



# **The Bursting of the Technology Bubble: International Implications**

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# Overview

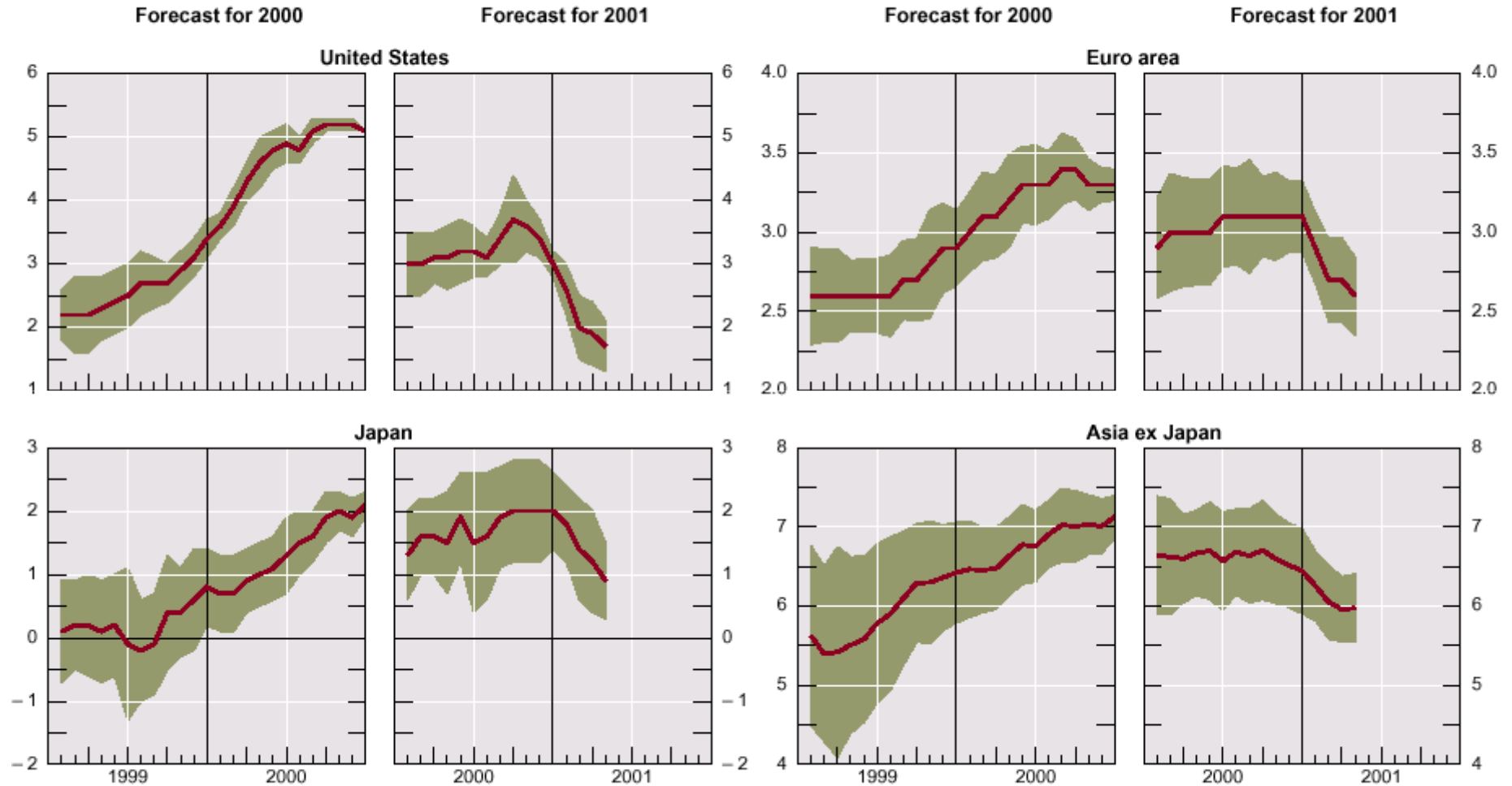
- Recent developments.
- Some historical context.
- Where to from here?
- Possible policy responses?



## Recent developments: real (1)

- A sharp slowdown in the US.
- Possible recession in Japan.
- Some deceleration in the euro area.
- Knock-on effects elsewhere.

## GDP forecasts for 2000 and 2001<sup>1</sup>



<sup>1</sup> Percentage changes over previous year. Forecasts for the calendar years shown, as published monthly by Consensus Economics. The observations are positioned at the end of the month in which the forecast was made. The shaded area represents the standard deviation around the Consensus forecast.

Source: Consensus Economics.



## Recent developments: real (2)

- Slowing down in many sectors.
- Including investment.
- With international effects.

### Contributions to GDP growth in 2000<sup>1</sup>

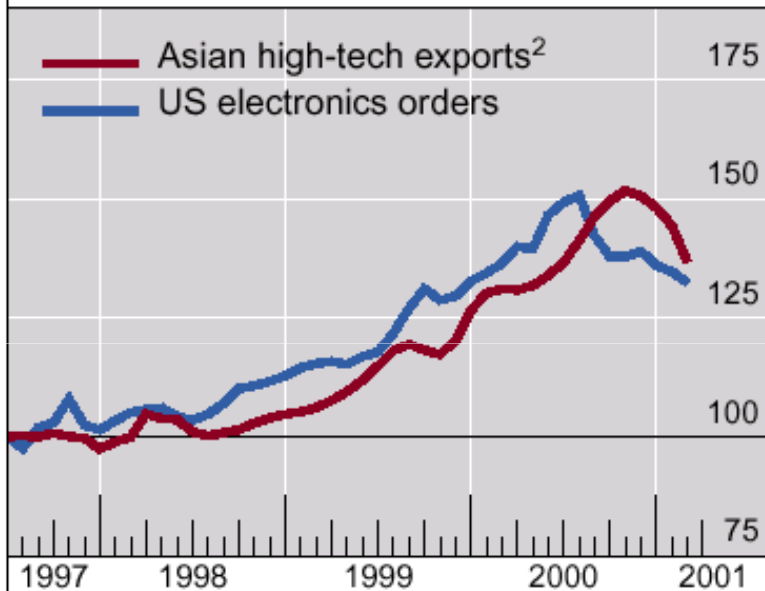
	United States		Euro area		Japan		United Kingdom		Canada		Australia	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
	in percentage points and percentages											
Domestic demand	6.9	3.7	3.1	2.0	2.6	0.1	3.6	4.0	5.7	3.7	4.7	-0.8
Consumption	4.3	2.6	2.1	1.1	0.9	0.3	2.7	3.4	2.7	2.7	2.7	1.7
Investment	2.5	1.1	1.0	0.9	1.7	-0.1	0.9	0.5	3.0	1.1	2.0	-2.6
Net exports	-0.9	-1.0	0.5	0.6	1.0	-0.4	-1.0	-0.9	-1.0	0.2	-0.0	2.1
GDP	5.9	2.8	3.6	2.6	3.6	-0.3	2.5	3.0	4.7	4.0	4.7	1.3

<sup>1</sup> Changes from previous period, seasonally adjusted at annual rates.

