Lecture 9: Intermediate macroeconomics, autumn 2012

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Literature: ***Mankiw, Chapters 15 and 17***
EEAG, Chapter 1
Swedish Fiscal Policy 2012, Chapters 1-2.

Stockholm University

Topics

- **Problems with stabilisation policy**
- **Economic-policy paradigms during different periods**
- **The time inconsistency problem of monetary policy**
- **Independent central banks**
- **Automatic stabilisers in fiscal policy**
- **Lessons from the financial crisis**
- **The Keynesian consumption function**
- **The intertemporal budget constraint**
- **Borrowing constraints**

Stabilisation policy in practice: problems

1. **Time lags**
   - **Inside lags: recognition lag and decision lag**
   - **Outside lags: effect lag**
   - **Longer decision lag for fiscal policy than for monetary policy (parliamentary process where also other considerations than stabilisation aspects enter)**
   - **The effect lag of monetary policy (until it affects the inflation rate) is often assessed to be around two years**

2. **Difficulties of economic forecasting**

3. **Economic relationships are often unstable**
   - **The Lucas critique**
   - **Examples: the Phillips curves and exchange rate pass-throughs**

Stabilisation policy in practice: problems (cont.)

4. **Measures often taken for political-economy reasons. Do not coincide with what is optimal from a stabilisation policy view.**

   - **Political business cycles: expansionary policy before an election (tax cuts and expenditure increases)**
   - **It is more popular to stimulate aggregate demand in a downturn than it is to stimulate it in a boom: the result is likely to be a *deficit bias* of fiscal policy (and an *inflation bias* of monetary policy)**
   - **Time inconsistency problem: a certain policy may be optimal *ex ante* (in advance) but not *ex post* (afterwards).**

Economic policy paradigms

The post-war period up to the mid 1970s

- **An activist (Keynesian) view dominated**
- **Full-employment goal**
- **The economy is fundamentally unstable and needs to be stabilised through policy**
- **Discretionary policy (active decisions): at any point of time one should choose the policy that is viewed as the best (no rules)**

1980s

- **An activist stabilisation policy with a full-employment goal is perceived to create an inflation bias**
- **The economy is fundamentally stable; shocks originate instead to a large extent from overambitious, but failed, attempts to stabilise the economy**
- **Rules-based policy instead of discretionary policy**
- **Fight unemployment with structural labour market reforms!**

Economic policy paradigms: Conventional wisdom before the financial crisis

- **Compromise between earlier paradigms**
- **Monetary policy more discretionary and activist again**
- **The price stability objective (an inflation target) is seen as the primary objective for monetary policy**
- **Independent central banks in charge of monetary policy, which should be the primary stabilisation policy tool**
  - **Rules-based fiscal policy: avoid discretionary policy action and rely instead on the automatic stabilisers**
  - **Budget objective over the business cycle**
    Sweden: budget surplus of 1 per cent of GDP over the cycle;
    EU: structural (cyclically adjusted) budget outcome should be in surplus or close to balance, and deficit as well as debt ceilings for the government
  - **government expenditure ceiling (Sweden)**
  - **decision of overall government expenditures taken before decisions on individual expenditures (so if one wants to increase one type of expenditure, one must reduce another once the overall decision has been taken) (Sweden)**

After the financial crisis

- **Price stability may be too narrow a goal for monetary policy**
- **Financial stability as an additional monetary policy goal**
- **Need for financial regulation instruments to achieve financial stability**
- **Increased emphasis on fiscal policy**
  - **monetary policy is not enough in a liquidity trap**
  - **more activist fiscal policy in the first phase of the financial crisis**
  - **now more a question of the speed of fiscal consolidation**

The time inconsistency (credibility) problem of monetary policy

- **Policy makers strive for both low inflation and low unemployment**
- **It is optimal to announce a low-inflation policy *ex ante*: if credible, anticipated inflation is reduced**
- **But once this has happened, it is tempting for monetary policy makers to let inflation increase, because this reduces unemployment**
- **Hence the optimal monetary policy is time inconsistent**
- **But such policy cannot work in the long run: the public learns to anticipate policy**
- **The economy gets stuck in an inflation equilibrium with high inflation without reaching lower unemployment (actual unemployment = equilibrium unemployment when actual inflation is anticipated)**

The optimisation problem of the central bank when monetary policy is discretionary

Surprise supply function

$$\boldsymbol{u = u^n - \alpha(\pi - E\pi)}$$

Loss (disutility) function

$$\boldsymbol{L = u + \gamma\pi^2}$$

Substitution of supply function into loss function:

$$\boldsymbol{L = u^n - \alpha(\pi - E\pi) + \gamma\pi^2}$$

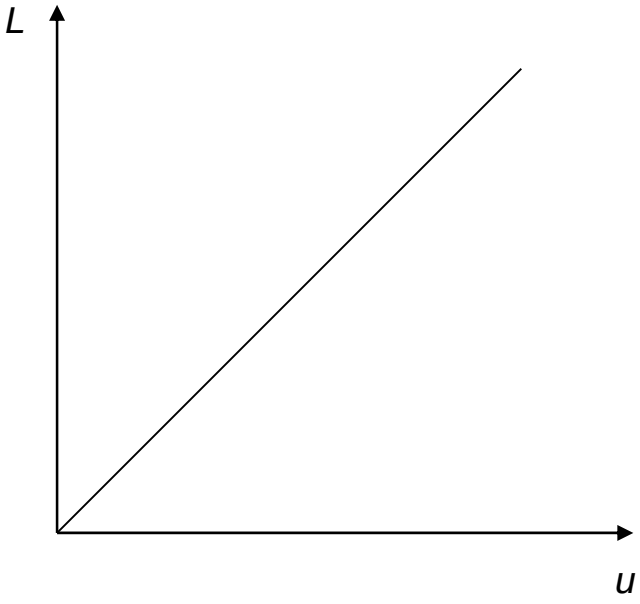
Policy makers choose π so as to minimise *L* (taking $E\pi$ as given):

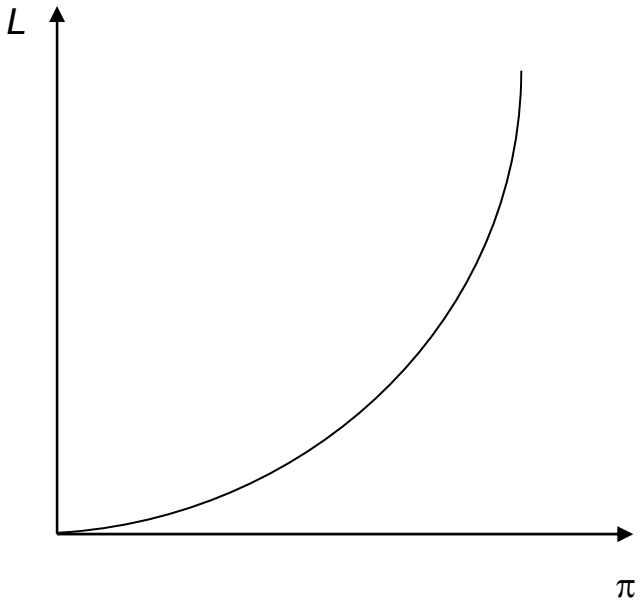
$$\frac{\partial L}{\partial \pi} = -\alpha + 2\gamma\pi = 0$$

$$\pi = \frac{\alpha}{2\gamma}$$

$$\alpha = 1 \text{ och } \gamma = 10 \Rightarrow \pi = \frac{1}{20} = 0{,}05$$

Loss function





Rules are better than discretion in the model

$$\boldsymbol{u = u^n - \alpha(\pi - E\pi)}$$

$$\boldsymbol{L = u + \gamma\pi^2}$$

- **In equilibrium with discretionary policy:** $\boldsymbol{\pi = E\pi = \alpha/2\gamma}$

  Hence: $u = u^n$

  L^D **= loss (disutility) under discretion**

  $$L^D = u^n + \gamma\left(\frac{\alpha}{2\gamma}\right)^2 = u^n + \frac{\alpha^2}{4\gamma}$$

- **Commitment to** $\boldsymbol{\pi = E\pi = 0}$ **(binding rule)**

  L^C **= loss (disutility under commitment)**

  $$L^C = u^n + 0 = u^n$$

- **Comparison of discretion and commitment**

  $$L^C = u^n < u^n + \frac{\alpha^2}{4\gamma} = L^D$$

- **Commitment gives smaller loss than discretion**

- **Hence commitment is better than discretion in the model**

Why cannot the central bank announce a zero-inflation policy under discretion and then stick to it?

