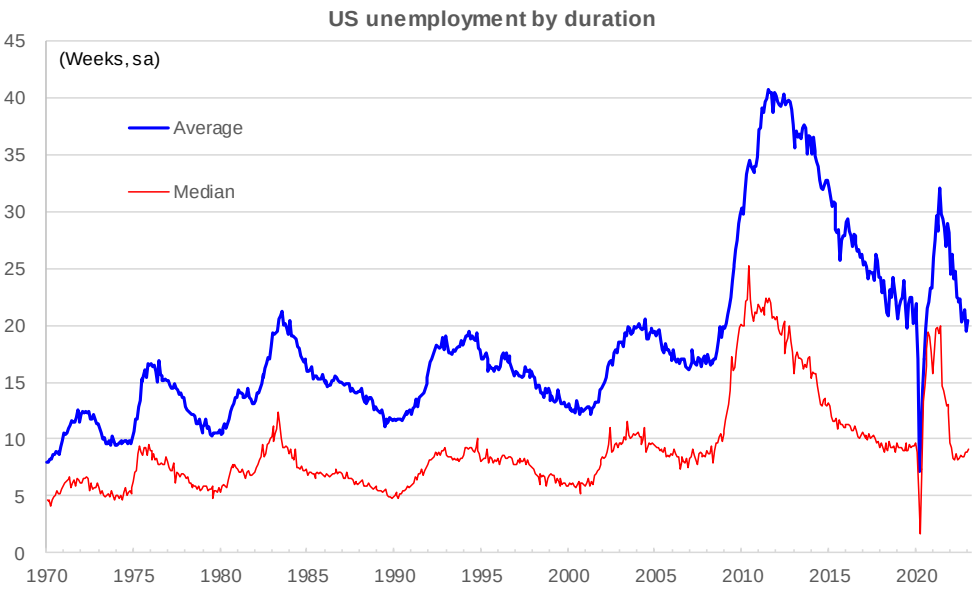
Sources: CEIC Database, US BLS, SBI SECURITIES.



Sources: CEIC Database, US BEA, US BLS, SBI SECURITIES

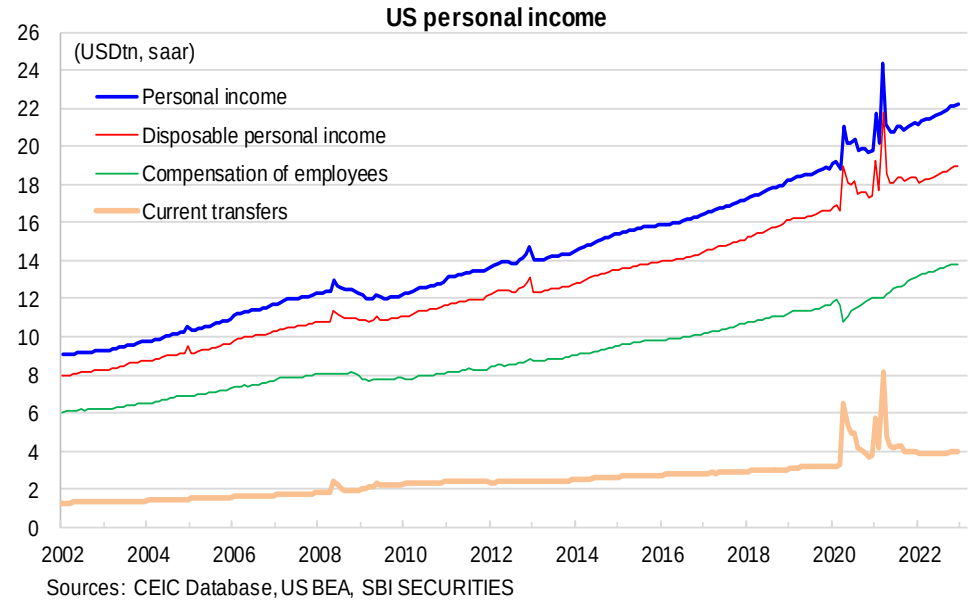


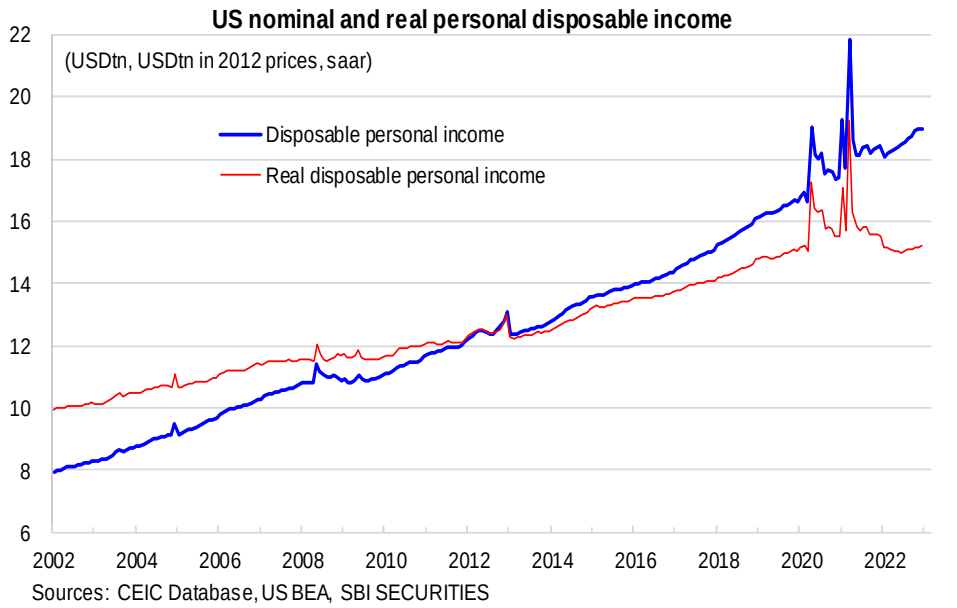
Sources: CEIC Database, US BLS, SBI SECURITIES.

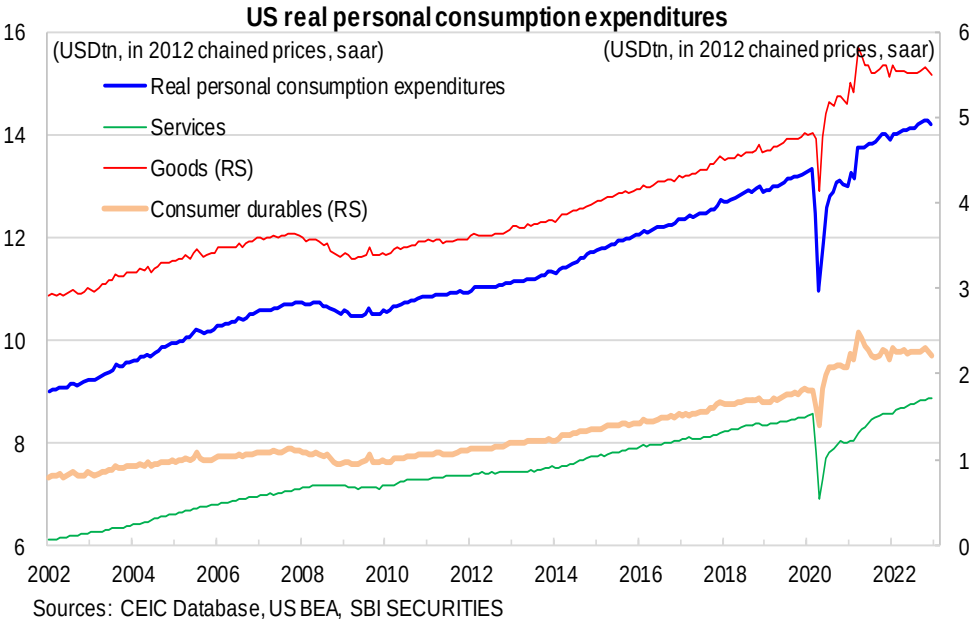


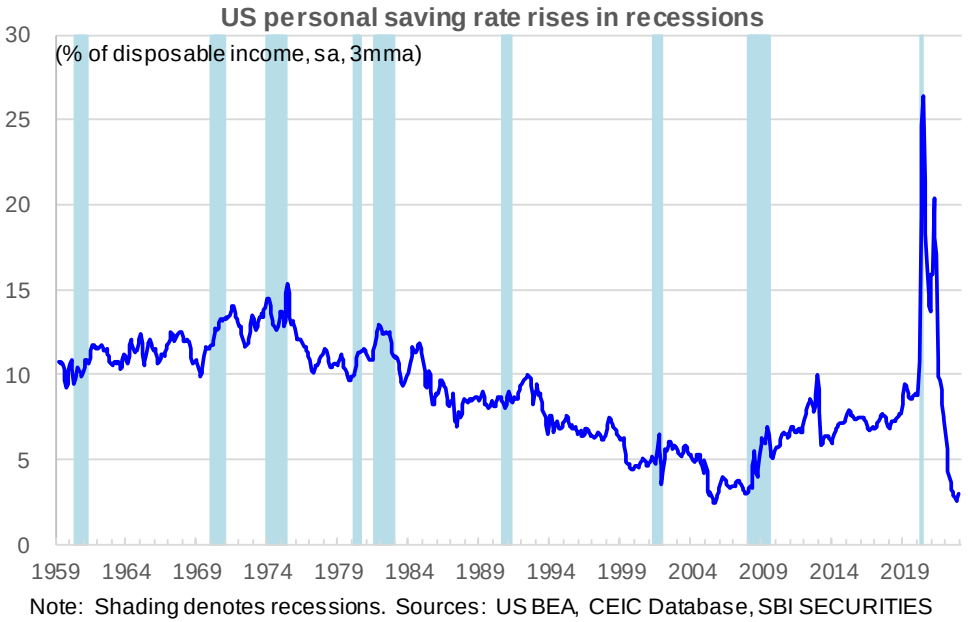
Sources: CEIC Database, US BLS, SBI SECURITIES

Stagnant real disposable income and goods consumption in the US









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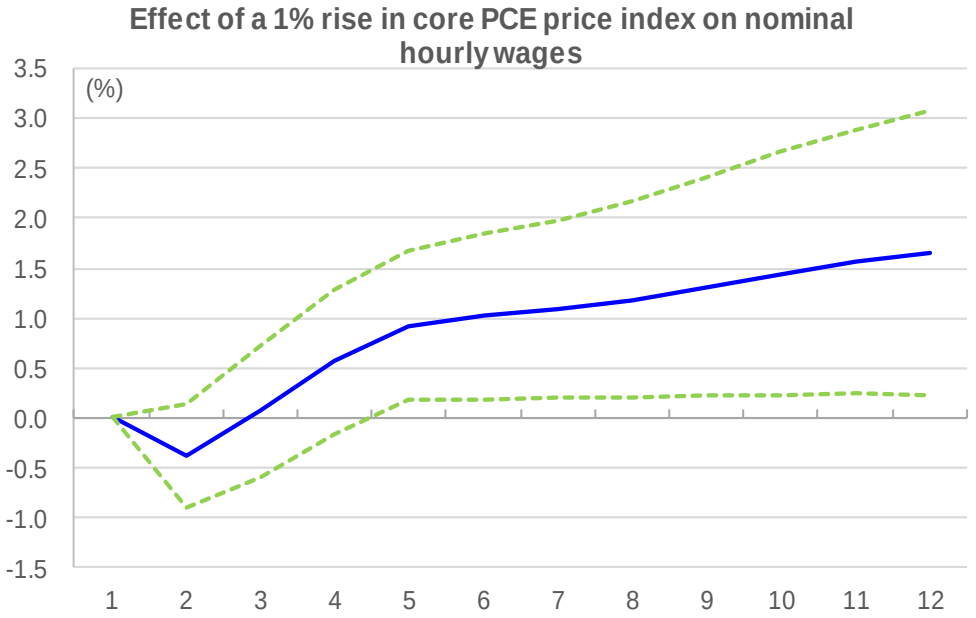
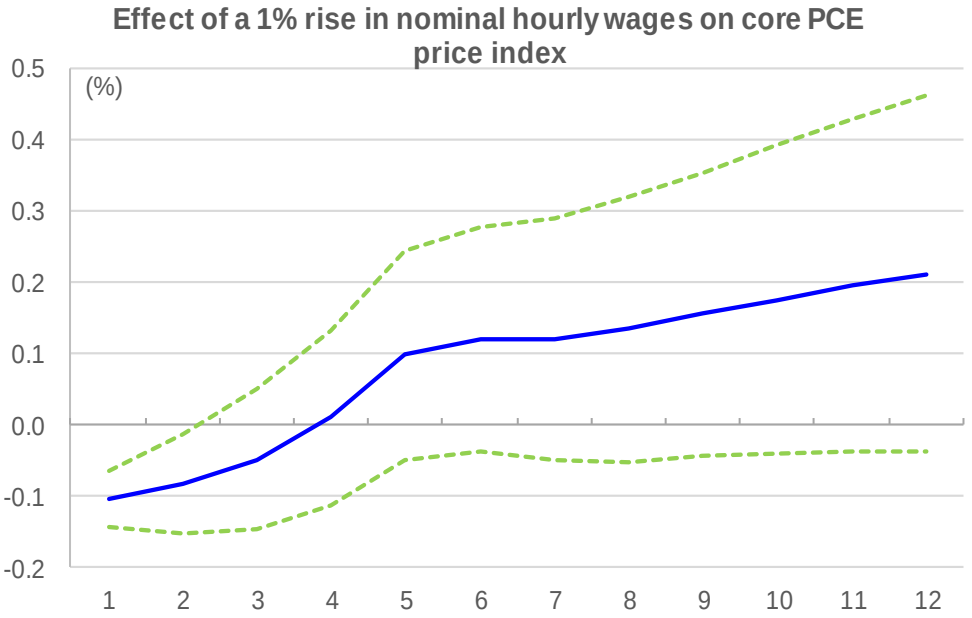
Price-wage spiral unlikely to materialize





Notes: Results from two-variable vector autoregression including nominal hourly wages and core PCE price index (excluding food and energy).
Lag length is set to four. Sample period: August 2006 – February 2022.
A solid center line is the average response. The dotted lines indicate a confidence interval with ± 2 standard errors.
Sources: CEIC Database, US BEA, US BLS, SBI SECURITIES

- Causality runs from prices to wages with a high sensitivity. However, the sensitivity of the reverse causality from wages to prices is low.
- Hourly wage growth has been slowing since its peak in November 2021.

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Effects of US monetary policy normalization on 10-year bond yield

Factors influencing US 10-year bond yield

Explanatory variables:		3-month rate (FF rate, %)	Fed's total assets (% of GDP)	Core CPI inflation (%)	Total
Parameters					
Case 1	US only	0.180	-0.066	0.108	
	OLS estimates	n.a.	-0.084	n.a.	
		0.428	n.a.	n.a.	
		0.525	-0.033	0.188	
	Average (1)	0.377	-0.061	0.148	
Case 2	US only	0.572	n.a.	n.a.	
	VAR estimates				
Case 3	Developed countries	0.303	n.a.	0.218	
	Panel estimates	0.550	-0.017	0.231	
		0.596	-0.014	0.159	
		0.684	-0.015	0.159	
	Average (2)	0.533	-0.015	0.192	
Case 4	Developed countries	n.a.	-0.065	n.a.	
	VAR estimates				
Average of parameters (A; Cases 1–4)		0.494	-0.047	0.170	
Assumed changes in explanatory variables (B)					
Assumption #B1	Fed Funds rate at 5.25%, Fed's balance sheet to fall by $2.3t, core CPI inflation to rise by 4.0ppt				
	(bps)	500		400	
	(USDbn)		-2,300		
	(% of GDP)		-9.2		
Effects on US 10-year yield (A x B1, bps)		**247**	**43**	**68**	**358**
	Excluding the effect from the central bank's balance sheet				**315**
Assumption #B2	Fed Funds rate at 3.25%, Fed's balance sheet to fall by $2.3t, core CPI inflation to fall by 3.3ppt from its peak (6.3%)				
	(bps)	-200		-330	
	(USDbn)		-2,300		
	(% of GDP)		-9.2		
Effects on US 10-year yield (A x B2, bps)		**-99**	**43**	**-56**	**-112**
	Excluding the effect from the central bank's balance sheet				**-155**

Note: Parameters that are not statistically significant are excluded.
The base period is set in 3Q 2021 (Fed Funds rate at 0.25%, Fed's balance sheet at $8.3t, and core CPI inflation at 2.3% YoY, and 10-year bond yield at 1.79%)
Sources: CEIC Database, national sources, SBI SECURITIES.

1) The US 10-year yield could fall by 155bps with a 200bps decline in the Fed Funds rate and a 3.3ppt decline in core CPI inflation.

2) It is not surprising even if the US 10-year yield to fall below 3% in 2023.

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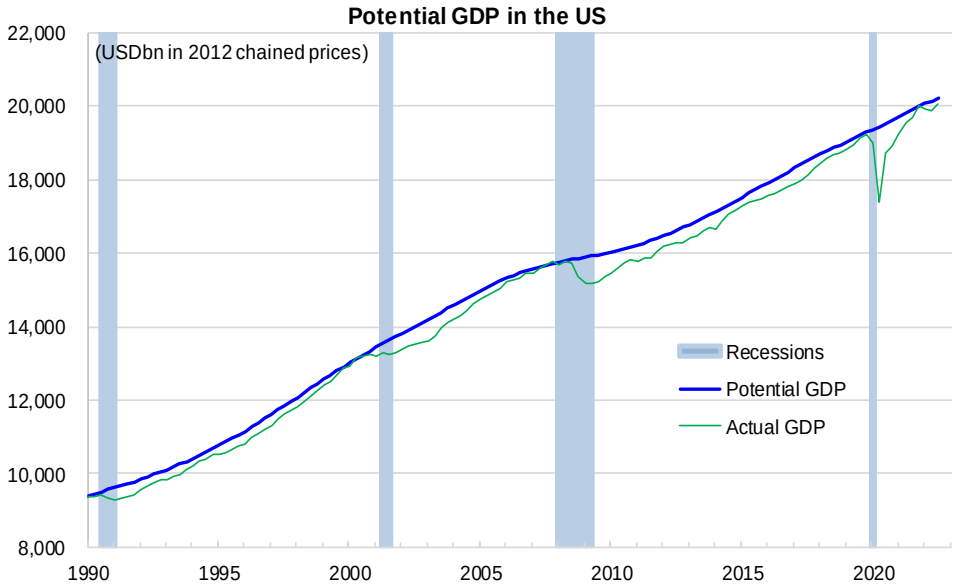
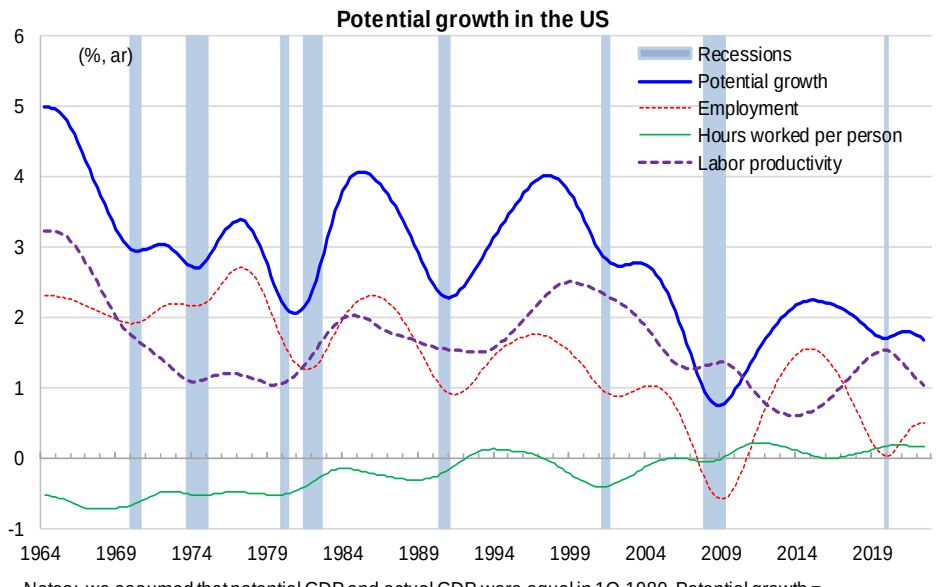
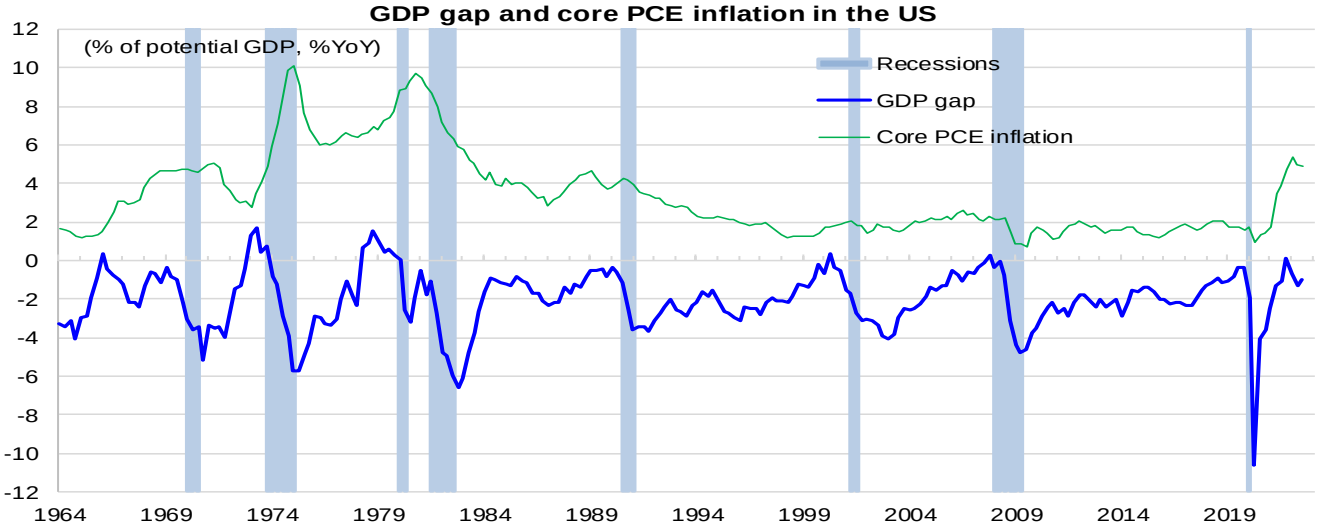
US potential GDP and its growth rate



Notes: we assumed that potential GDP and actual GDP were equal in 1Q 1980. Potential growth = employment growth + growth in hours worked per person + labor productivity growth Shading denotes recessions.
Sources: CEIC Database. US BEA. US BLS. CBO. NBER. SBI SECURITIES



Notes: we assumed that potential GDP and actual GDP were equal in 1Q 1980. Potential growth = employment growth + growth in hours worked per person + labor productivity growth. Shading denotes recessions.
Sources: CEIC Database, US BEA, US BLS, NBER, SBI SECURITIES

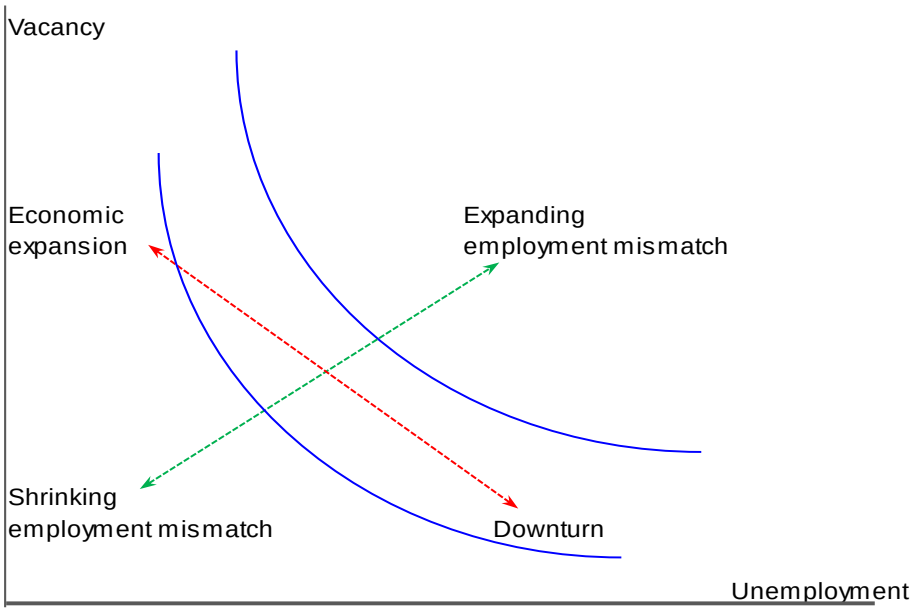


Note: GDP gap = (actual GDP - potential GDP) / potential GDP. Shading denotes recessions.
Sources: CEIC Database, US BEA, US BLS, NBER, SBI SECURITIES

Reallocation shock and employment mismatch (1)

1. The pandemic induced a reallocation shock which forces shifts of factor inputs (labor, capital, and technology) through the shift in demand across industries (this trend has been in place over the last 10–15 years with the progress in information technology and automation, but has been accelerated by the COVID-19 shock).
2. The relationship between labor and capital is changing from complements to substitutes.
3. Industries facing a permanent decline in demand tend to be labor-intensive. Industries facing a permanent increase in demand tend to be labor-replacing. This lowers the ability of labor-intensive industries to create jobs and brings down the labor force participation rate.
4. A reallocation shock accompanies 1) an expansion in employment mismatch, 2) a rise in the natural unemployment rate, 3) a decline in the potential growth, and 4) an expansion in the dispersion of stock price returns across industries.
5. During this transition, the supply side cannot catch up with the speed of the shift of demand across industries, resulting in disequilibrium between supply and demand.
6. In goods and services markets and the labor market where demand exceeds supply, upward forces on prices and wages are likely to emerge.
7. However, higher wage growth in industries where demand has permanently declined is unlikely to be sustained.

Beveridge curve (UV curve)



Sources: SBI SECURITIES.

- Beveridge curve (or UV curve): the vacancy rate on the vertical axis and the unemployment rate on the horizontal axis. A shift of the Beveridge curve towards the top-right indicates an expanding employment mismatch while a shift towards the origin indicates a narrowing employment mismatch.

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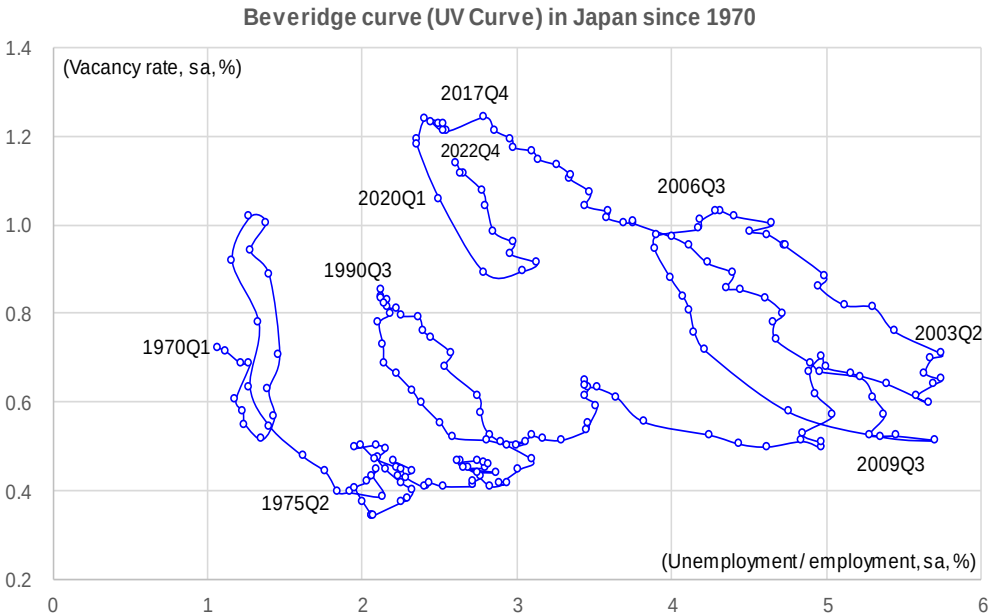
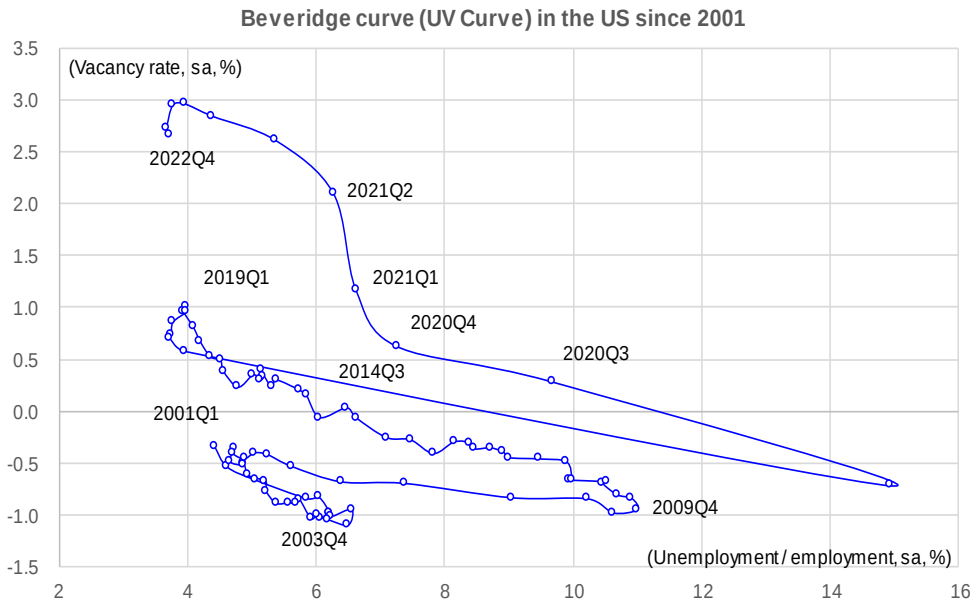
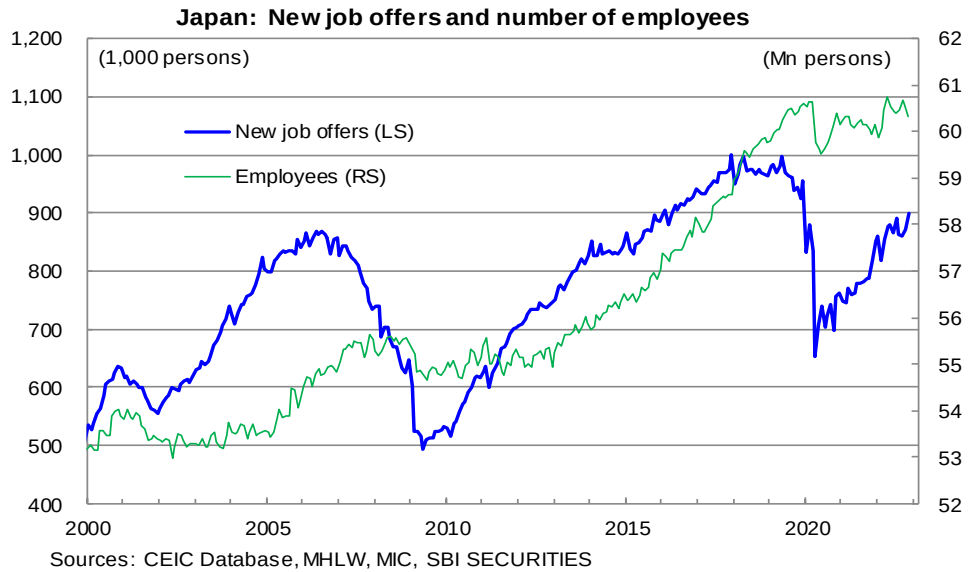
Reallocation shock and employment mismatch (2)



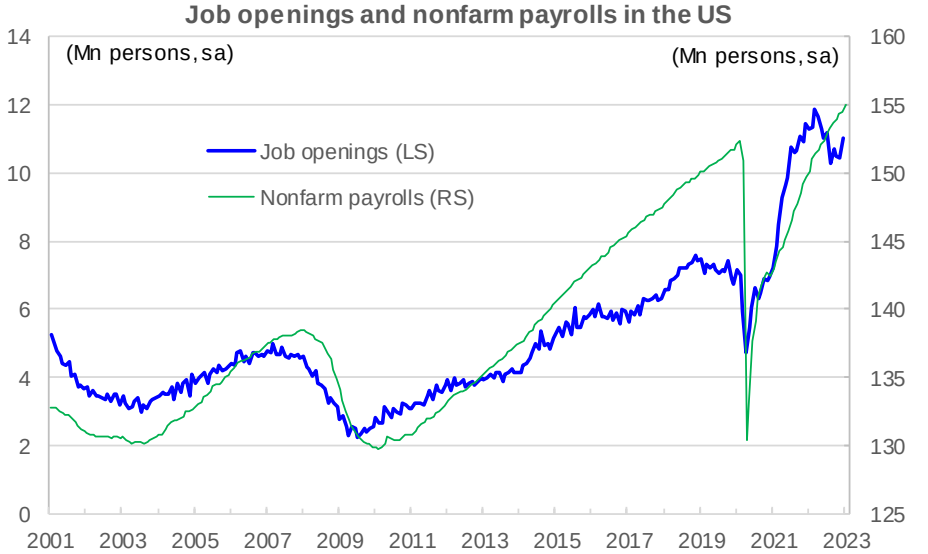
Note: Vacancy rate = (new job offers - jobs filled) / labor force. Sources: CEIC Database, MHLW, SBI SECURITIES.



Note: Vacancy rate = (job openings - hires) / labor force. Sources: CEIC Database, US BLS, SBI SECURITIES.