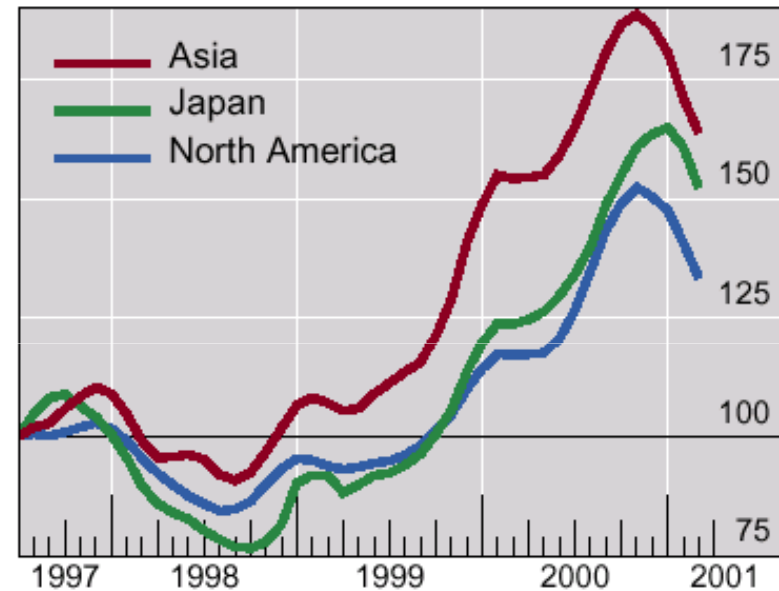
Sources: ECB; national data.

## High-tech activity in Asian economies<sup>1</sup>

Asian exports and US electronics orders



Global semiconductor sales<sup>3</sup>



<sup>1</sup> June 1997 = 100; three-month moving averages. <sup>2</sup> To the United States; defined as the sum of the trade classifications SITC 75, 76 and 77. Asia defined as China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan and Thailand. <sup>3</sup> Including domestic sales.

Sources: Bloomberg; Semiconductor Industry Association; national data.

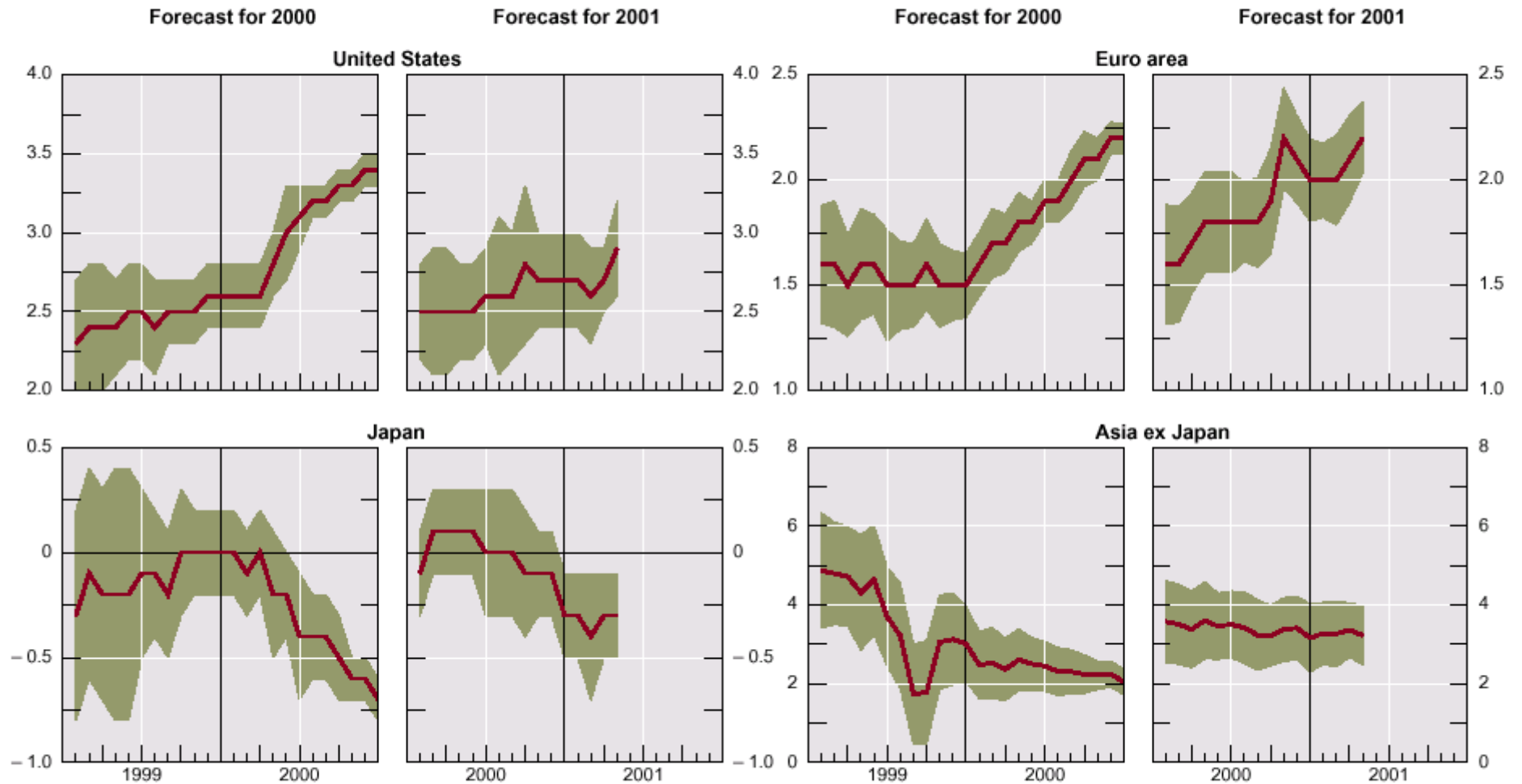


## Recent developments: nominal

- Inflation generally well behaved.
- But recent uptick in US and euro area.
- Although not elsewhere.



## Inflation forecasts for 2000 and 2001<sup>1</sup>



<sup>1</sup> Percentage changes over previous year. Forecasts for the calendar years shown, as published monthly by Consensus Economics. The observations are positioned at the end of the month in which the forecast was made. The shaded area represents the standard deviation around the Consensus forecast.

Source: Consensus Economics.