- **Assume that policy makers announce a policy of zero inflation and that the announcement is believed!**

$$E\pi = 0$$

- **Hence:**

$$u = u^n - \alpha(\pi - E\pi) = u^n - \alpha\pi$$

$$L = u + \gamma\pi^2 = u^n - \alpha\pi + \gamma\pi^2$$

- **Policy makers choose inflation to minimise *L*:**

$$\frac{\partial L}{\partial \pi} = -\alpha + 2\pi\gamma = 0$$

$$\pi = \alpha / 2\gamma$$

- ***Ex post* the government thus chooses to inflate all the same.**

Methods of commitment

1) **Gold standard**

2) **Bretton Woods fixed exchange rate**

3) **Currency board**

4) **Constitutional stipulations**

5) **Common currency (Italy, Finland, Greece)**

6) **Independent central bank**
   - **conservative governor(s)**
   - **inflation target**

Central bank independence

- **Long periods of office for governors**
- **Governors cannot be fired during period of office**
- **Prohibitions both for governments to give instructions and for central bankers to receive them**
- **Governors should have professional competence (this potentially rules out politicians)**
- **Freedom to use monetary policy instruments**
- **Ban on government borrowing in the central bank**
- **Transparent objective (inflation target): commitment or constrained disaction**

Central bank independence (cont.)

Conflict of goals: accountability (democratic control) versus efficiency of monetary policy (low inflation and effective stabilisation)

- **New Zealand: the minister for finance can fire the Governor of the central bank after recommendation by the board of the central bank**
- **UK: deviations from the inflation target must be explained publicly (formal letter to the Chancellor of the Exchequers)**
- **Public hearings (Riksbanken: the Finance Committee of the Swedish Parliament; ECB: the Committee for Monetary Affairs in the European Parliament)**

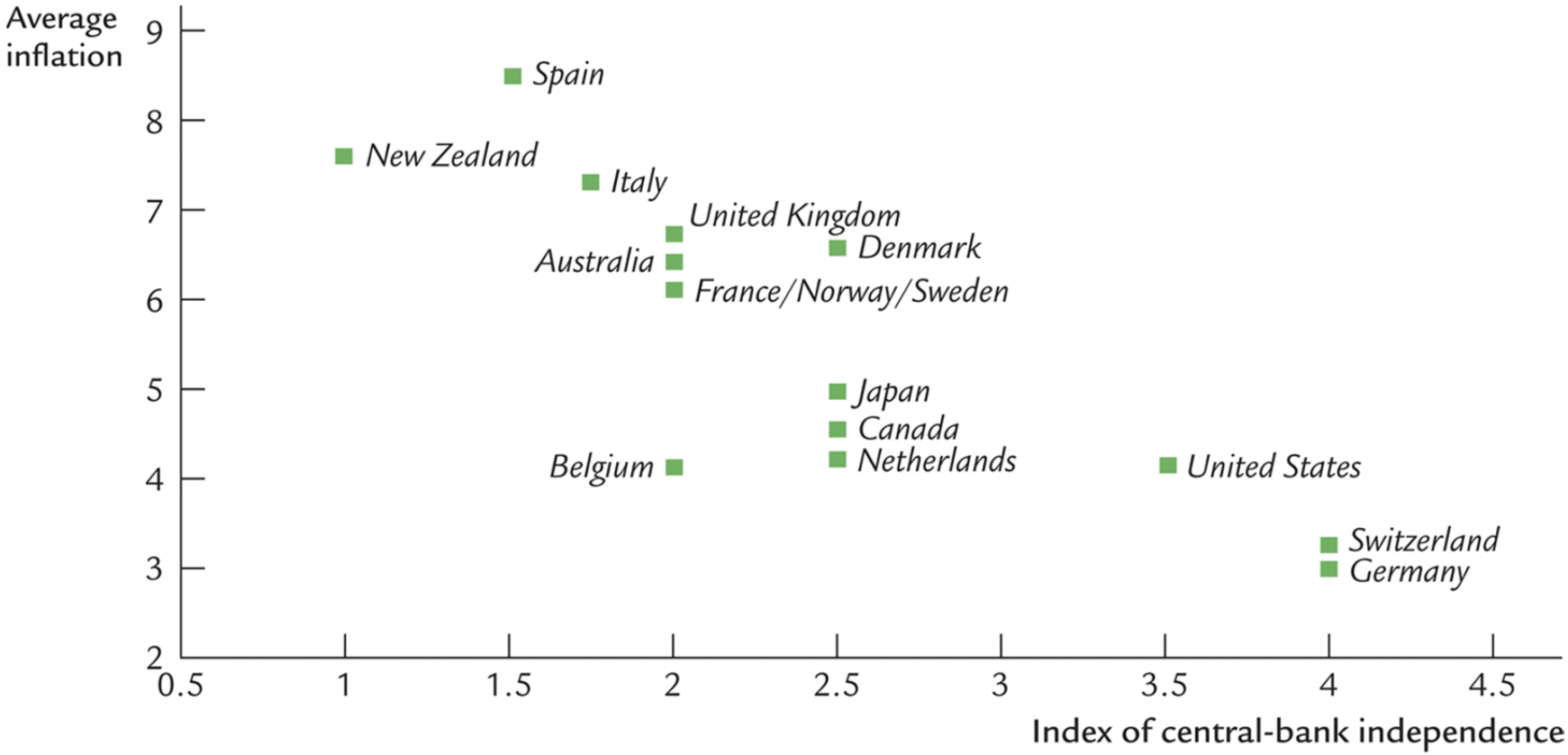


Figure 15.2 Inflation and Central-Bank Independence
Mankiw: Macroeconomics, Seventh Edition

Fiscal policy

- **Avoid discretionary fiscal action**
- **Rely on the automatic stabilisers**
- **Automatic stabilisers = the automatic change in the fiscal balance that occurs over the business cycle**
  - **tax revenues fall (rise) when GDP falls (rises)**
  - **some government expenditures (unemployment benefits) rise (fall) when unemployment rises (falls)**
- **No decision mistakes with automatic stabilisers if demand shocks**
  - **but the automatic stabilisers may be problematic in the case of permanent supply shocks**

Structural fiscal balance and automatic stabilisers

- **Structural fiscal balance is the fiscal balance that would prevail in a normal cyclical situation**
- **The structural fiscal balance is used as a measure of discretionary fiscal policy**

Actual fiscal balance = Structural fiscal balance + Automatic stabilisers

Automatic stabilisers = Budget elasticity × GDP gap

- **Everything is measured in per cent of GDP**
- **The budget elasticity measures how the fiscal balance (in per cent of GDP) changes when GDP changes by one per cent (≈ a one percentage point change in the GDP gap).**

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The budget elasticity and the size of government

B = Fiscal balance

t = Tax rate

Y = GDP

G = Government expenditure

$b = \frac{B}{Y}$ = Fiscal balance as a share of GDP

$$B = tY - G$$

$$b = \frac{B}{Y} = t - \frac{G}{Y}$$

$$\frac{db}{dY} = \frac{G}{Y^2}$$

$$\frac{db}{dY/Y} = \frac{G}{Y}$$

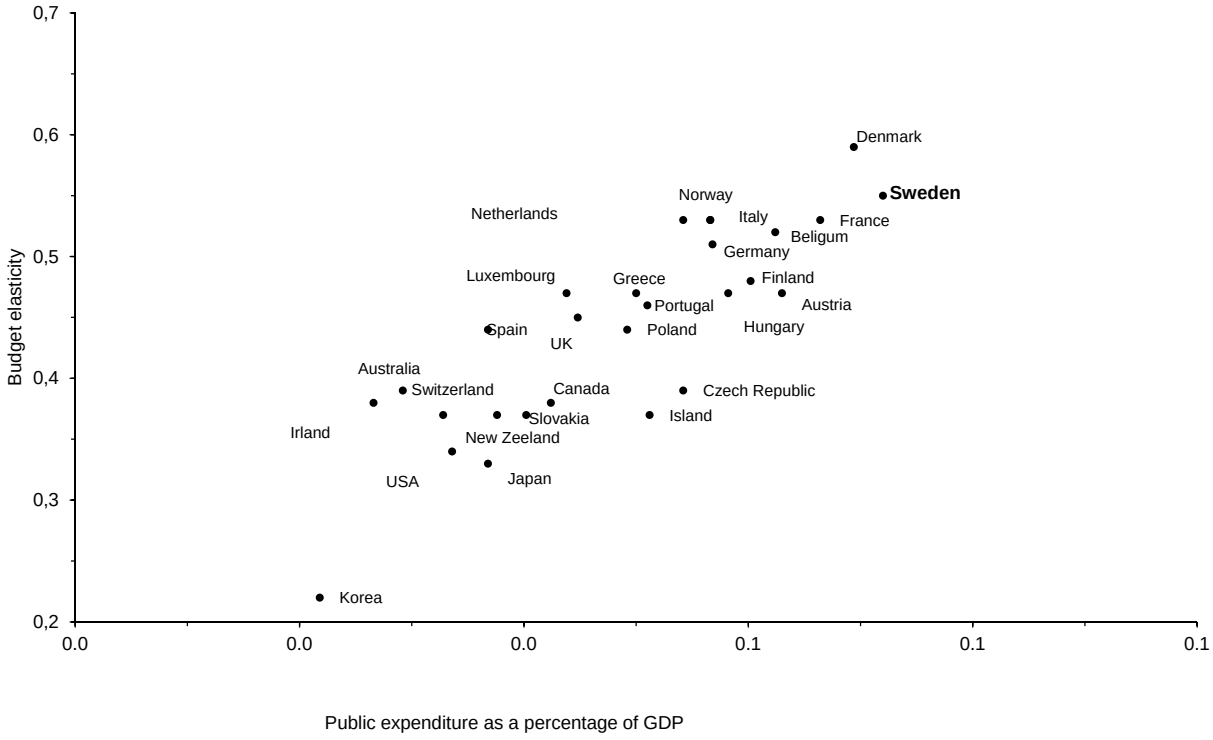
<u>Interpretation</u>: A one per cent increase (decrease) in output improves (deteriorates) the fiscal balance by G/Y percentage points.