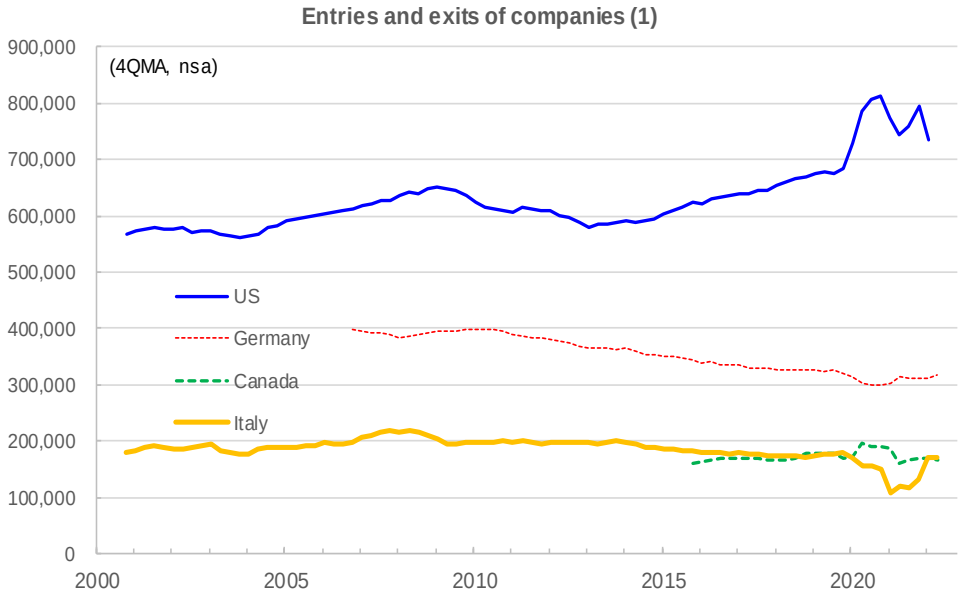


Sources: CEIC Database, MHLW, MIC, SBI SECURITIES

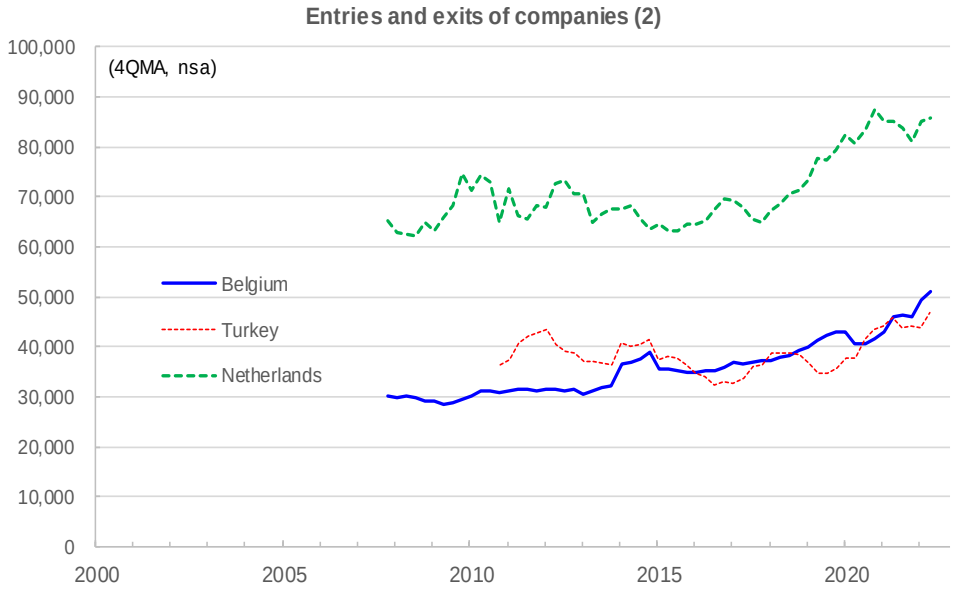


Sources: CEIC Database, US BLS, SBI SECURITIES

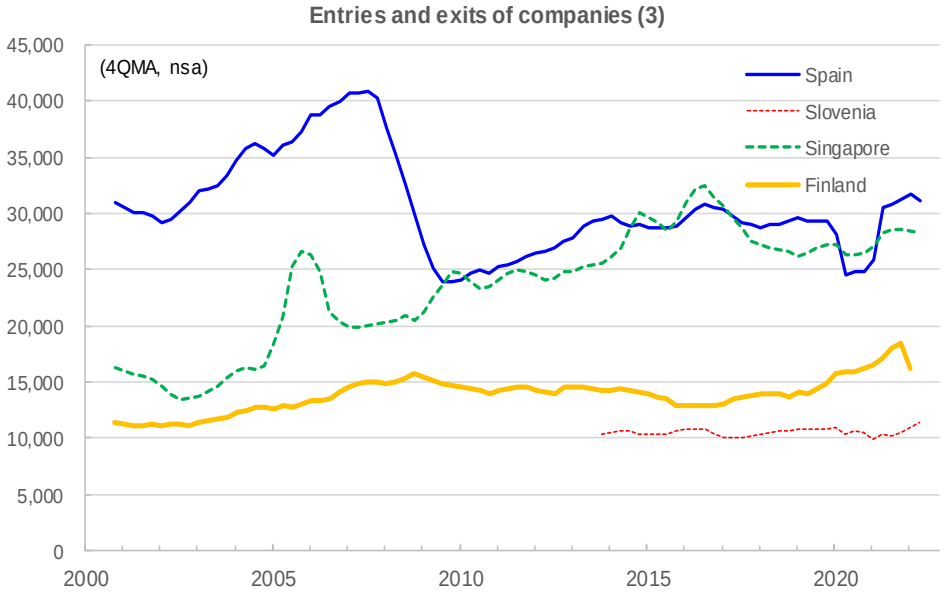
Reallocation shock simultaneously induces new entries and exits of companies



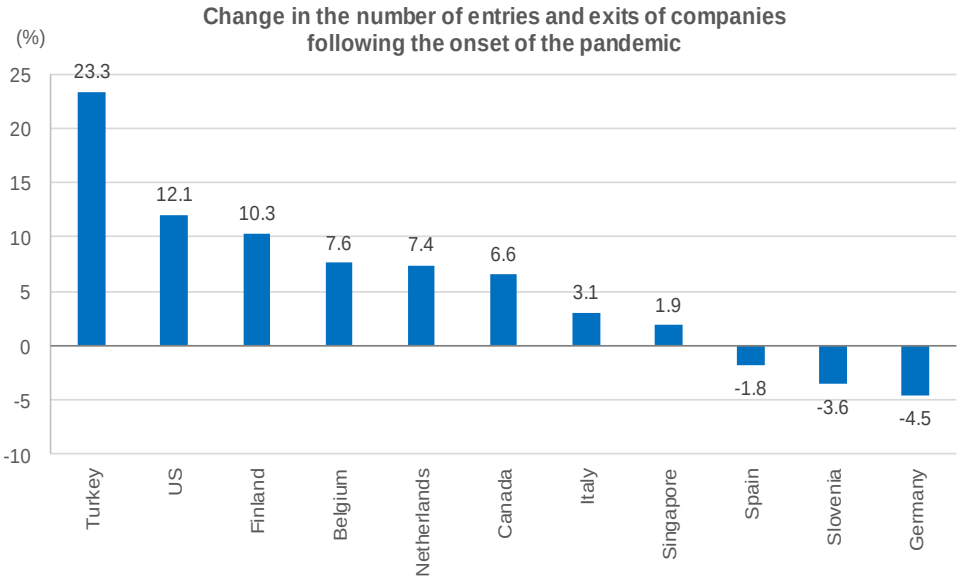
Sources: OECD, SBI SECURITIES



Sources: OECD, SBI SECURITIES



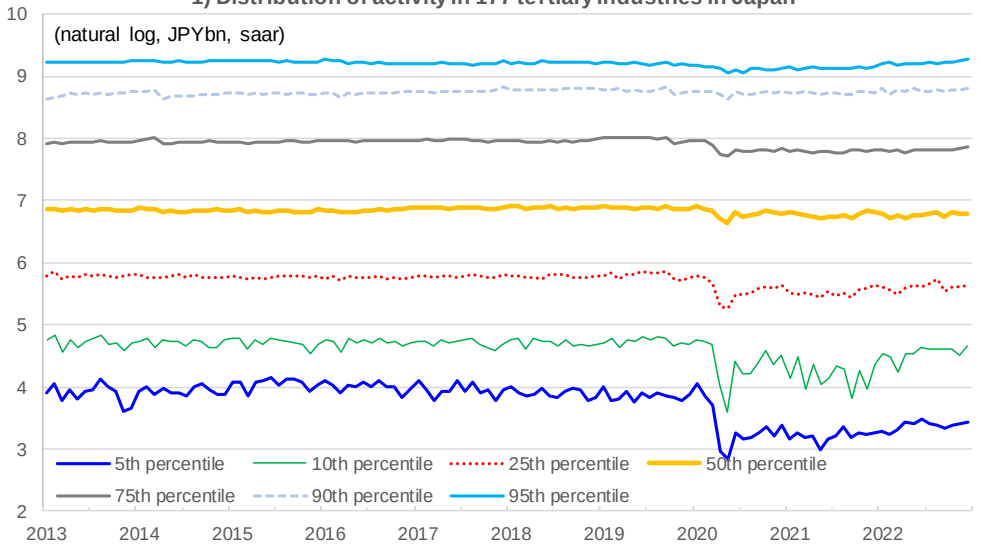
Sources: OECD, SBI SECURITIES



Note: percentage change in the number of entries and exits during 2Q2020 – 2Q2022 over pre-pandemic 2019. Sources: OECD, SBI SECURITIES

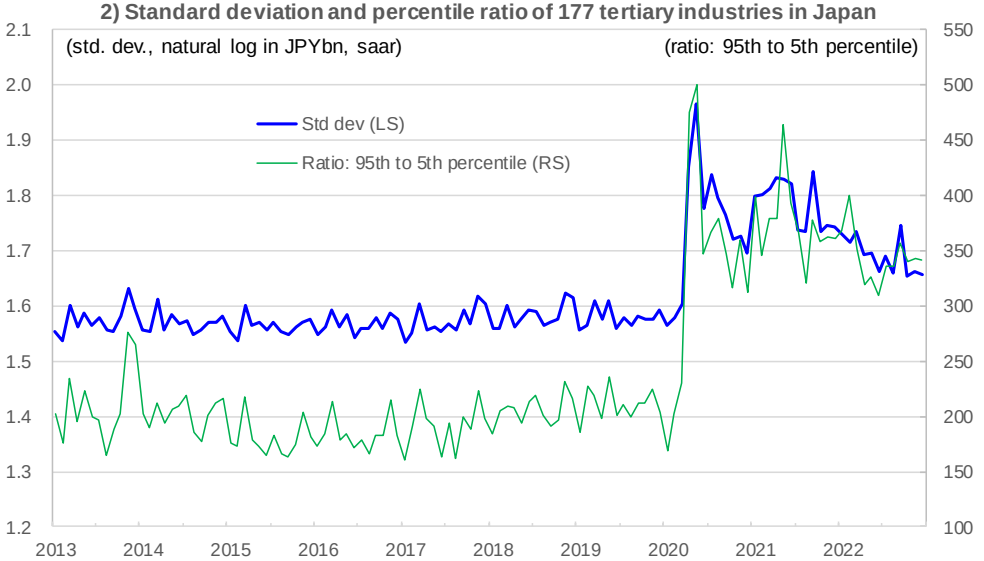
Ongoing shifts in demand across industries in Japan

1) Distribution of activity in 177 tertiary industries in Japan



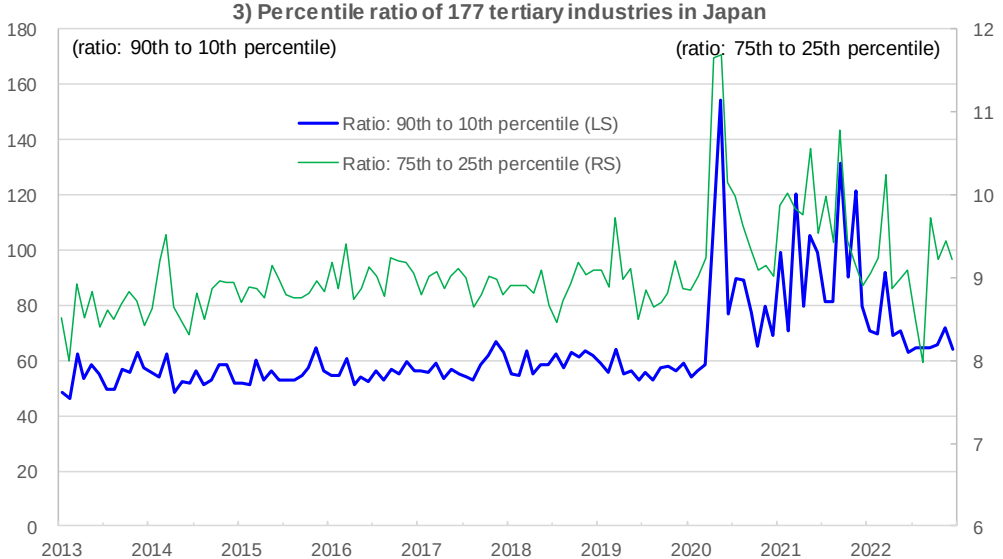
Note: Based on 177 tertiary industries, converted to JPYbn using 2015 GDP by industry.
Sources: METI, SBI SECURITIES

2) Standard deviation and percentile ratio of 177 tertiary industries in Japan



Note: Based on 177 tertiary industries, converted to JPYbn using 2015 GDP by industry.
Sources: METI, SBI SECURITIES

3) Percentile ratio of 177 tertiary industries in Japan



Note: Based on 177 tertiary industries, converted to JPYbn using 2015 GDP by industry.
Sources: METI, SBI SECURITIES

- A large jump in the standard deviation in activity of 177 tertiary industries and large jumps in the percentile ratios following the onset of the pandemic indicate an unprecedented shift of demand across industries, which is continuing to date.

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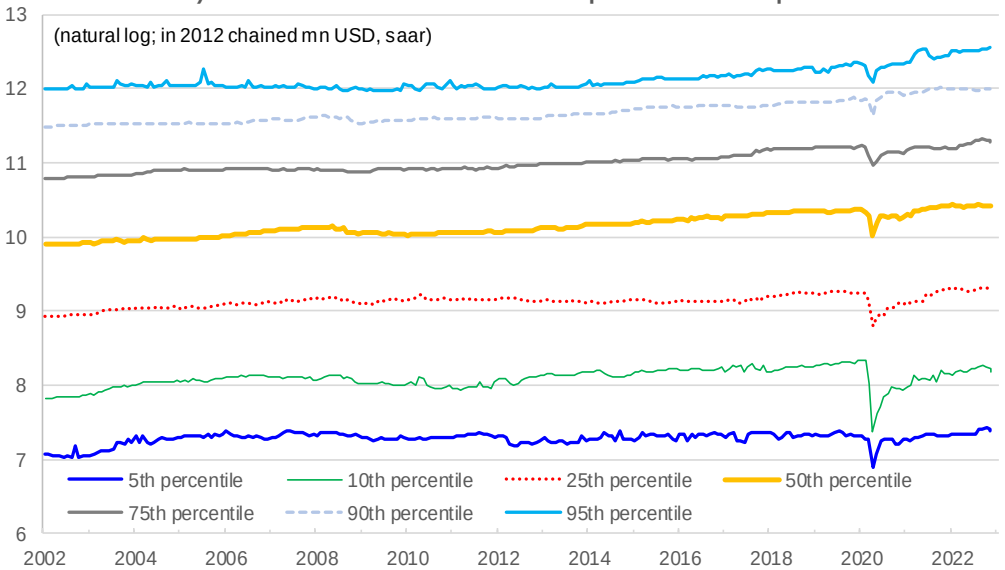
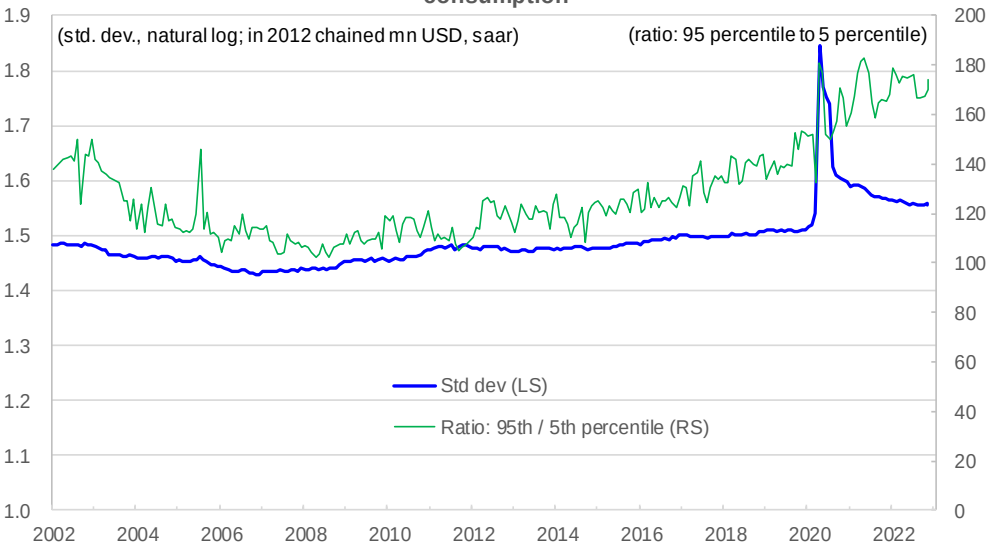
Ongoing shifts in US consumption across items

1) Distribution of 244 items in US real personal consumption



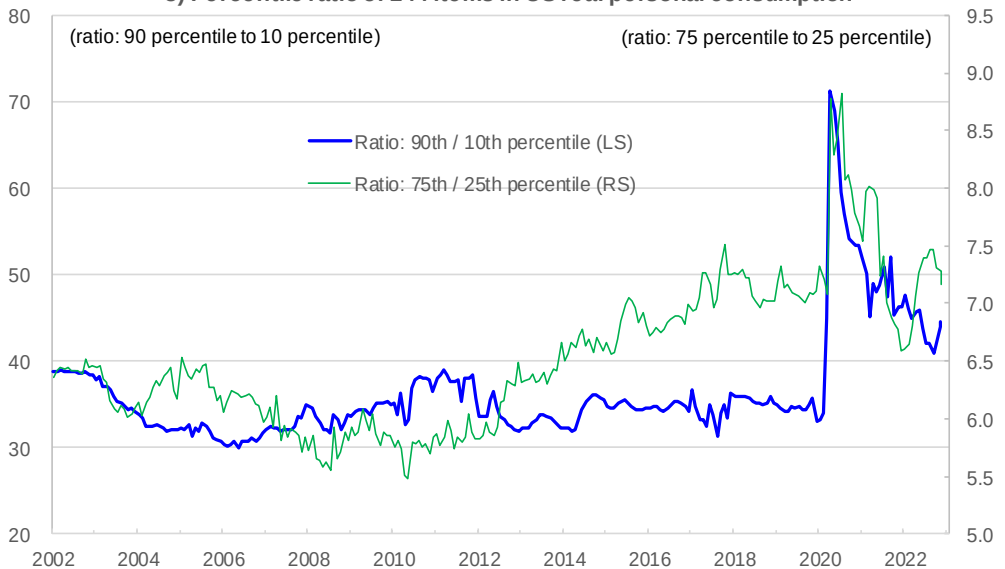
Note: 244 items in the smallest classification. Sources: US BEA, SBI SECURITIES.

2) Standard deviation and percentile ratio of 244 items in US real personal consumption



Note: 244 items in the smallest classification. Sources: US BEA, SBI SECURITIES.

3) Percentile ratio of 244 items in US real personal consumption



Note: 244 items in the smallest classification. Sources: US BEA, SBI SECURITIES.

- A large jump in the standard deviation among 244 consumption items and large jumps in the percentile ratios following the onset of the pandemic indicate an unprecedented shift of demand across consumption bundles, which is continuing to date.

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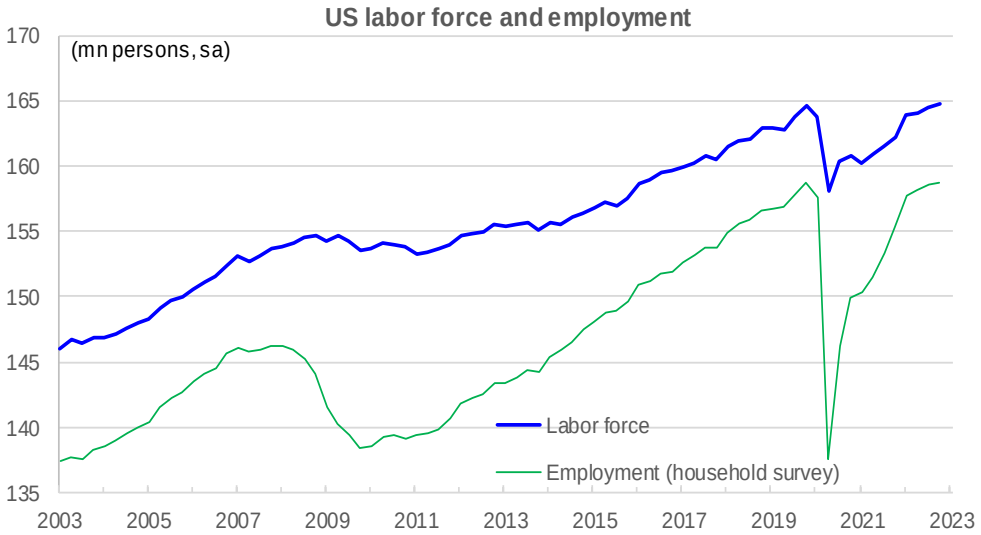
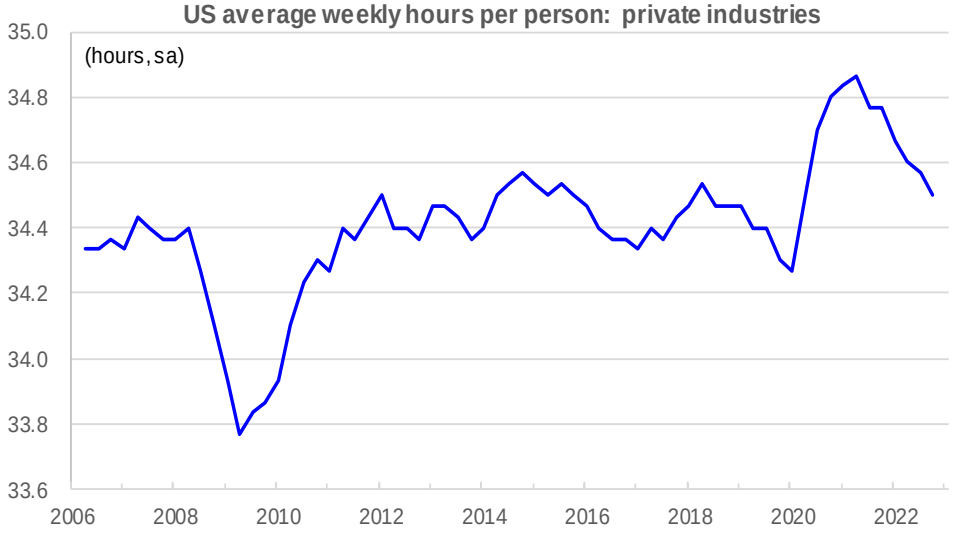
US potential GDP and its growth rate has fallen following the pandemic (1)



Sources: CEIC Database, US BLS, SBI SECURITIES



Sources: CEIC Database, US BLS, SBI SECURITIES

Sources: CEIC Database, US BEA, US BLS, SBI SECURITIES

- Potential growth = growth of workers + growth of weekly work hours (per person) + growth of labor productivity
- Following the onset of the pandemic, labor force and employment have substantially declined, a part of which has been offset by a rise in work hours and faster labor productivity growth, but not entirely.
- Labor productivity growth accelerates in the beginning of the business cycle recovery and slows thereafter. We believe it is difficult to expect the current pace of productivity growth over the previous eight quarters to be maintained going forward.
- The potential GDP and its growth rate have declined in the US since the onset of the pandemic, in our view.

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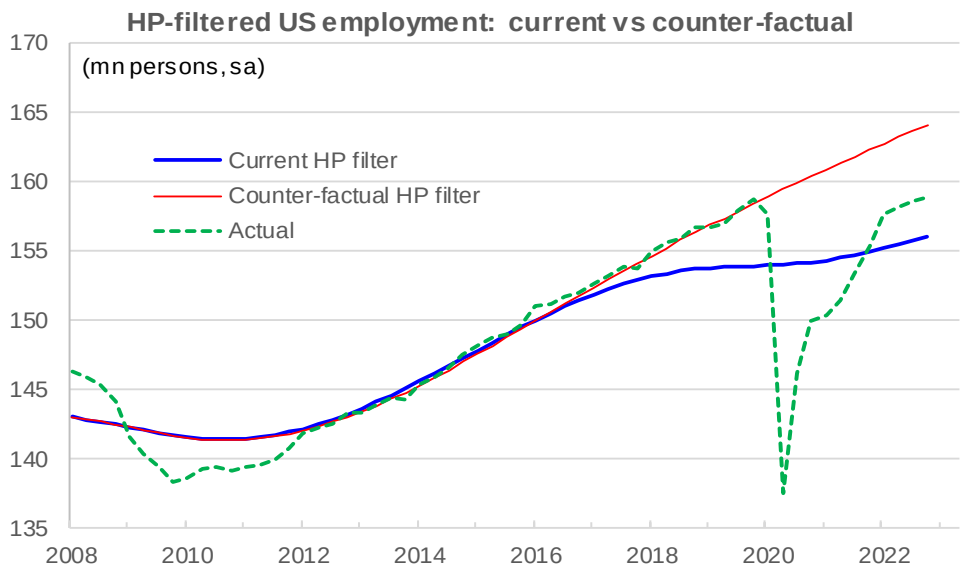
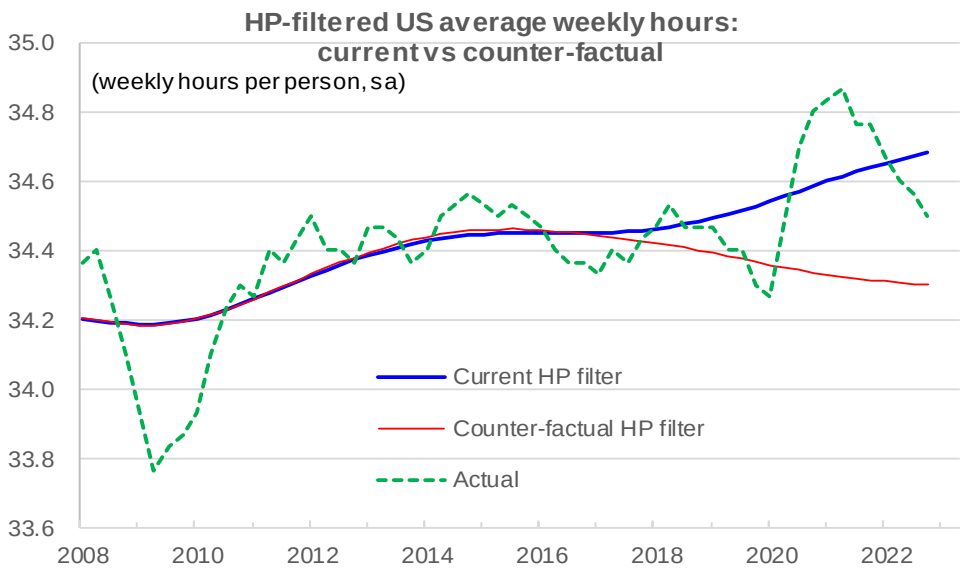
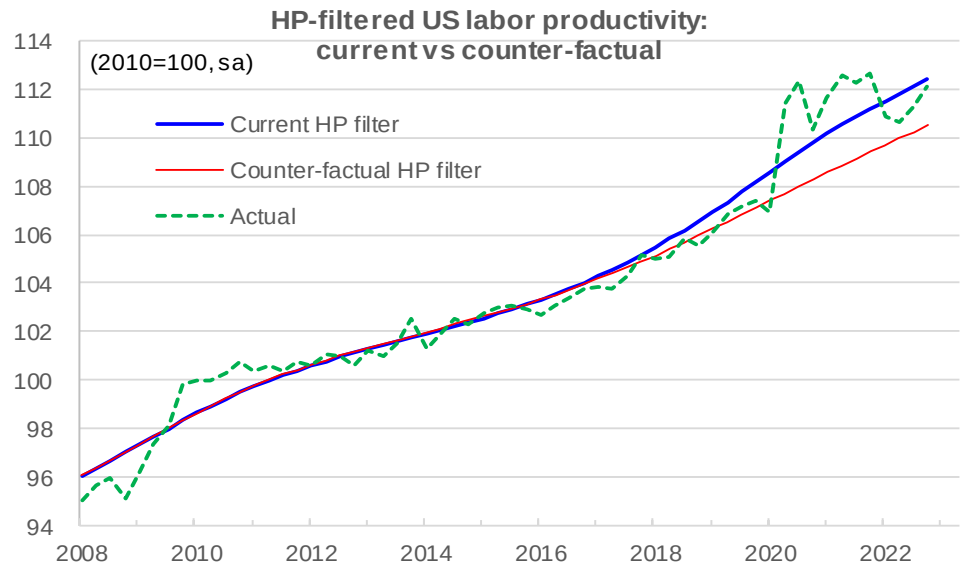
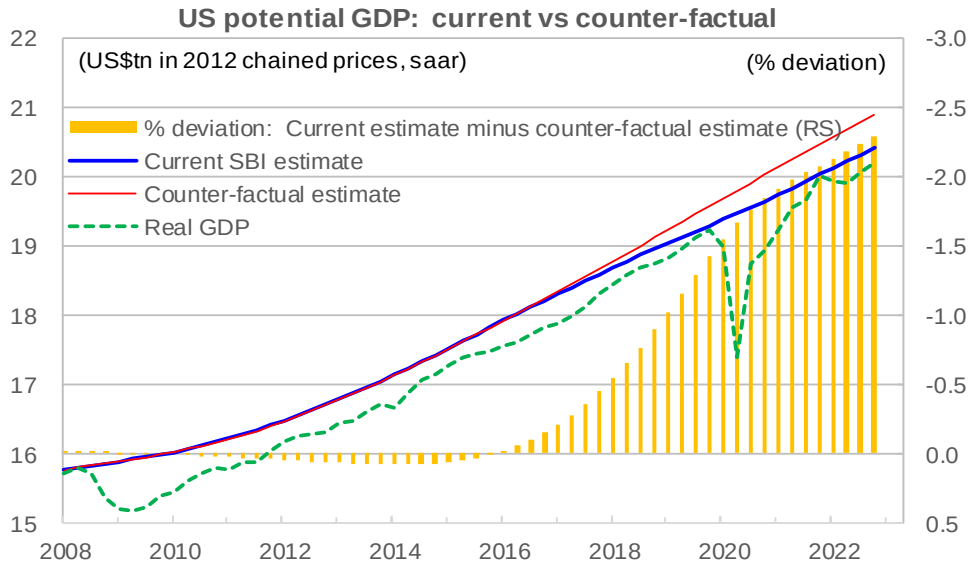
US potential GDP and its growth rate has fallen following the pandemic (2)



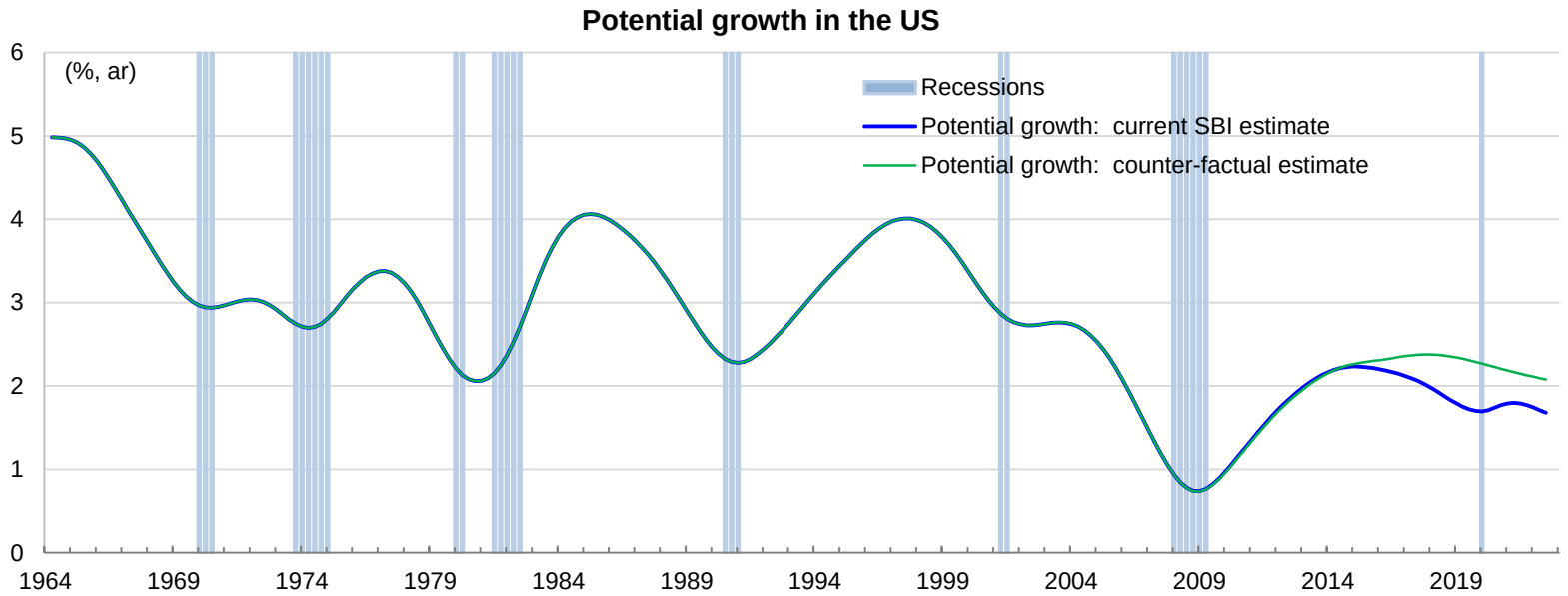






Notes: Counter-factual (hypothetical) values are obtained by setting the annual growth of 1.44m for the labor force, 1.80m for employment, zero growth for weekly work hours per person, and 0.95% for labor productivity for 1Q 2020–4Q 2025, and then applying HP filter through 4Q 2025. Sources: CEIC Database, US BEA, US BLS, SBI SECURITIES.

US potential GDP and its growth rate has fallen following the pandemic (3)

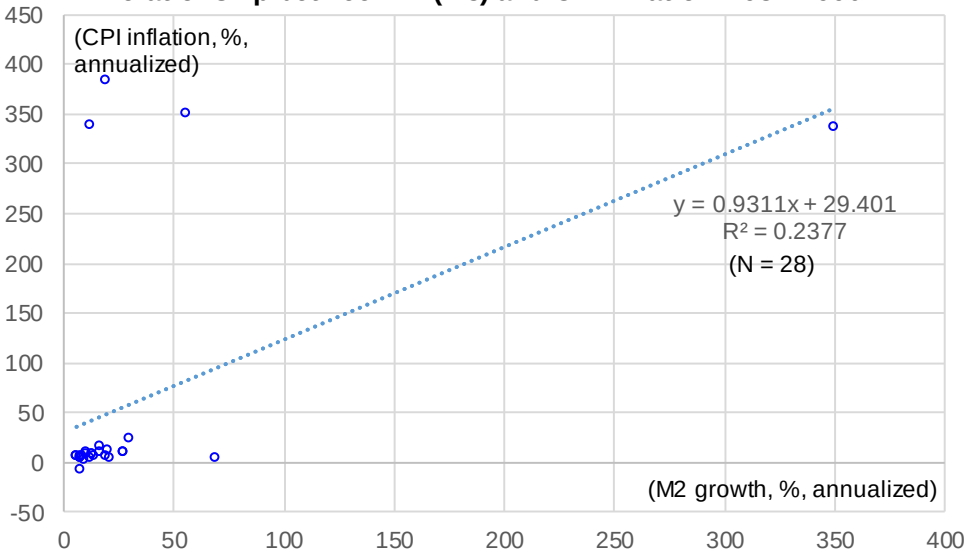


Notes: we assumed that potential GDP and actual GDP were equal in 1Q 1980. Potential growth = employment growth + growth in hours worked per person + labor productivity growth. Shading denotes recessions. The counter-factual potential growth estimate is obtained by setting hypothetical annual growth of 1.80m for employment, zero growth for weekly hours worked, and 0.95% growth for labor productivity during 1Q 2020 – 4Q 2025, and applying HP filter. Sources: CEIC Database, US BEA, US BLS, CBO, NBER, SBI SECURITIES

- The level of the US potential GDP has declined by as much as 3.8% (or at least by the range of 2.5% to 3.0%), while the potential growth has declined by 0.9% a year (2.2% without the pandemic versus 1.3% with the pandemic).
- 1) A rapid and substantial decline in the macroeconomic supply-side upper bound, and 2) an expanded disequilibrium between the supply and demand in industries that have been hit by the pandemic, could raise the near-term inflationary forces.
- However, the decline in the potential growth is disinflation over the medium to the long-term and lowers the neutral interest rate. Sustainability of wage growth in industries where demand disappeared is questionable.
- Even if the YoY CPI inflation peaks in March or April 2022, which is followed by a slower pace of the decline in inflation, the hawkish monetary policy stance by the US Federal Reserve is unlikely to be withdrawn, so that the stress on real economic activity could accumulate.

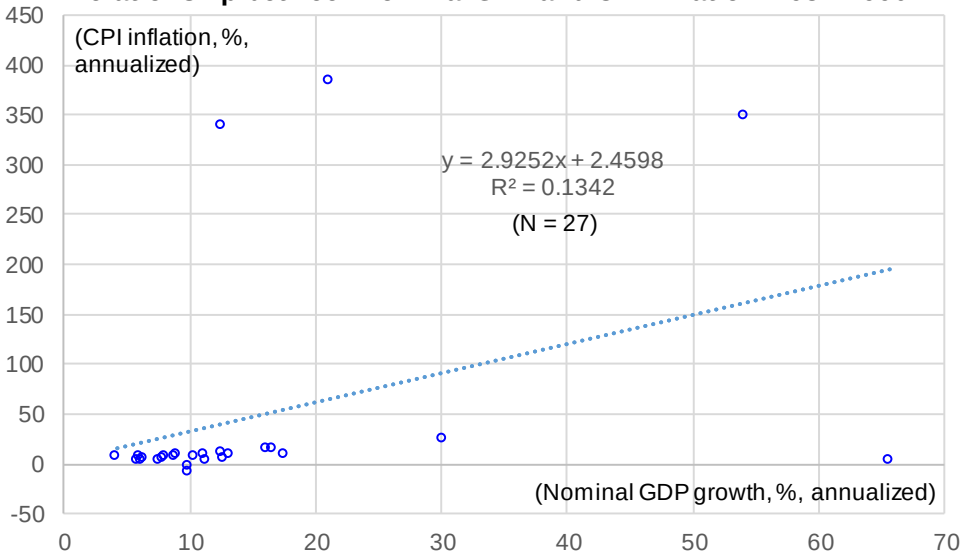
Long-term relationship among inflation, nominal growth, and broad money growth (1)

Relationship between M2(M3) and CPI inflation: 1981-1990



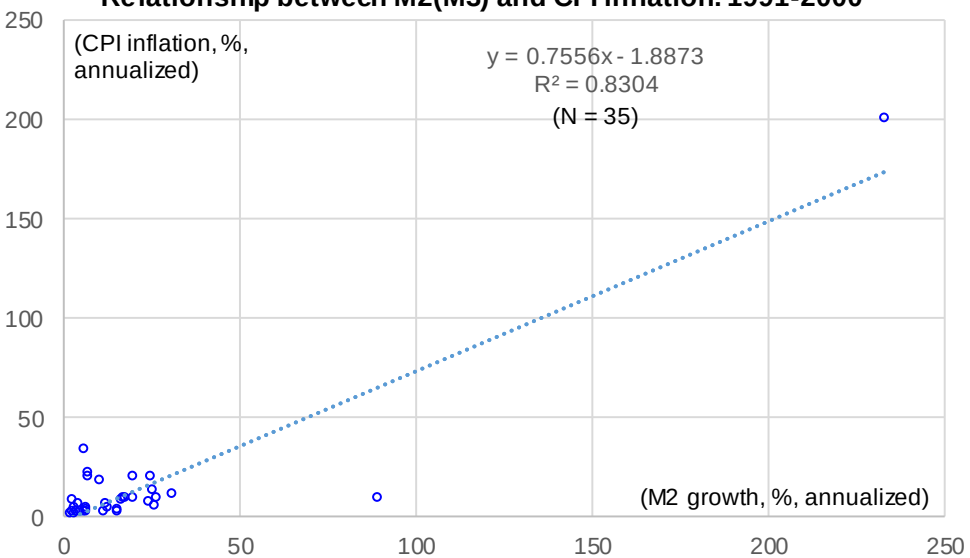
Sources: CEIC Database, SBI SECURITIES

Relationship between nominal GDP and CPI inflation: 1981-1990



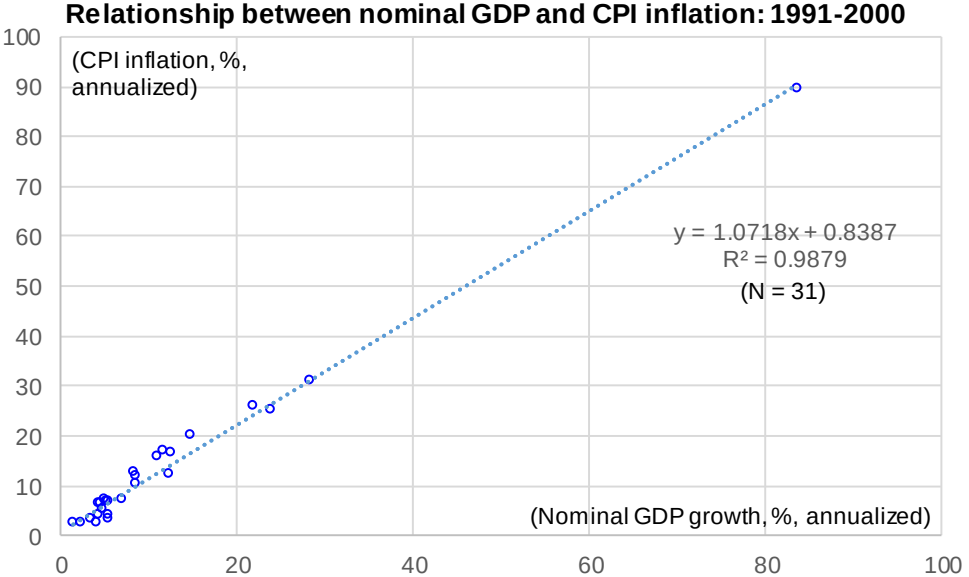
Sources: CEIC Database, SBI SECURITIES

Relationship between M2(M3) and CPI inflation: 1991-2000



Sources: CEIC Database, SBI SECURITIES

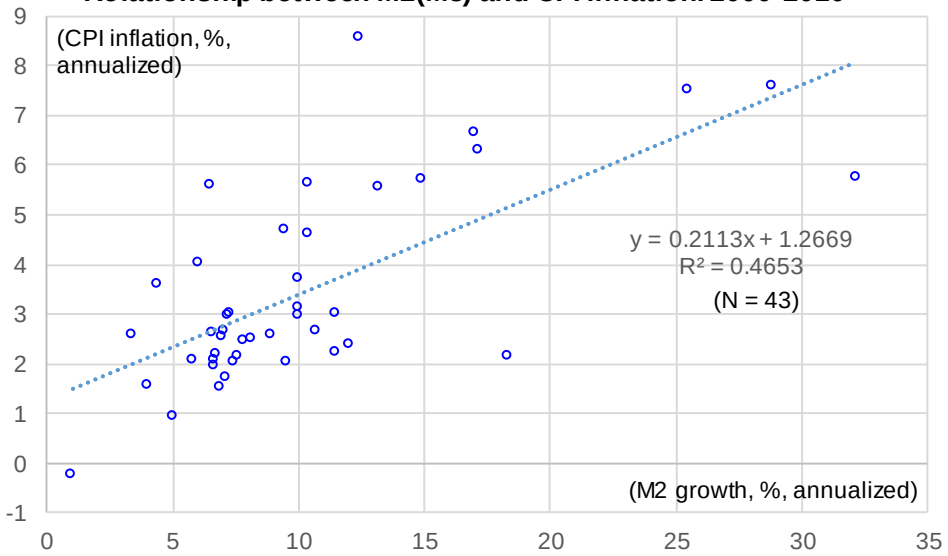
Relationship between nominal GDP and CPI inflation: 1991-2000