## Recent developments: financial

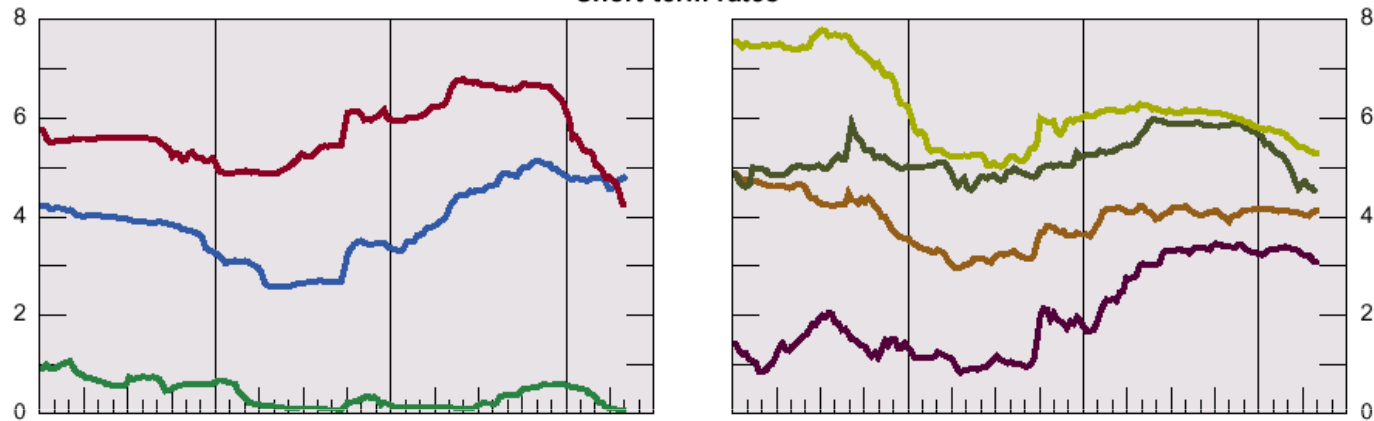
- Higher then lower policy rates.
- Lower then higher long rates.
- Falling equity prices.
- Widening credit spreads.
- Pushing on a string?

## Interest rates in major industrial countries

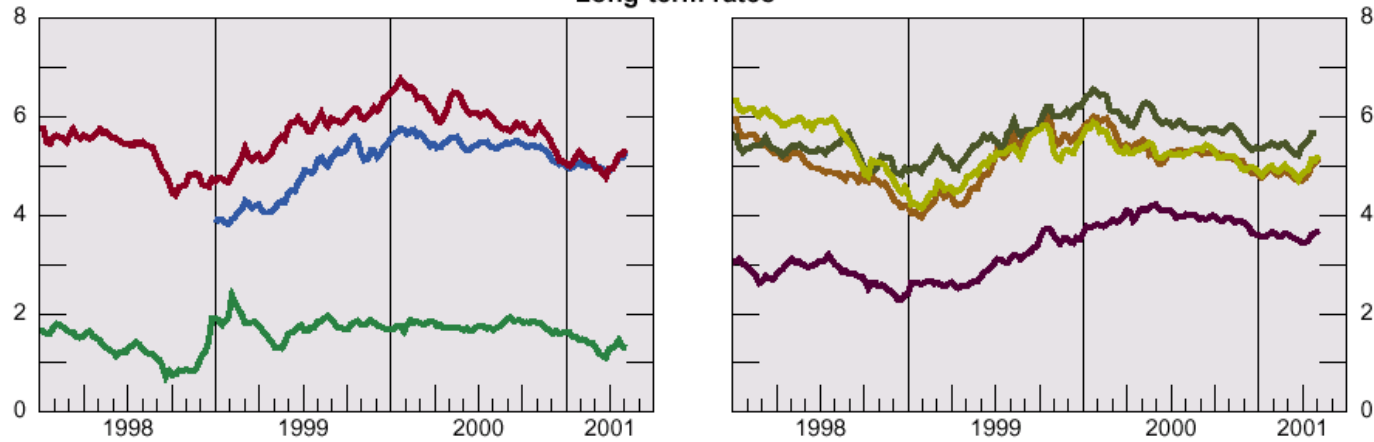
Weekly averages



Short-term rates<sup>1</sup>



Long-term rates<sup>2</sup>

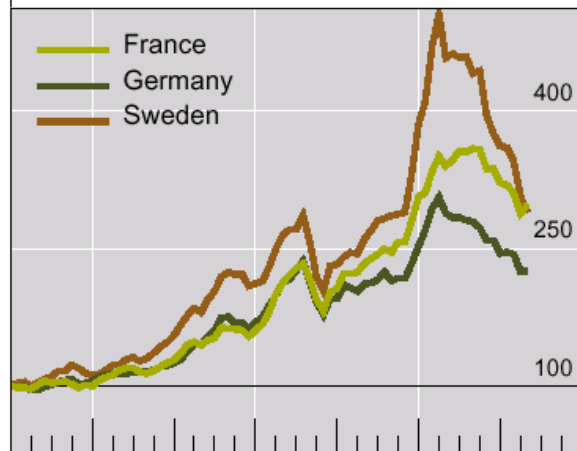
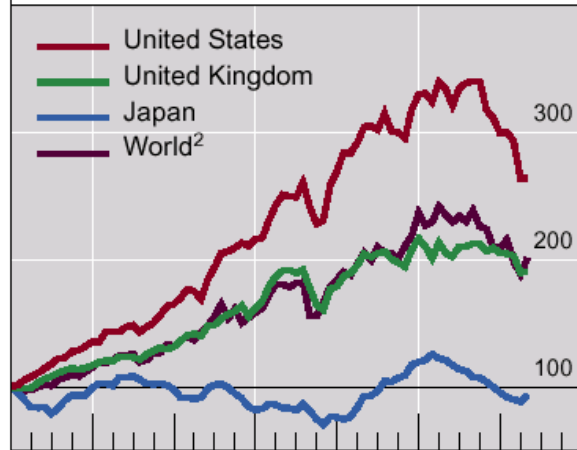


<sup>1</sup> Three-month rates. <sup>2</sup> Ten-year government bonds or their closest equivalent.