$\frac{G}{Y}$ = the share of government expenditure in GDP

$\frac{G}{Y}$ is an appropriate indicator of the strength of automatic stabilisers (the budget elasticity)

The OECD and the Swedish Ministry of Finance assumes a budget elasticity of 0.55 ($\approx G/Y$) for Sweden.

Figure 1.13 The budget elasticity and the size of the public sector

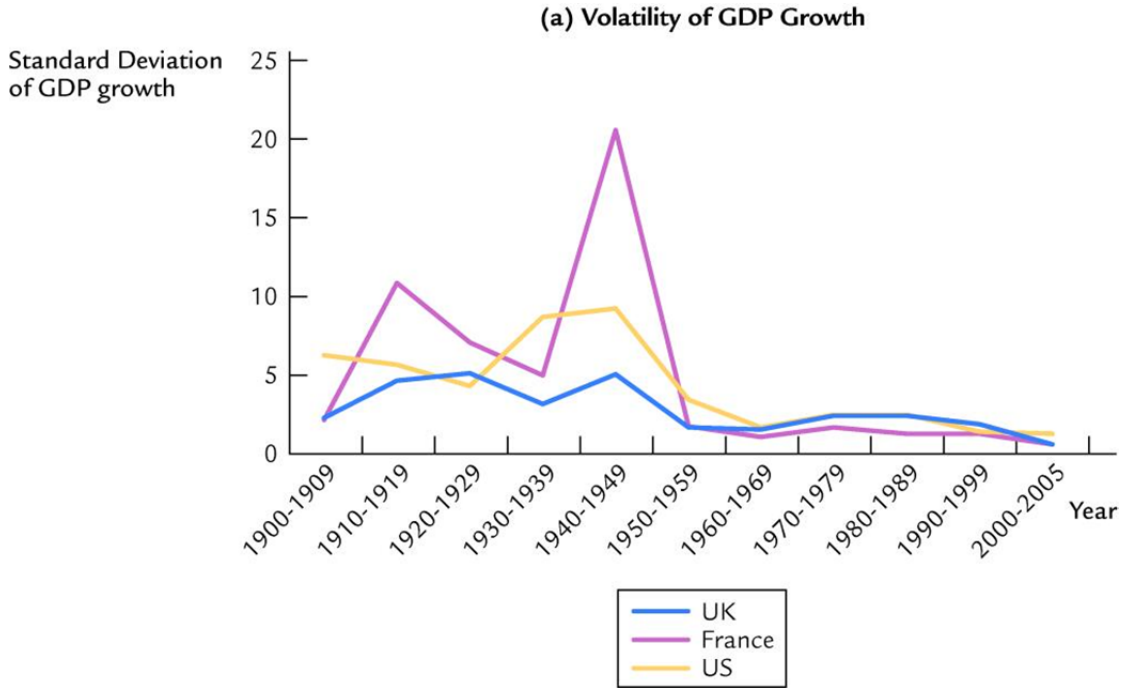


Note: Public expenditure refers to the total of all public sector expenditures as a percentage of GDP in 2005.

Sources: Girouard and Andrés (2005) and OECD (2008)

Belief in the Great Moderation before the financial crisis: lower output and inflation volatility

- **Larger importance for less volatile service sectors**
- **Good luck – absence of shocks**
- **Better macroeconomic management (because of better institutions?)**
- **The great moderation came to a sudden end. Financial crisis and world recession**



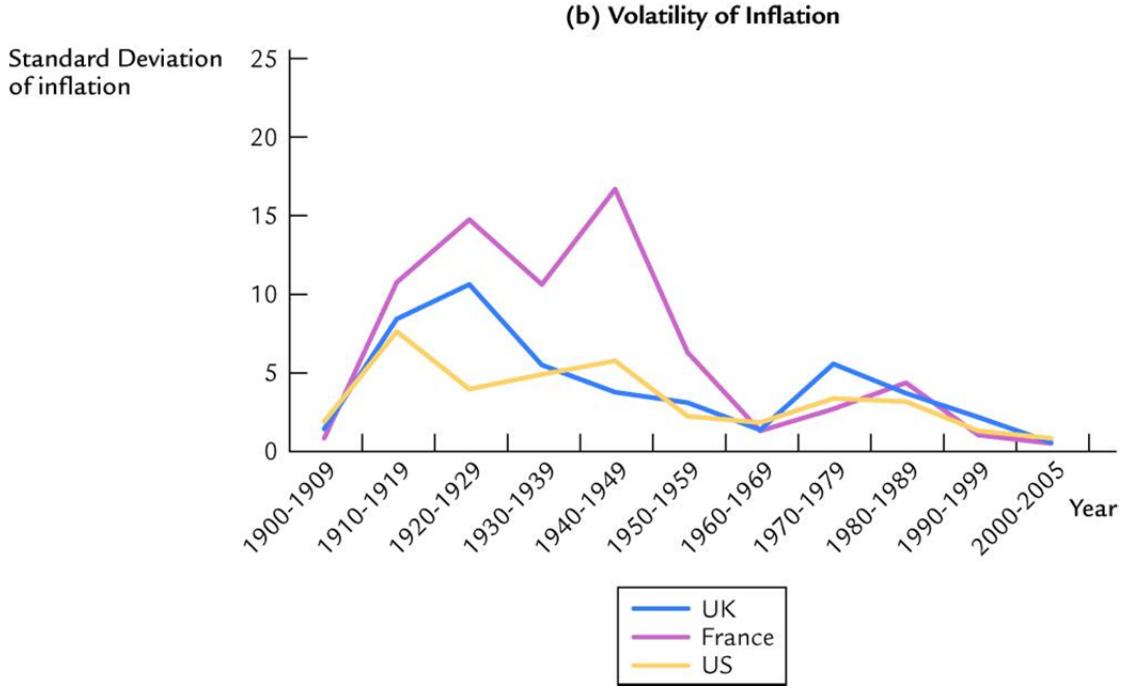
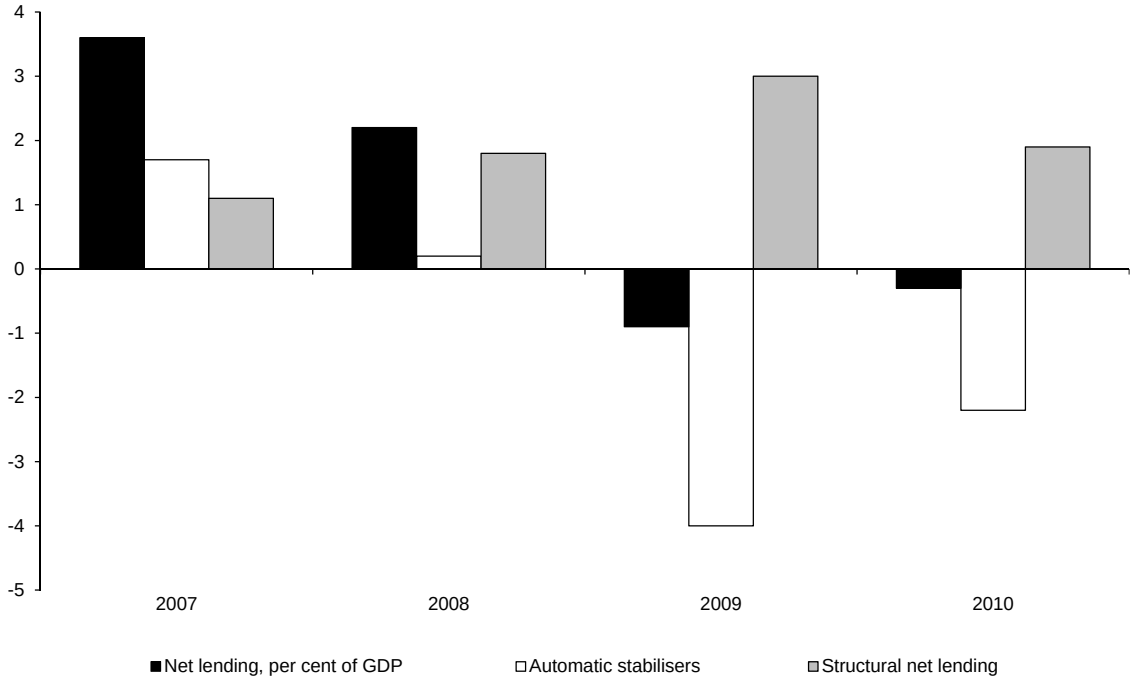


Figure 14.1 Macroeconomic volatility in the UK, France and the US since 1900.