Sources: CEIC Database, SBI SECURITIES

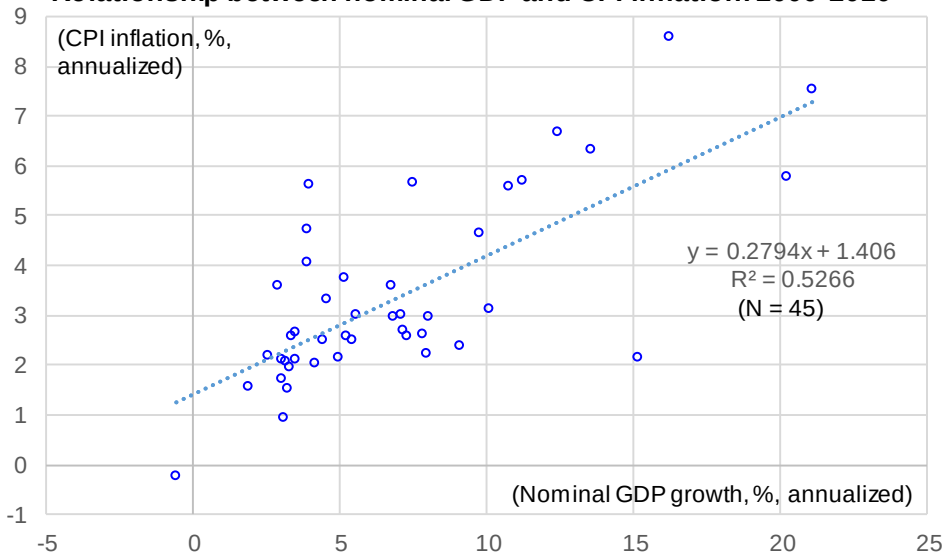
Long-term relationship among inflation, nominal growth, and broad money growth (2)

Relationship between M2(M3) and CPI inflation: 2000-2010



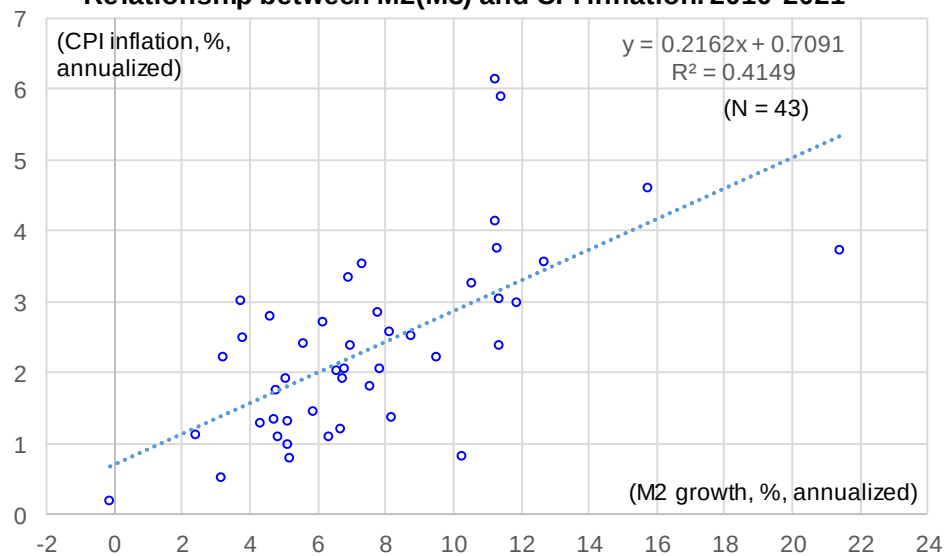
Sources: CEIC Database, SBI SECURITIES

Relationship between nominal GDP and CPI inflation: 2000-2010



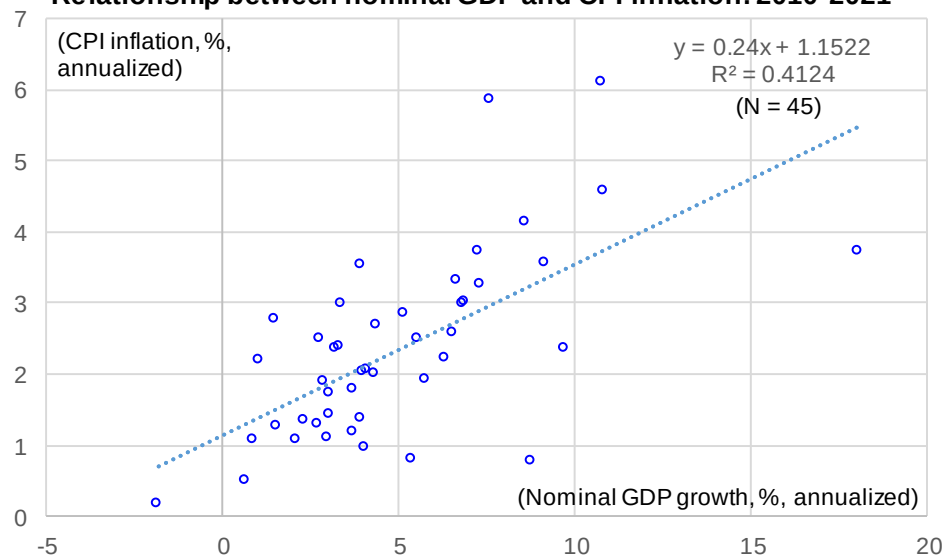
Sources: CEIC Database, SBI SECURITIES

Relationship between M2(M3) and CPI inflation: 2010-2021



Sources: CEIC Database, SBI SECURITIES

Relationship between nominal GDP and CPI inflation: 2010-2021

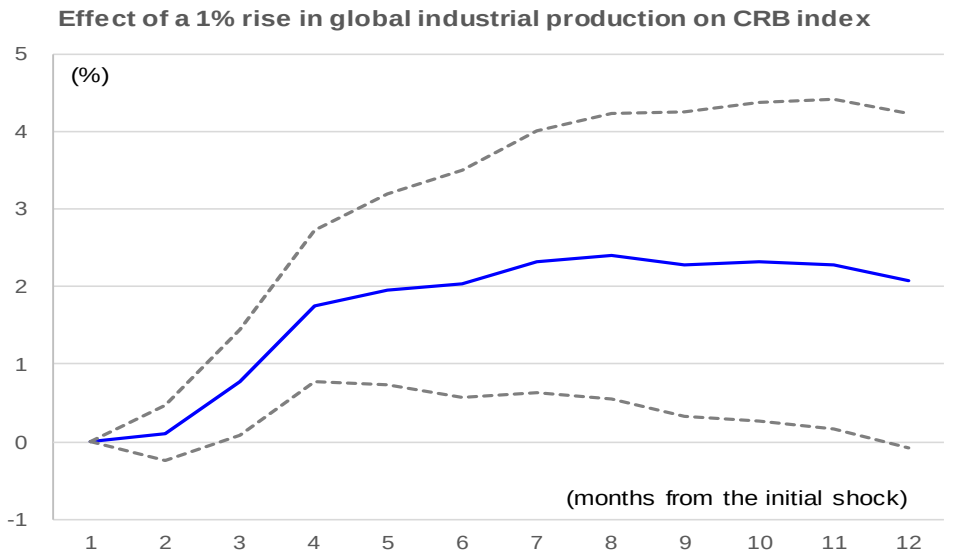


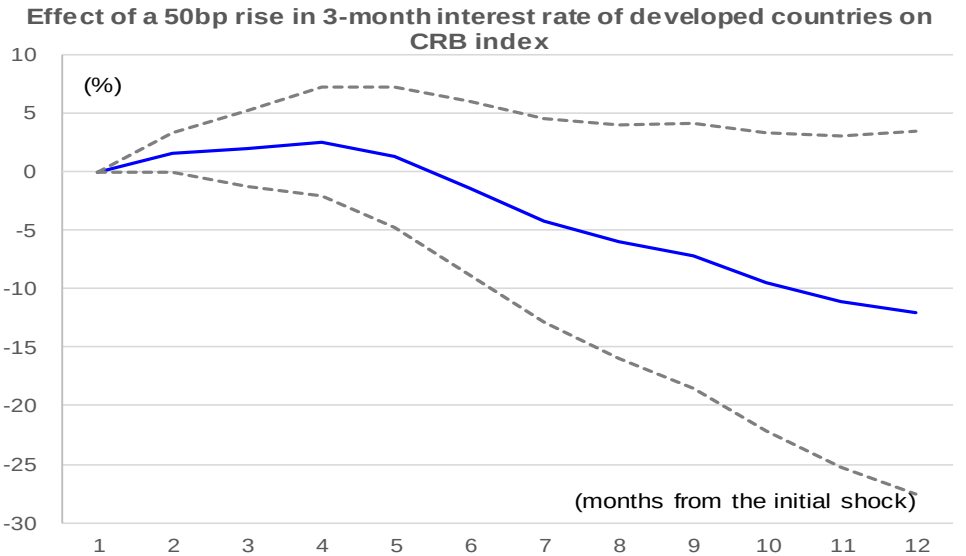
Sources: CEIC Database, SBI SECURITIES

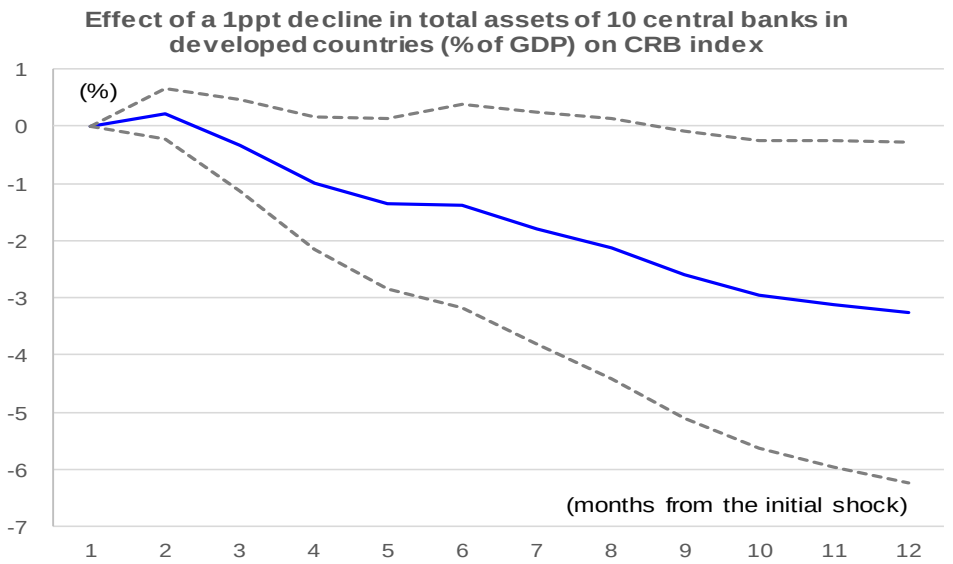
CRB index, industrial production, bond yields, and central banks' balance sheet (1)

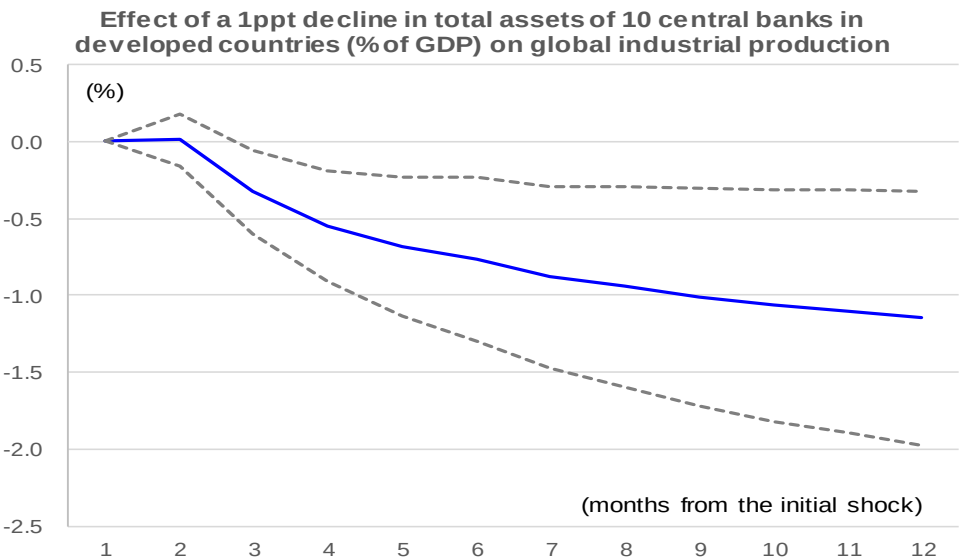
1) A rise in raw material prices in the early stage of business cycle recoveries is common. (Recovery momentum is stalled if it is counted by monetary tightening in response to rising inflation.)
2) Prices transmit from raw materials to intermediate goods, then to finished goods.
3) Price fluctuation scales are larger in this order: raw materials >> intermediate goods >> finished goods >> CPI. A rise in raw material prices cannot forecast CPI inflation.
4) Commodity prices did not always rise in the global economic expansion phases of the 1990s, the 2000s, and the 2010s.
5) The YoY% increases in raw material prices in both Japan and the US are approaching the peak momentum. Should we anticipate the current pace of raw material price inflation to continue for another year or two?
6) Demand for commodities = real demand (proxied by industrial production) + speculative demand (proxied by interest rates and central banks' balance sheets)
7) The effects of real demand on commodity prices begin to dissipate after three months. Those of speculative demand continue even after 12 months.
8) Monetary policy, proxied by the balance sheet of the central banks give sustained influence on commodity prices. Premature monetary policy normalization hinders this process.
9) A deepening of the "closed economy regime" lowers purchasing power of households and businesses. A faster nominal GDP growth through credit creation is difficult to achieve under tougher financial regulations.
10) Premature monetary tightening by taking advantage of the supply shock further lowers the natural interest rate (= potential growth).

CRB index, industrial production, bond yields, and central banks' balance sheet (2)









Note: Results from a four-variable vector autoregression, including global industrial production, CRB index, 3-month interest rate of developed countries, and total assets of 10 major central banks. A solid center line represents the average response, and the dotted lines represent a confidence interval of ± 2 std. errors.
Sample period is set to August 2002 to October 2022. Lag length is set to six. The first difference of natural log specification is used.
3-month interest rate is a weighted average of six developed countries and the euro area.
Sources: CEIC Database, CPB, SBI SECURITIES.

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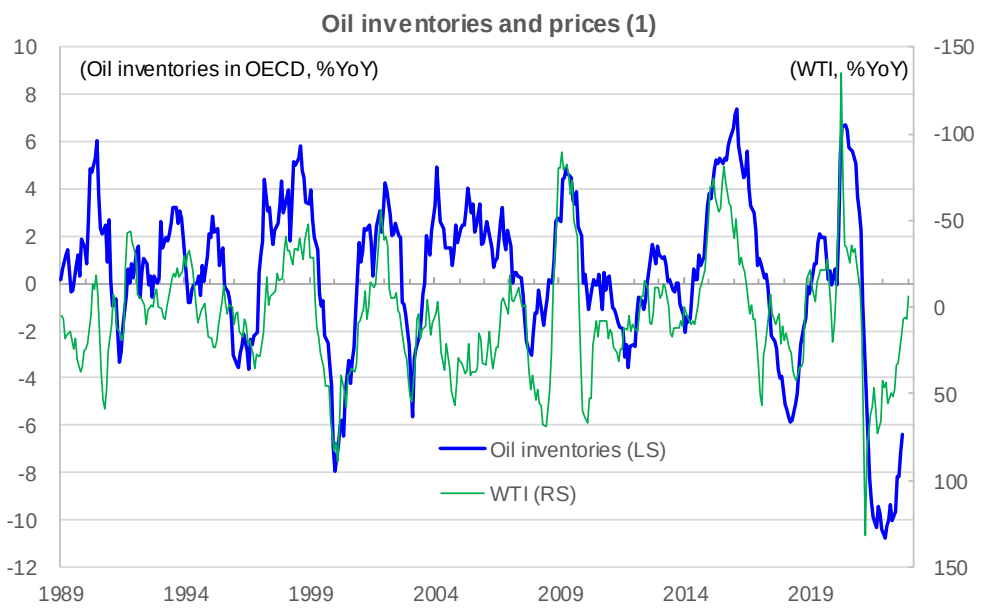
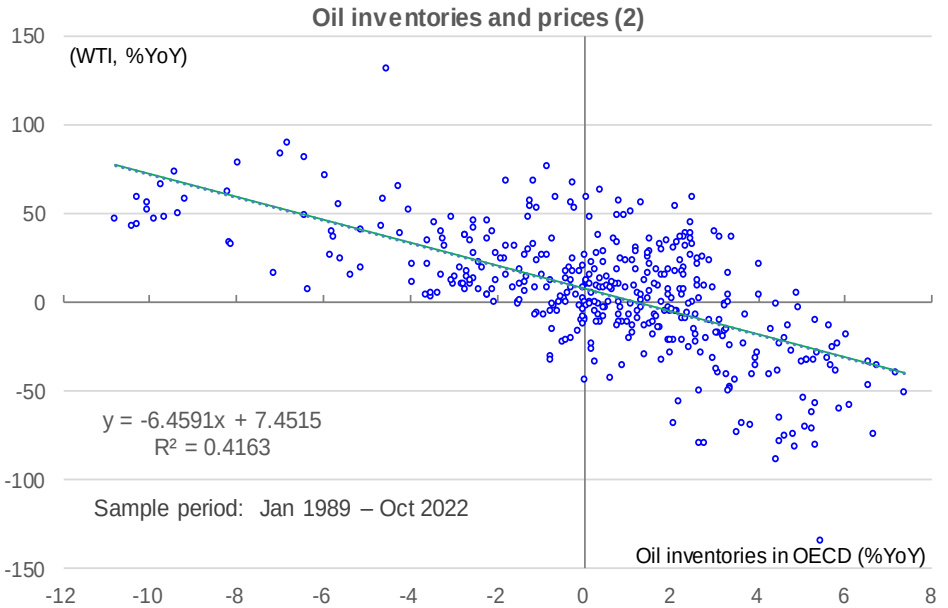
Oil inventories and prices (1)



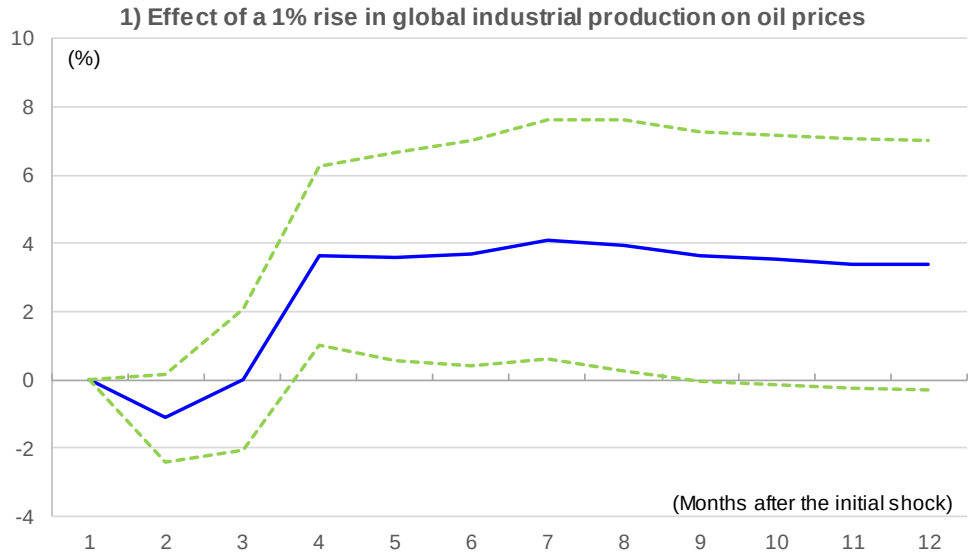
Note: Changes in natural log. Sources: US EIA, CEIC Database, SBI SECURITIES

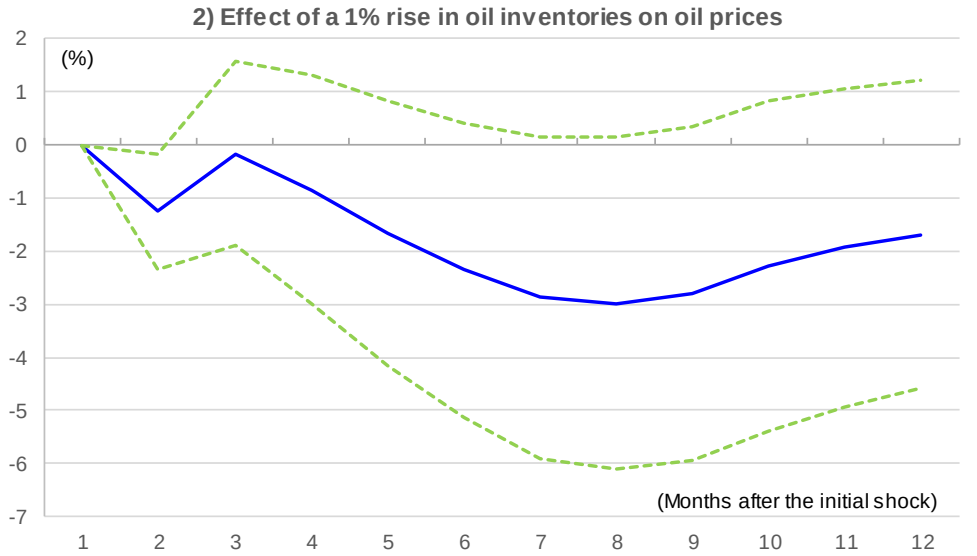


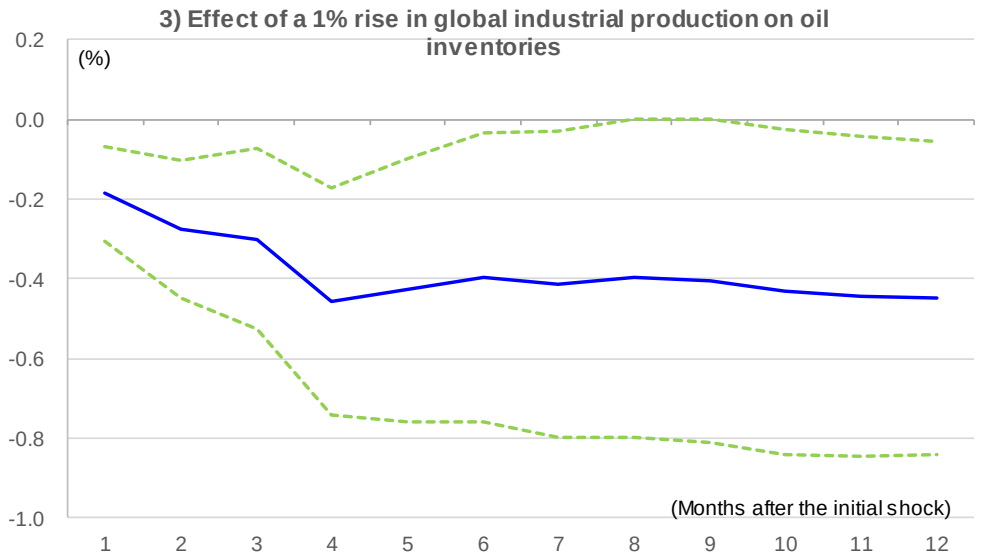
Note: Changes in natural log. Sources: US EIA, CEIC Database, SBI SECURITIES

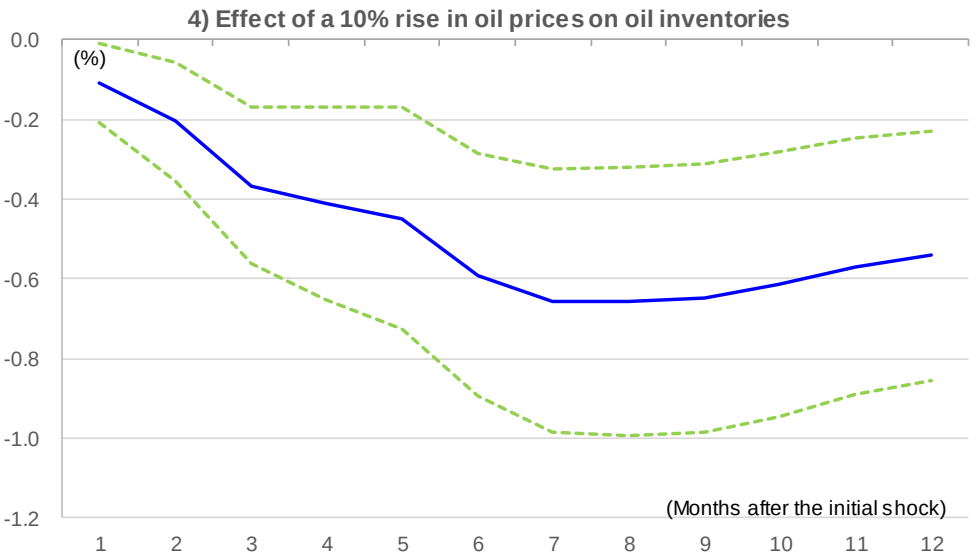
- While there is no stable relationship between the levels of oil inventories and oil prices, there exists a certain relationship between the rate of change in oil inventories and oil prices such that a rise (decline) in inventories lowers (increases) oil prices.
- We should monitor not only factors that push up oil prices (a decline in inventories) but also factors that lower oil prices (global economic slowdown, a rise in oil inventories as a result of more oil production by other oil-producing countries, and a decline in speculative demand through monetary tightening).
- A 1% rise in global industrial production raises oil prices by 8.8% in four months.
- A 1% rise in oil inventories lowers oil prices by 3.1% in eight months.
- A 1% rise in global industrial production lowers oil inventories by 0.51%.

Oil inventories and prices (2)



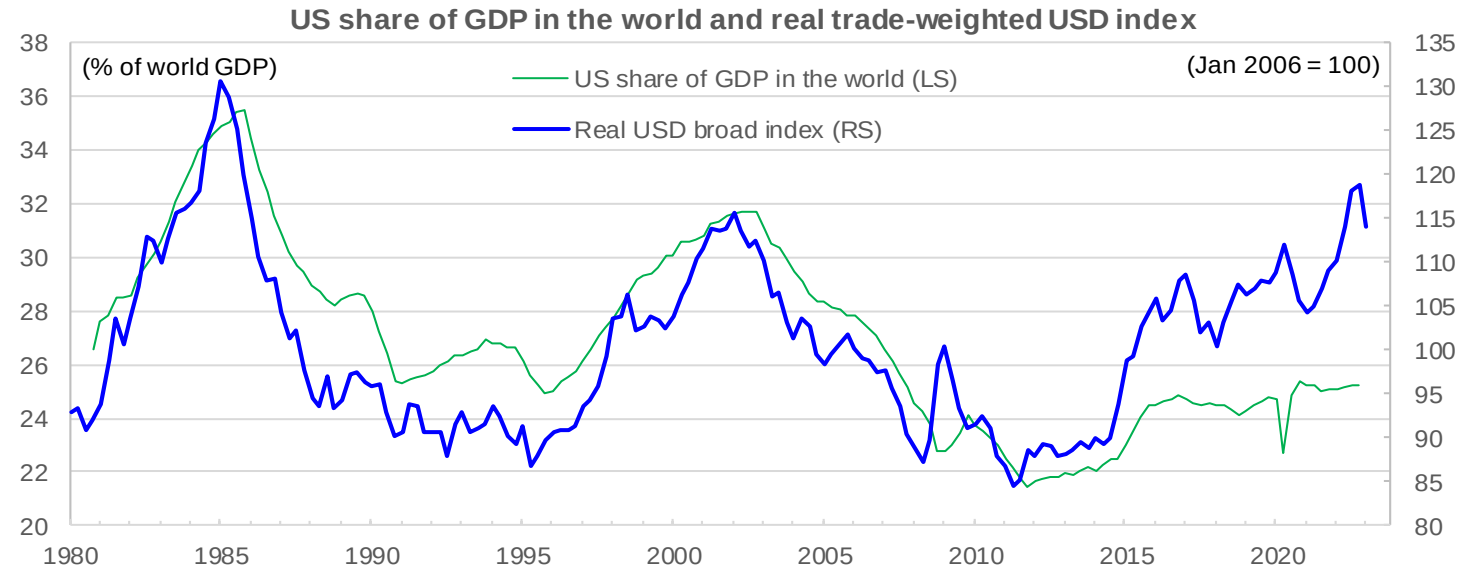




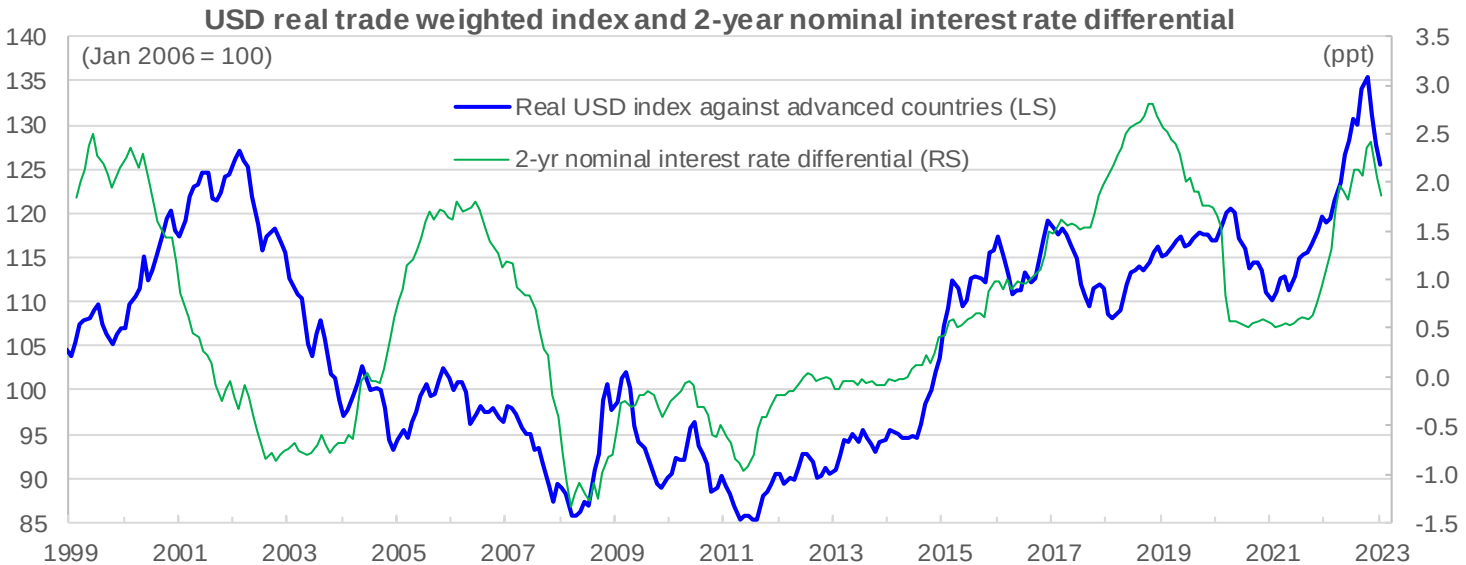


Notes: Obtained from three-variable vector autoregresssion, including global industrial production, oil prices, and oil inventories in OECD.
Lag length is set to six. The solid blue line is an average response. The dotted green lines represent a confidence interval of ± 2 standard errors.
First differences of natural log for each variable are used. Sample period: August 1991 - August 2022.
Sources: US EIA, CPB Netherlands Bureau for Economic Policy Analysis, CEIC Database, SBI SECURITIES.

Skepticism about sustainability of USD appreciation

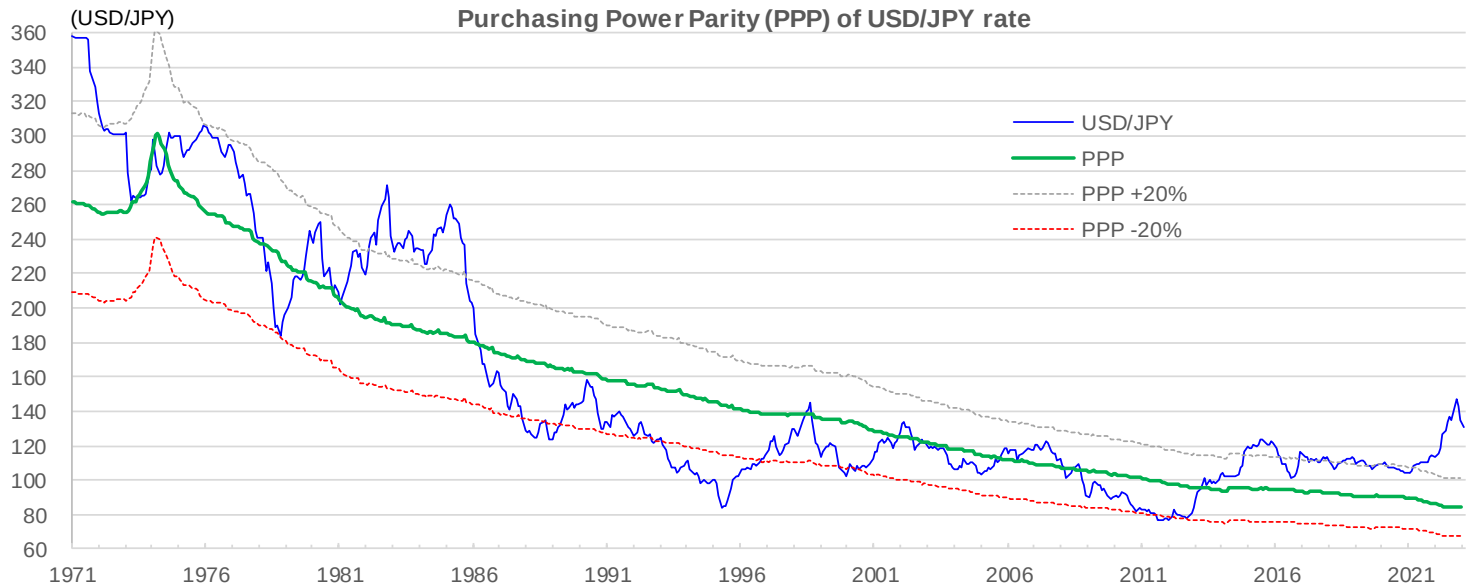


Note: World GDP data is interpolated to quarterly frequency.
Sources: IMF, US BEA, CEIC Database, SBI SECURITIES

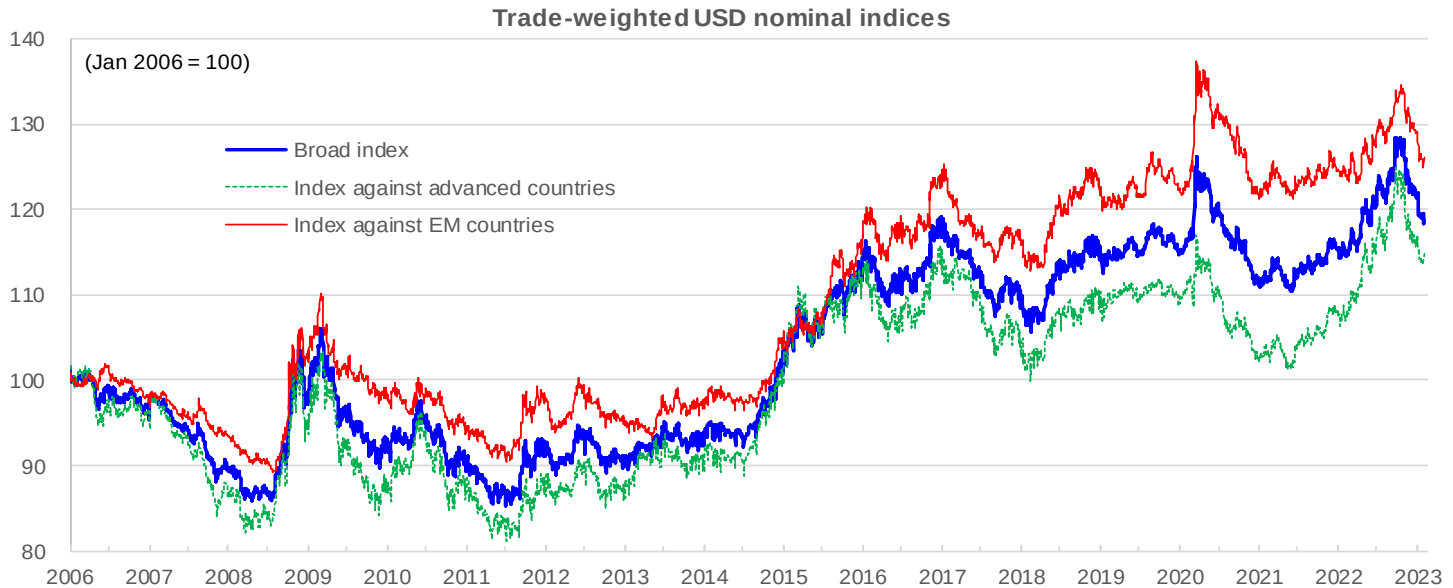


Sources: Federal Reserve, Census Bureau, OECD, Bloomberg, CEIC Database, SBI SECURITIES

USD/JPY purchasing power parity (PPP), nominal trade-weighted USD index



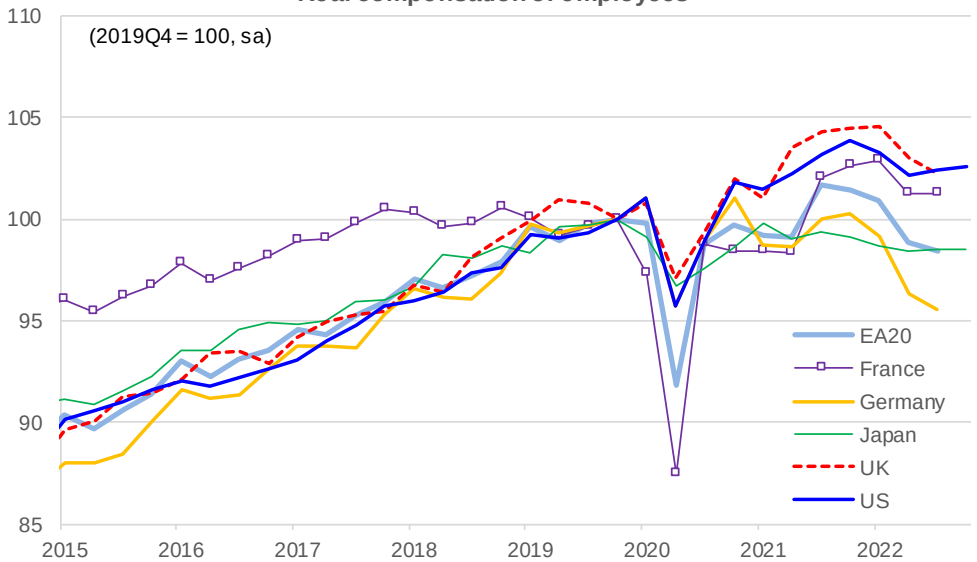
Note: LN(USD/JPY) = -0.767*LN(US capital goods prices / Japan capital goods prices) + 4.953 Sample period: 1971/1 - 2022/12 Adj. R-sq = 0.774
Sources: CEIC Database, US BLS, BoJ, SBI SECURITIES



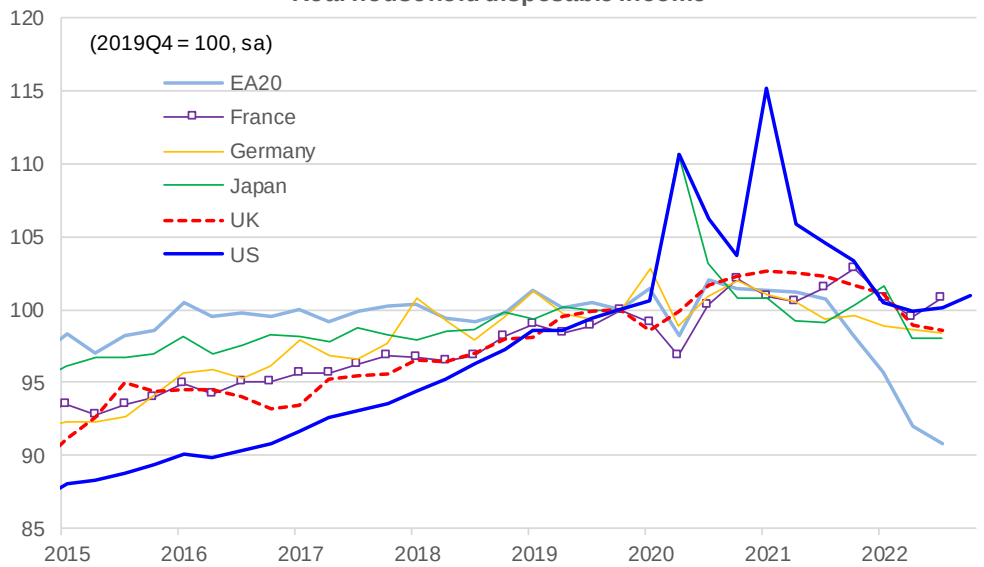
Sources: CEIC Database, Federal Reserve, SBI SECURITIES.