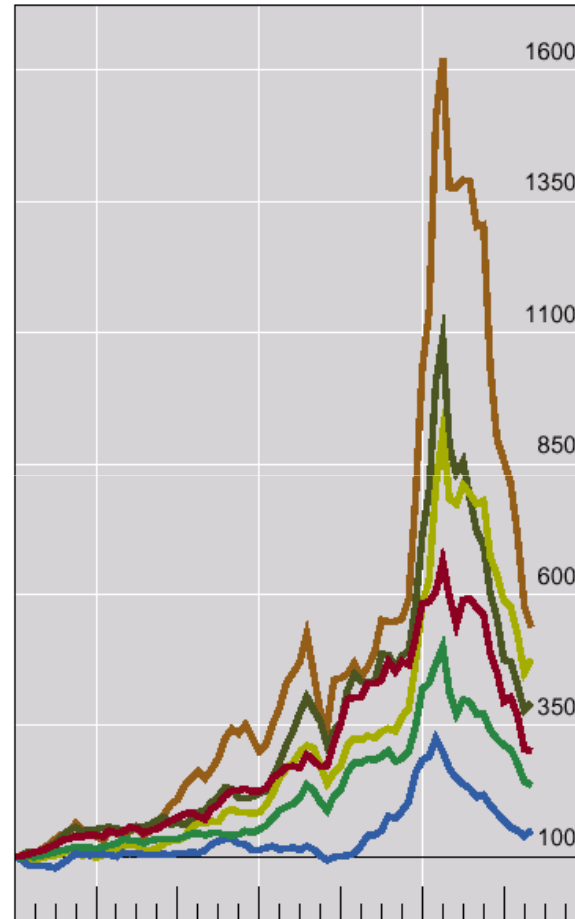
# Stock market indices

Monthly averages, December 1994 = 100

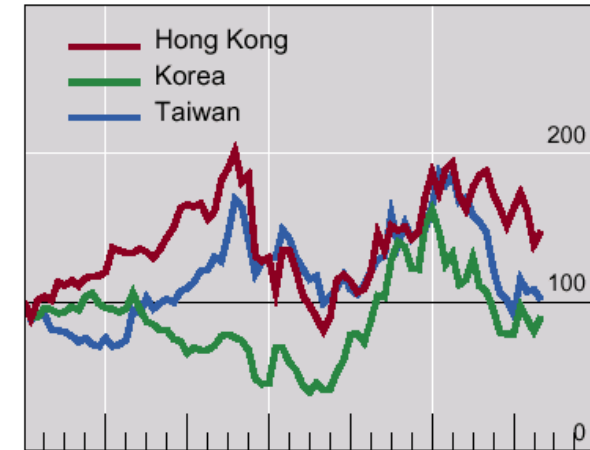
Broad market indices



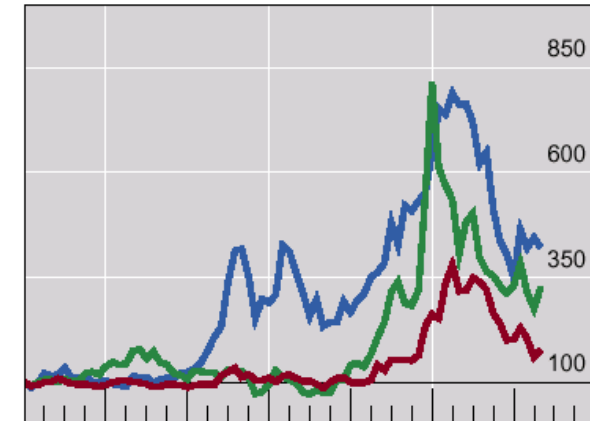
Technology indices<sup>1</sup>



Asia: broad market indices



Asia: technology indices<sup>1</sup>



<sup>1</sup> Technology, media and telecommunications stocks. <sup>2</sup> Morgan Stanley Capital International (MSCI) World Index.  
Source: Datastream.

### Equity prices and market capitalisation in 2000 and 2001

	Price changes				Market capitalisation							
	in percentages				at end of April 2001 <sup>1</sup> , in US\$ trillions		changes, in US\$ billions				% of GDP	
	since beginning of April 2001		peak of 2000 to end-March 2001				since beginning of April 2001		peak of 2000 to end-March 2001			
	Total	TMT	Total	TMT	Total	TMT	Total	TMT	Total	TMT	Total	TMT
Global	4.4	12.6	-11.2	-59.1	19.6	6.6	974	603	-2123	-6614	-7	-21
United States	6.7	12.9	-10.8	-59.6	9.2	3.5	658	370	-828	-3712	-8	-37
Japan	6.2	8.3	-16.3	-57.3	2.4	0.8	221	79	-943	-1028	-20	-22
Euro area	4.3	12.1	-12.9	-61.1	3.3	1.1	165	129	-427	-1000	-7	-16
United Kingdom	3.7	6.6	-6.3	-58.5	1.9	0.5	107	34	-206	-569	-15	-40
South East Asia	-2.5	26.2	-42.4	-53.2	0.2	0.1	-6	-1	-111	-32	-22	-6
Other Asia <sup>2</sup>	3.1	7.2	-32.3	-54.1	0.6	0.3	27	22	-242	-156	-26	-17

Note: TMT = Telecommunications, media, technology; Total = Total market excluding TMT.

<sup>1</sup> As of 26 April. <sup>2</sup> Hong Kong, Korea and Taiwan.

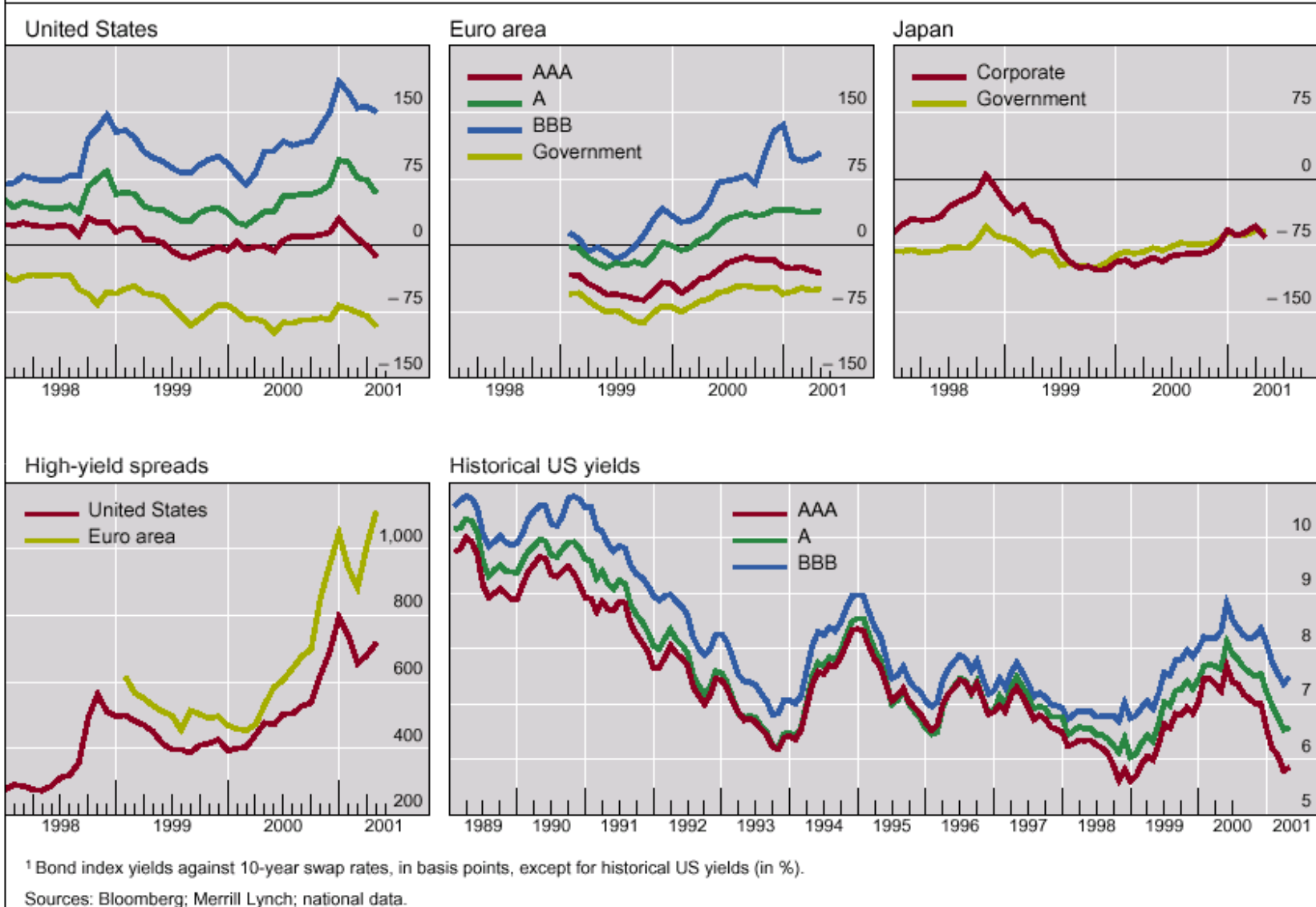
Sources: Datastream; national data.