Figure 1.12 Automatic stabilisers 2007-2010



Note: In our calculations, the Government's estimate of a budget elasticity of 0.55 has been used.
Sources: The 2011 Budget Bill and own calculations.

Figure 1.1

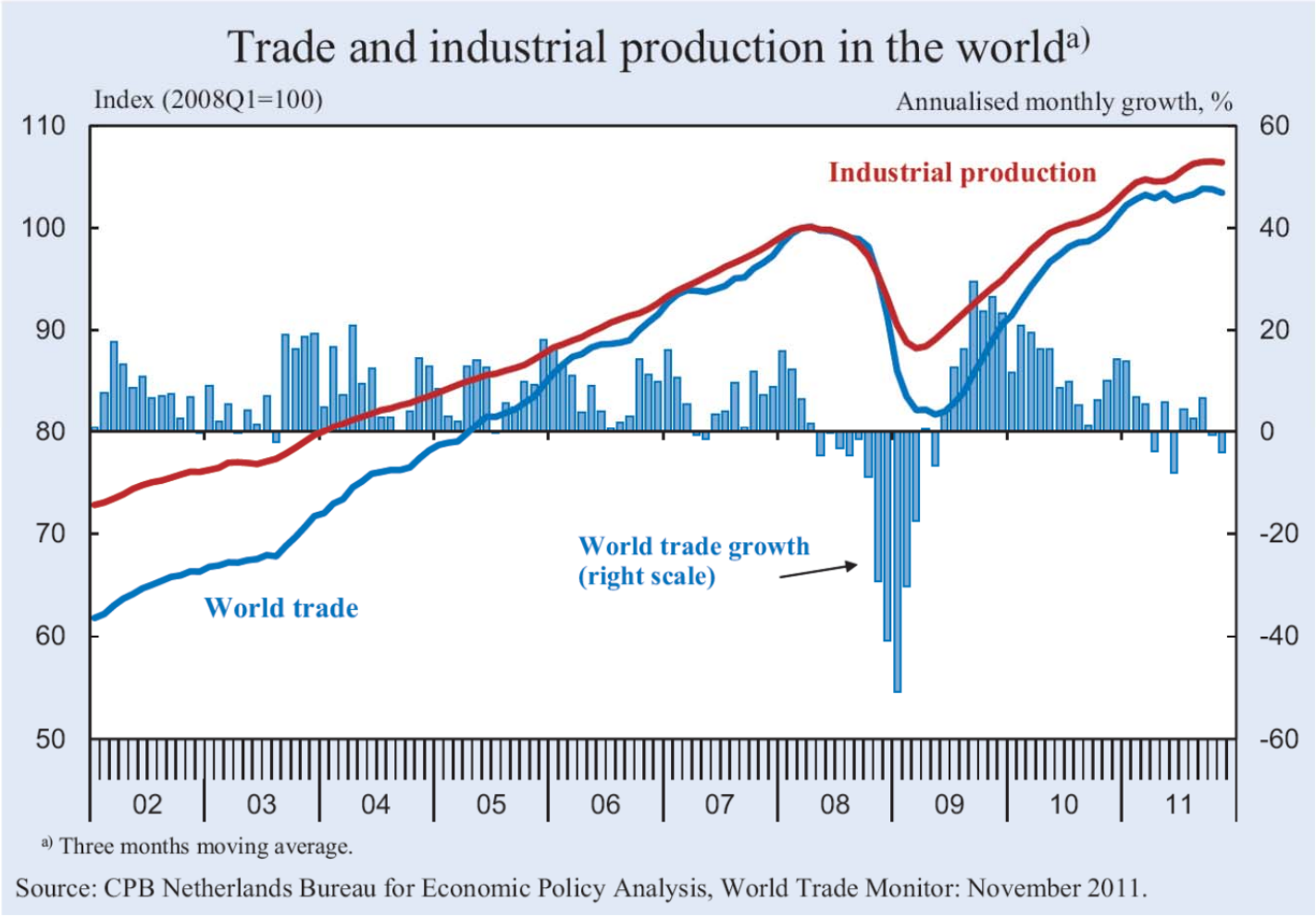
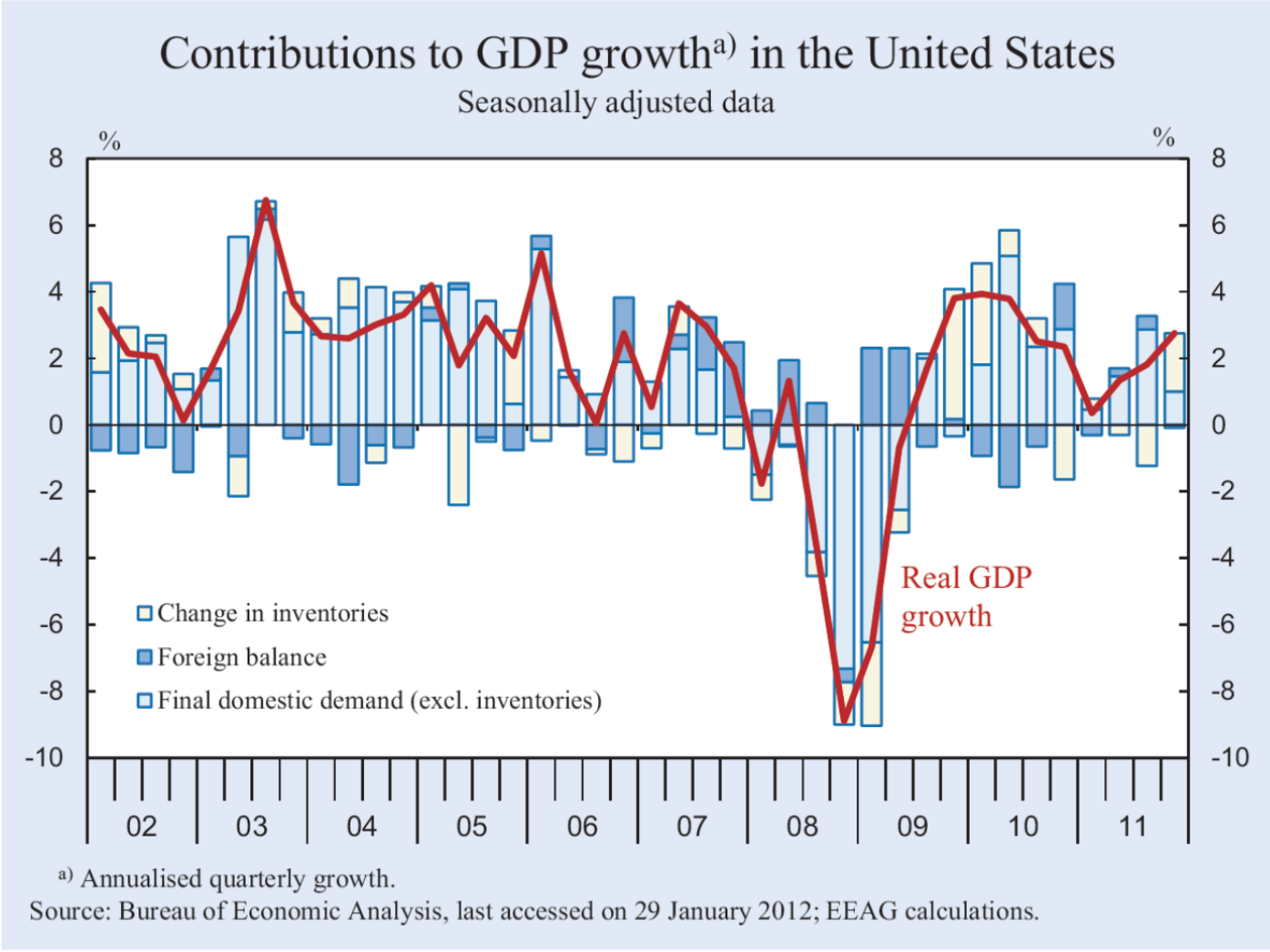

Trade and industrial production in the world[a)]
Index (2008Q1=100)
Annualised monthly growth, %
110
100
90
80
70
60
50
60
40
20
0
-20
-40
-60
Industrial production
World trade
World trade growth
(right scale)
02
03
04
05
06
07
08
09
10
11
a) Three months moving average.
Source: CPB Netherlands Bureau for Economic Policy Analysis, World Trade Monitor: November 2011.