- USD/JPY deviation of more than 20% from PPP in the past has been resolved by a large-scale economic policy turnaround (US monetary tightening in the early 1980s and an expanding external imbalance led to the Plaza Accord in Sep 1985 and USD devaluation; the BoJ's post-bubble monetary tightening and a recession led to fiscal and monetary stimuli in Aug 1995).
- This time we should focus on an economic policy turnaround toward JPY appreciation: an interruption of the US interest rate hikes, inflation differential through PPP, expanding US external imbalances, and the BoJ's premature monetary policy normalization.

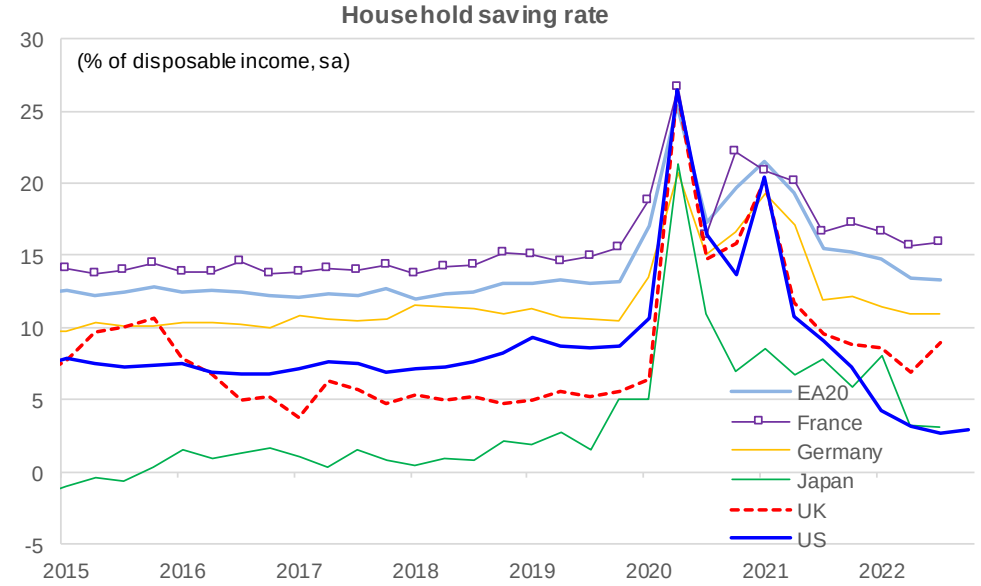
Household disposable income, saving rate, and consumption in developed countries



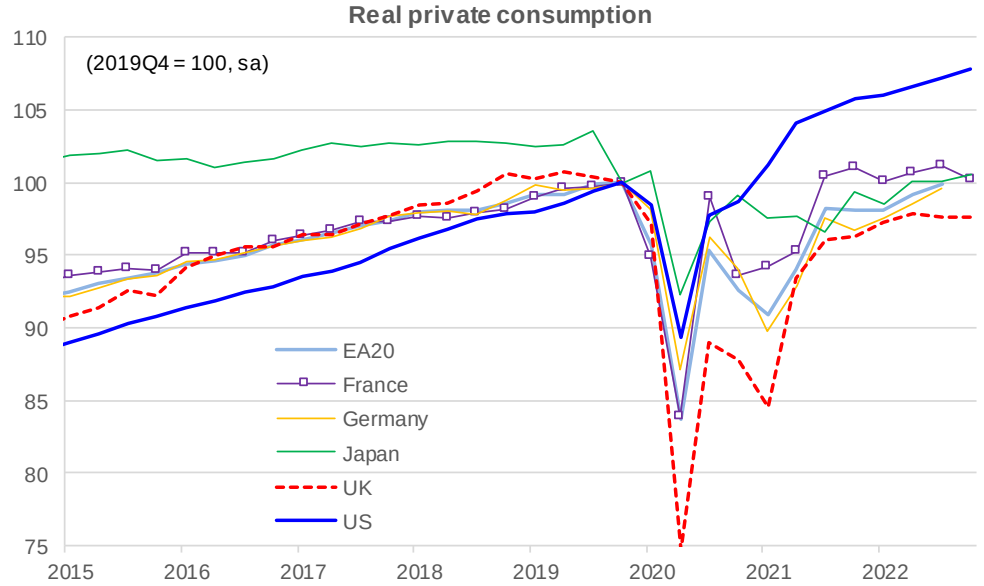
Sources: CEIC Database, national sources, SBI SECURITIES



Sources: CEIC Database, national sources, SBI SECURITIES



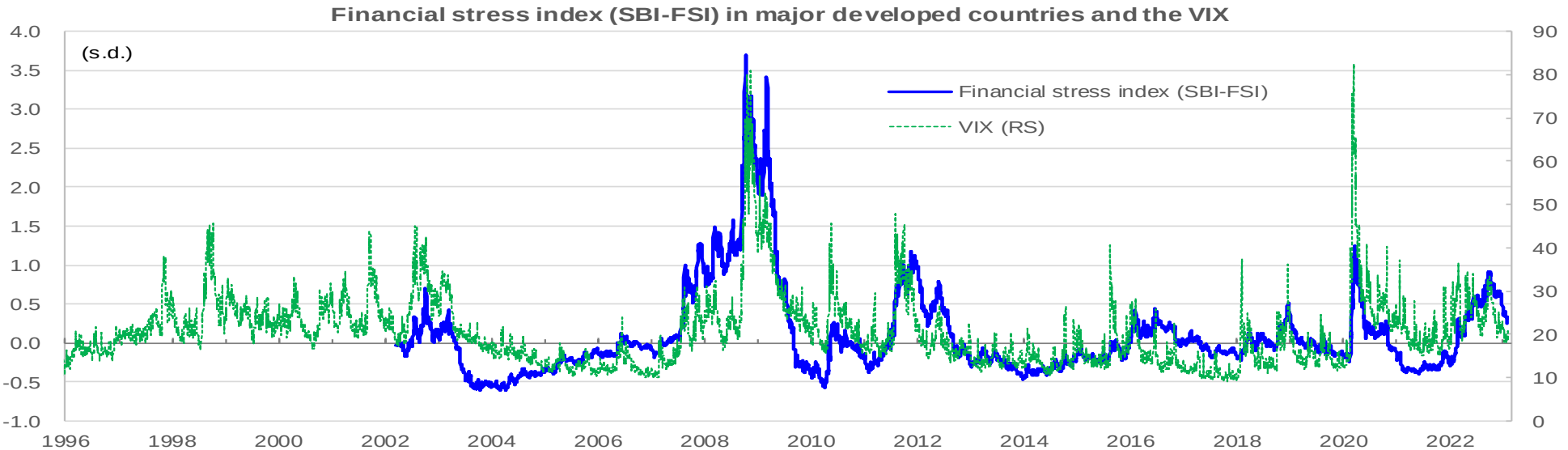
Sources: CEIC Database, national sources, SBI SECURITIES



Sources: CEIC Database, national sources, SBI SECURITIES

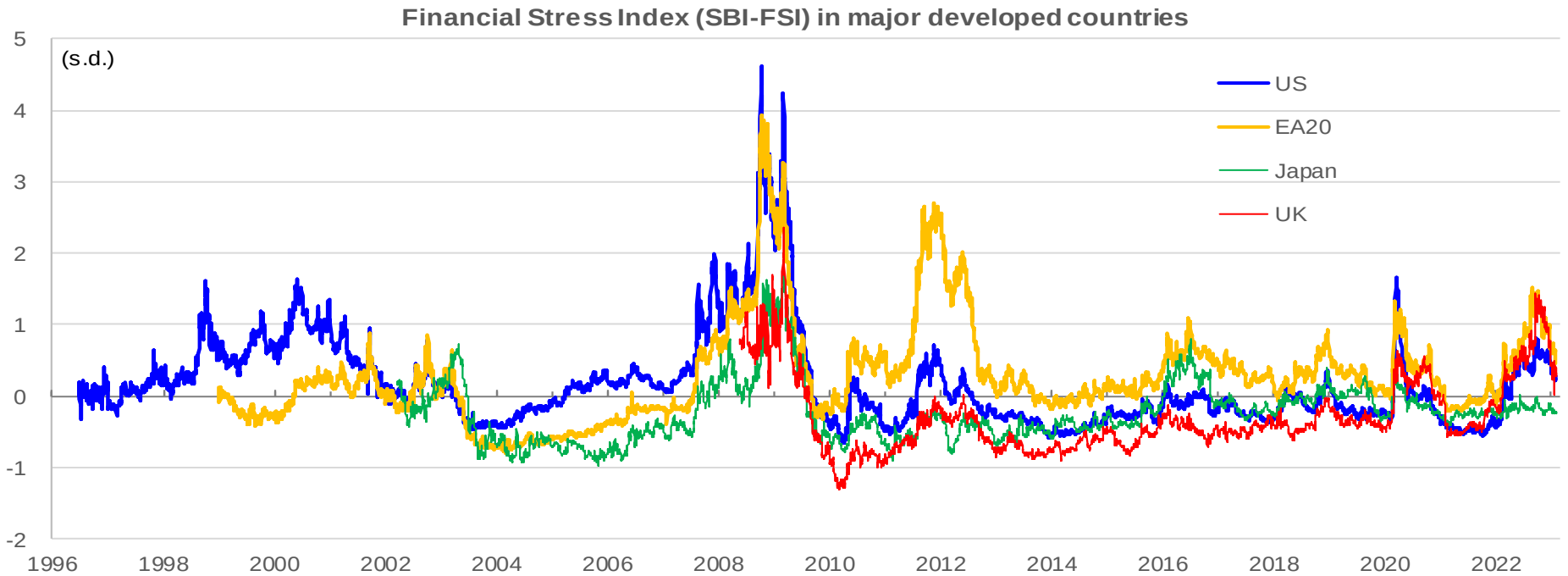
Financial stress index (SBI-FSI) in major developed countries (1)

- The SBI-FSI is designed to quantify the financial markets' response to various types of shocks. In particular:
  1) the emergence of financial systemic risk through a rise in counterparty risks.
  2) the scale of the shock in the financial market and the linkage of its transmission to the real economy.
- Characteristics of a systemic financial crisis: contagion, self-fulfillment, and flight to quality.
- Front-loading of monetary tightening in prioritizing containment of inflation raises the risk of a systemic financial crisis (SBI-FSI above +1.0 s.d.). This could lead to an end to monetary tightening, followed by a return to monetary easing.
- We need to focus on the following entities and markets: growth-oriented medium-sized financial institutions and nonfinancial businesses that have expanded via M&A financed by POs and debt issuance, high-yield debt, net energy-importing EM running current account deficit, SPACs, and crypto currencies.



Note: Financial stress index is the weighted average for four regions (EA19, Japan, the UK, and the US), consisting from maximum seven elements.
Sources: Bloomberg, CEIC database, FRED Database, SBI SECURITIES

Financial stress index (SBI-FSI) in major developed countries (2)



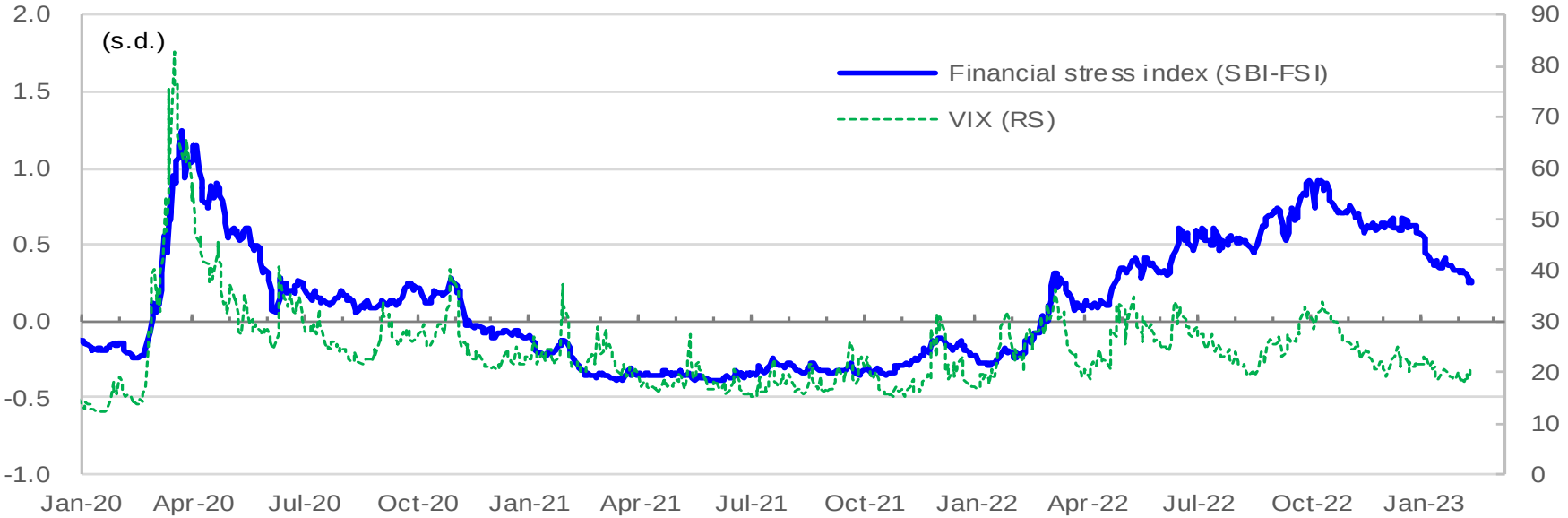
Sources: Bloomberg, CEIC database, FRED Database, SBI SECURITIES

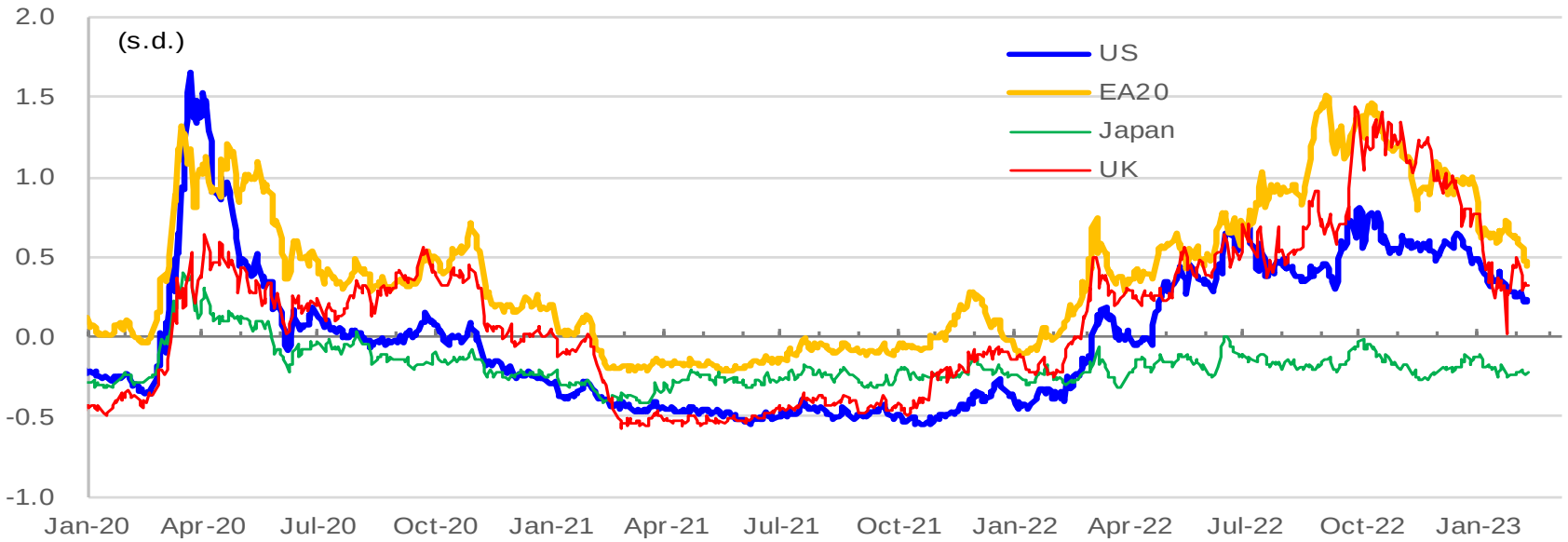
Components of financial stress index

	EA20	Japan	UK	US
3-month interbank rate minus 3-month T-bill yield	✓ (Germany)	✓	✓	✓
1-yr swap rate minus 1-yr government bond yield	✓ (Germany)	✓	✓	✓
5-yr swap rate minus 5-yr government bond yield	✓ (Germany)	✓	✓	✓
10-yr government bond yield spread versus Germany	✓ (Italy, Spain, Portugal)			
Bank stock prices: max prices over the past 250 days / today's price	✓ STOXX	✓ TOPIX	✓ FT350	✓ S&P500
Stock price index: max prices over the past 250 days / today's price	✓ STOXX	✓ TOPIX	✓ FT350	✓ S&P500
Treasury yield curve (10y minus 1y) x (-1)	✓ (Germany)	✓	✓	✓
Corporate bond yield spread				✓
Weight (%)	32.8	13.2	7.1	46.9

Notes: US corporate bond yield spread … ICE BofA 7-10yr; Moody's Baa minus 10-yr UST.
Sample period for standardization: January 1, 2002 - December 31, 2019.
We calculated each country's financial stress index when minimum five components are available for Japan and the UK, and minimum six components for EA20 and the US.
The weight of overall financial stress index is taken from the share of average nominal GDP in 2011-2020.
Sources: Bloomberg, CEIC Database, FRED Database, SBI SECURITIES.

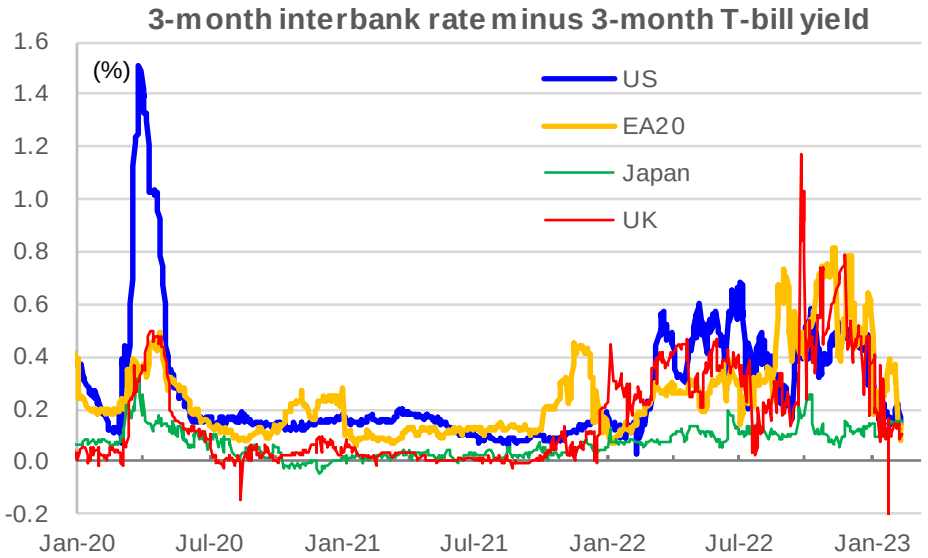
Financial stress index (SBI-FSI) in major developed countries (3) : Components

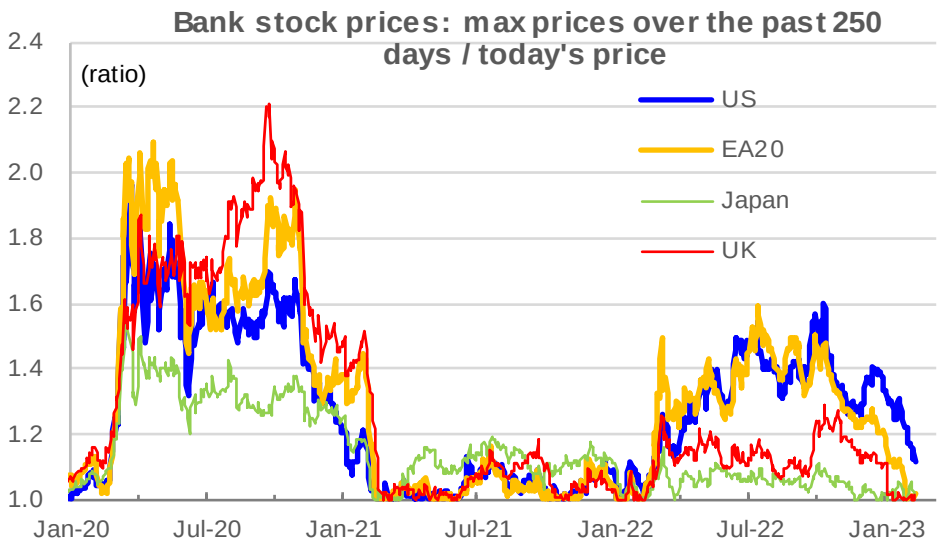


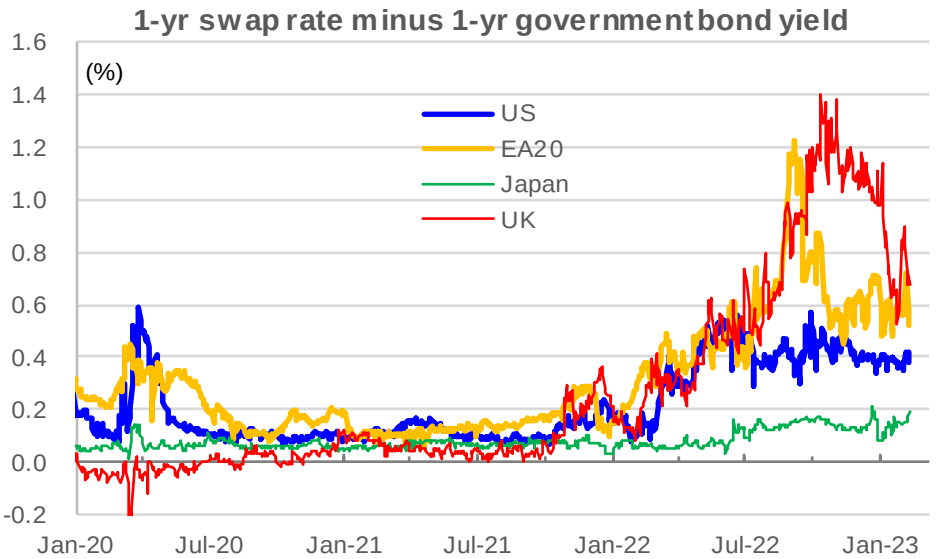


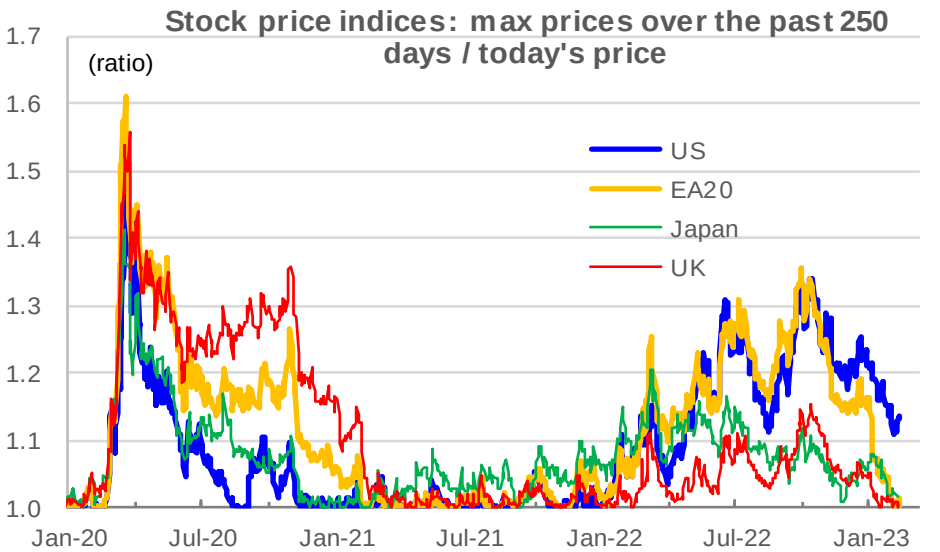
Note: Financial stress index is the weighted average for four regions (EA19, Japan, the UK, and the US), consisting from maximum seven elements.
Sources: Bloomberg, CEIC database, FRED Database, SBI SECURITIES

Financial stress index (SBI-FSI) in major developed countries (4) : Components



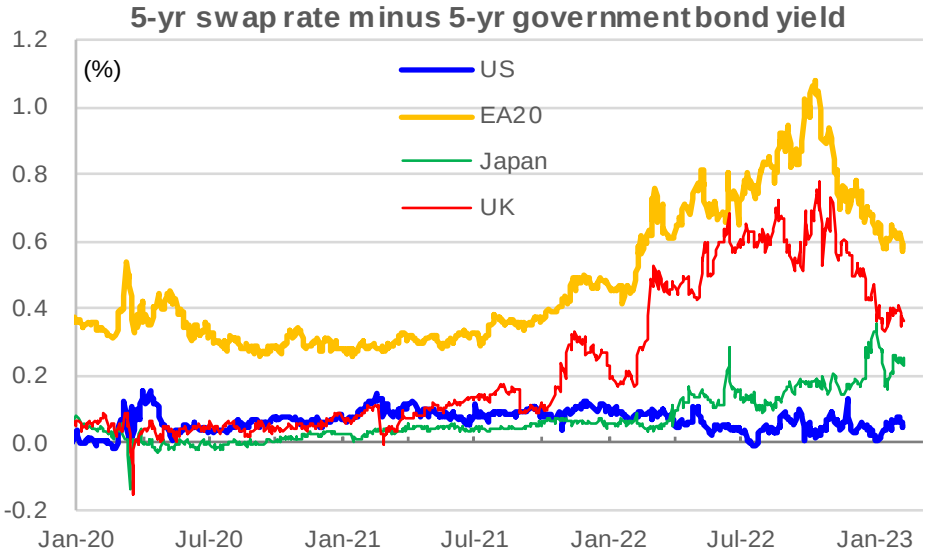


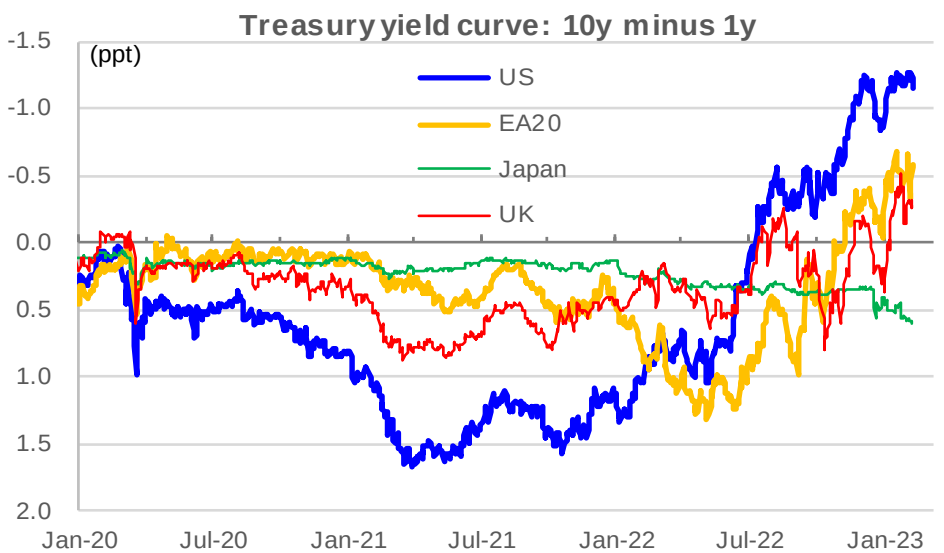


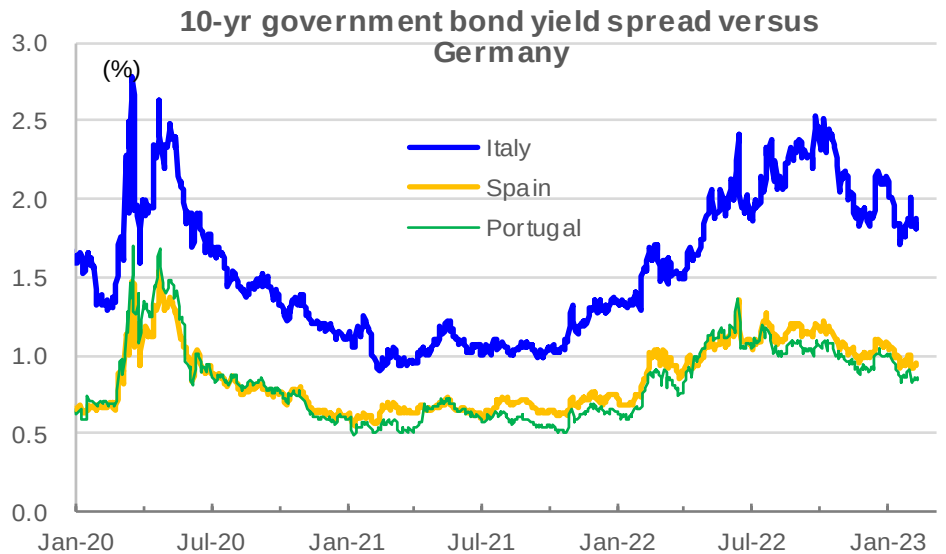


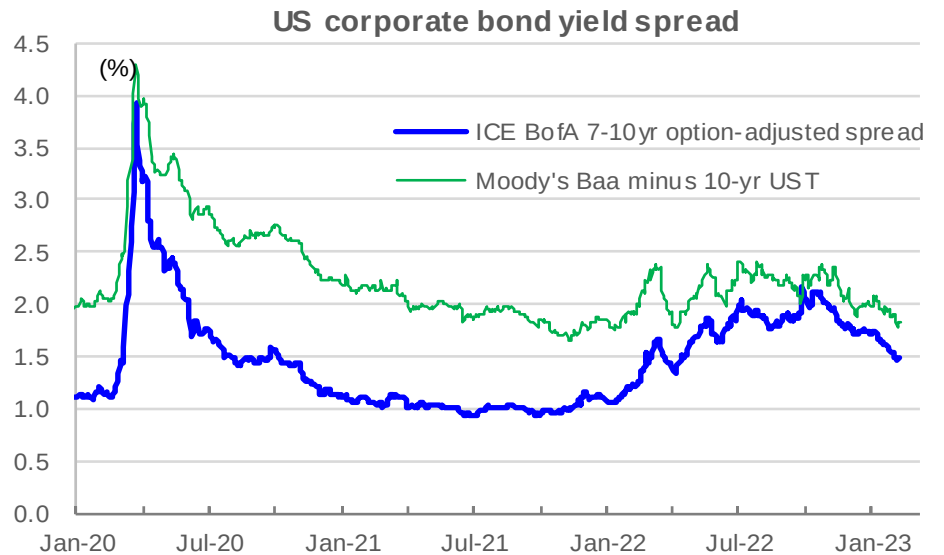
Note: Financial stress index is the weighted average for four regions (EA19, Japan, the UK, and the US), consisting from maximum seven elements.
Sources: Bloomberg, CEIC database, FRED Database, SBI SECURITIES

Financial stress index (SBI-FSI) in major developed countries (5) : Components







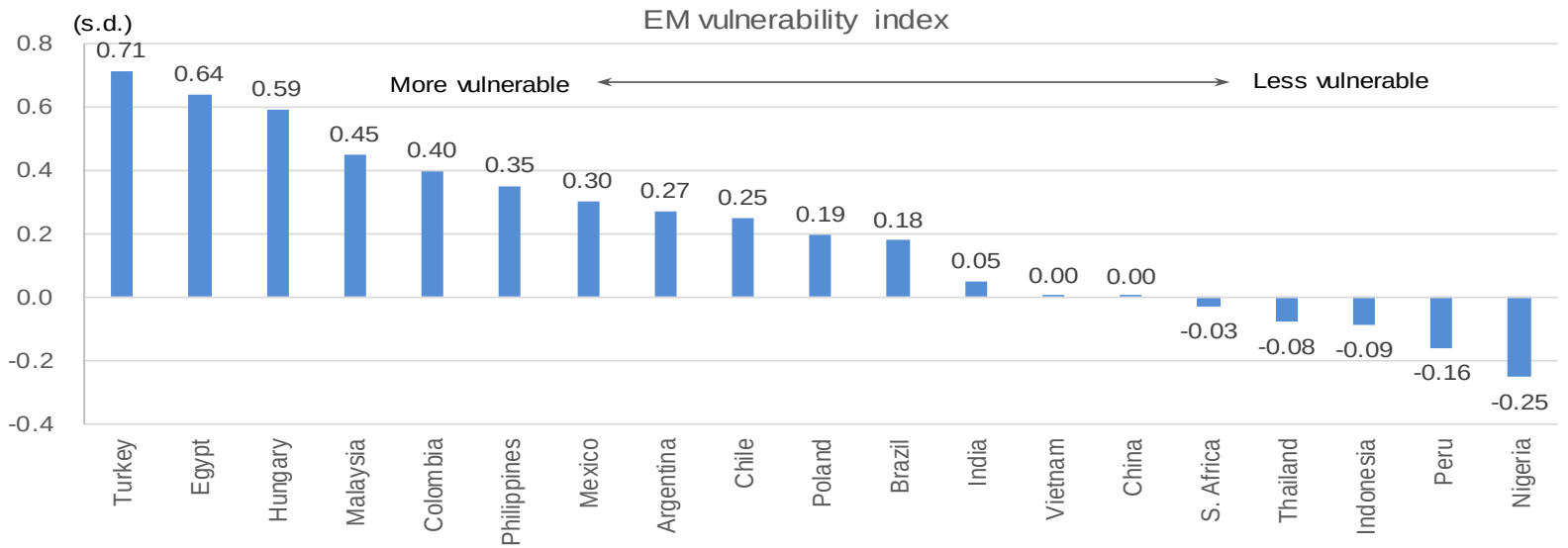


Note: Financial stress index is the weighted average for four regions (EA19, Japan, the UK, and the US), consisting from maximum seven elements.
Sources: Bloomberg, CEIC database, FRED Database, SBI SECURITIES

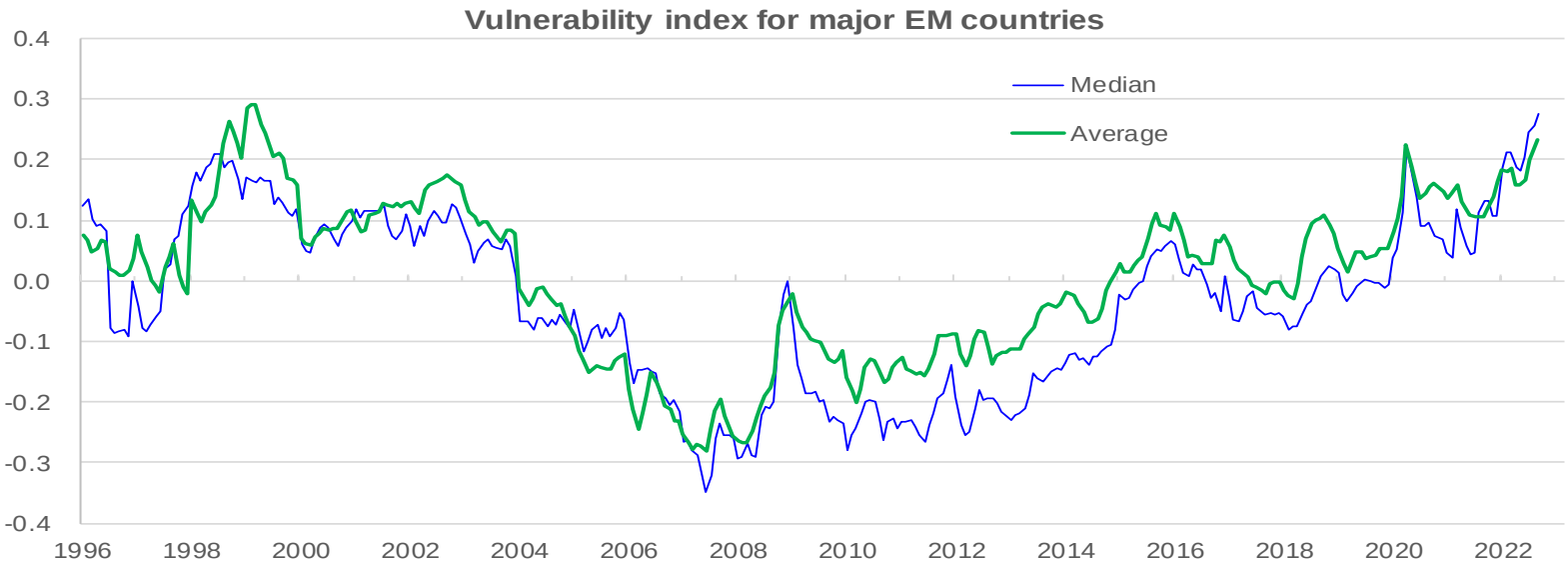
EM vulnerability index (1)

1) The EM vulnerability index consists of 14 economic indicators which often deteriorate prior to the onset of an external debt crises, covering 20 EM countries.
2) Characteristics of EM countries: susceptible to a regime shift from the virtuous cycle (twin deficits in the current account and budget balances, net capital inflows leading to local currency appreciation, lower interest rates, and an easing repayment pressure on external debt) to a vicious cycle (currency depreciation, rising domestic interest rates, and a rising repayment pressure on external debt).
3) The EM vulnerability index continues to rise following the onset of the pandemic, exceeding the 1997–1998 peak at the time of the Asian and Russian crises.
4) Inflation tends to rise faster in countries that have been hit harder by the pandemic and where the share of basic consumption in CPI is higher. Interest rate hikes in the US and USD appreciation reinforce the need for monetary tightening in EM countries.
5) Top five vulnerable countries: Turkey, Egypt, Hungary, Malaysia, and Colombia.
6) China is a net creditor nation, which can afford disposal of bad debt in real estate and construction sectors at their preferred pace. Like Japan, China is likely to head for sustained decay (implosion), instead of an external debt crisis (explosion).
7) The “Disappearance of the growth frontiers” following the 2008 GFC raised the hurdles for EMs to catch up with developed countries. A series of global shocks since 2020 (the pandemic, rising inflation, monetary tightening, Russian invasion of Ukraine, and USD appreciation) have further raised the hurdles, leading to a widening of the income differential between advanced and EM countries.
8) Symptoms of the disappearance of the growth frontiers: a) a continued decline in the rate of return on overseas investments, b) a decline in net capital inflows to EM countries, c) an end to the rise in the ratio of per-capita income of EM countries to that of developed countries, and d) the premature de-industrialization of EM countries.