## Distribution of equity holdings in the G-7 countries<sup>1</sup>

	US	JP	DE	FR	IT	UK	CA
	in percentages						
Households	57.4 <sup>2</sup>	18.7	17.5	24.9	29.4	17.4	54.8 <sup>2</sup>
Non-resident	10.0	14.5	16.0	17.2	11.0	25.9	8.1
Pension funds <sup>3</sup>	22.1	5.2	9.0	--	4.0	26.7	10.9
Banks	0.1	9.5	13.5	8.0	6.5	2.4	4.4
Other financial institutions	8.5	16.7	13.6	31.6	19.3	10.9	17.4
Others <sup>4</sup>	1.1	35.4	30.4	18.3	29.8	16.7	4.4
<i>Memo: Equities/GDP</i>	171	96	52	73	66	164	104

<sup>1</sup> Market values at end-2000, except for Germany and France (end-1999), Italy (3<sup>rd</sup> quarter 2000) and Canada (book values). <sup>2</sup> Including mutual funds. <sup>3</sup> Including life insurance companies. <sup>4</sup> Mostly non-financial corporations.

# Corporate and government bond spreads<sup>1</sup>





## Some historical context: theories

- Hayek, Haberler and the Austrian School.
- Credit expansion and New Era optimism...
  - turns to “excessive optimism”...
  - profits and shares collapse...
  - leading to distress in the financial system.
- And all without inflation.





## Some historical context: facts (1)

- Precedents pre-World War I.
- Each associated with a New Era.
- Back-to-the-future through deregulation and globalisation.
- Similarities and differences between Japan (1985-90) and the US (1995-2000).

### Comparative developments in Japan and the United States

	Japan			United States	
	1981–85	1986–90	1991–95	1991–95	1996–2000
GDP volume <sup>1</sup>	3.3	4.9	1.4	2.4	4.3
Labour productivity <sup>1</sup>	2.3	3.4	0.8	1.4	2.7
Consumer prices <sup>1</sup>	2.8	1.3	1.4	3.1	2.5
Non-residential investment/GDP <sup>2</sup>	15.7	17.9	16.7	10.4	12.5
Real interest rate <sup>3</sup>	4.8	4.1	3.6	4.2	4.1
Price/earnings ratio <sup>4</sup>	35.2	69.5 <sup>5</sup>	86.5	17.5	32.4 <sup>5</sup>
Imports/GDP <sup>2</sup>	12.5	8.1	7.5	11.1	13.2
Residential property prices <sup>6</sup>	131	190	172	113	147
Equity prices <sup>6</sup>	211	563 <sup>5</sup>	314	187	452 <sup>5</sup>
Nominal effective exchange rate <sup>6</sup>	129	154	208	99	122
Net private saving/GDP <sup>2</sup>	4.7	1.6	3.7	3.5	-2.8
Budget balance/GDP <sup>2</sup>	-2.8	1.3	-1.1	-4.5	0.1
Current account/GDP <sup>2</sup>	1.8	2.8	2.6	-1.0	-2.7
Net capital inflows/GDP <sup>2, 7</sup>	-1.3	-3.6	-0.9	0.1	3.3
Household saving/disposable income <sup>2</sup>	22.0	17.6	14.0	7.2	3.1
Household debt/GDP <sup>8</sup>	47	61	63	67	74
Enterprise debt/GDP <sup>8</sup>	99	131	132	69	73
Broad money <sup>1</sup>	8.3	10.4	2.1	1.8	8.7

<sup>1</sup> Average annual percentage change. <sup>2</sup> Percentages, average for period. <sup>3</sup> Ten-year nominal rate less annual rate of inflation (consumer expenditure deflator), average for period. <sup>4</sup> End of period. <sup>5</sup> Peak in final year. <sup>6</sup> Index (1980 = 100 for Japan; 1990 = 100 for the United States), end of period. <sup>7</sup> Net direct investment and portfolio flows. <sup>8</sup> Percentages, end of period.

Sources: OECD; national data; BIS.

## US and Japanese bubbles: comparison and contrast

Similarities	Differences
Acceleration of GDP	Opening of US economy (globalised investment goods & Asia's role?)
Acceleration of labour productivity	Real estate price inflation (worse in Japan)
Decline of CPI inflation	Real appreciation (worse in Japan)
Acceleration of private investment	Decline in private savings (worse in the US)
Stability of real interest rate	Private capital flows (Japan out; US in)
P/E weak (w/ adjusted for JP crossholding)	Larger household & corporate debt buildup JP
Equity price inflation	
Fiscal improvement	
Deterioration of current account (not shown in the data, but end of 1980s in Japan)	
Household savings decline	