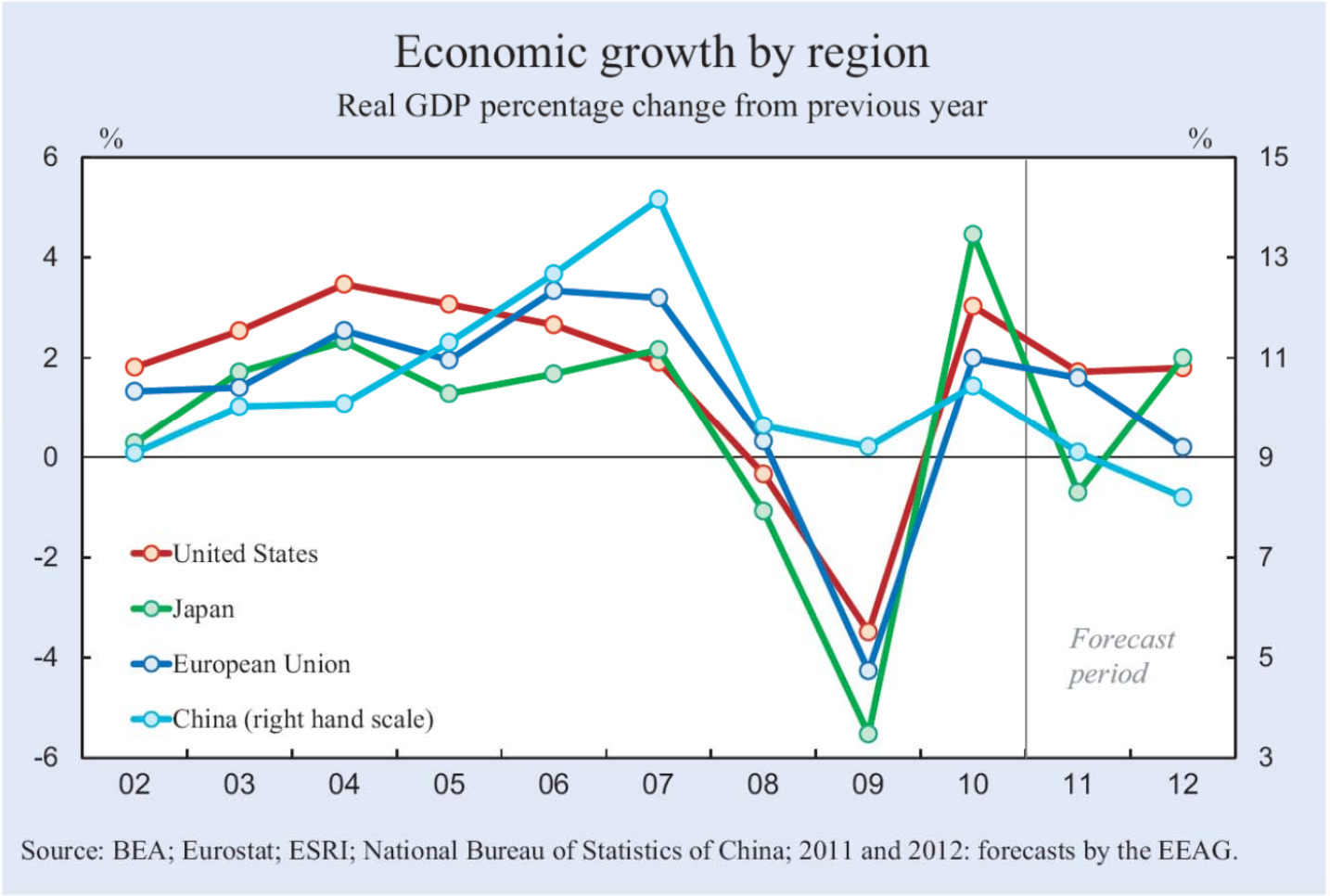
Figure 1.4



[a)] Annualised quarterly growth.

Source: Bureau of Economic Analysis, last accessed on 29 January 2012; EEAG calculations.

Figure 1.30



Source: BEA; Eurostat; ESRI; National Bureau of Statistics of China; 2011 and 2012: forecasts by the EEAG.

Lågkonjunkturen fördjupas i euroområdet

BNP-gap i USA och euroområdet, procent av potentiell BNP, säsongsrensade kvartalsvärden