EM vulnerability index (2)



Notes: Vulnerability is calculated from 14 indicators. Most recent observation during June to October 2022.
Vietnam is excluded because of unavailability of more recent data in 2022.
Sources: CEIC Database, IMF, World Bank, national sources, SBI SECURITIES.



Notes: The vulnerability index for each country is calculated when seven or more components are available. The average and s tandard deviation are obtained from the sample period of January 1990 - December 2015.
Sources: CEIC Database, BIS, IMF, World Bank, national sources, SBI SECURITIES

EM vulnerability index (3)

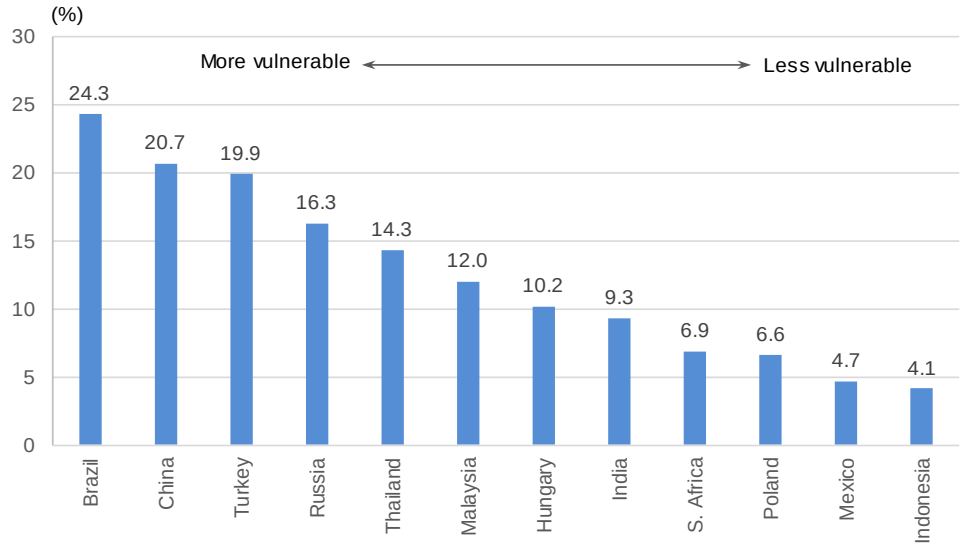
List of variables in EM vulnerability index and availability

	Sign condition	Argentina	Brazil	Chile	China	Colombia	Egypt	Hungary	India	Indonesia	Malaysia	Mexico	Nigeria	Peru	Philippines	Poland	Russia	South Africa	Thailand	Turkey	Vietnam
1) Domestic debt service ratio of private nonfinancial sector (% of debt)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2) Credit to all nonfinancial sectors (% of GDP)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3) General government fiscal balance (12mma or 4qma, % of GDP)	✓	x	x	x	x	x		x	x	x	x	x				x	x	x	x	x	
4) General government gross debt (% of GDP)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5) FX reserves (months of imports)	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6) External debt service (% of exports)		x	x		x	x	x		x	x		x	x	x	x		x	x	x	x	x
7) Trade balance (12mma, % of GDP)	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8) Portfolio investment net inflows (3mma, % of GDP) *	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9) External debt (% of GDP)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10) External debt: short-term (% of GDP)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
11) Net international investment position (% of GDP)	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
12) Deposits + stock market capitalization - government debt (% of GDP)	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
13) Real policy rate (policy rate or money market rate - CPI inflation, %)	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14) USD exchange rate (LCY value per USD, %YoY) **		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

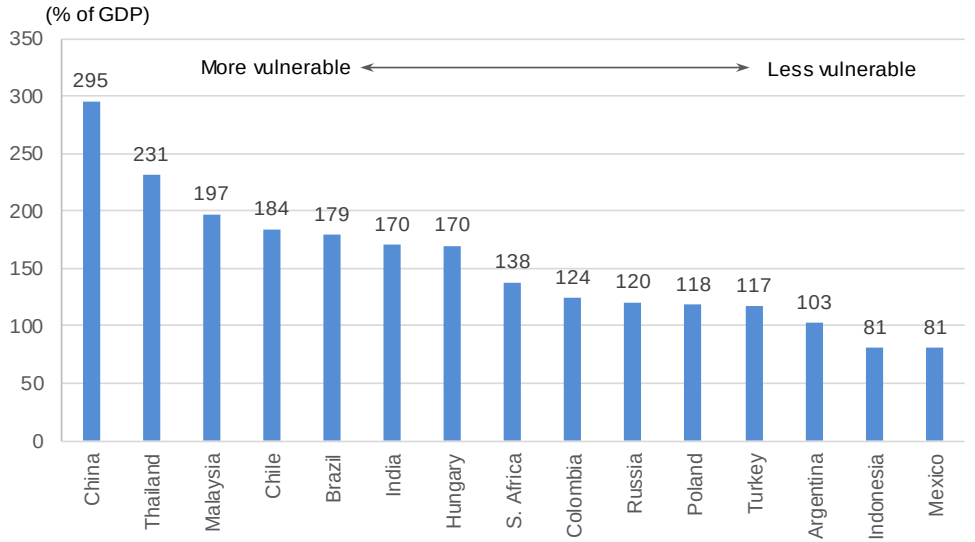
Notes: * … A plus (minus) number indicates net inflows (outflows). ** … A plus (minus) number indicates USD appreciation (depreciation) against EM currency.
✓indicates that higher values mean less vulnerable, and lower values mean more vulnerable. Higher values for variables without ✓ mean more vulnerable.
Sources: CEIC Database, IMF, World Bank, national sources, SBI SECURITIES.

EM vulnerability index (4)

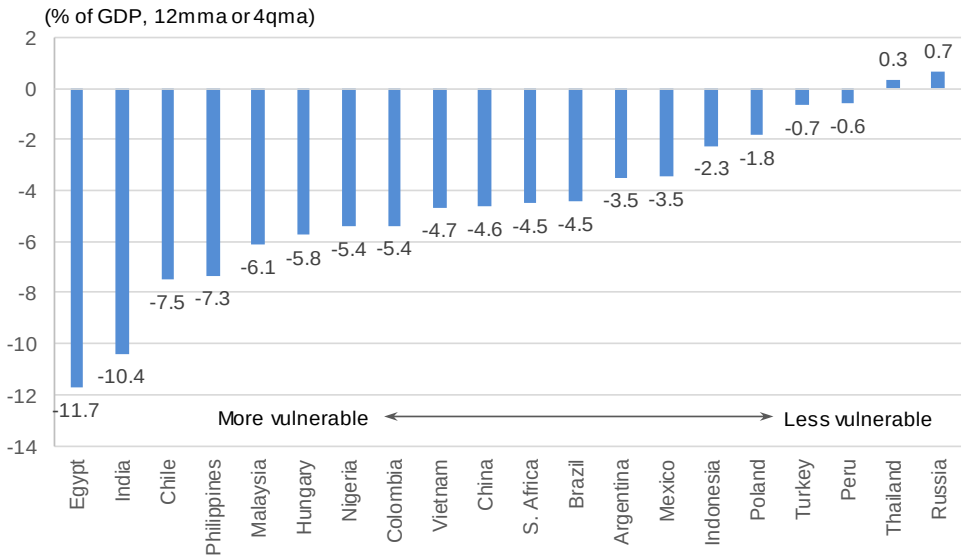
1) Domestic debt service ratio of private nonfinancial sector



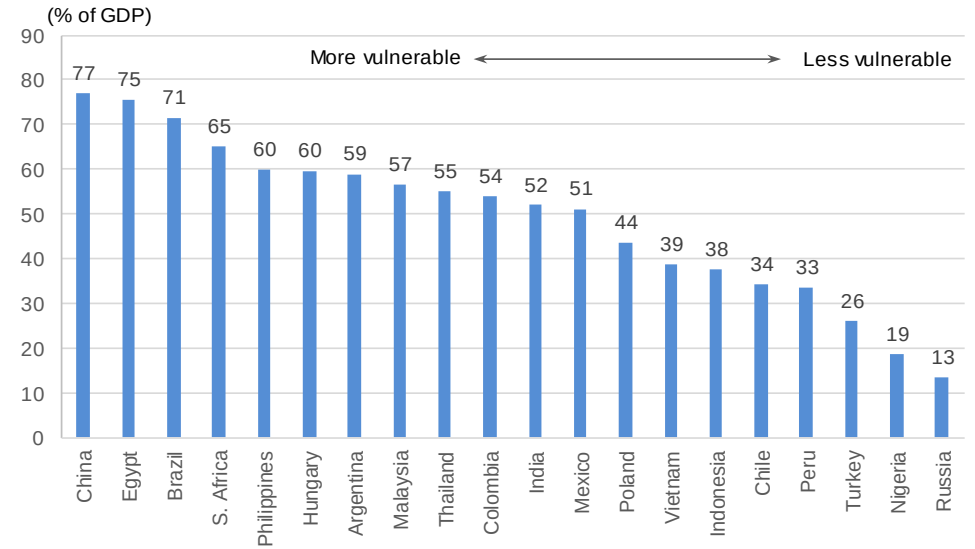
2) Domestic nonfinancial sector debt



3) General government fiscal balance



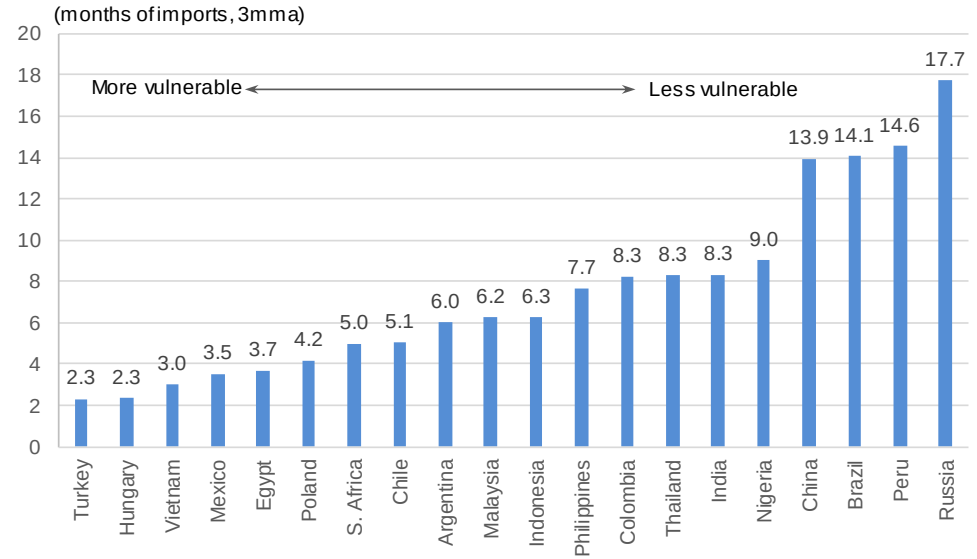
4) General government gross debt



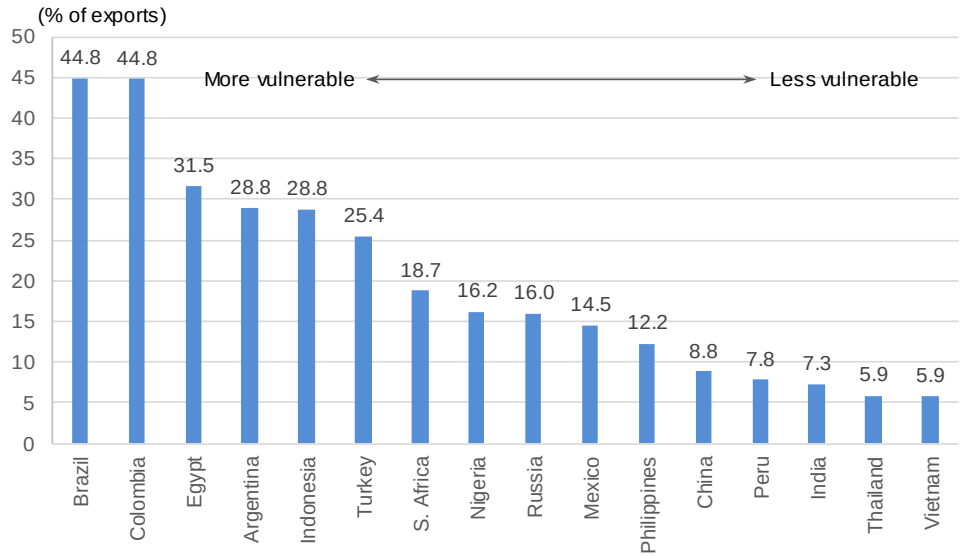
Note: Values for the most recent month, which varies by country. Sources: CEIC Database, BIS, IMF, World Bank, national sources, SBI SECURITIES

EM vulnerability index (5)

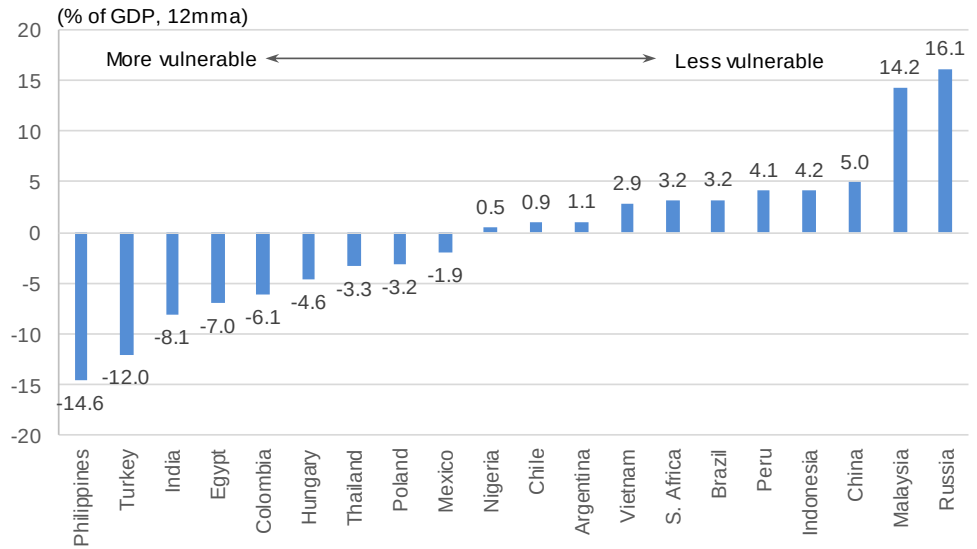
5) FX reserves / monthly imports



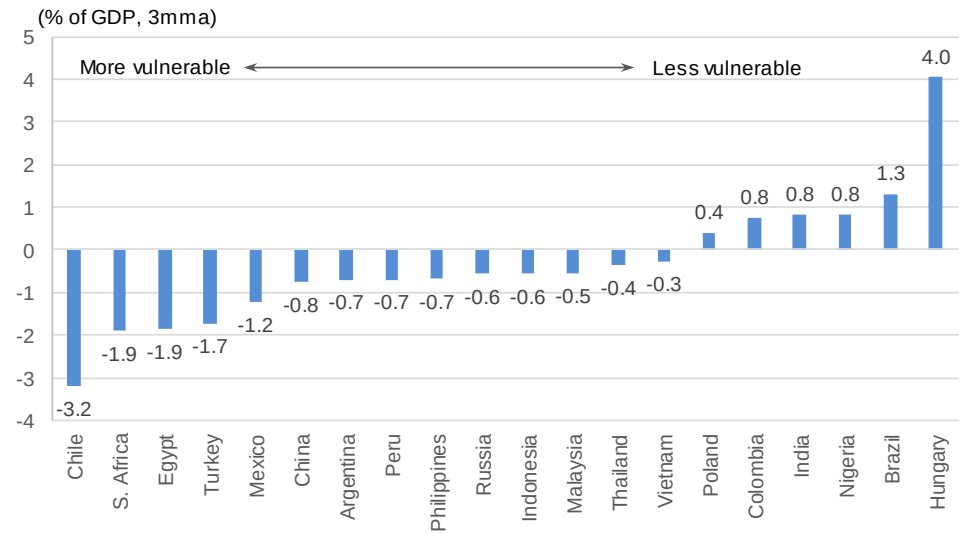
6) External debt service ratio



7) Trade balance



8) Net inflows of portfolio investment

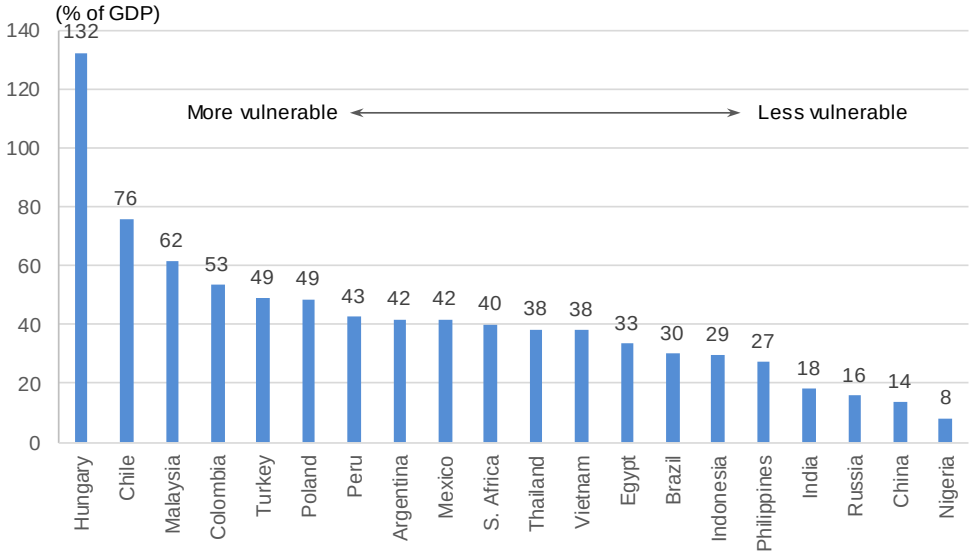


Note: plus numbers are net inflows, negative numbers are net outflows.

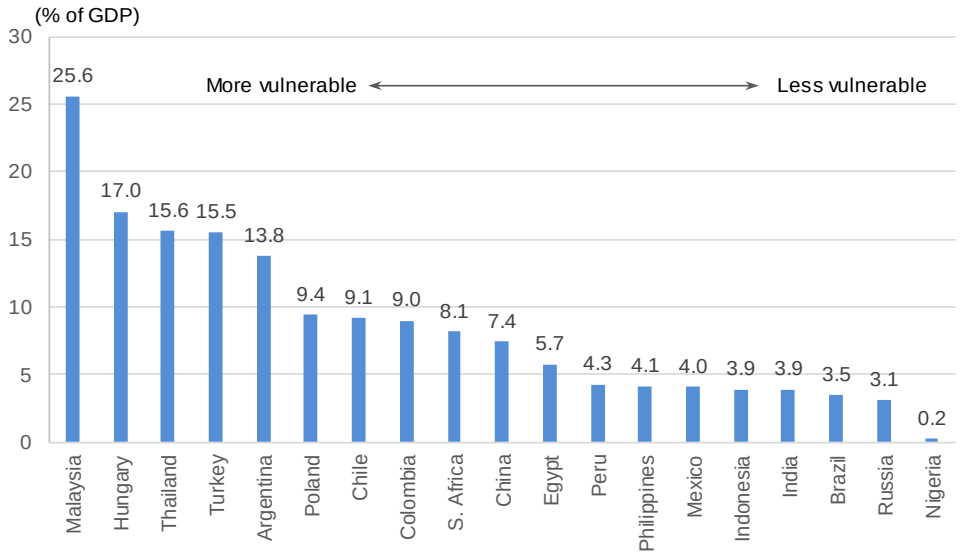
Note: Values for the most recent month, which varies by country. Sources: CEIC Database, BIS, IMF, World Bank, national sources, SBI SECURITIES

EM vulnerability index (6)

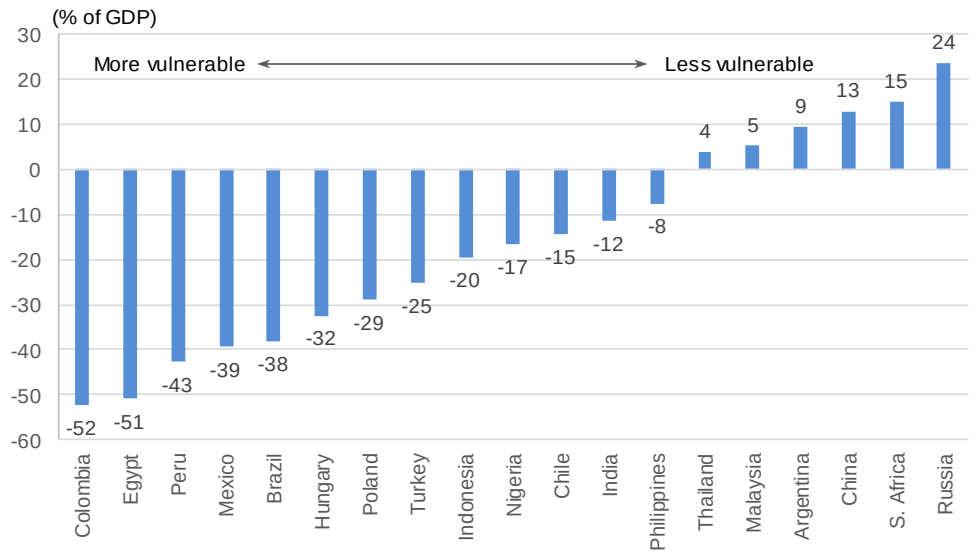
9) External debt



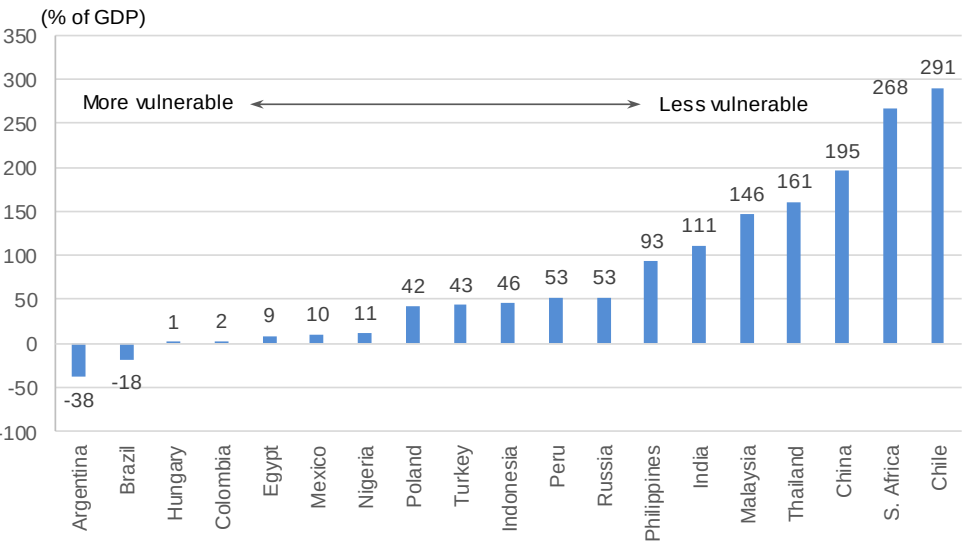
10) Short-term external debt



11) Net international investment position



12) Deposits + stock market capitalization - government debt

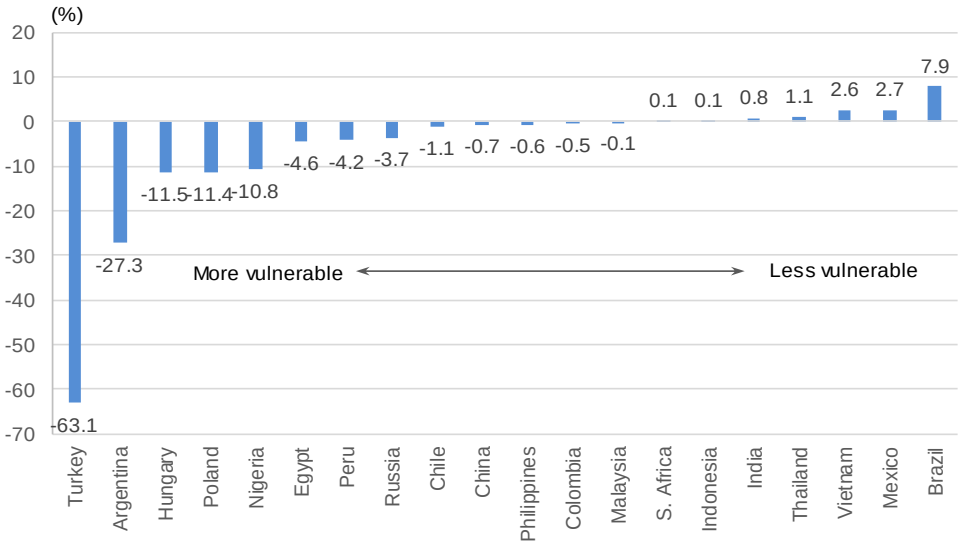


Note: plus numbers are net foreign assets, negative numbers are net foreign liabilities.

Note: Values for the most recent month, which varies by country. Sources: CEIC Database, BIS, IMF, World Bank, national sources, SBI SECURITIES

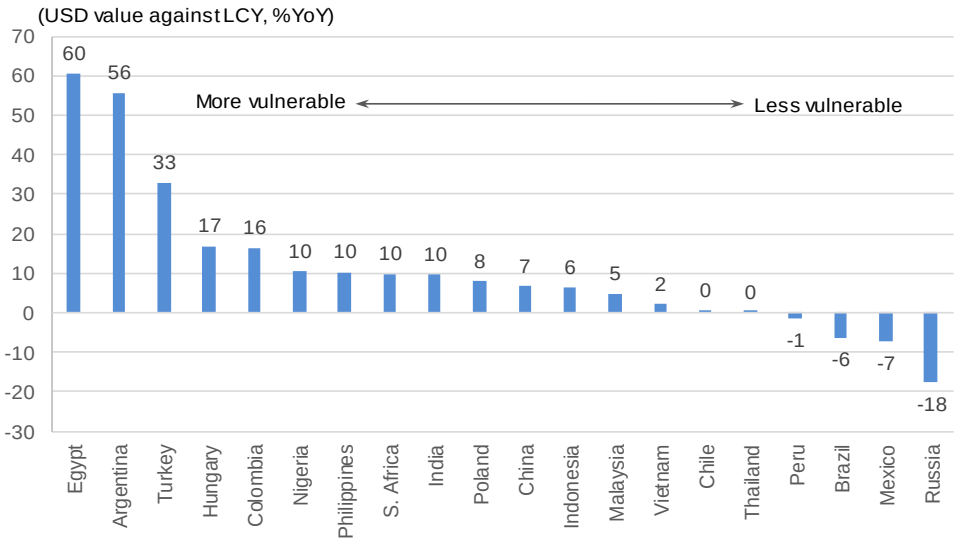
EM vulnerability index (7)

13) Real short-term interest rate



Note: Policy rate or money market rate minus CPI inflation.

14) USD exchange rate



Note: plus numbers are USD appreciation, negative numbers are USD depreciation.

Note: Values for the most recent month, which varies by country. Sources: CEIC Database, BIS, IMF, World Bank, national sources, SBI SECURITIES

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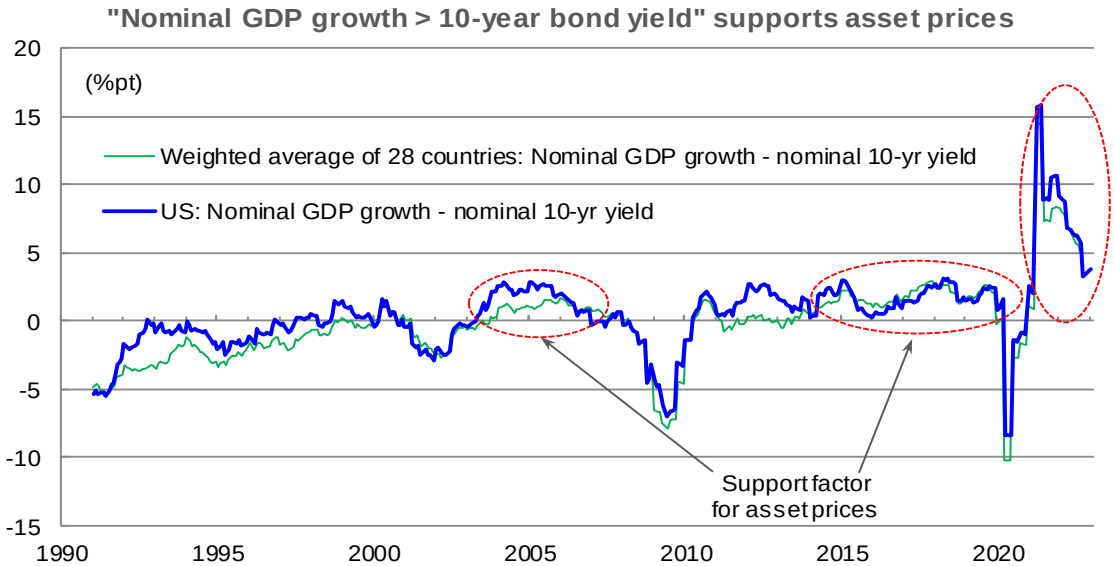
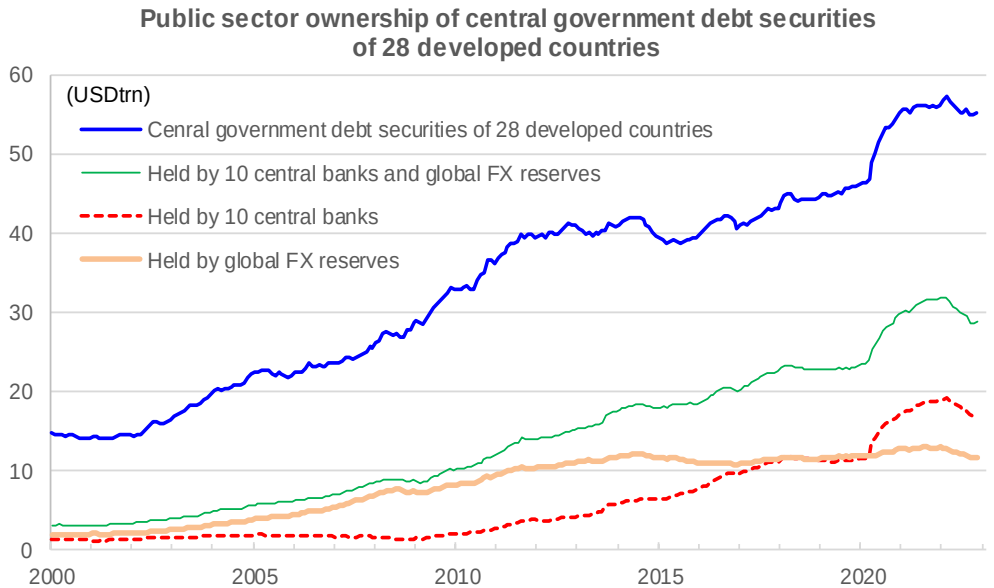
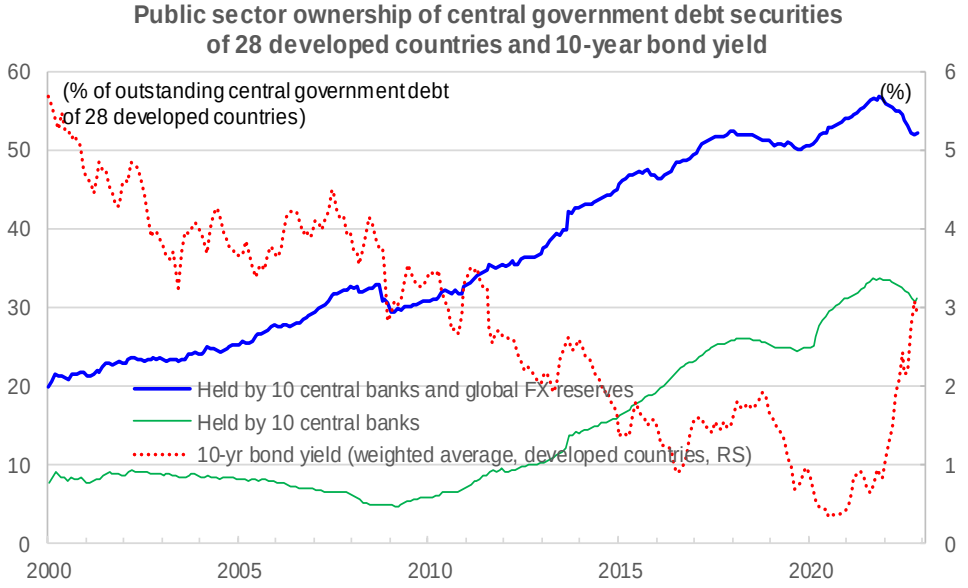
Regime of “nominal GDP growth > 10-year yield” could disappear



Note: Weighted average of 28 countries. Sources: CEIC Database, SBI SECURITIES

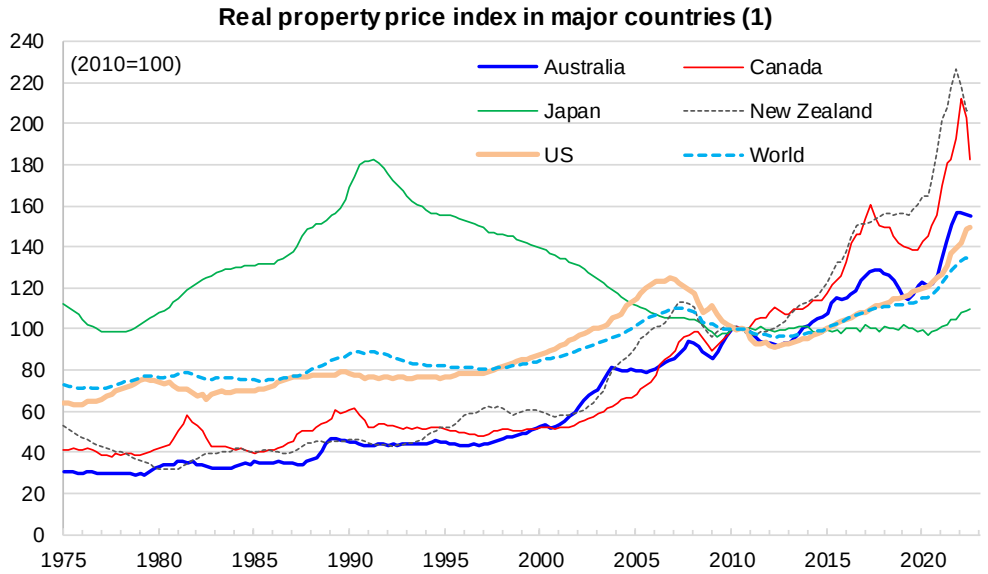


Note: Investment by the Norges Bank is not included. Only government securities are included.
Sources: CEIC Database, SBI SECURITIES.

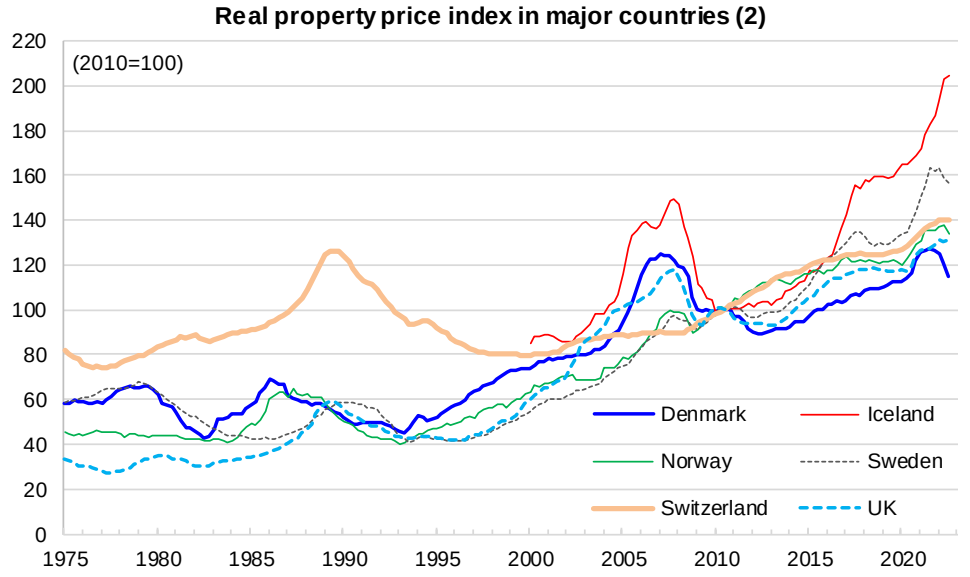


Note: Investment by the Norges Bank is not included. Only government securities are included.
Sources: CEIC Database, SBI SECURITIES.