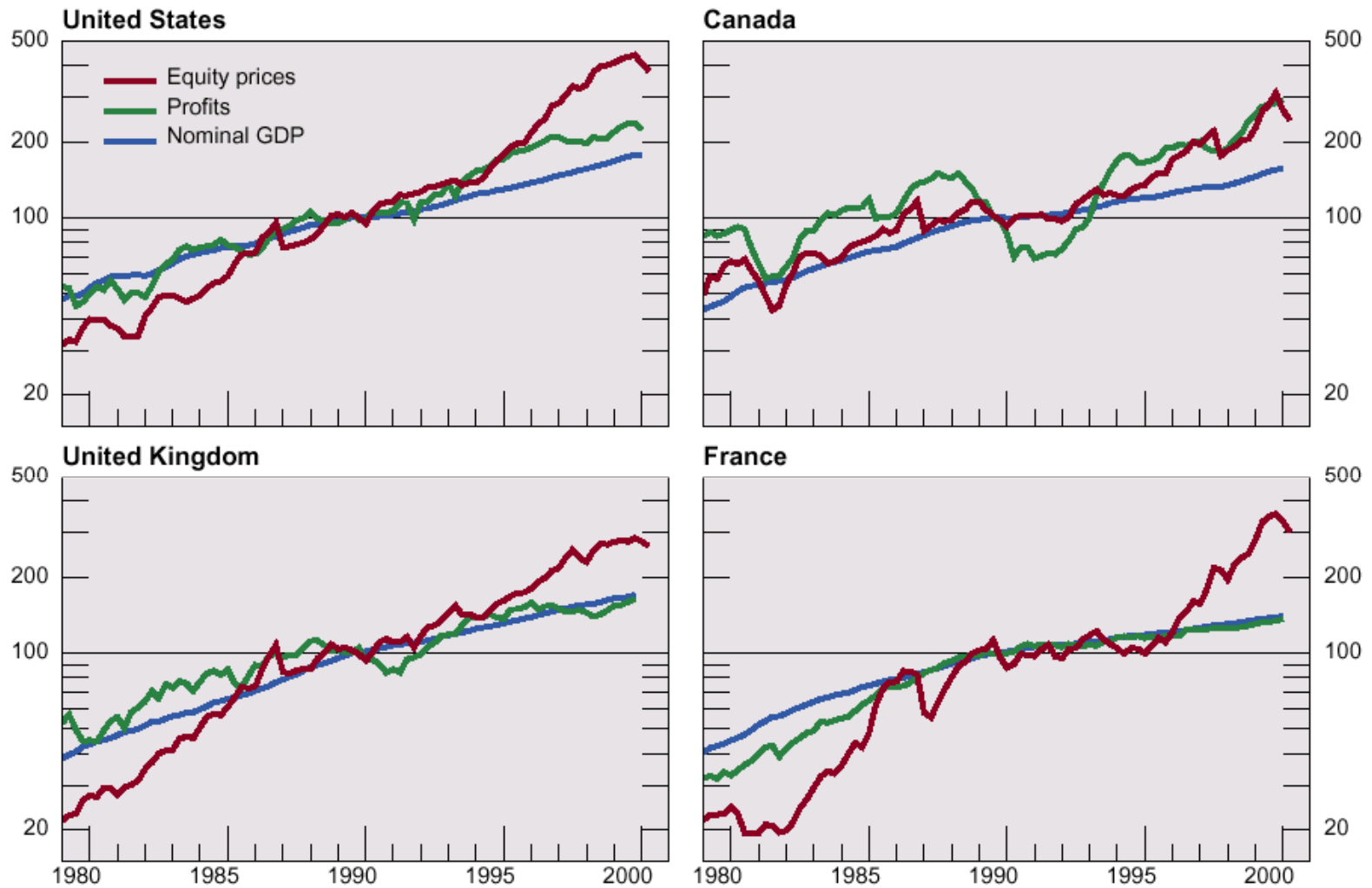


## Some historical context: facts (2)

- The equity boom preceding the bust?
- Due to easy policy?
- And credit excesses?

## Equity prices, profits and nominal GDP

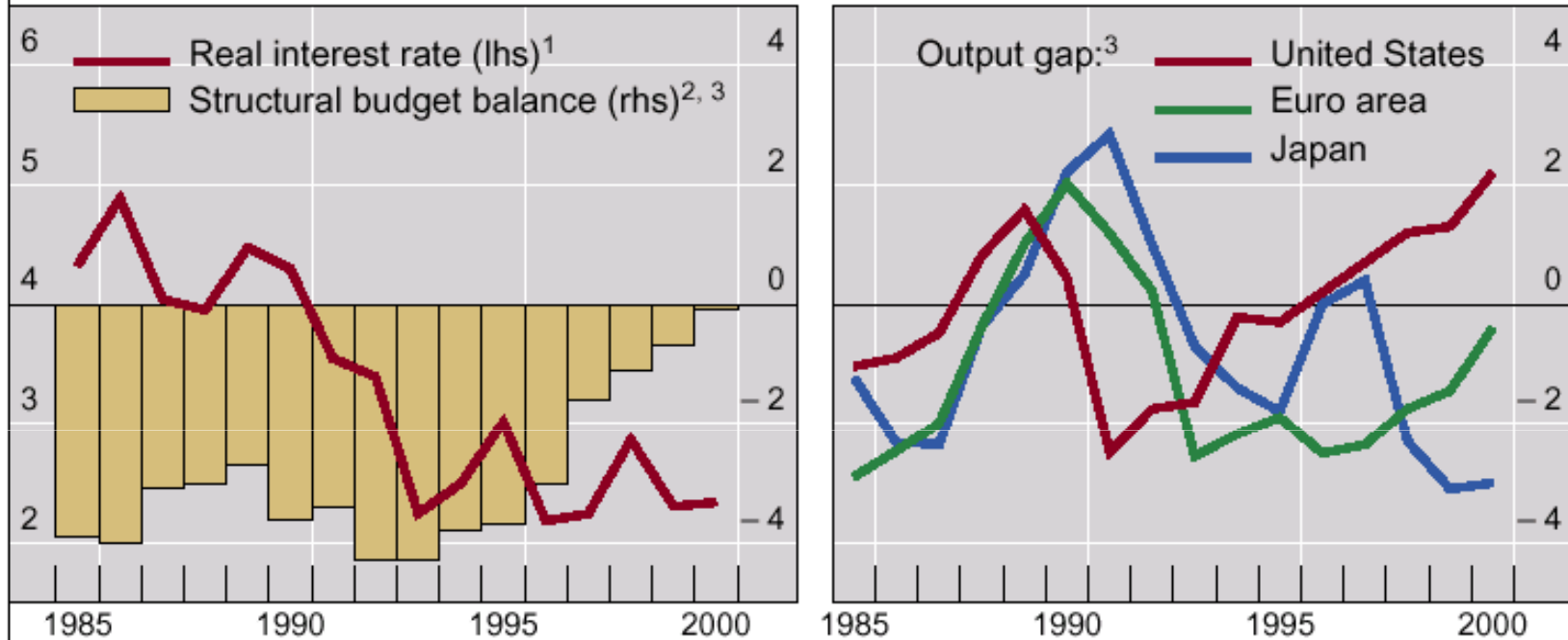
Quarterly data; 1990 = 100 (semi-logarithmic scale)



Source: National data.