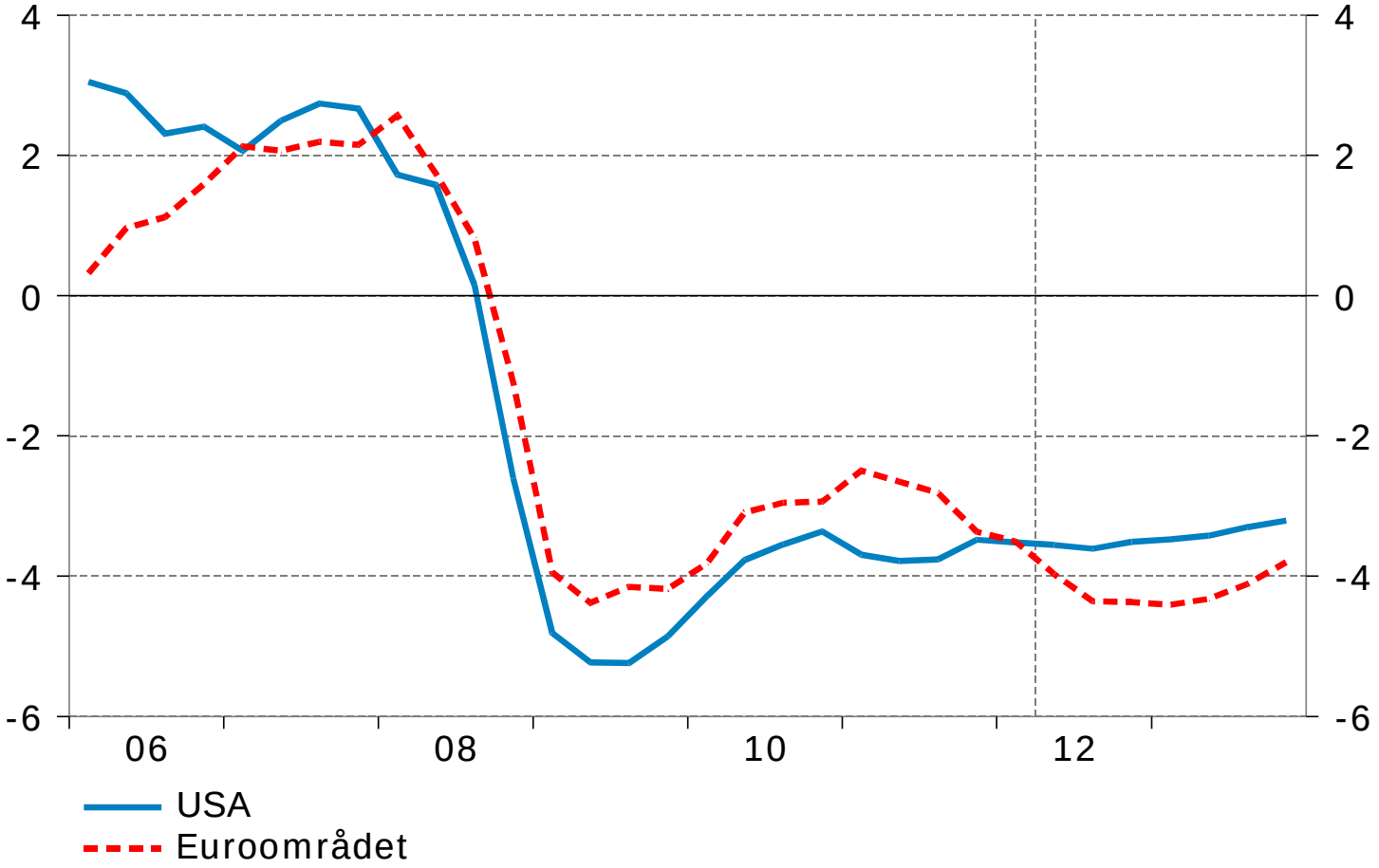


Figure 1.3

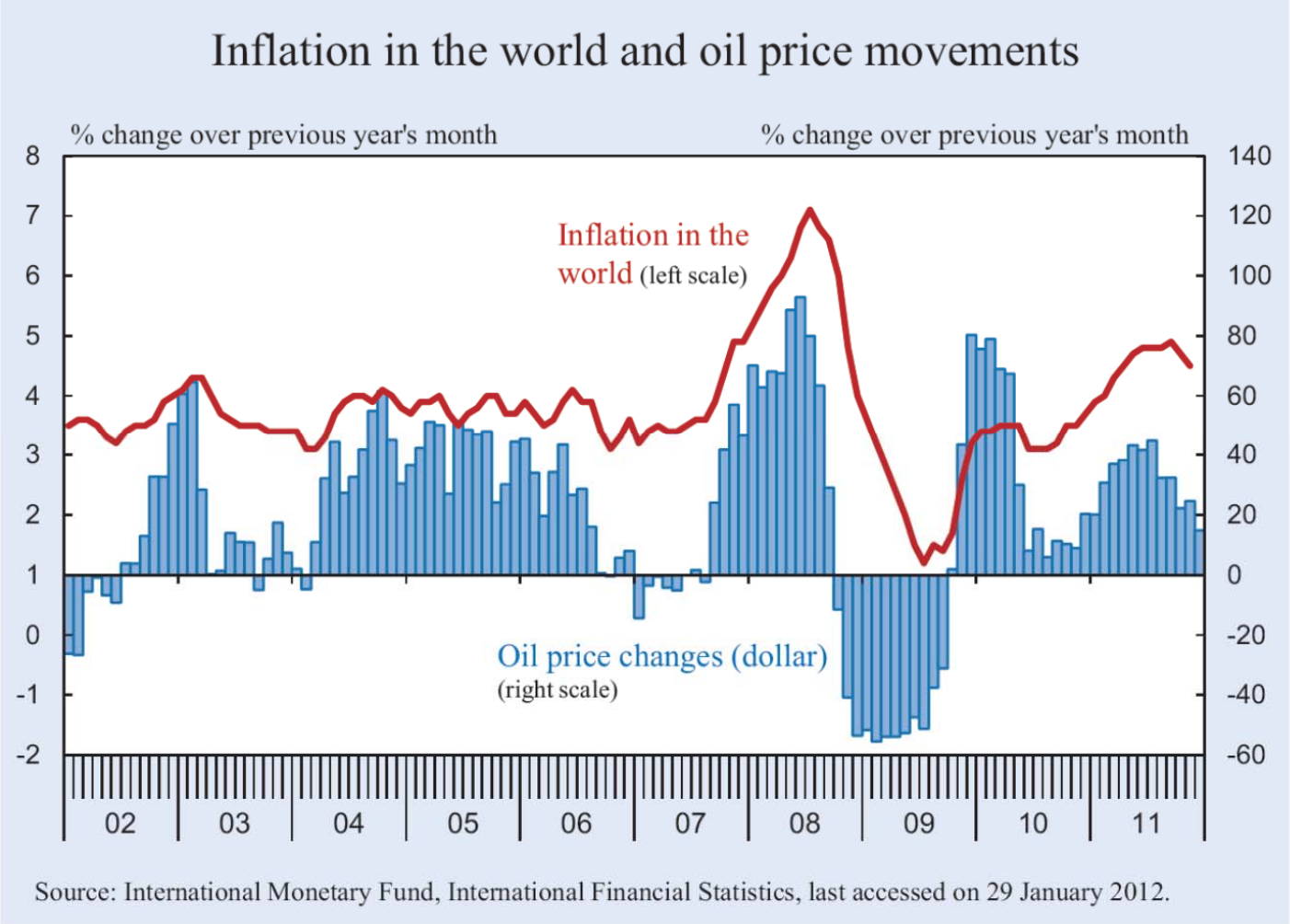
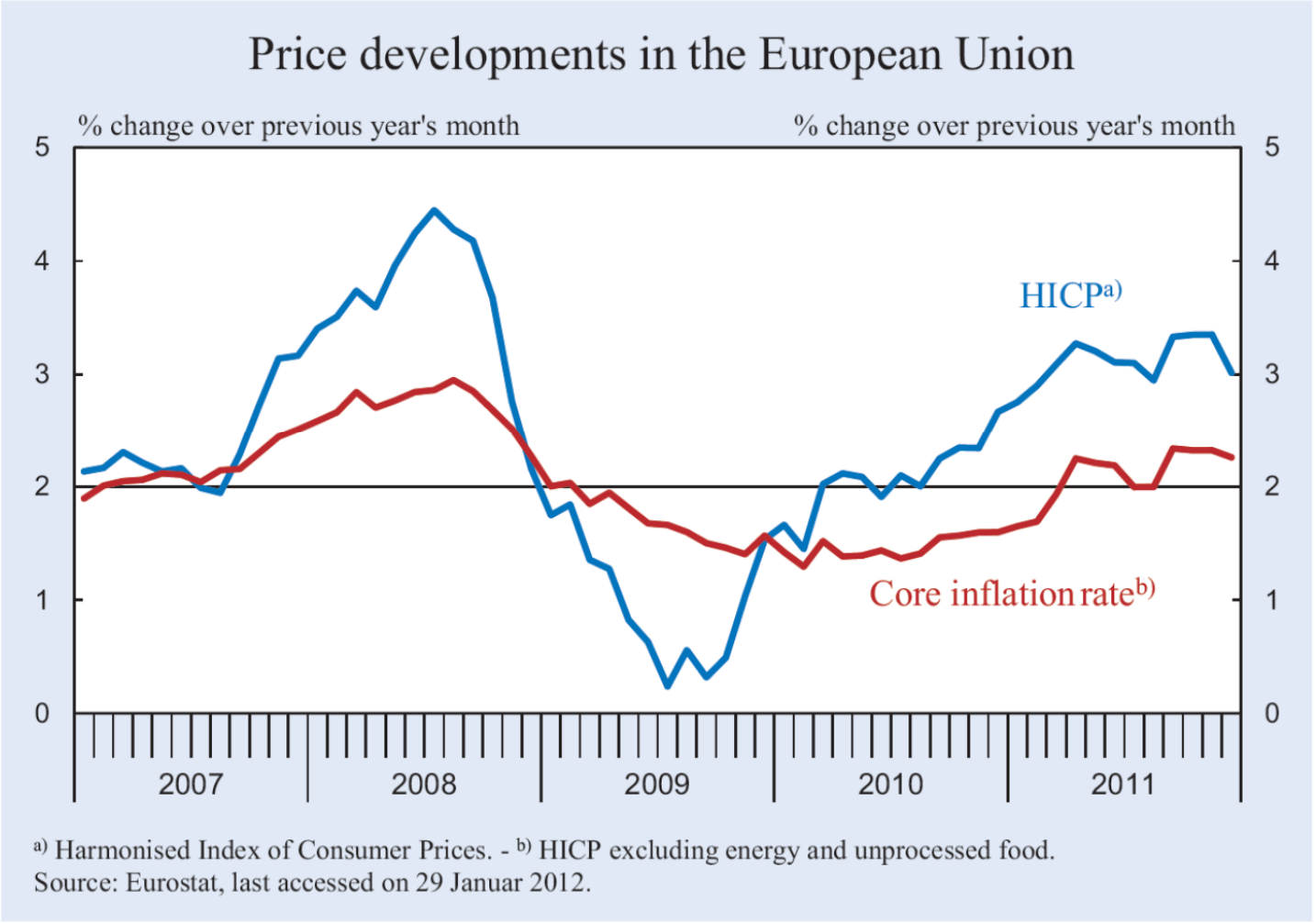
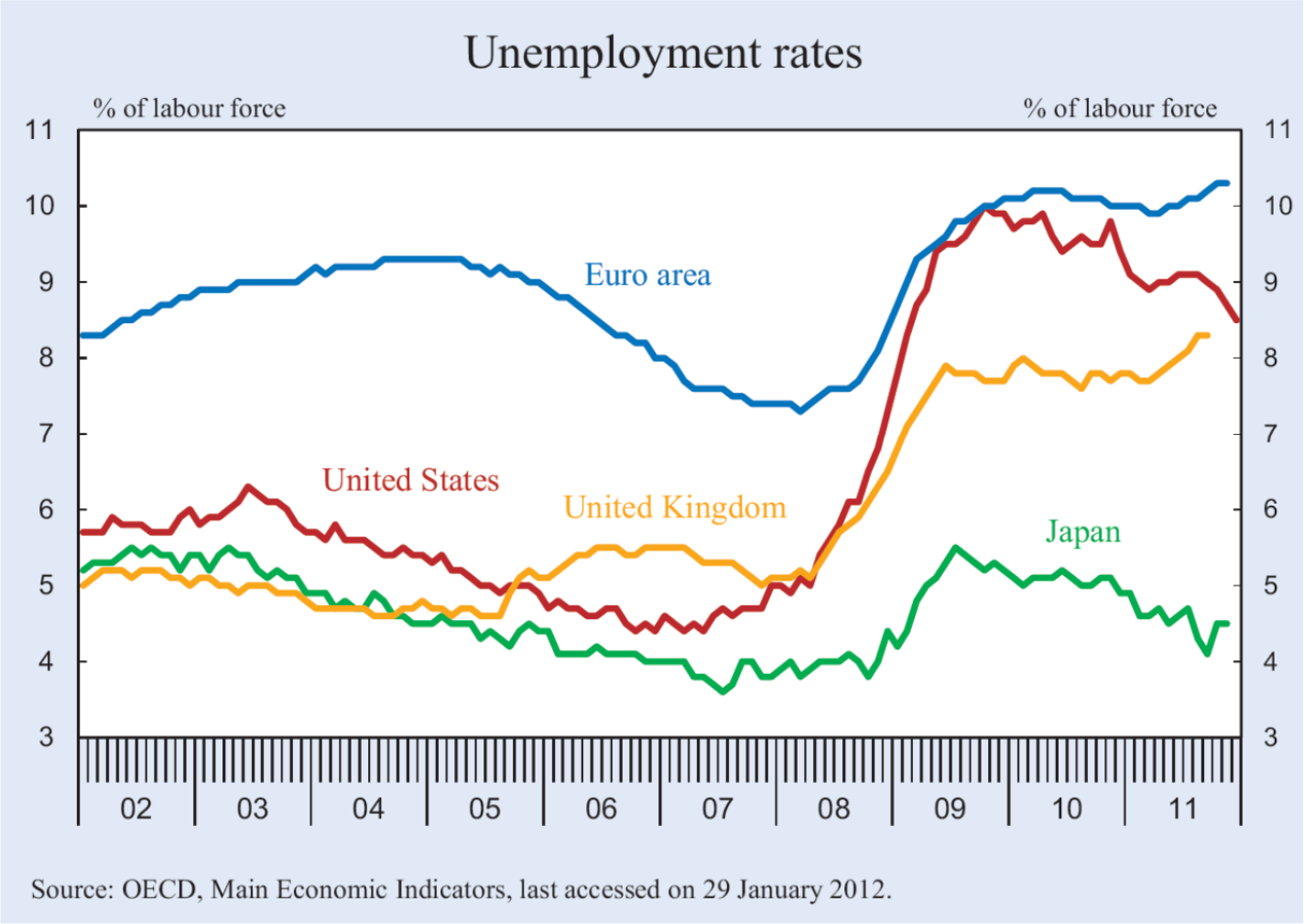

Inflation in the world and oil price movements
% change over previous year's month
% change over previous year's month
8
7
6
5
4
3
2
1
0
-1
-2
140
120
100
80
60
40
20
0
-20
-40
-60
Inflation in the world (left scale)
Oil price changes (dollar) (right scale)
02
03
04
05
06
07
08
09
10
11
Source: International Monetary Fund, International Financial Statistics, last accessed on 29 January 2012.