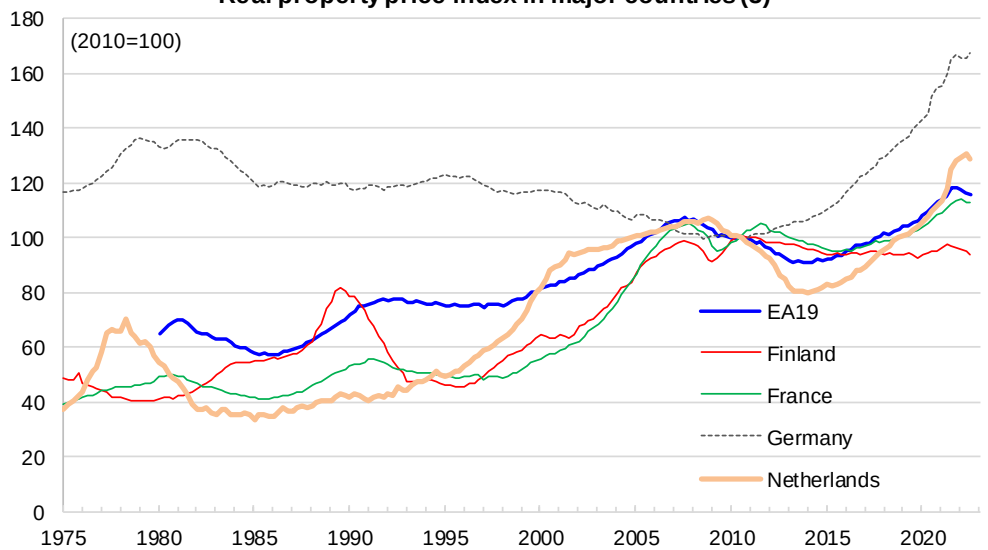
Real property price index in major economies (1)



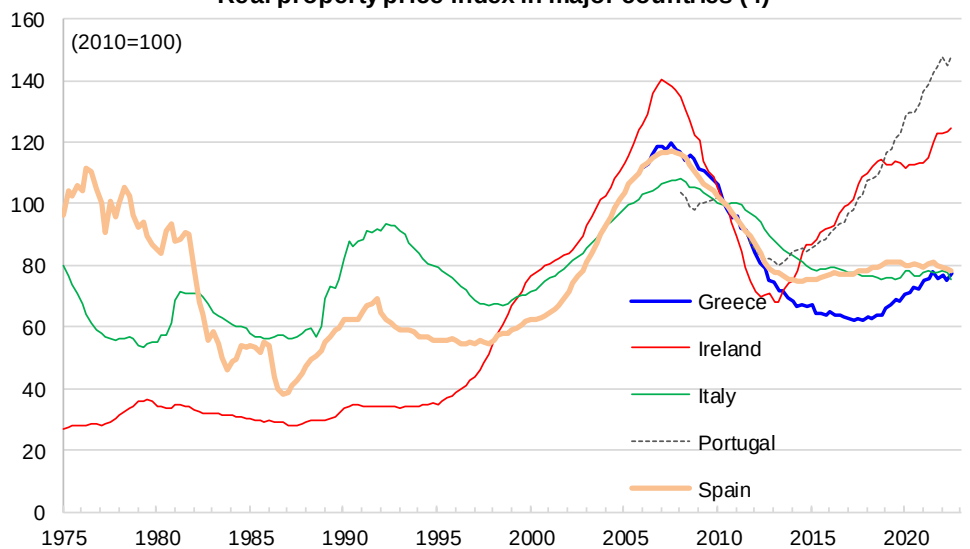
Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES



Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES



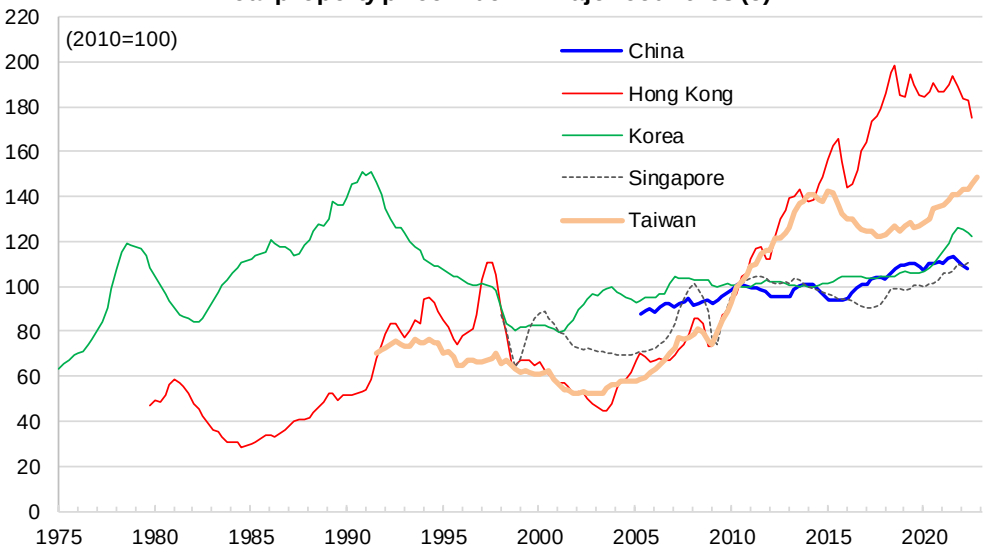
Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES



Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES

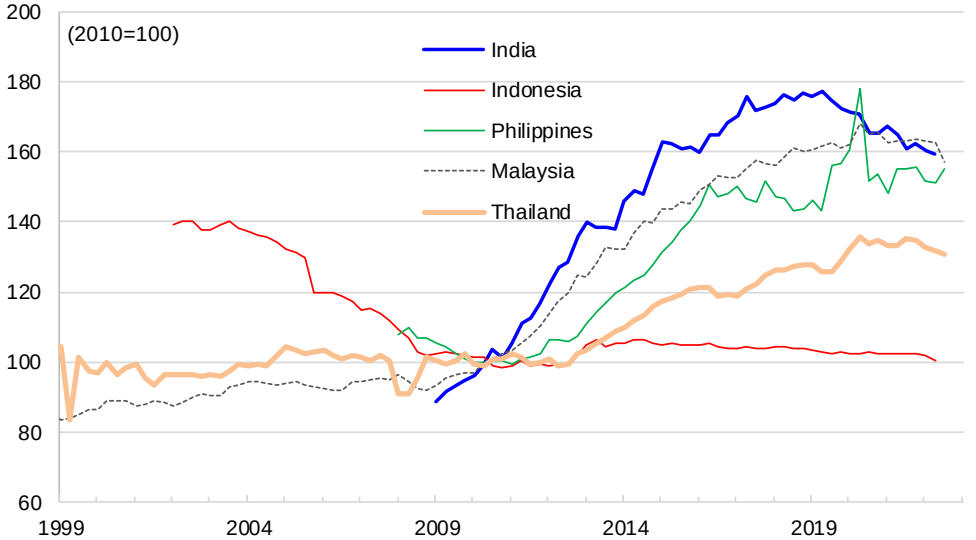
Real property price index in major economies (2)

Real property price index in major countries (5)



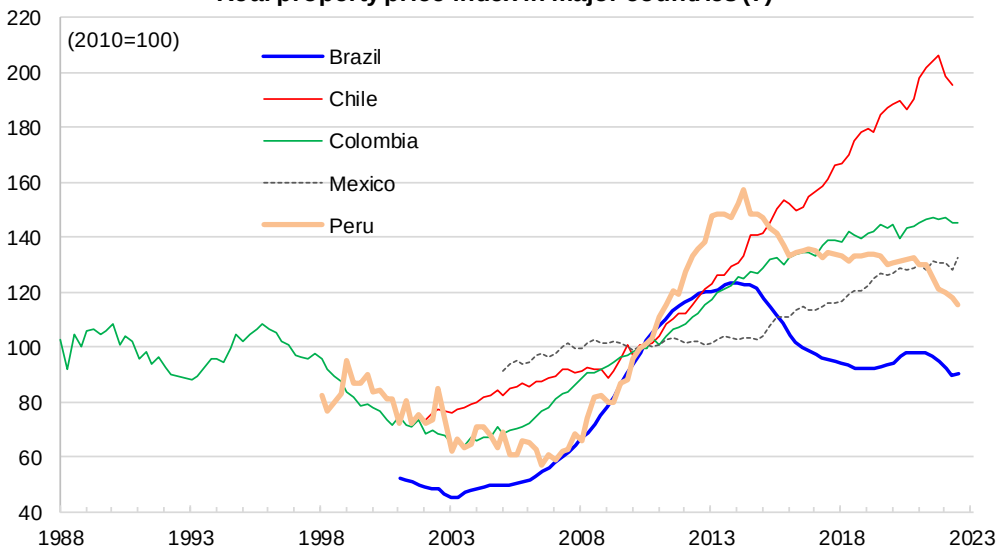
Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES

Real property price index in major countries (6)



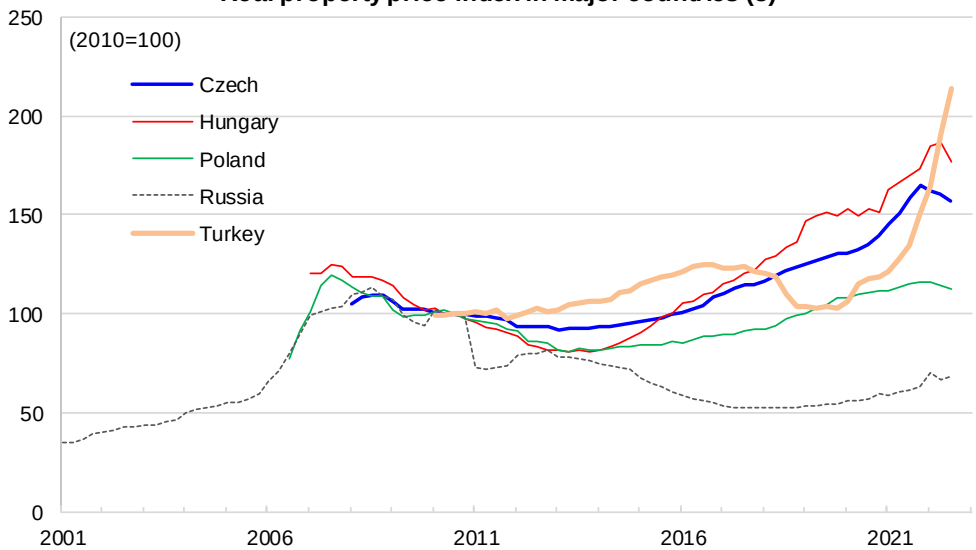
Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES

Real property price index in major countries (7)



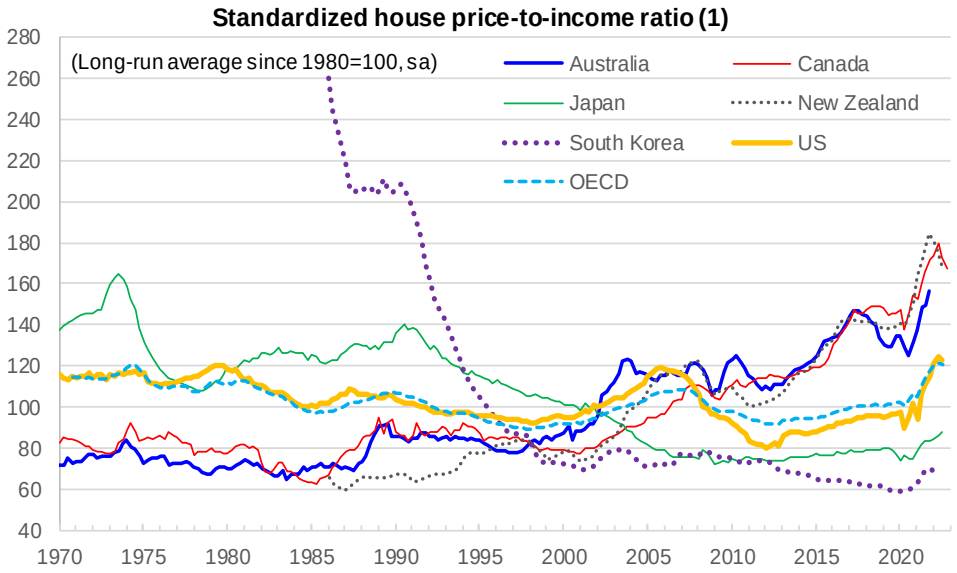
Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES

Real property price index in major countries (8)

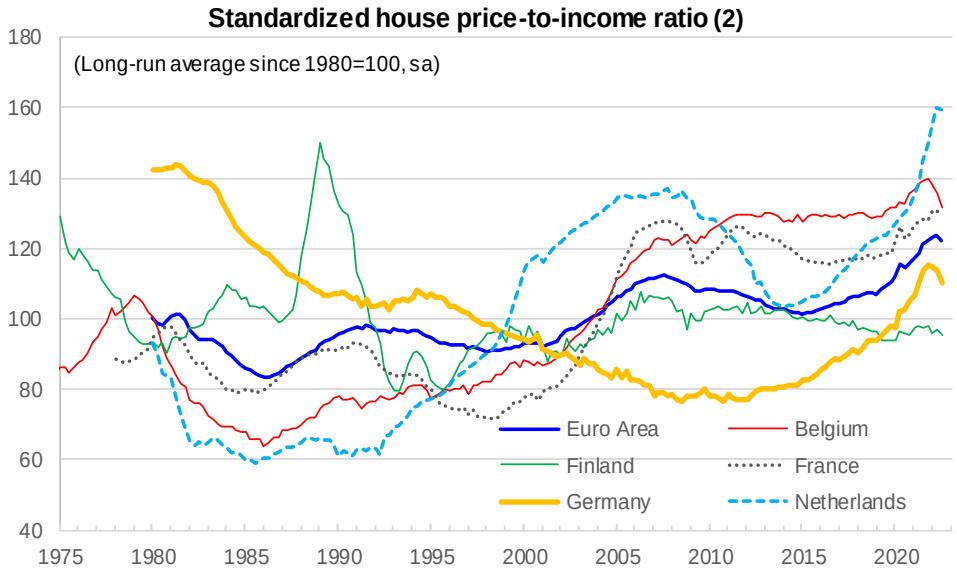


Note: Real property price = nominal property price / CPI.
Sources: CEIC Database, BIS, Federal Reserve Bank of Dallas, SBI SECURITIES

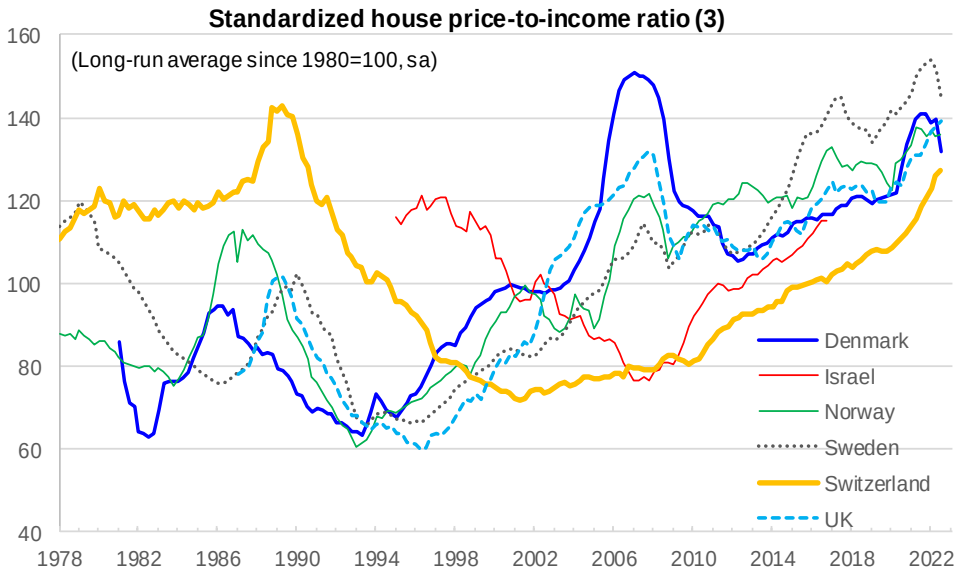
Standardized house price-to-income ratio in major countries



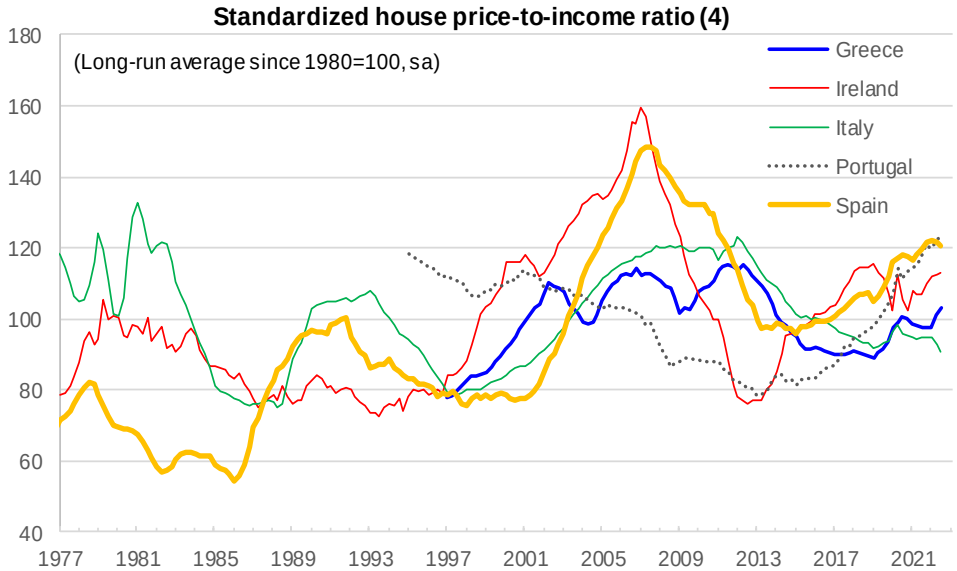
Sources: CEIC Database, OECD, SBI SECURITIES



Sources: CEIC Database, OECD, SBI SECURITIES

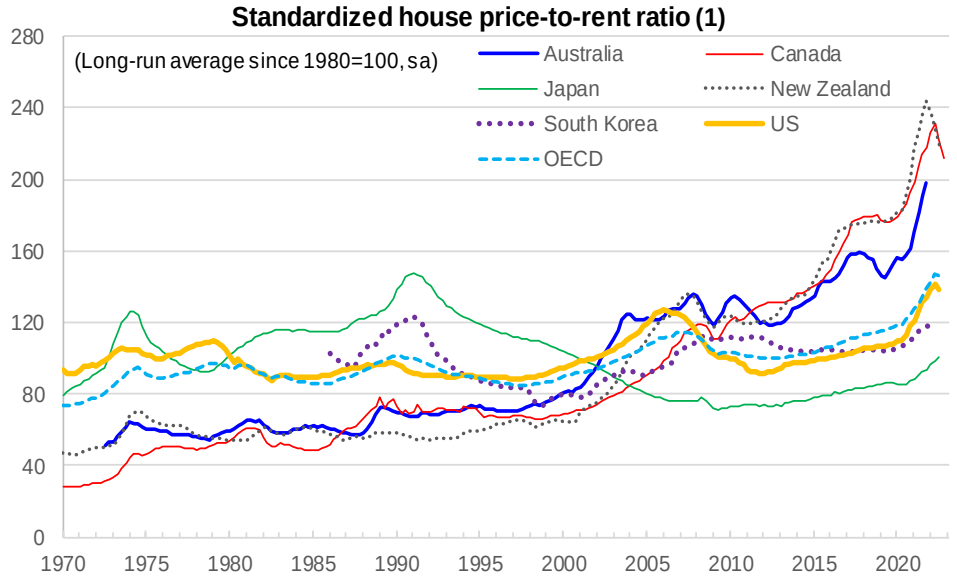


Sources: CEIC Database, OECD, SBI SECURITIES

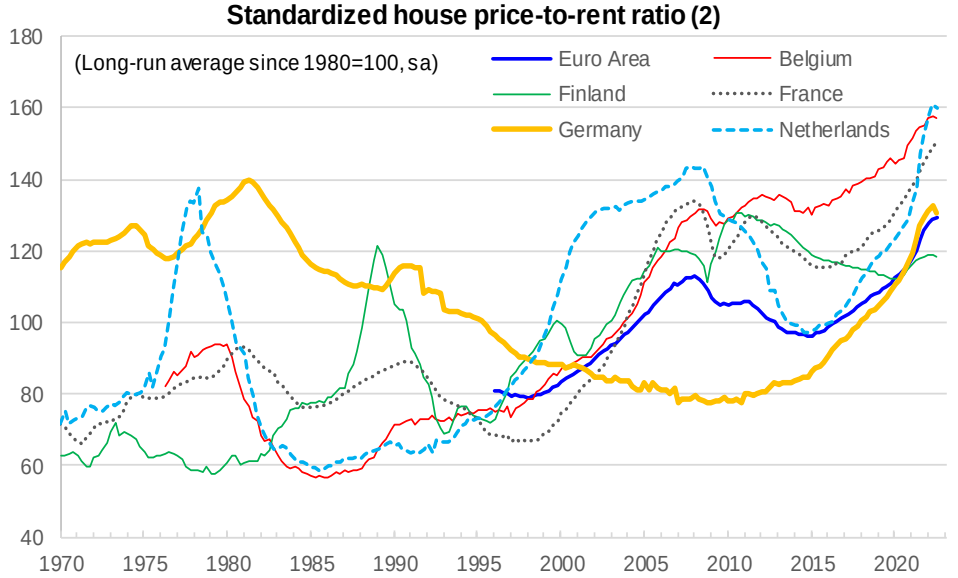


Sources: CEIC Database, OECD, SBI SECURITIES

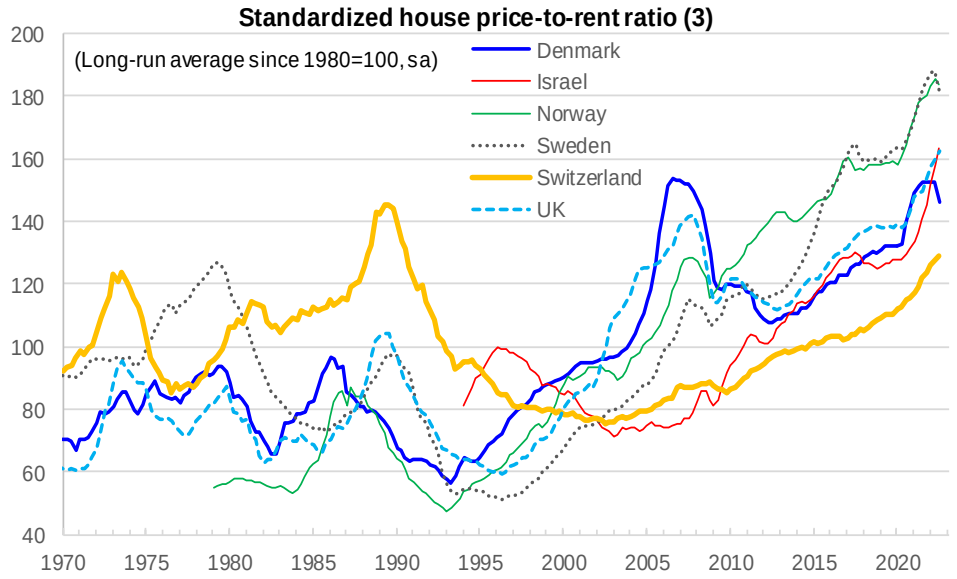
Standardized house price-to-rent ratio in major countries



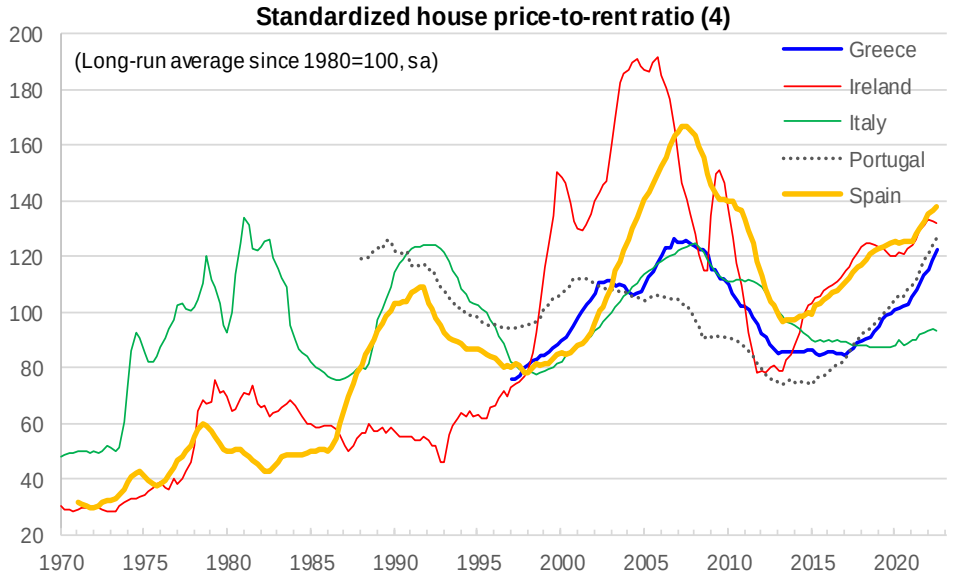
Sources: CEIC Database, OECD, SBI SECURITIES



Sources: CEIC Database, OECD, SBI SECURITIES



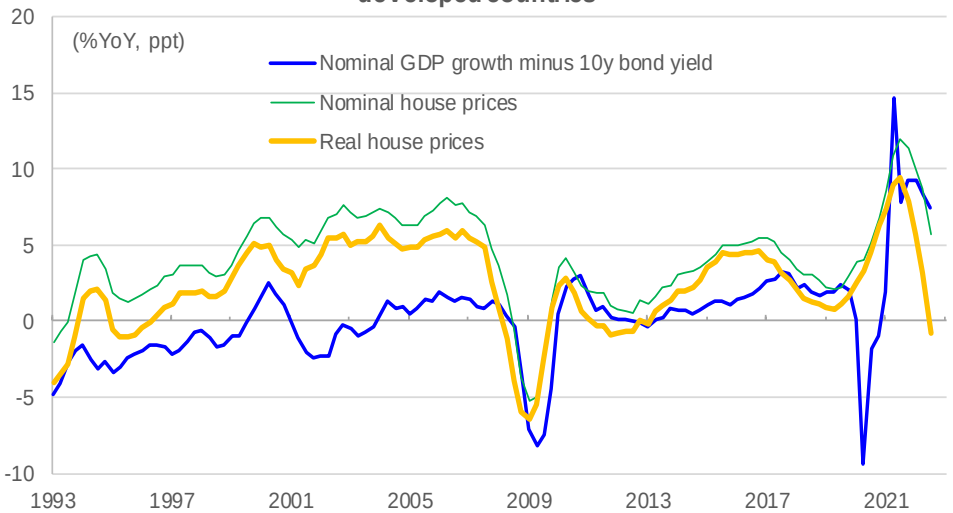
Sources: CEIC Database, OECD, SBI SECURITIES



Sources: CEIC Database, OECD, SBI SECURITIES

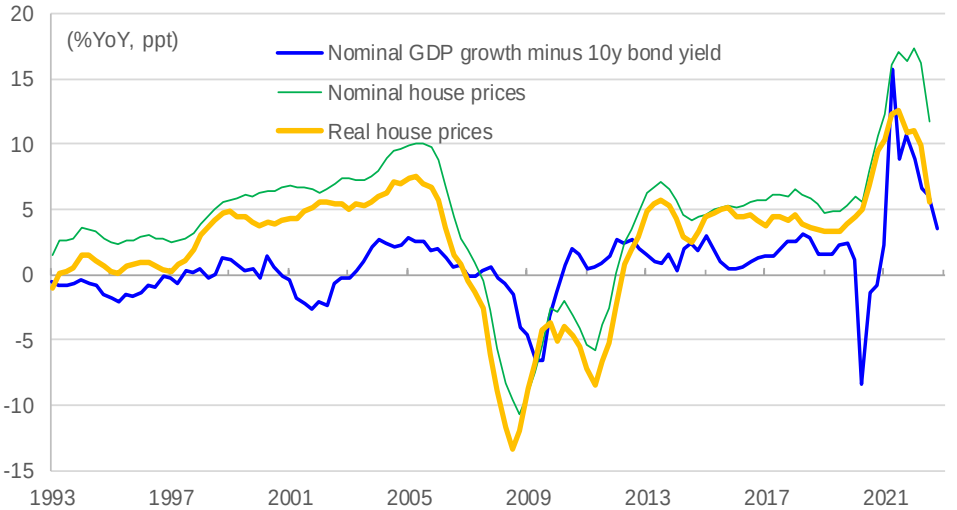
Monetary policy and house prices (1)

'Nominal GDP growth minus 10y yield' and house price inflation in developed countries



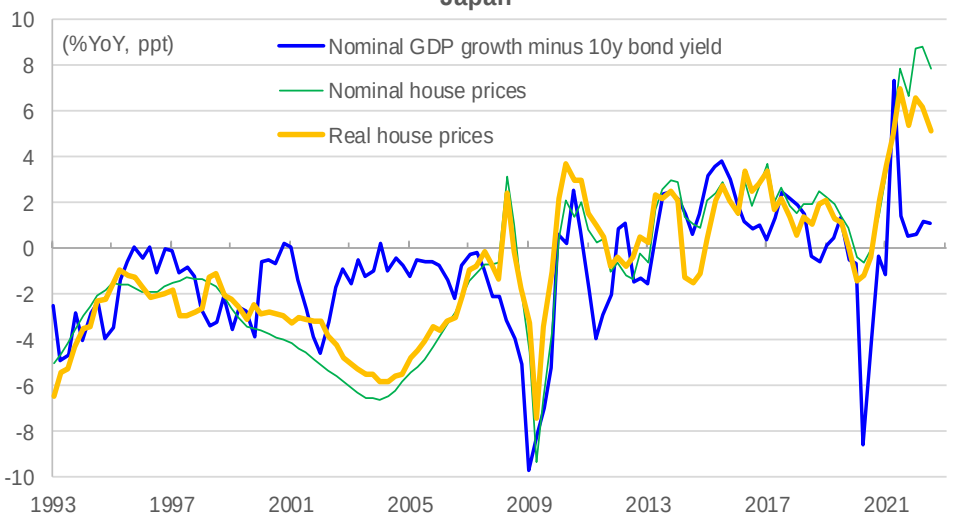
Note: Average from 15 developed countries and the euro area.
Sources: CEIC Database, OECD, SBI SECURITIES

'Nominal GDP growth minus 10y yield' and house price inflation in the US



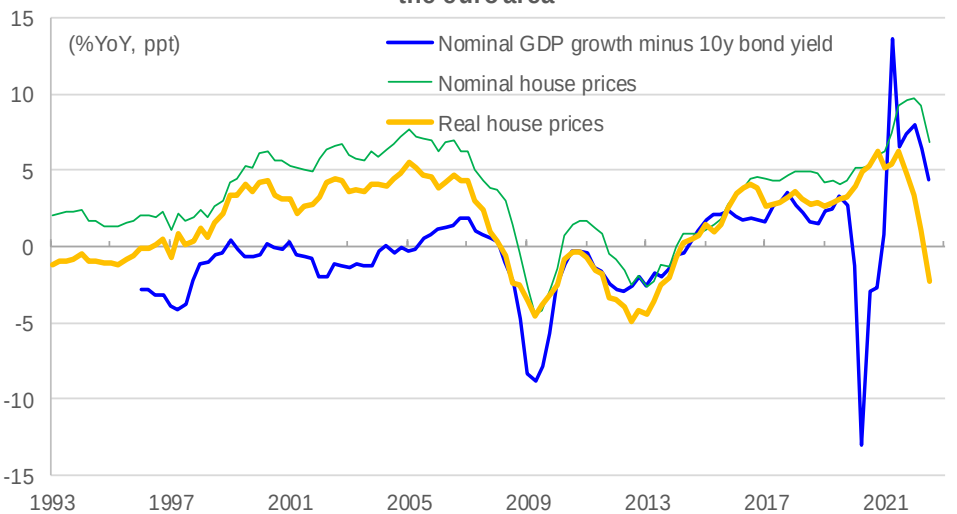
Sources: CEIC Database, OECD, SBI SECURITIES

'Nominal GDP growth minus 10y yield' and house price inflation in Japan



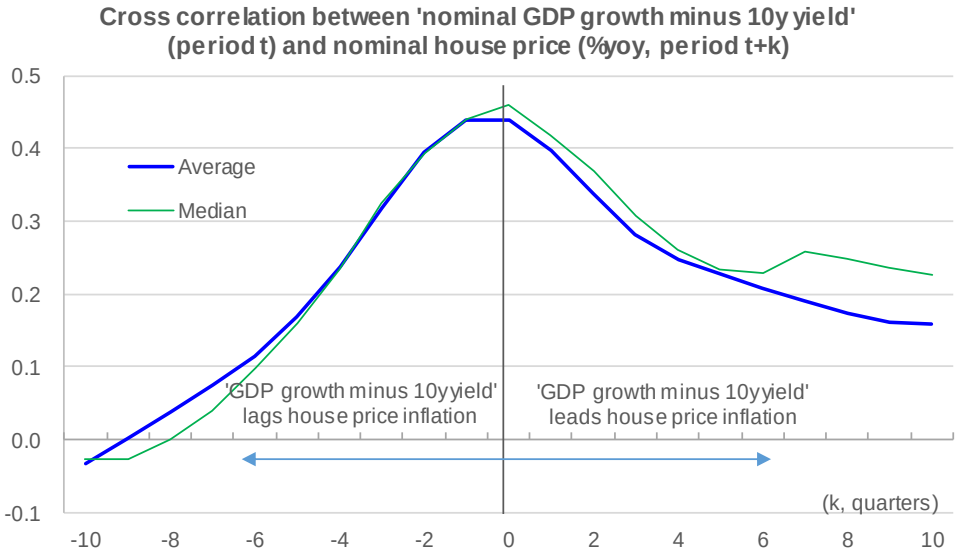
Sources: CEIC Database, OECD, SBI SECURITIES

'Nominal GDP growth minus 10y yield' and house price inflation in the euro area

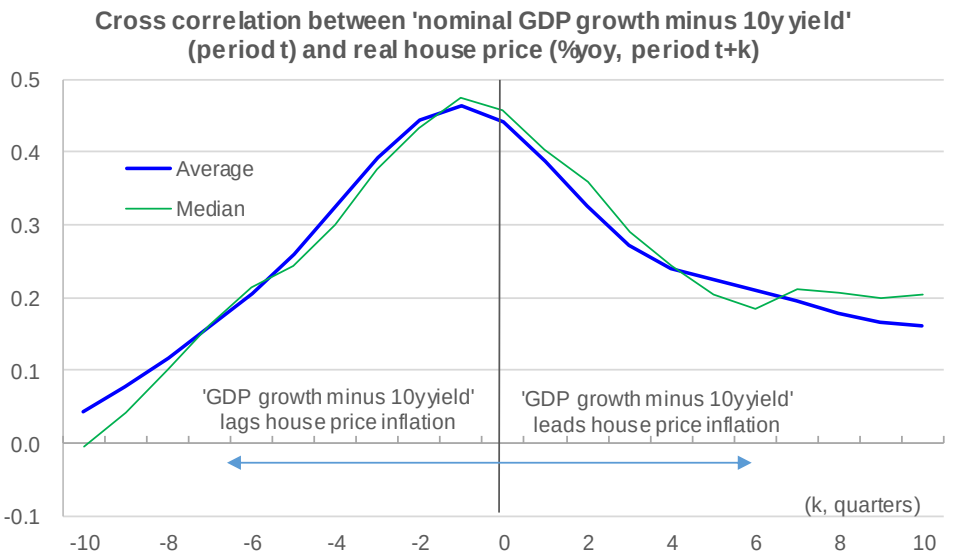


Sources: CEIC Database, OECD, SBI SECURITIES

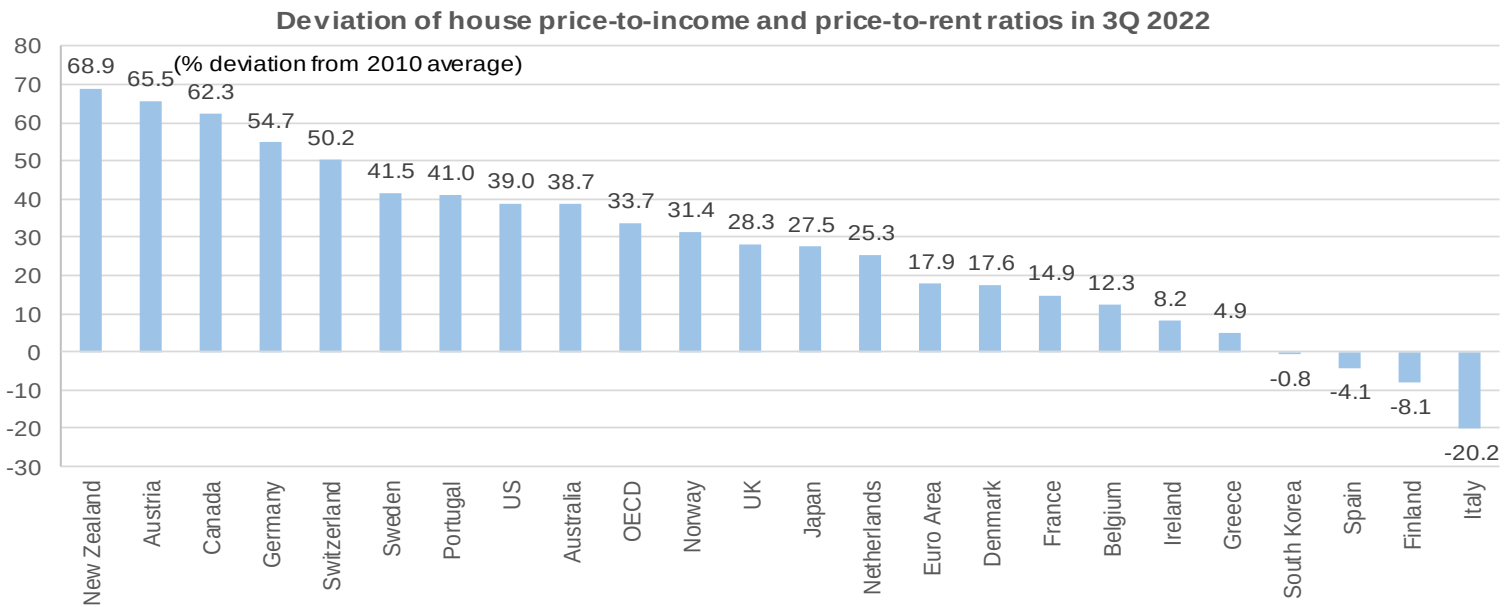
Monetary policy and house prices (2)



Notes: Sample period: 1Q 1990 – 4Q 2021. 15 developed countries and euro area.
Sources: CEIC Database, OECD, SBI SECURITIES

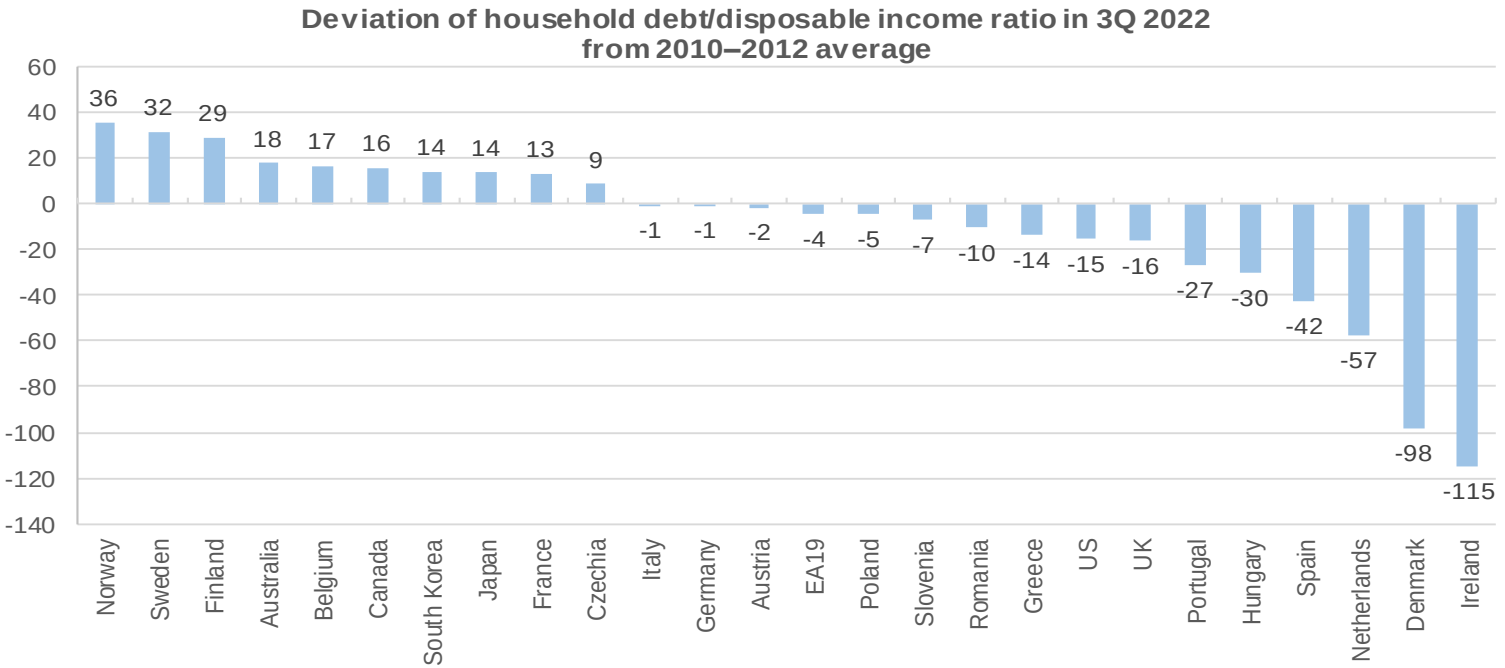


Note: Sample period: 1Q 1990 – 4Q 2021. 15 developed countries and euro area
Sources: CEIC Database, OECD, SBI SECURITIES



Note: Simple average of two measures of deviation. Sources: CEIC Database, OECD, SBI SECURITIES

Monetary policy and house prices (3)



Sources: CEIC Database, SBI SECURITIES.