## Real interest rate, structural budget balance and output gaps

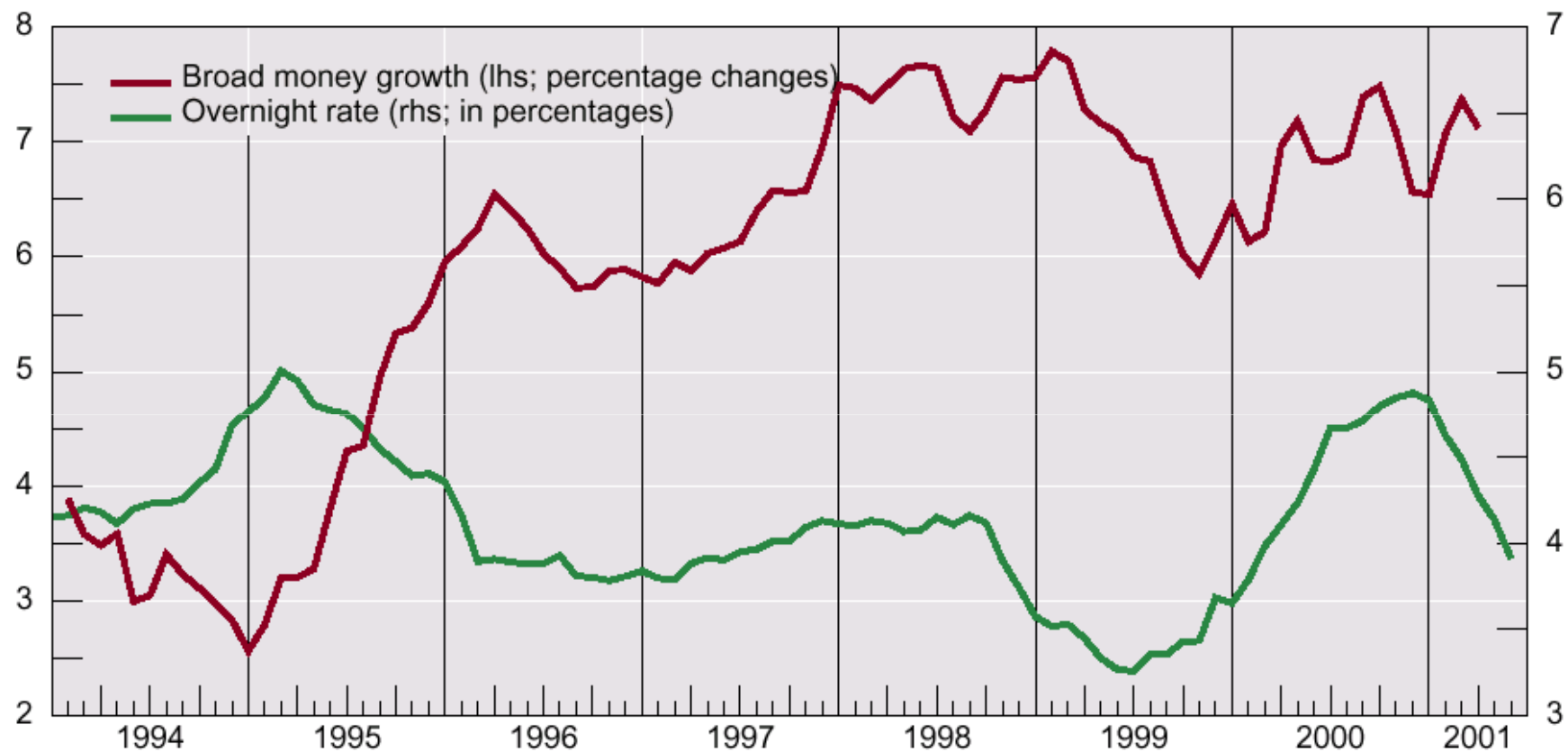
In percentages



<sup>1</sup> Weighted average, based on 1995 GDP and PPP exchange rates, of OECD countries' short-term interest rates deflated by annual consumer price inflation. <sup>2</sup> General government in the OECD countries. <sup>3</sup> As a percentage of potential GDP.

Sources: OECD; national data.

## Globally aggregated money growth and short-term interest rates<sup>1</sup>



<sup>1</sup> Weighted average of the United States, Japan, the euro area and the United Kingdom.



## Where to from here?

- The New Era paradigm.
- The Keynesian paradigm.
- The Austrian paradigm.





## The New Era paradigm

- New technology has pushed up potential output and profits.
- Buoying share prices, consumption and investment.
- And giving better control over inventories.



## The Keynesian paradigm

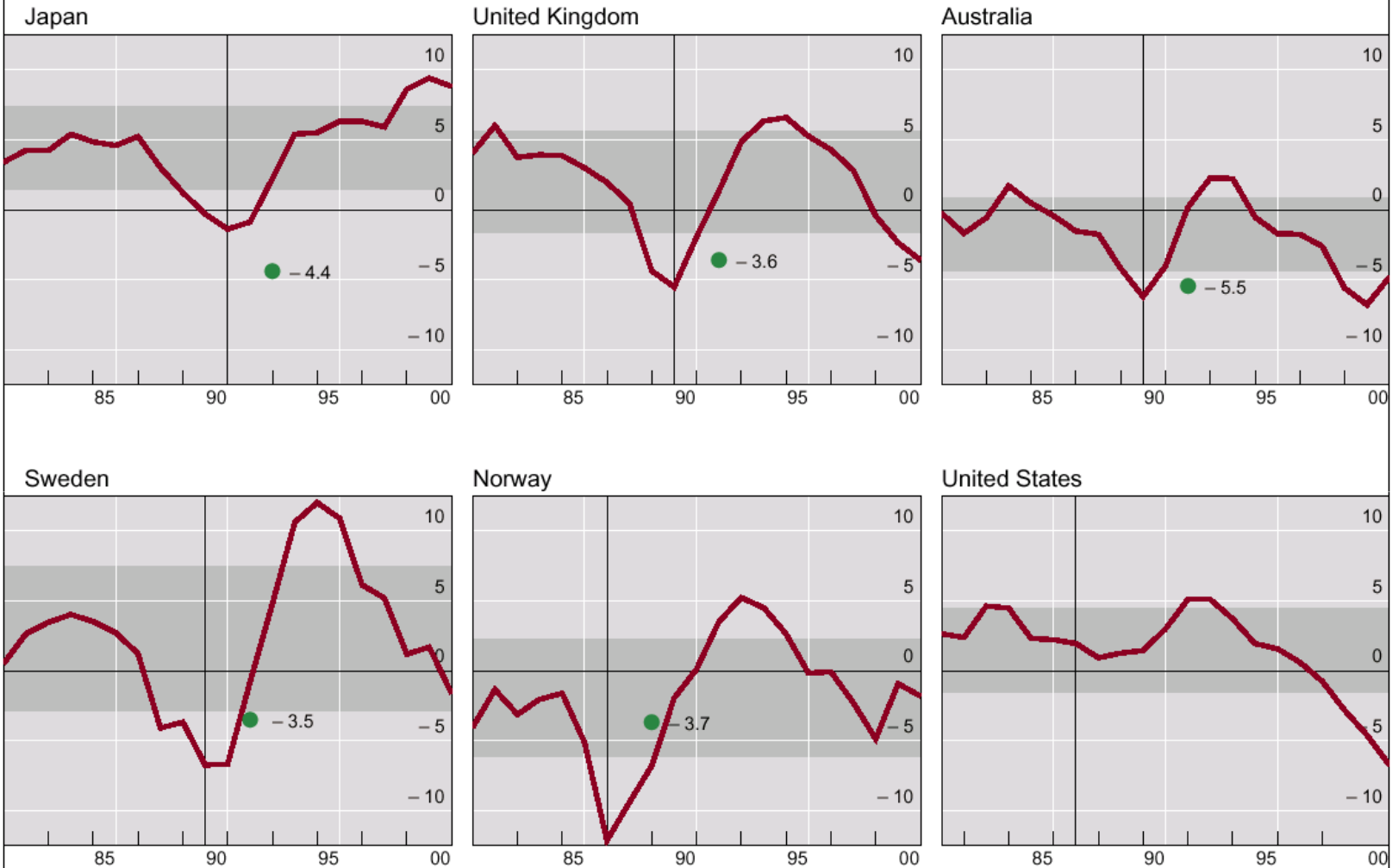
- Aggregate demand has outstripped supply.
- Postwar slowdowns have all been “hard”.
- Possible stagflation could make it worse.