Figure 1.11



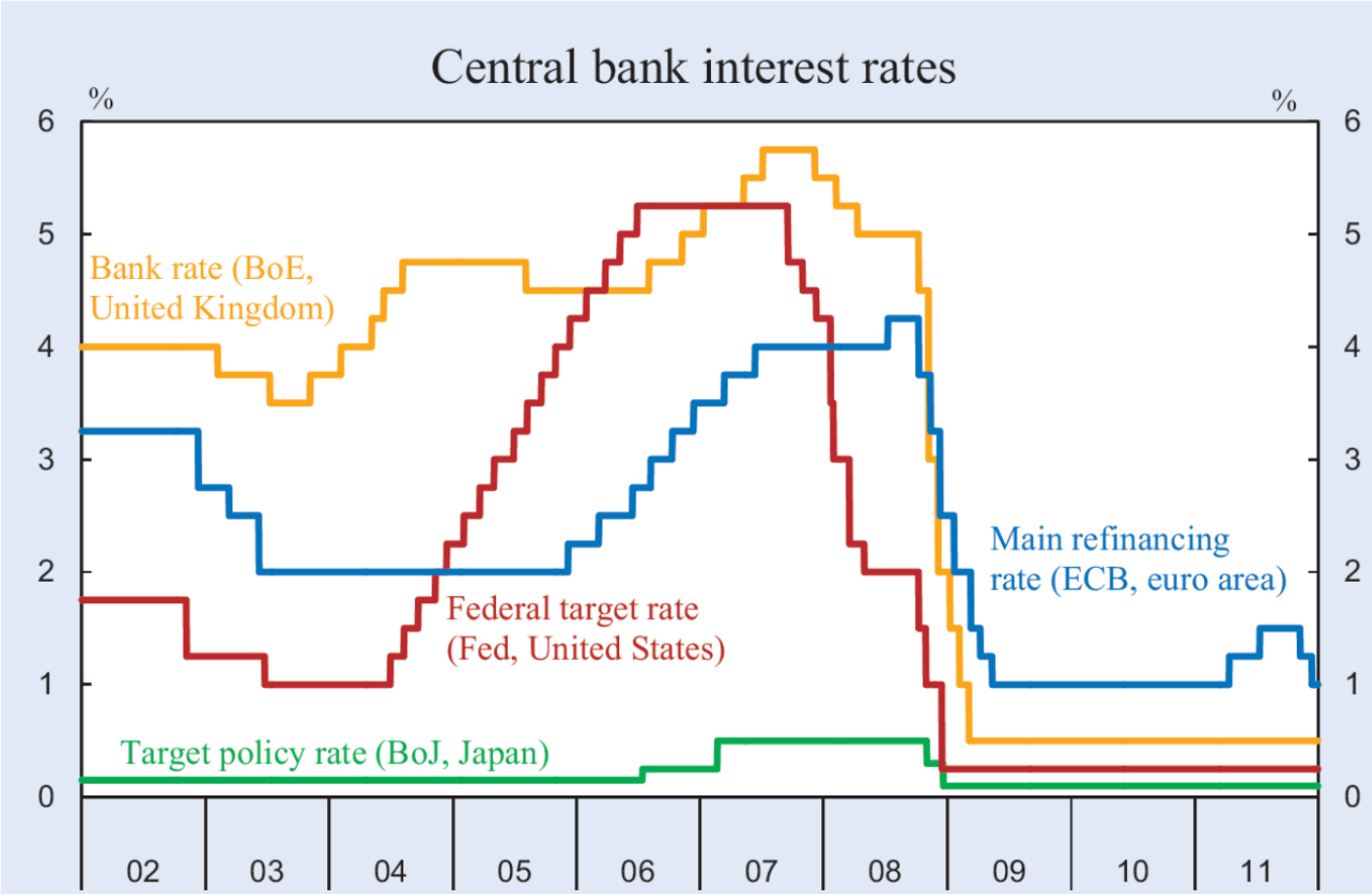
[a)] Harmonised Index of Consumer Prices. - [b)] HICP excluding energy and unprocessed food.
Source: Eurostat, last accessed on 29 Januar 2012.

Figure 1.6



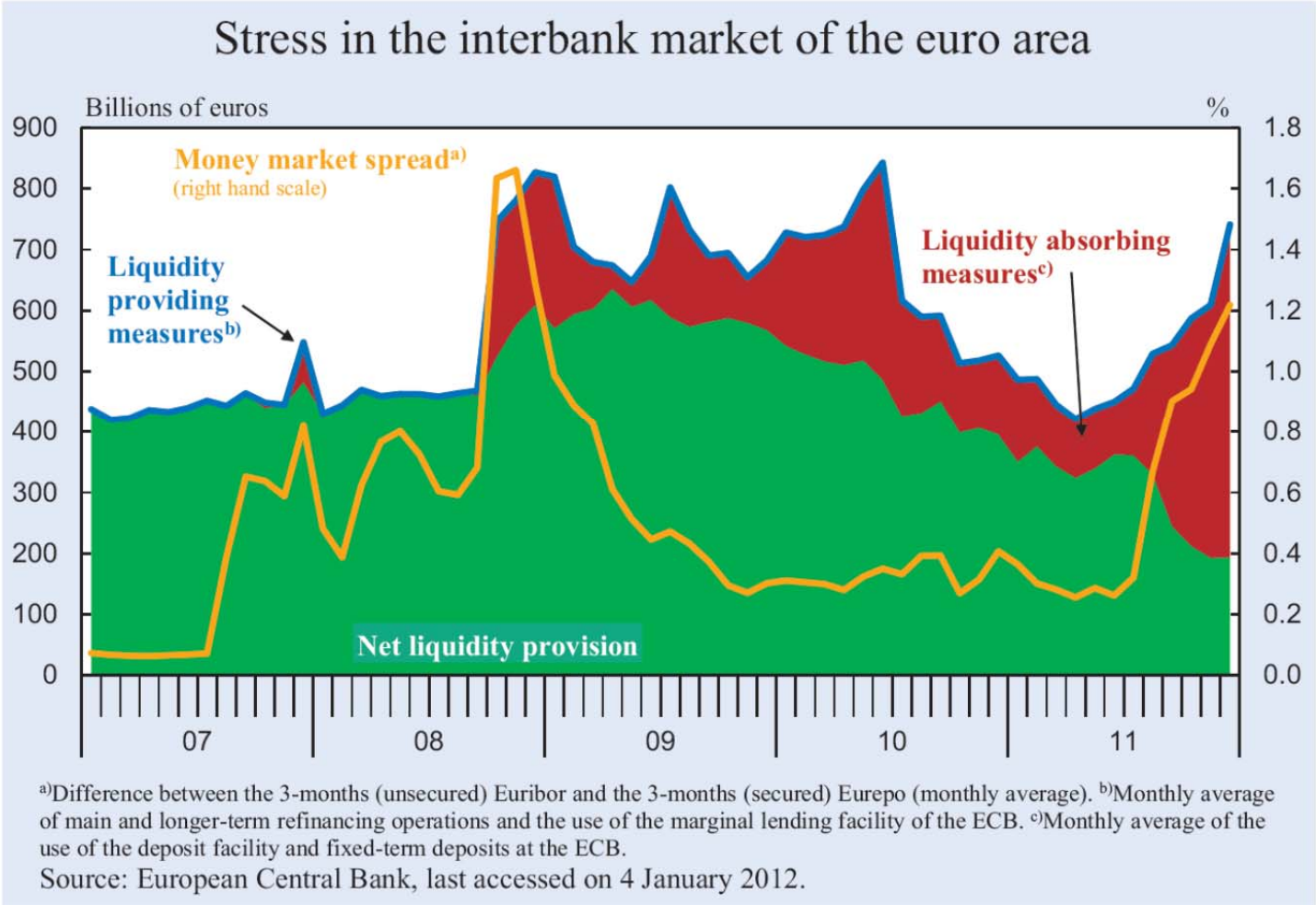
Source: OECD, Main Economic Indicators, last accessed on 29 January 2012.