- The differential between nominal GDP growth and the 10-year bond yield, a proxy for financial conditions, and the YoY changes in house prices move roughly in tandem with each other in major developed countries.
- Monetary tightening with priority on the containment of inflation, reinforces adjustment pressures on asset prices, including house prices, through the tightening of financial conditions.
- Countries with the following characteristics could face stronger adjustment forces on house prices, which reinforces an ongoing economic slowdown through declines in both housing investment and house prices:

1) countries with large increases in real (and/or nominal) house prices over the past decade,

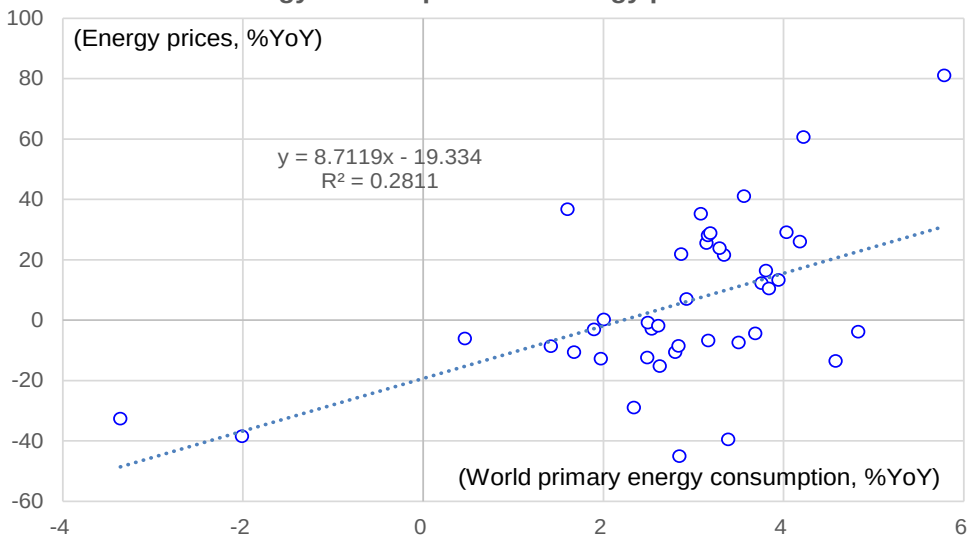
2) countries with large upward deviations from past trends in the house price-to-rent ratio and house price-to-income ratio,

3) countries with large scale monetary tightening, and

4) countries with large increases in the household debt-to-disposable income ratio over the past decade.

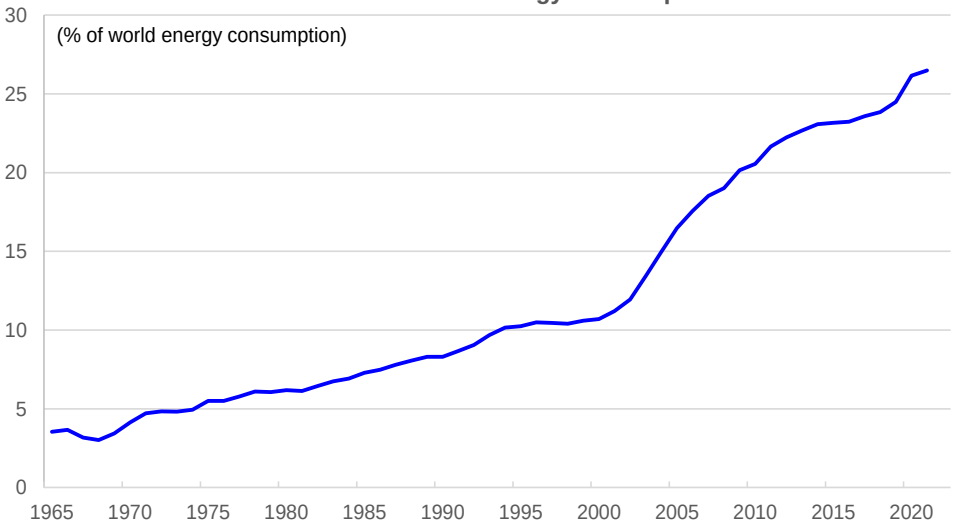
Re-opening of China and energy prices

World energy consumption and energy prices: 1981–2021



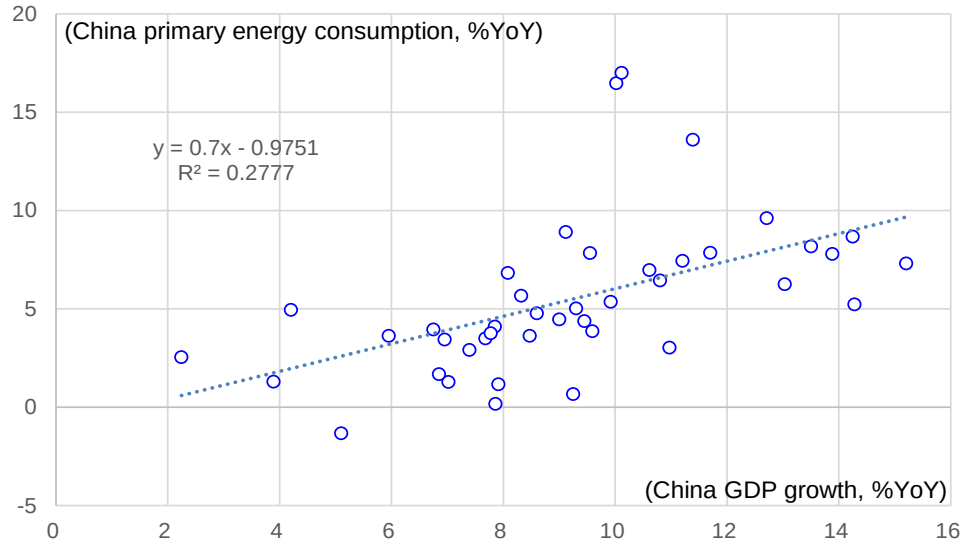
Sources: CEIC Database, World Bank, BP, SBI SECURITIES

China's share of world energy consumption



Sources: BP, SBI SECURITIES

China GDP growth and energy consumption: 1981–2021



Sources: CEIC Database, IMF, BP, SBI SECURITIES

- A 1ppt rise in China's real GDP growth raises their energy consumption by 0.65% where China's share in world energy consumption is 26.5%. A 1% rise in world energy consumption raises energy prices by 8.7%. In sum, a 1ppt rise in China's real GDP growth raises the world energy prices by 1.5% (=0.65 x 0.265 x 8.7).

Downward shift of China's potential growth

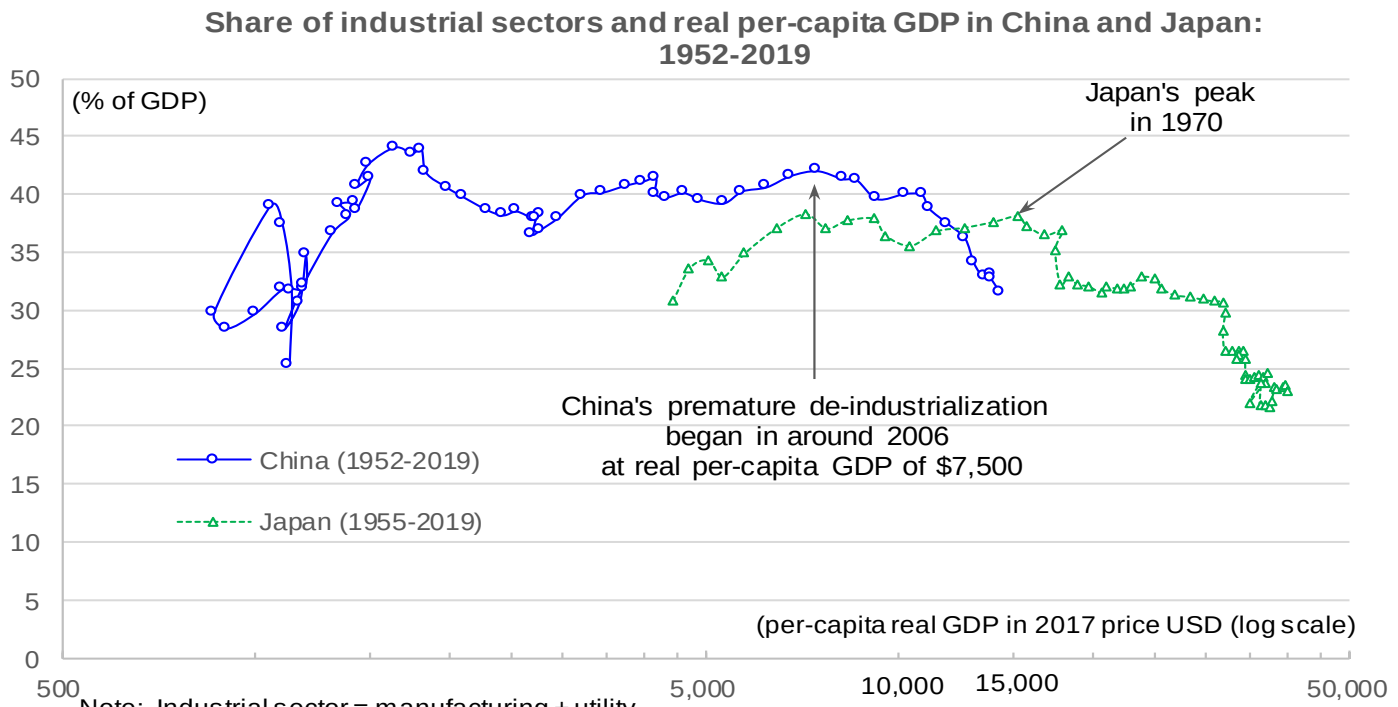
★ **Factors contributing to the decline in potential growth**: could fall to as low as 3% or below

1. Premature deindustrialization
2. The ratio of per-capita GDP in China to G5 developed countries approaching 0.3 is a sign that EM's catching-up process stalls, falling in a middle income country's trap
3. China's downward shift in the potential growth started at a level of per-capita GDP lower than that for South Korea and Japan when they started their downward shift.
4. Financial deepening: China's debt-to-GDP ratio is already at par with that for a typical developed country despite China's per-capita GDP only at one-third to one-fourth of developed countries; debt accumulation leads to a diminishing marginal return of capital; being unable to front-load economic growth via debt accumulation anymore.
5. Larger income inequality despite socialist-oriented economy than in the US: need to prioritize redistribution over growth, leading to larger government and inefficiency.
6. Growth accounting: a decline in contribution from capital stock (slower capital stock accumulation, a rise in capital coefficient, a decline in internal rate of return of capital); negative labor contribution; near zero TFP growth over the past five years.
7. A rise in age dependency ratio leads to a substantial slowdown in economic growth.

★ China is a net creditor nation: most debt is denominated in local currency, and held by domestic agents, which does not lead to an external debt crisis, but to domestic debt implosion and prolonged decay. The effects on the global economy manifest themselves mainly on the real economy through trade and FDI, rather than on the financial markets through higher volatility in asset prices.

★ The linear extrapolation of the most recent trend such that China's GDP grows X% a year and reaches the level of GDP of the US by year 20YY does not hold.

China's deindustrialization started at half the income level when Japan started deindustrialization

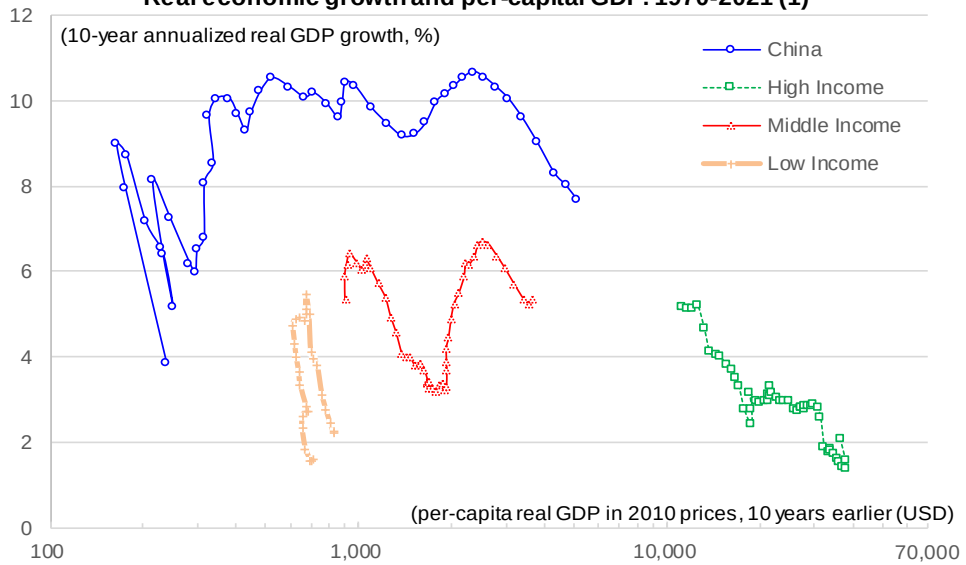


Note: Industrial sector = manufacturing + utility
Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES

Comparison of the peak share of industrial sector's value added in the economy and per-capita real GDP at that time shows that both measures for developed countries are higher than those for EM. Deindustrialization of EM started at income levels lower than those at which developed countries started deindustrialization and at industrial sector's peak shares lower than those for developed countries. (e.g. Japan's industrial sector share peaked in 1970 at per-capita real GDP of $15,300; China's industrial sector share peaked in 2006 at per-capita real GDP of $7,500). An expansion of low-productivity non-manufacturing sector's share in the economy makes it difficult for EM to catch up with the level of income of developed countries.

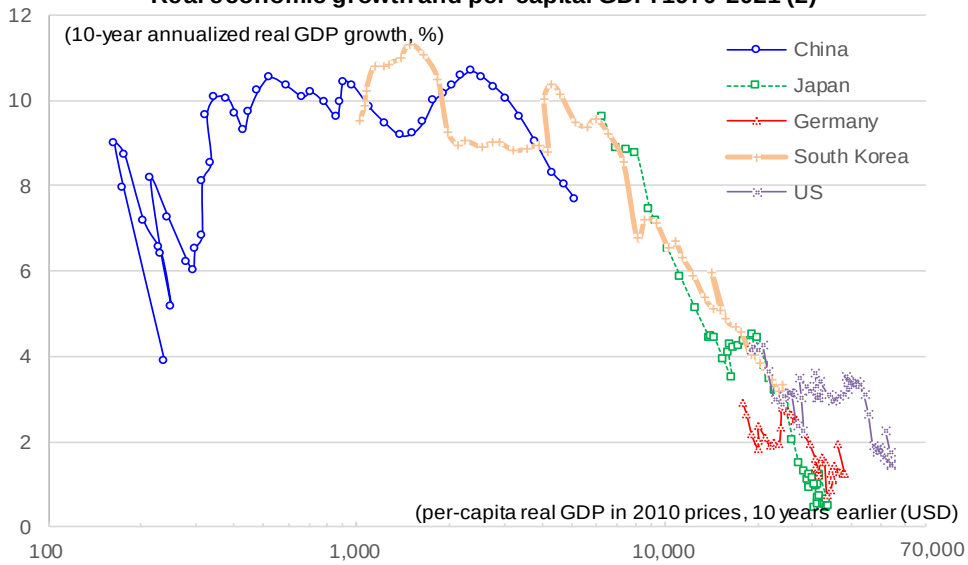
A rise in per-capita income is followed by slower economic growth

Real economic growth and per-capital GDP: 1970-2021 (1)



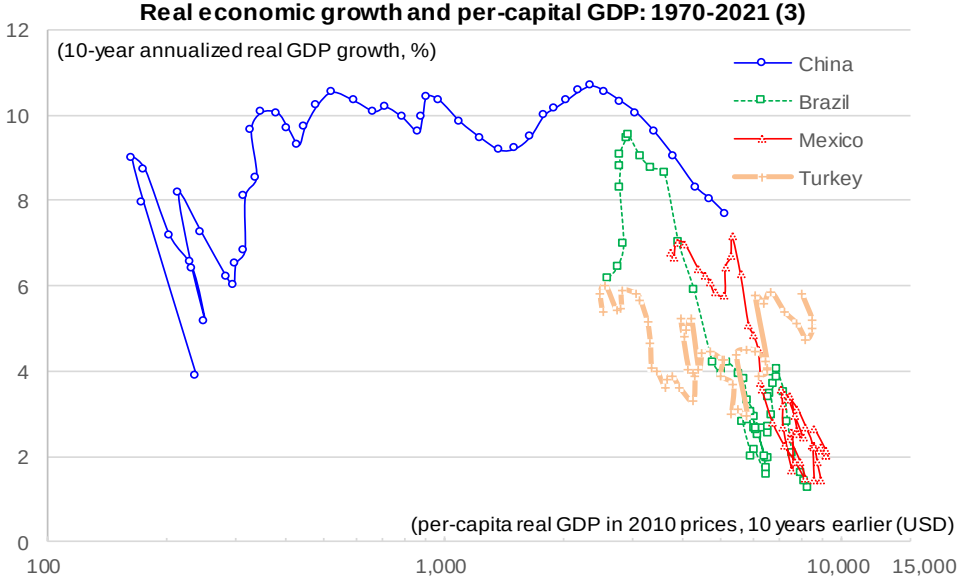
Sources: CEIC Database, World Bank, SBI SECURITIES

Real economic growth and per-capital GDP: 1970-2021 (2)



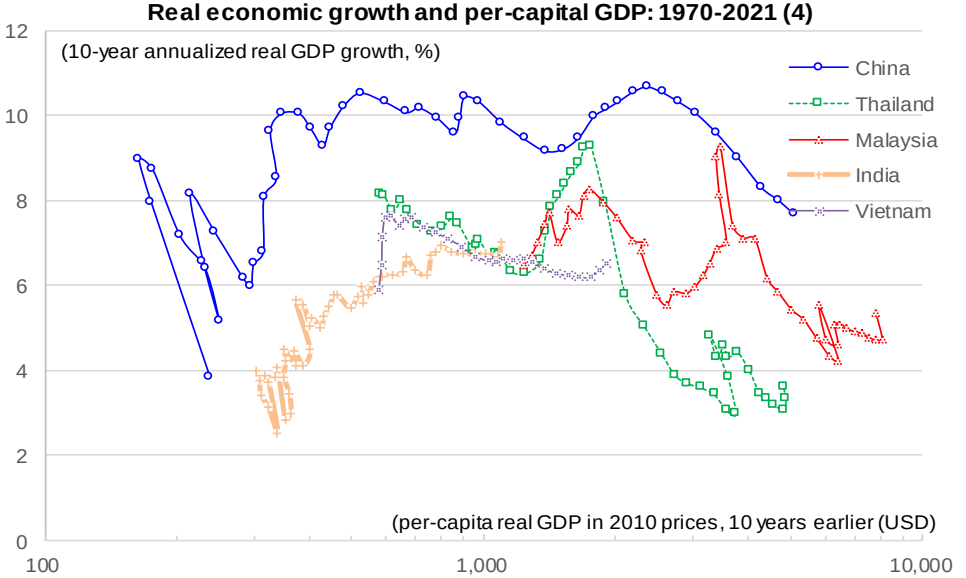
Sources: CEIC Database, World Bank, SBI SECURITIES

Real economic growth and per-capital GDP: 1970-2021 (3)



Sources: CEIC Database, World Bank, SBI SECURITIES

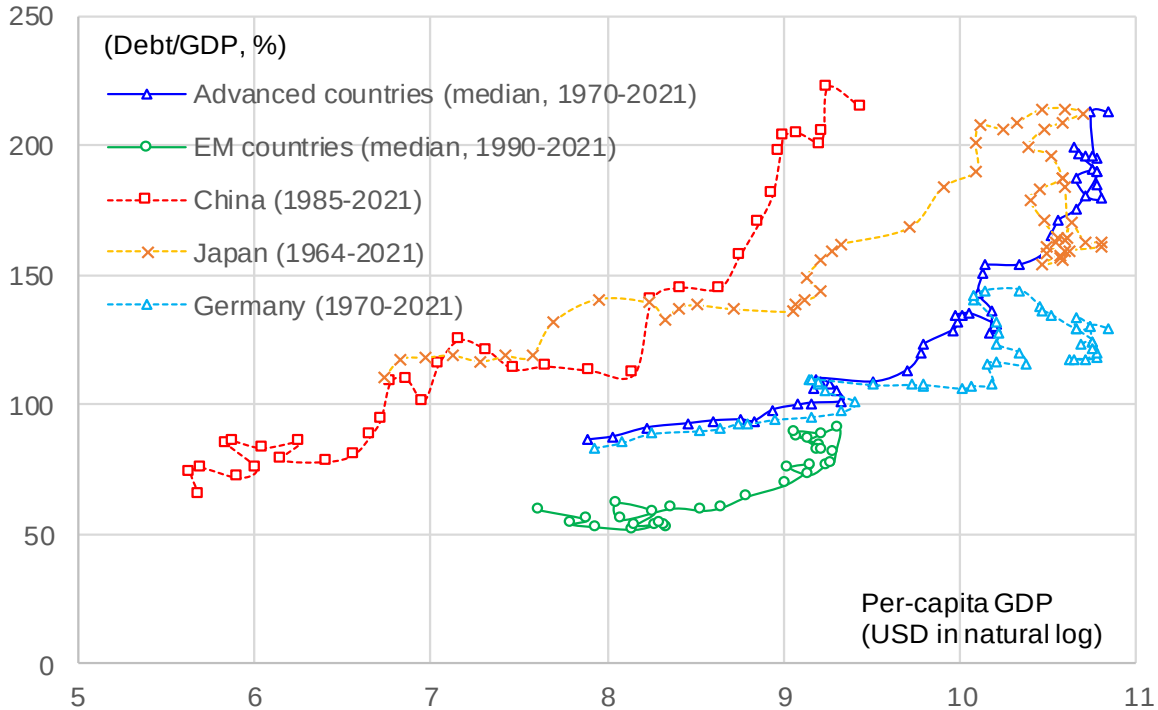
Real economic growth and per-capital GDP: 1970-2021 (4)



Sources: CEIC Database, World Bank, SBI SECURITIES

China's nonfinancial sector debt-to-GDP ratio reached similar levels to developed countries (2)

Private nonfinancial sector debt-to-GDP ratio and per-capita GDP



Note: Median is taken from 19 advanced and 13 EM countries.
Sources: CEIC Database, BIS, IMF, SBI SECURITIES

- China's debt-to-GDP ratio has continued to rise at a pace even much faster than that of Germany and Japan which experienced post-war reconstruction, and reached to levels similar to the average developed countries, despite China's per-capita GDP being only one-third to one-quarter of per-capita GDP of developed countries.
- China is likely to have been facing the diminishing marginal returns on capital.
- It cannot pursue an economic development strategy of front-loading growth via debt accumulation, under no more tolerance of debt expansion.

Decline in contributions from TFP (total factor productivity) and capital stock to China's growth

Growth accounting in major countries: 1997-2019

	Labor contribution			Capital stock contribution			TFP contribution			Real GDP growth		
(%)	1997-2007	2008-2019	2015-2019	1997-2007	2008-2019	2015-2019	1997-2007	2008-2019	2015-2019	1997-2007	2008-2019	2015-2019
China	0.82	0.20	0.01	4.79	4.96	4.10	1.07	-0.16	-1.27	7.43	5.37	3.04
Japan	-0.31	-0.15	0.08	0.69	0.18	0.27	0.07	0.16	0.32	1.04	0.50	0.98
South Korea	-0.07	-0.13	-0.08	2.98	1.88	1.79	1.56	0.65	0.44	5.18	3.07	2.77
Taiwan	0.48	0.50	0.65	1.58	0.93	0.99	1.48	0.62	0.29	5.12	2.88	2.48
Thailand	0.44	-0.38	-1.07	0.89	1.08	1.07	0.59	1.26	2.47	3.21	3.08	3.40
Malaysia	0.66	1.01	0.75	3.22	3.45	3.45	0.10	-0.10	0.47	4.51	4.70	4.88
France	0.49	0.18	0.44	0.79	0.58	0.55	0.57	-0.34	-0.01	2.41	0.92	1.56
Germany	0.05	0.37	0.59	0.64	0.47	0.51	0.55	0.19	0.35	1.64	1.19	1.63
Italy	0.53	-0.22	0.60	1.12	0.36	0.25	-0.72	-0.81	-0.26	1.53	-0.32	1.00
UK	0.48	0.59	0.70	1.01	0.67	0.79	0.96	-0.39	-0.07	3.09	1.13	1.67
US	0.58	0.33	0.84	1.04	0.54	0.61	0.95	0.42	0.66	3.22	1.68	2.45
Czech Republic	-0.20	0.30	0.73	0.61	0.44	0.46	1.51	0.59	1.98	3.29	1.82	3.71
Hungary	-0.23	0.48	1.16	1.21	0.82	1.03	1.88	-0.01	1.22	3.70	1.81	4.05
Poland	0.25	0.20	0.30	1.91	1.90	1.65	1.50	0.98	1.85	4.42	3.61	4.42
Russia	0.60	-0.05	0.01	-0.28	0.39	0.28	4.34	0.30	0.18	5.36	1.30	0.79
Turkey	0.18	0.93	0.71	3.80	3.86	3.76	-0.10	-0.89	-0.96	4.58	4.47	4.13
Argentina	0.92	0.39	0.05	1.37	1.31	0.88	0.43	-1.42	-1.78	3.07	0.89	-0.29
Brazil	1.15	0.50	-0.07	1.18	1.16	0.54	-0.64	-1.50	-2.29	2.89	1.53	-0.64
Chile	0.76	0.35	0.19	2.95	2.91	2.25	-0.13	-0.94	-0.69	4.28	2.91	2.04
Mexico	0.78	0.82	0.80	1.73	1.51	1.37	-0.15	-0.88	-0.59	3.04	1.85	2.02
Peru	1.20	0.94	0.77	2.36	3.57	2.54	0.26	-0.26	-0.31	4.31	4.56	3.17

Note: Real GDP and real gross capital stock are measured in 2017 national prices and USD. As a result, the economic growth could differ from the published statistics.

Sources: Groningen Growth and Development Center, CEIC Database, SBI SECURITIES.

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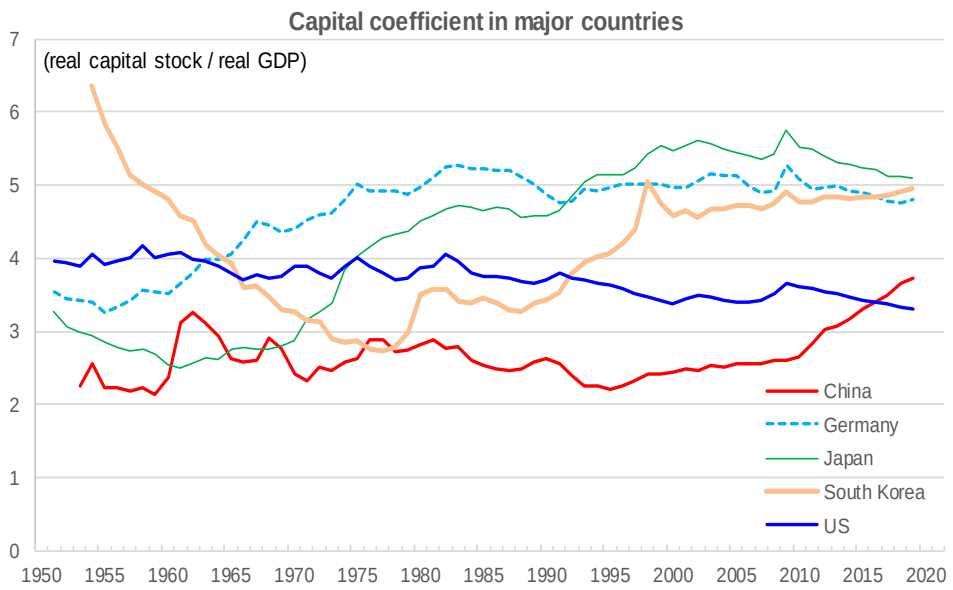
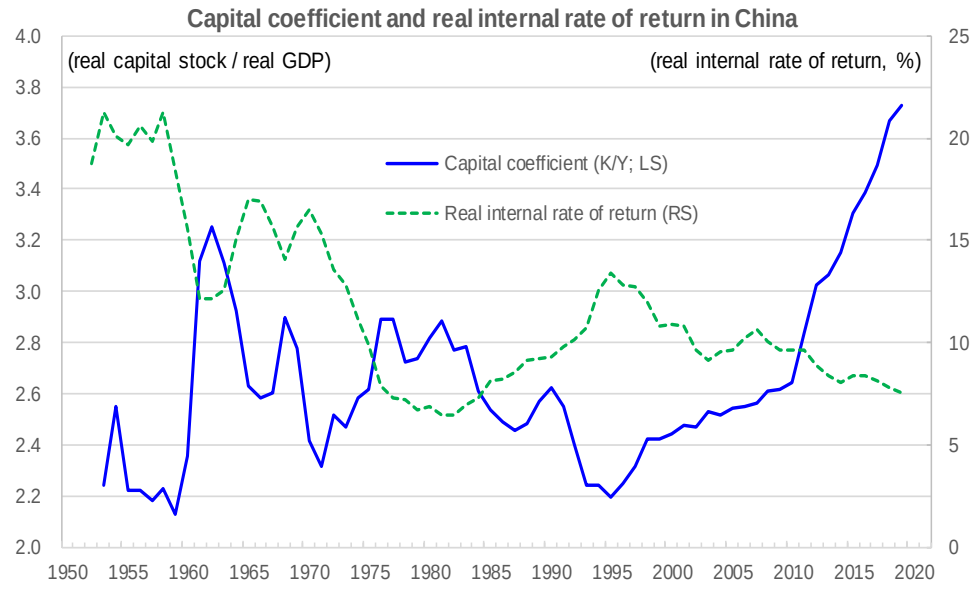
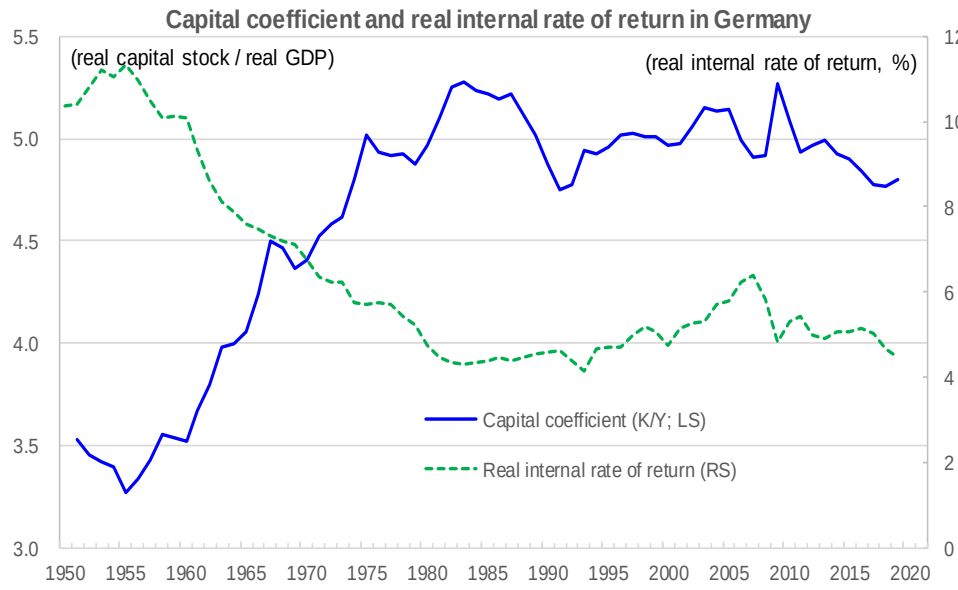
Capital coefficient rapidly rises once accelerating growth phase (post-war reconstruction) ends (1)



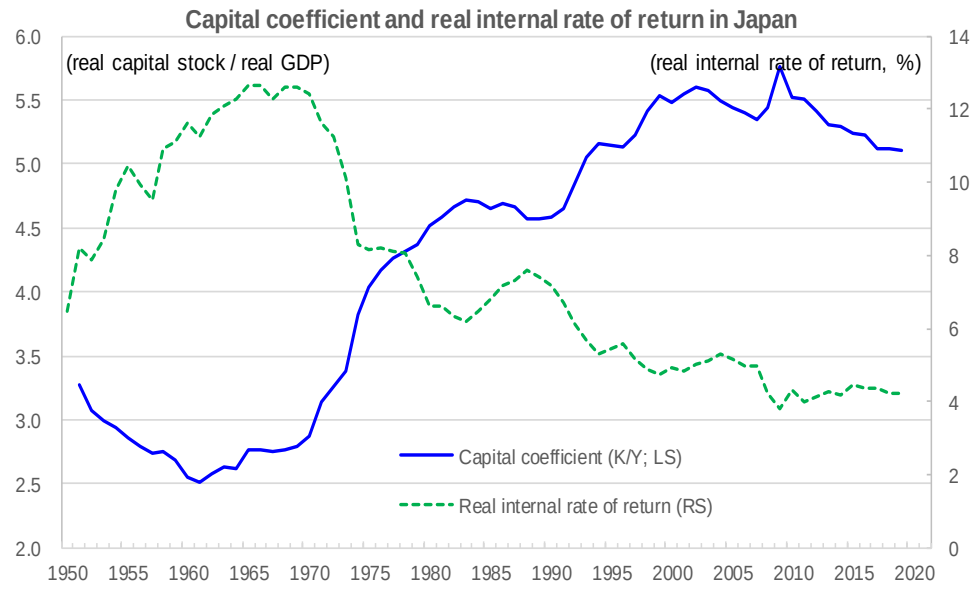
Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES



Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES

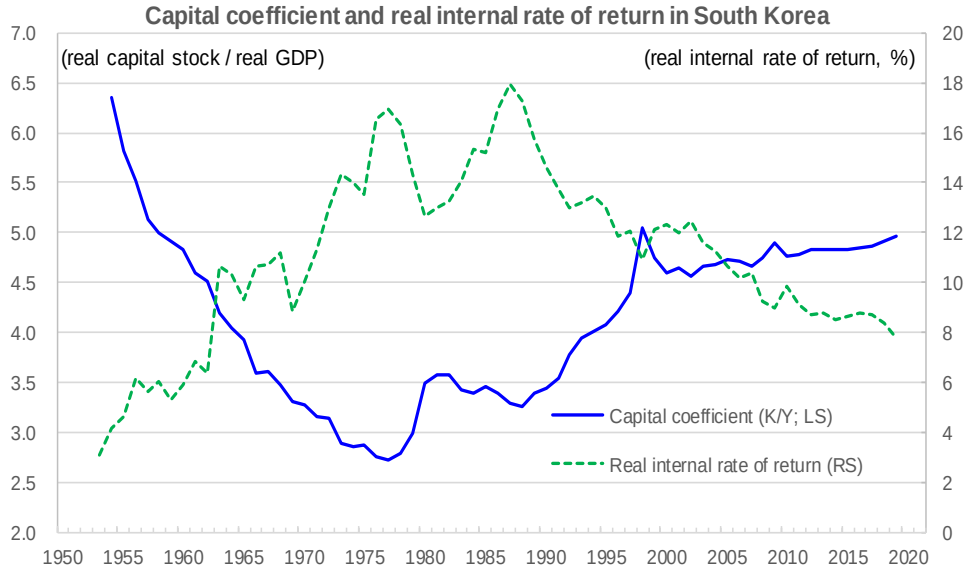


Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES

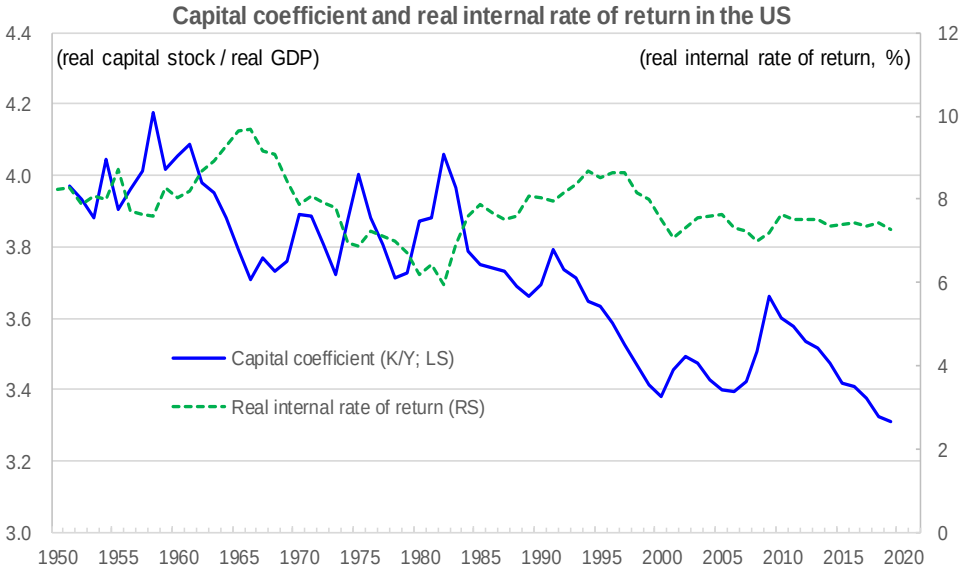


Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES

Capital coefficient rapidly rises once accelerating growth phase (post-war reconstruction) ends (2)



Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES



Sources: CEIC Database, Groningen Growth and Development Center, SBI SECURITIES

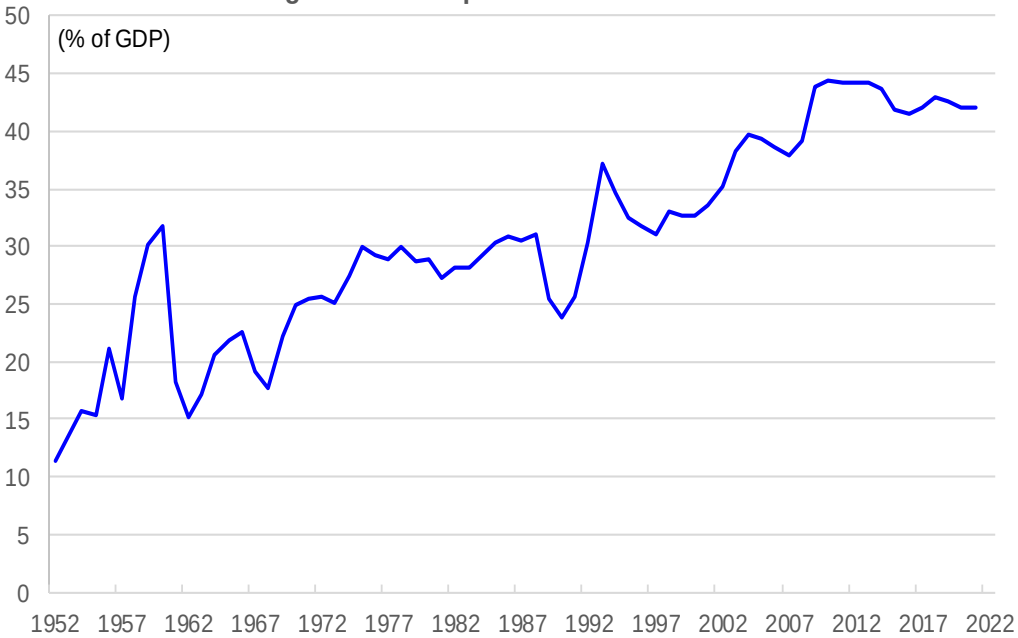
Growth accounting and demographics

1) Labor input has already started to fall.
2) Decline in contribution from capital stock (capital stock accumulation financed by debt accumulation cannot continue; a decline in internal rate of return of capital stock as a result of a rise in capital coefficient (capital stock was scarce in the past but now is abundant; the accelerating growth phase has ended).
3) The rate of technological progress (TFP growth) has barely risen over the past five years (2015-2019).