## The Austrian paradigm

- Many financial imbalances remain.
- Many macro imbalances remain.
- Possible financial vulnerabilities.
- And the need for rebalancing.

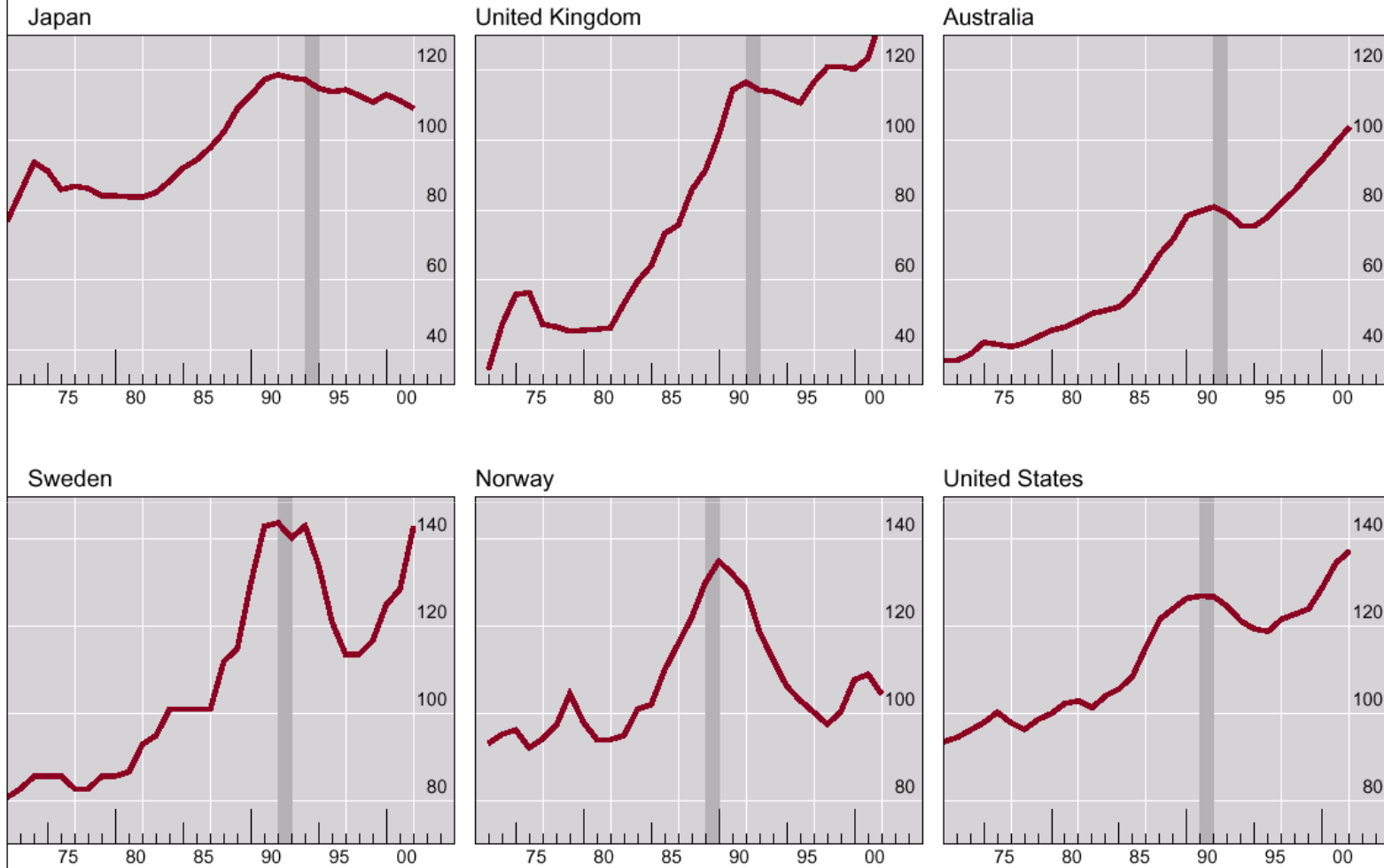
# Net private saving<sup>1</sup>



Note: The shading represents  $\pm 1$  standard deviation around the mean of the observation period, and the dots the change in GDP growth two years after the indicated trough. <sup>1</sup> As a percentage of GDP.

Sources: OECD; national data.

## Credit cycles and financial stress<sup>1</sup>



<sup>1</sup> Private credit as a percentage of GDP; comparability across countries is restricted by differences in the definition of private credit. The shaded areas mark the onset of stress in the financial system.

Sources: G Kaminsky and C Reinhart, "The twin crises: The causes of banking and balance-of-payments problems", American Economic Review, June 1999; national data; BIS estimates.



## Possible policy responses

- Given a sharp rebound?
- Given a shallow recession?
- Given a deep recession?



## Given a sharp rebound

- Inflation in the US could rise: energy, ULC and the dollar.
- Underlying imbalances could worsen.
- Could imply the need for tightening.



## Given a shallow recession

- Inflation less of a problem.
- Imbalances are resolved over time.
- Unpleasant, but the best of the possible alternatives.
- Policy could stay easy for an extended period.





## Given a deep recession

- Restructure the supply side and recapitalise banks as quickly as possible.
- Use monetary and fiscal policies to back in aggregate demand.
- Both required because Hayek and Keynes both had a point.



**But cheer up,  
it may never happen!**