- A rise in age dependency ratio (the share of population aged 0-14 and over-65 to population aged 15-64) leads to a significant decline in economic growth.

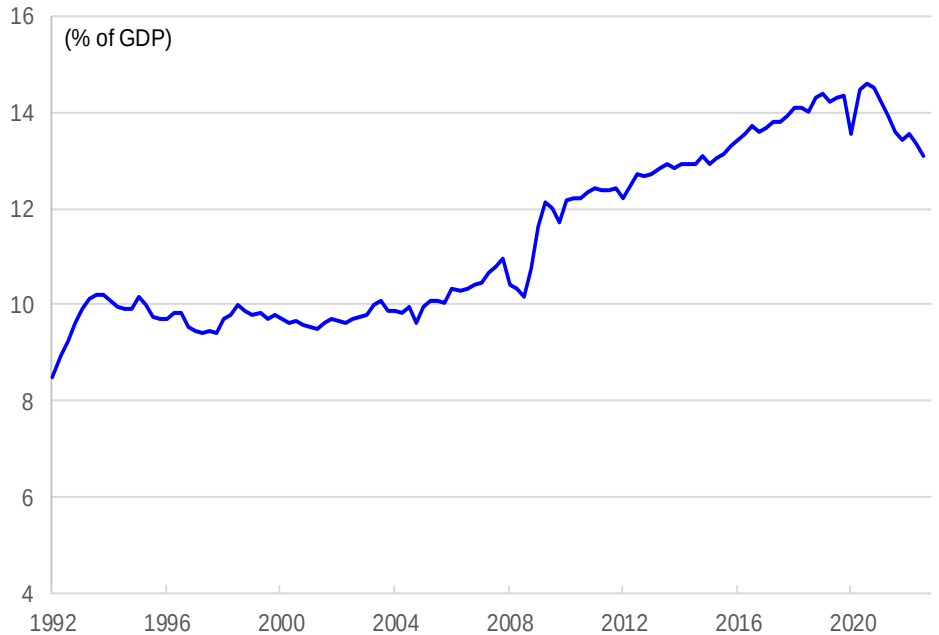
High levels of GFCF point to a decline in capital stock's internal rate of return

Share of gross fixed capital formation in GDP in China



Sources: CEIC Database, SBI SECURITIES

Share of construction and real estate industries in GDP in China

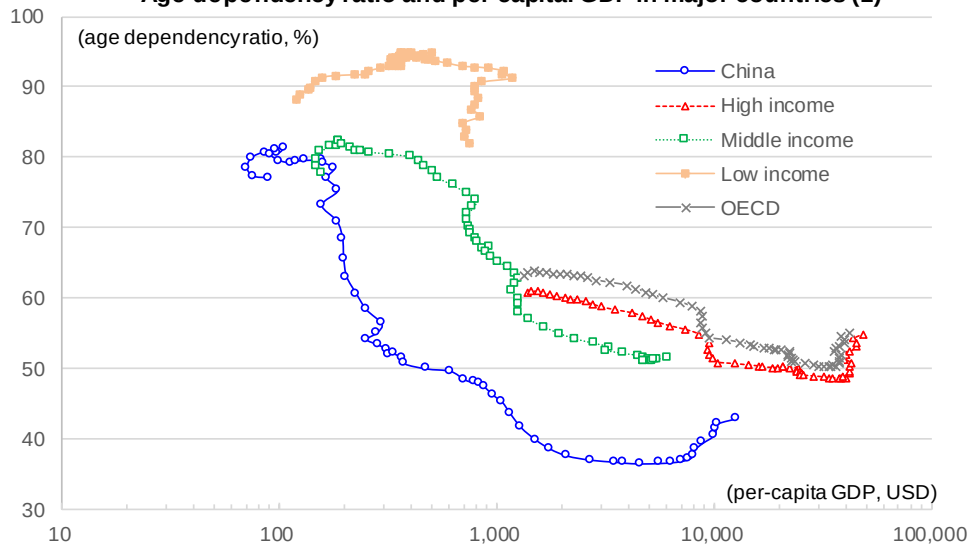


Sources: CEIC Database, SBI SECURITIES

- Continuation of high levels of the share of gross fixed capital formation to GDP, above 40%, even taking into account high economic growth, has led to an excess in capital stock and a resulting decline in the internal rate of return of capital stock.

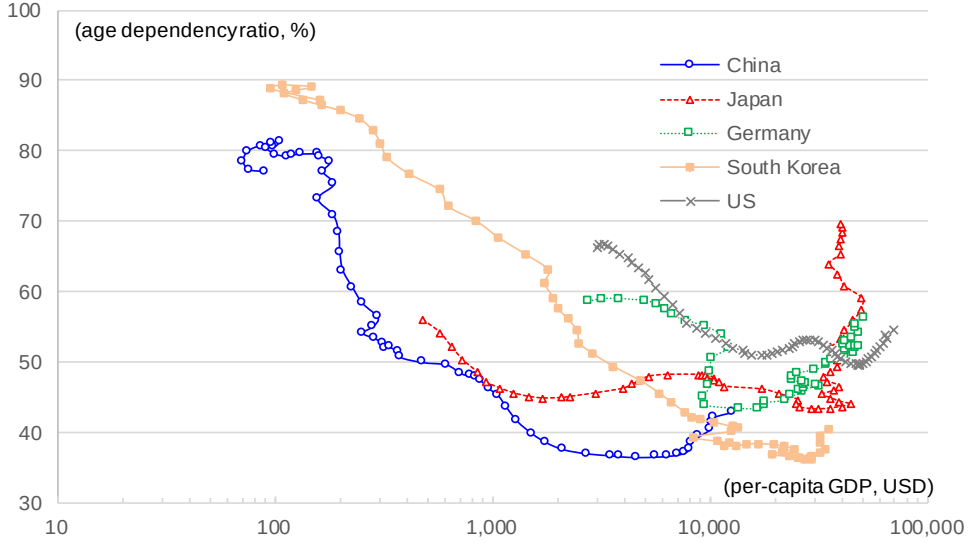
A rise in age dependency ratio accompanies a decline in economic growth (1)

Age dependency ratio and per-capital GDP in major countries (1)



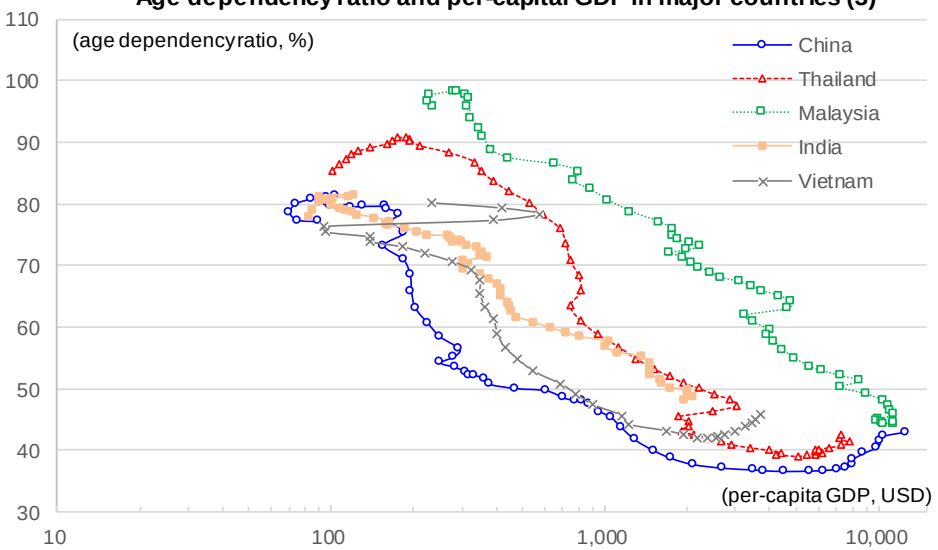
Note: Age dependency ratio = population aged 0-14 and over 65 / population aged 15-64 (%)
Sources: CEIC Database, World Bank, SBI SECURITIES

Age dependency ratio and per-capital GDP in major countries (2)



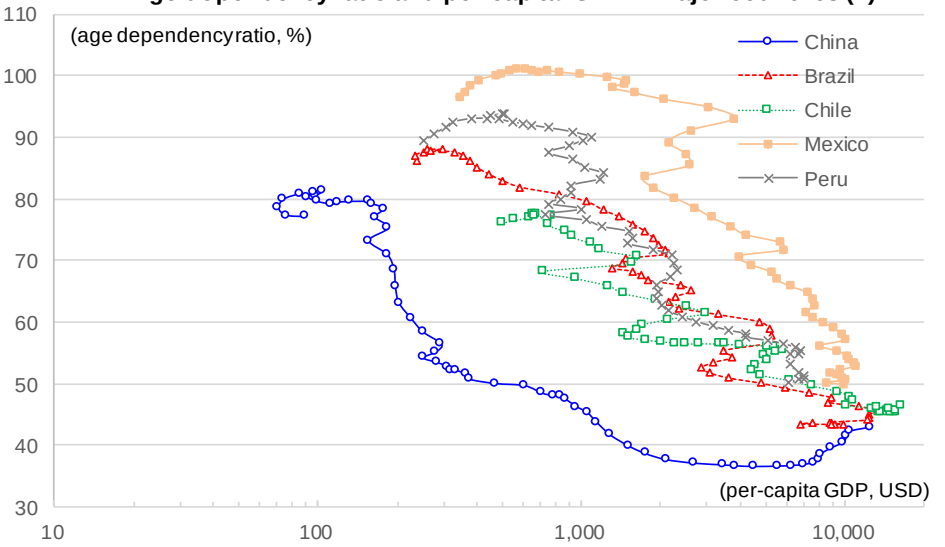
Note: Age dependency ratio = population aged 0-14 and over 65 / population aged 15-64 (%)
Sources: CEIC Database, World Bank, SBI SECURITIES

Age dependency ratio and per-capital GDP in major countries (3)



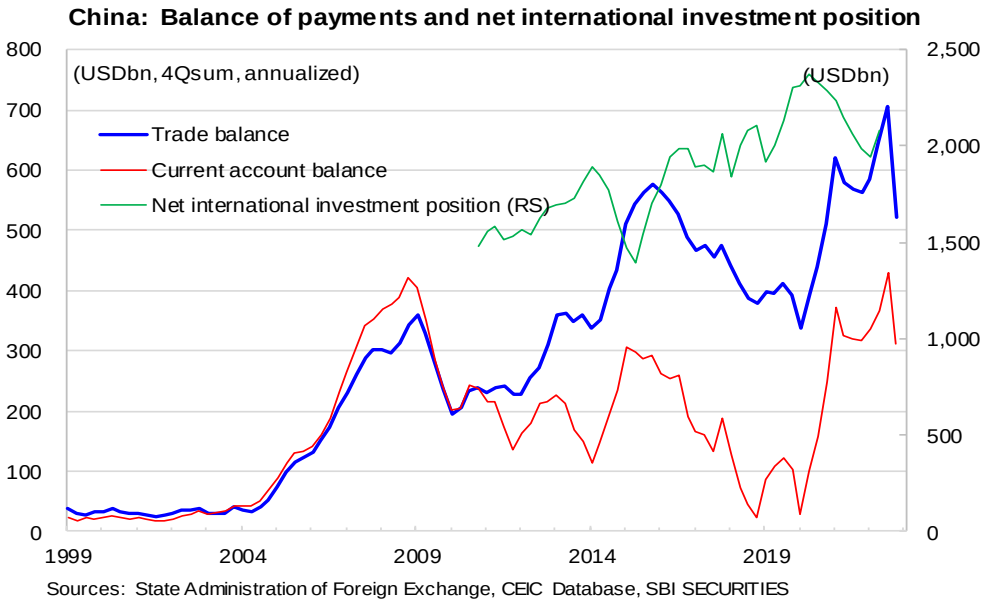
Note: Age dependency ratio = population aged 0-14 and over 65 / population aged 15-64 (%)
Sources: CEIC Database, World Bank, SBI SECURITIES

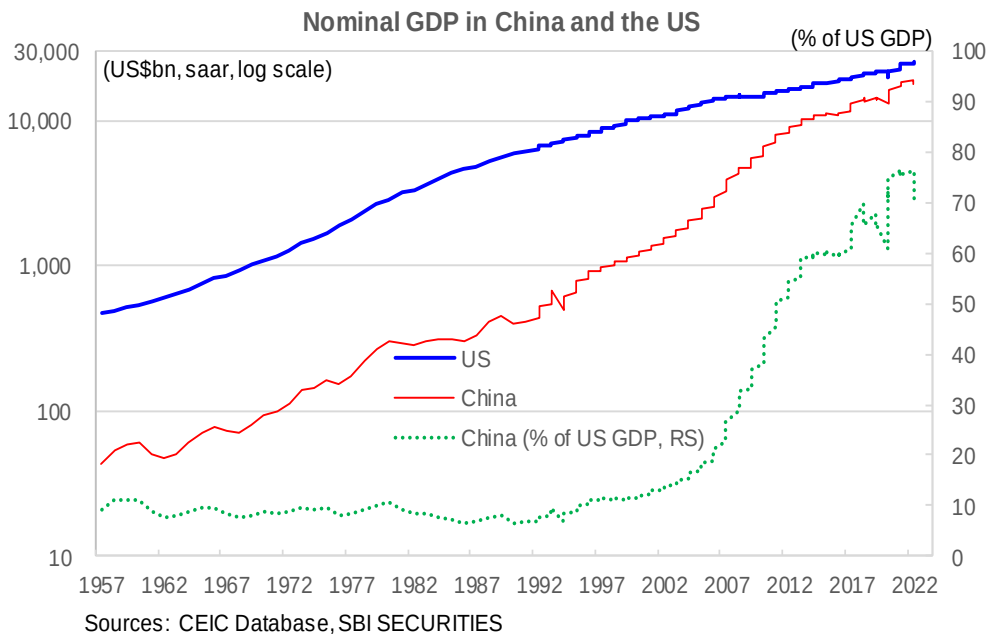
Age dependency ratio and per-capital GDP in major countries (4)



Note: Age dependency ratio = population aged 0-14 and over 65 / population aged 15-64 (%)
Sources: CEIC Database, World Bank, SBI SECURITIES

A net creditor country encounters prolonged decay, not an external debt crisis





- China is a net creditor nation: most debt is denominated in local currency, and held by domestic agents, which does not lead to an external debt crisis, but to domestic debt implosion and prolonged decay. The effects on the global economy manifest themselves mainly on the real economy through trade and FDI, rather than on the financial markets through higher volatility in asset prices.
- The linear extrapolation of the most recent trend such that China's GDP grows X% a year and reaches the level of GDP of the US by year 20YY does not hold.

Japan's economic outlook for 2022-2025

Japan's economic outlook

		FY20	FY21	FY22(F)	FY23(F)	FY24(F)	FY25(F)	CY20	CY21	CY22(F)	CY23(F)	CY24(F)	CY25(F)
Real GDP	%YoY	-4.6	2.4	1.7	1.0	1.2	1.1	-4.7	1.7	1.5	1.2	1.0	1.2
Domestic demand contribution	%pt	-3.9	1.6	2.0	0.5	0.9	0.7	-3.8	0.7	2.0	0.6	0.9	0.7
External demand contribution	%pt	-0.7	0.9	-0.2	0.5	0.3	0.4	-0.9	1.1	-0.5	0.6	0.2	0.5
Real final sales	%YoY	-4.4	2.3	1.7	1.1	1.2	1.2	-4.5	1.9	1.2	1.4	1.1	1.2
Real private consumption	%YoY	-5.5	2.6	2.8	0.5	0.9	0.8	-5.2	1.3	2.9	0.7	0.9	0.8
Real private nonresidential investment	%YoY	-7.8	0.7	2.9	0.2	0.5	-0.4	-7.0	-0.7	1.7	1.0	0.6	-0.4
Real exports of goods and services	%YoY	-10.1	12.6	6.1	5.1	2.3	5.7	-11.7	11.9	5.2	6.8	1.5	5.5
Real imports of goods and services	%YoY	-6.3	7.1	7.3	2.5	0.9	3.8	-6.8	5.1	7.6	3.7	0.7	3.2
Nominal GDP	%YoY	-3.9	1.3	2.2	3.0	1.6	1.2	-3.8	0.8	1.4	3.3	1.7	1.2
CPI overall	%YoY	-0.3	0.1	2.9	1.7	1.1	1.1	0.0	-0.2	2.4	2.2	1.1	1.1
CPI excl. food & energy	%YoY	-0.1	-1.3	1.1	1.5	1.0	1.1	0.0	-0.8	0.2	1.7	1.1	1.0
Industrial production	%YoY	-10.0	5.9	1.7	-0.1	1.6	3.1	-10.6	5.6	0.7	1.7	-0.5	3.8
Unemployment rate	%	2.9	2.8	2.6	2.6	2.6	2.7	2.8	2.8	2.6	2.6	2.6	2.7
Nominal compensation of employees	%YoY	-1.4	1.8	1.9	1.7	1.5	1.9	-1.1	1.6	1.6	1.9	1.4	1.8
Unit labor cost	%YoY	3.1	-0.4	-3.1	-0.6	-0.4	0.1	3.2	0.3	-2.6	-1.3	-0.4	-0.1
Labor productivity	%YoY	-0.7	1.3	0.4	0.9	1.5	1.0	-1.3	1.0	0.9	0.6	1.3	1.3
Labor's share	%	53.1	53.3	53.2	52.6	52.5	52.9	52.8	53.2	53.3	52.6	52.5	52.8
Policy rate (eop)	%	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
10-yr government bond yield (period avg)	%	0.04	0.09	0.24	0.25	0.25	0.25	0.01	0.07	0.23	0.25	0.25	0.25
M2	%YoY	8.1	4.9	3.4	3.2	2.9	3.0	6.5	6.4	3.4	3.3	3.0	3.0
USD/JPY exchange rate (period avg)	¥/$	106	112	135	123	117	115	107	110	131	126	118	115
Imported oil prices (period avg)	$/b	43	77	102	77	81	84	46	69	102	79	80	83
General government net lending	% of GDP	-9.8	-5.0	-4.1	-2.7	-0.8	0.1	-8.9	-5.5	-4.3	-3.3	-1.2	0.0
Current account balance	¥trn	16.39	20.19	9.68	8.34	6.05	5.66	15.58	21.52	11.00	9.83	5.95	5.78
	% of GDP	3.1	3.8	1.8	1.5	1.1	1.0	3.0	4.0	2.0	1.8	1.1	1.0

Notes: Final sales = GDP minus increases in inventories; Household saving rate = household saving / household disposable income;
Labor's share = nominal compensation of employees / nominal GDP; labor productivity = real GDP / (total hours worked per person x number of workers).
CY and FY growth rates are calculated from seasonally adjusted series, which could slightly differ from the published figures that are calculated from unadjusted series.
Sources: Cabinet Office, BoJ, METI, MHLW, MoF, MIC, SBI SECURITIES forecast.

Quarterly profile of Japan's economic outlook (1)

Real Gross Domestic Product

		2022				2023				2024				2025				2026
(¥trn in 2015 prices, saar)		Q1	Q2	Q3	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)
Real GDP	¥trn	539.2	545.3	543.6	548.3	548.6	549.6	551.9	552.7	553.2	555.7	557.6	559.4	561.0	562.6	563.8	565.3	567.0
	%QoQ	0.1	1.1	-0.3	0.9	0.1	0.2	0.4	0.1	0.1	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.3
	%saar	0.2	4.6	-1.2	3.5	0.2	0.8	1.6	0.6	0.3	1.8	1.4	1.3	1.2	1.2	0.9	1.0	1.2
	%YoY	0.9	1.6	1.9	1.7	1.7	0.8	1.5	0.8	0.8	1.1	1.0	1.2	1.4	1.3	1.1	1.1	1.1
Contribution from domestic demand	%pt, QoQ	0.5	1.0	0.4	0.2	-0.1	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3
Contribution from external demand	%pt, QoQ	-0.5	0.2	-0.6	0.7	0.2	0.2	0.2	-0.1	-0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Final sales	¥trn	536.1	543.6	542.3	547.2	547.8	549.0	551.2	552.2	552.6	555.1	557.1	558.7	560.2	561.8	563.3	565.0	566.7
	%QoQ	-0.4	1.4	-0.2	0.9	0.1	0.2	0.4	0.2	0.1	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	%saar	-1.8	5.7	-0.9	3.7	0.4	0.9	1.6	0.7	0.3	1.8	1.4	1.1	1.1	1.2	1.1	1.2	1.2
	%YoY	0.2	1.2	1.7	1.6	2.2	1.0	1.6	0.9	0.9	1.1	1.1	1.2	1.4	1.2	1.1	1.1	1.2
Private consumption	¥trn	293.9	297.5	298.3	299.4	298.8	298.8	299.5	300.4	301.0	301.6	302.2	302.8	303.4	304.0	304.7	305.3	305.9
	%QoQ	0.3	1.2	0.3	0.4	-0.2	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	%saar	1.3	5.1	1.1	1.4	-0.8	0.0	1.0	1.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	%YoY	2.2	3.0	4.3	2.2	1.7	0.4	0.4	0.3	0.8	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8
Private housing investment	¥trn	18.10	17.75	17.68	17.76	17.81	17.85	17.88	17.91	17.93	17.93	17.89	17.85	17.80	17.75	17.71	17.71	17.71
	%QoQ	-1.3	-1.9	-0.4	0.5	0.2	0.2	0.2	0.2	0.1	0.0	-0.2	-0.2	-0.3	-0.3	-0.2	0.0	0.0
	%saar	-5.2	-7.4	-1.7	2.0	1.0	1.0	0.6	0.6	0.4	0.0	-0.8	-0.8	-1.2	-1.2	-0.8	0.0	0.0
	%YoY	-2.9	-6.2	-4.9	-3.1	-1.6	0.6	1.2	0.8	0.7	0.4	0.0	-0.3	-0.7	-1.0	-1.0	-0.8	-0.5
Private nonresidential investment	¥trn	83.27	85.25	86.56	86.35	86.17	86.00	86.17	86.35	86.52	86.69	86.87	86.69	86.52	86.35	86.17	86.35	86.60
	%QoQ	-0.1	2.4	1.5	-0.2	-0.2	-0.2	0.2	0.2	0.2	0.2	0.2	-0.2	-0.2	-0.2	-0.2	0.2	0.3
	%saar	-0.5	9.9	6.3	-1.0	-0.8	-0.8	0.8	0.8	0.8	0.8	0.8	-0.8	-0.8	-0.8	-0.8	0.8	1.2
	%YoY	-1.0	0.2	4.2	3.6	3.5	0.9	-0.4	0.0	0.4	0.8	0.8	0.4	0.0	-0.4	-0.8	-0.4	0.1
Change in private inventories	¥trn	3.00	1.76	1.38	1.00	0.80	0.60	0.60	0.50	0.50	0.50	0.50	0.70	0.80	0.80	0.50	0.30	0.30
	%pt, QoQ	0.5	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Government consumption	¥trn	116.5	117.5	117.5	117.8	118.2	118.7	119.2	119.8	120.4	121.0	121.6	122.3	122.8	123.4	123.9	124.5	125.0
	%QoQ	0.4	0.8	0.0	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
	%saar	1.6	3.4	0.0	1.2	1.4	1.6	1.8	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.8	1.8	1.8
	%YoY	2.1	2.1	0.9	1.5	1.5	1.1	1.5	1.7	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.8
Public investment	¥trn	26.06	26.33	26.65	26.45	26.32	26.19	26.06	25.93	25.80	25.67	25.54	25.41	25.29	25.29	25.29	25.29	25.29
	%QoQ	-3.0	1.0	1.2	-0.8	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	0.0	0.0	0.0	0.0
	%saar	-11.5	4.2	4.9	-3.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	0.0	0.0	0.0	0.0
	%YoY	-12.1	-9.0	-4.5	-1.6	1.0	-0.5	-2.2	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.5	-1.0	-0.5	0.0
Net exports	¥trn	-1.22	-0.24	-3.76	0.07	1.05	2.07	2.96	2.33	1.54	2.80	3.52	4.22	4.94	5.65	6.19	6.49	6.77
Exports of goods and services	¥trn	104.88	106.72	108.78	111.66	113.44	115.58	116.56	116.00	115.12	116.27	117.70	119.18	120.91	122.68	124.47	126.08	127.70
	%QoQ	1.1	1.8	1.9	2.6	1.6	1.9	0.9	-0.5	-0.8	1.0	1.2	1.3	1.5	1.5	1.5	1.3	1.3
	%saar	4.6	7.2	7.9	11.0	6.5	7.8	3.5	-1.9	-3.0	4.1	5.0	5.1	5.9	6.0	6.0	5.3	5.2
	%YoY	4.6	2.9	5.6	7.7	8.2	8.3	7.2	3.9	1.5	0.6	1.0	2.7	5.0	5.5	5.8	5.8	5.6
Imports of goods and services	¥trn	106.10	106.96	112.54	111.59	112.39	113.50	113.60	113.67	113.59	113.47	114.18	114.97	115.97	117.02	118.28	119.58	120.93
	%QoQ	3.6	0.8	5.2	-0.8	0.7	1.0	0.1	0.1	-0.1	-0.1	0.6	0.7	0.9	0.9	1.1	1.1	1.1
	%saar	15.1	3.3	22.6	-3.4	2.9	4.0	0.3	0.3	-0.3	-0.4	2.5	2.8	3.5	3.7	4.4	4.5	4.6
	%YoY	7.3	3.8	10.6	8.9	5.9	6.1	0.9	1.9	1.1	0.0	0.5	1.1	2.1	3.1	3.6	4.0	4.3

Notes: QoQ contributions to GDP growth and the sum of GDP components do not add up. Final sales = GDP minus changes in inventories.
Sources: Cabinet Office, SBI SECURITIES forecast.

Quarterly profile of Japan's economic outlook (2)

Main economic indicators

		2022				2023				2024				2025				2026
		Q1	Q2	Q3	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)	Q2(F)	Q3(F)	Q4(F)	Q1(F)
Nominal GDP	¥trn	544.0	548.6	545.9	557.5	561.5	566.3	569.2	570.9	573.1	576.0	578.3	579.5	581.3	583.1	584.4	586.2	588.4
	%QoQ	0.4	0.8	-0.5	2.1	0.7	0.8	0.5	0.3	0.4	0.5	0.4	0.2	0.3	0.3	0.2	0.3	0.4
	%saar	1.5	3.4	-2.0	8.8	2.9	3.4	2.1	1.2	1.6	2.0	1.6	0.8	1.2	1.3	0.9	1.3	1.5
	%YoY	0.2	1.2	1.4	2.9	3.2	3.2	4.3	2.4	2.1	1.7	1.6	1.5	1.4	1.2	1.0	1.2	1.2
GDP deflator	2015=100, sa	100.9	100.6	100.4	101.7	102.4	103.0	103.1	103.3	103.6	103.7	103.7	103.6	103.6	103.6	103.6	103.7	103.8
	%QoQ	0.3	-0.3	-0.2	1.3	0.7	0.7	0.1	0.1	0.3	0.0	0.1	-0.1	0.0	0.0	0.0	0.1	0.1
Domestic demand deflator	2015=100, sa	103.1	104.1	105.0	105.6	106.0	106.3	106.6	106.9	107.2	107.4	107.7	108.0	108.3	108.6	108.9	109.3	109.6
	%QoQ	0.9	1.0	0.9	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3
Industrial production	2015=100, sa	95.7	93.1	98.5	97.8	99.0	98.5	97.5	96.6	95.6	96.8	98.2	99.2	100.2	101.0	101.5	102.0	102.2
	%QoQ	0.8	-2.7	5.9	-0.7	1.3	-0.5	-1.0	-1.0	-1.0	1.3	1.5	1.0	1.0	0.8	0.5	0.5	0.2
Corporate goods prices	2015=100, sa	110.4	113.6	115.9	116.4	116.2	116.0	116.3	116.6	117.0	117.4	117.8	118.1	118.5	119.0	119.5	120.0	120.4
	%QoQ	2.0	2.9	2.0	0.4	-0.2	-0.1	0.3	0.3	0.4	0.3	0.4	0.2	0.4	0.4	0.4	0.4	0.4
CPI Overall	2020=100, sa	100.8	101.8	102.6	103.3	103.8	104.2	104.5	104.8	105.1	105.4	105.7	105.9	106.2	106.5	106.8	107.1	107.4
	%YoY	0.9	2.4	2.8	3.3	3.0	2.4	1.8	1.5	1.2	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.1
CPI excl. fresh food	2020=100, sa	100.6	101.4	102.5	103.2	103.7	104.0	104.4	104.7	105.0	105.3	105.5	105.8	106.1	106.4	106.7	107.0	107.3
	%YoY	0.5	2.1	2.7	3.1	3.1	2.6	1.8	1.5	1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.1	1.1
CPI excl. fresh food and energy	2020=100, sa	99.4	100.0	100.8	101.6	102.2	102.7	103.1	103.4	103.7	104.1	104.3	104.6	104.9	105.2	105.5	105.9	106.2
	%YoY	-1.0	0.9	1.6	2.5	2.9	2.7	2.2	1.8	1.5	1.3	1.2	1.2	1.1	1.1	1.2	1.2	1.2
CPI excl. food and energy	2020=100, sa	98.5	99.2	99.6	100.1	100.6	100.9	101.3	101.5	101.8	102.1	102.3	102.5	102.8	103.1	103.4	103.7	104.0
	%YoY	-1.8	0.2	0.7	1.6	2.1	1.8	1.6	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.2
Policy interest rate	%	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
Total assets of the Bank of Japan	¥trn (eop)	736.3	732.7	685.8	697.8	702.8	707.8	712.8	716.8	719.8	722.8	725.8	728.8	730.8	732.8	734.8	736.8	738.8
10-yr government bond yield	% (period avg)	0.19	0.24	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
M2	%YoY	3.5	3.3	3.4	3.5	3.4	3.3	3.3	3.2	3.1	3.0	3.0	2.9	2.9	2.9	3.0	3.0	3.0
Customs trade balance	¥trn, saar	-11.67	-21.67	-26.19	-22.21	-20.19	-18.28	-19.26	-21.84	-23.10	-22.99	-23.64	-24.99	-25.73	-26.52	-27.63	-28.70	-29.79
Merchandise trade balance (BoP)	¥trn, saar	-6.75	-15.10	-23.40	-20.26	-18.65	-16.92	-18.03	-20.74	-22.14	-22.12	-22.86	-24.28	-25.13	-26.02	-27.24	-28.41	-29.62
Exports	%QoQ	6.0	8.8	3.9	1.0	-4.0	-2.4	-3.1	-4.6	-2.7	-1.3	0.0	-1.7	0.2	0.2	0.2	-0.2	-0.2
Imports	%QoQ	10.2	16.8	10.7	-1.7	-4.7	-3.5	-1.6	-1.4	-0.9	-1.0	0.7	0.0	0.9	0.9	1.2	0.9	0.9
Current account balance (BoP)	¥trn, saar	16.71	12.88	3.13	11.29	11.42	11.84	9.87	6.20	5.46	6.26	6.29	5.78	5.87	5.95	5.72	5.57	5.41
	% of GDP	3.1	2.3	0.6	2.0	2.0	2.1	1.7	1.1	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9
USD/JPY exchange rate	(¥/$, period avg)	116	130	138	140	132	128	124	120	120	118	118	115	115	115	115	115	115
Import oil prices	($/b)	86.1	111.0	113.2	98.0	85.0	76.0	77.0	78.0	78.0	79.0	80.0	81.0	82.0	83.0	84.0	84.0	84.0
Nominal compensation of employees	¥trn, saar	291.0	292.3	293.1	295.1	297.0	298.1	299.1	299.8	300.9	302.1	303.2	304.4	305.7	307.3	308.8	310.3	311.7
	%QoQ	0.9	0.5	0.3	0.7	0.6	0.4	0.3	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
Number of employees	%QoQ	0.1	0.7	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment rate	%	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7
Hours worked per person	%QoQ	-0.9	1.9	-0.7	0.3	0.2	0.1	-0.1	-0.1	0.1	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.1	0.1
Nominal disposable household income	¥trn, saar	320.9	318.5	317.7	320.4	318.1	319.6	320.3	320.8	321.5	322.5	323.3	324.3	325.3	326.8	328.1	329.2	330.3
	%QoQ	1.9	-0.7	-0.2	0.8	-0.7	0.5	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.5	0.4	0.3	0.3
Household saving rate	%	9.8	5.4	4.3	4.2	3.3	3.5	3.3	3.0	2.8	2.8	2.7	2.7	2.7	2.8	2.8	2.8	2.8
General government net lending	¥trn, saar	-26.70	-25.06	-21.02	-20.98	-24.22	-24.78	-13.86	-11.83	-10.42	-8.17	-5.25	-4.56	-0.73	-0.32	0.36	1.05	1.75
	% of GDP	-4.9	-4.6	-3.8	-3.8	-4.3	-4.4	-2.4	-2.1	-1.8	-1.4	-0.9	-0.8	-0.1	-0.1	0.1	0.2	0.3
Unit labor cost	(2010=100)	103.4	101.2	100.8	100.1	100.3	100.3	100.0	99.9	100.0	99.8	99.6	99.6	99.6	99.6	99.7	99.8	99.8
	%QoQ	-0.2	-2.1	-0.4	-0.7	0.2	0.0	-0.3	-0.1	0.1	-0.2	-0.1	0.0	0.0	0.0	0.1	0.0	0.0
Labor productivity	(2010=100)	107.8	106.4	106.8	107.4	107.2	107.4	108.0	108.3	108.2	108.9	109.4	109.9	110.2	110.4	110.5	110.7	110.9
	%QoQ	0.9	-1.2	0.3	0.6	-0.1	0.2	0.5	0.3	0.0	0.6	0.5	0.5	0.3	0.2	0.1	0.2	0.2
Labor's share	% of GDP	53.5	53.3	53.7	52.9	52.9	52.6	52.6	52.5	52.5	52.4	52.4	52.5	52.6	52.7	52.9	52.9	53.0

Notes: Household saving rate = household saving / household disposable income; labor's share = nominal compensation of employees / nominal GDP; labor productivity = real GDP / (total hours worked per person x number of workers).
Sources: Cabinet Office, BoJ, METI, MHLW, MoF, MIC, SBI SECURITIES forecast.

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