Figure 1.18



Source: European Central Bank; Federal Reserve Bank of St. Louis; Bank of England; Bank of Japan.
Last accessed 2 January 2012.

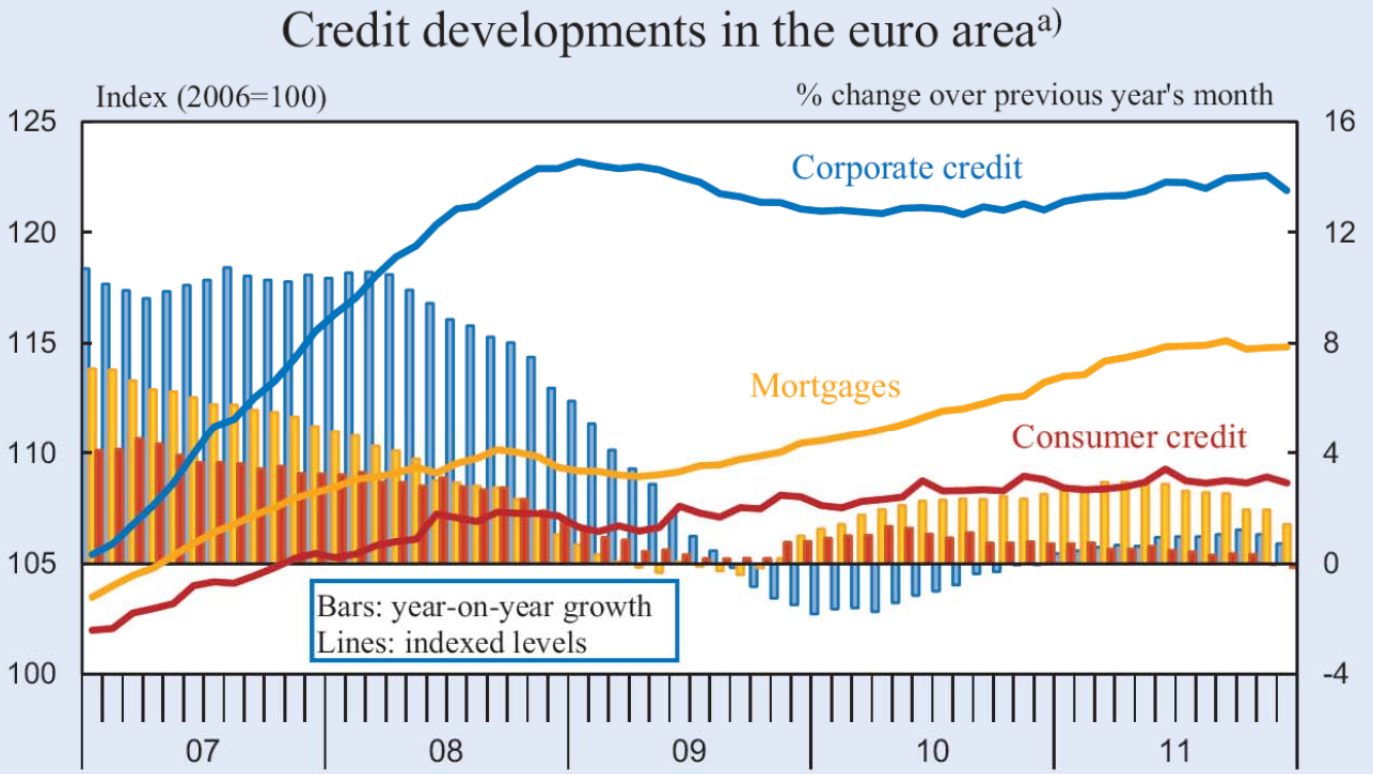
Figure 1.19



[a)]Difference between the 3-months (unsecured) Euribor and the 3-months (secured) Eurepo (monthly average). [b)]Monthly average of main and longer-term refinancing operations and the use of the marginal lending facility of the ECB. [c)]Monthly average of the use of the deposit facility and fixed-term deposits at the ECB.

Source: European Central Bank, last accessed on 4 January 2012.

Figure 1.20



[a)] These indexes of adjusted outstanding amounts are calculated according to $I_t = I_{t-1}(1+F_t/L_{t-1})$, where L stands for the outstanding nominal amount of credit and F the amount of transactions (credit granted). The transactions F are calculated from differences in outstanding amounts adjusted for reclassifications, other revaluations, exchange rate variations and other changes which do not arise from transactions (see European Central Bank 2010 for details).
Source: European Central Bank, last accessed on 29 January 2012.

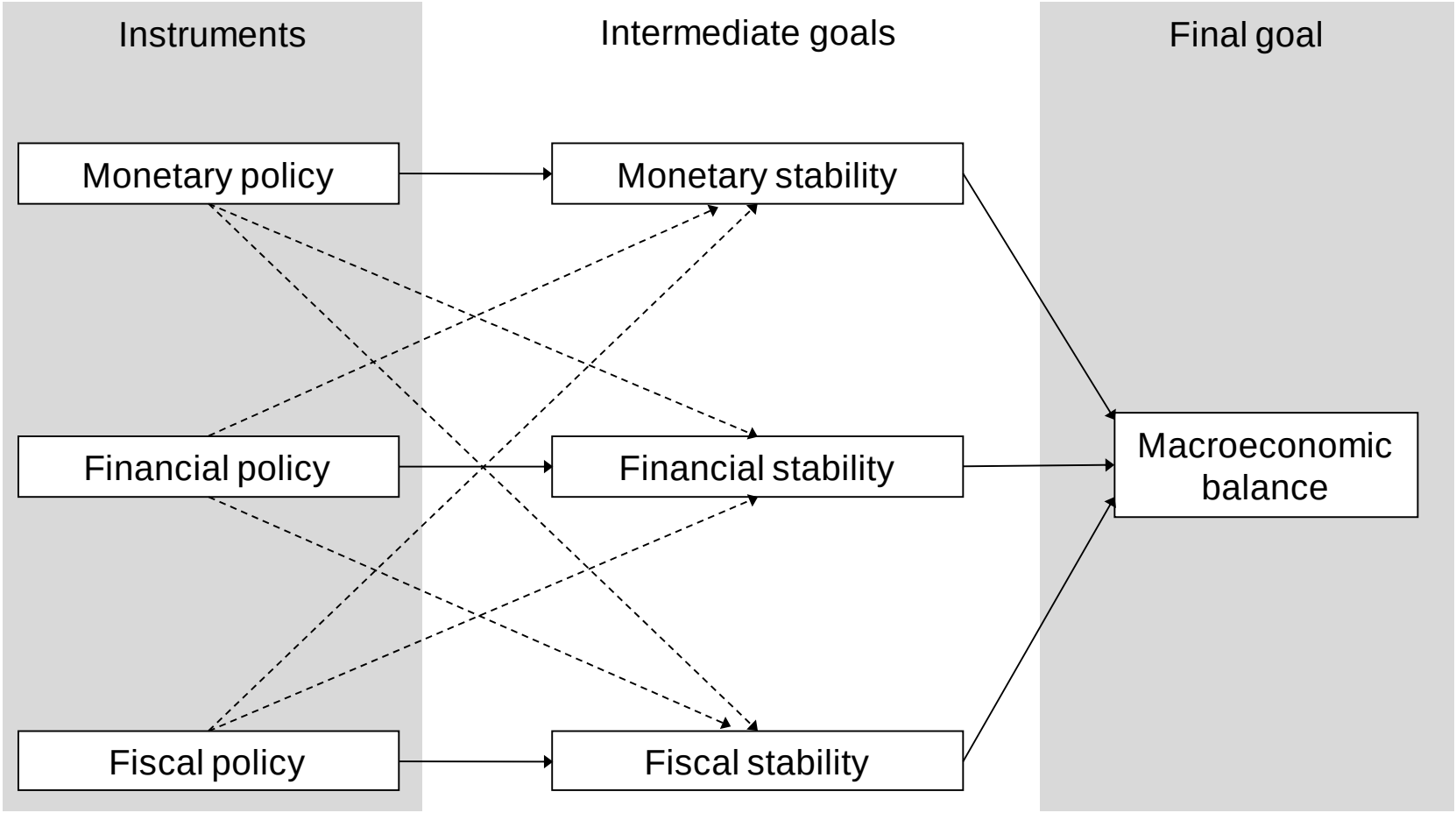
Rethink of macroeconomics

- **The worst recessions involve financial crises**
- **Boom – bust cycles**
- **Boom**
  - **increased demand for credit**
  - **asset price inflation (houses, shares)**
  - **value of potential collateral increases**
  - **further increase in credit demand**
  - **further increases in asset prices**
  - **wealth effects**
  - **underestimation of credit risks in financial sector**
  - **lower equity capital relative to lending in banks**
  - **lower saving**
  - **general overheating of the economy**
- **Bust**
  - **higher interest rates**
  - **lower credit growth**
  - **asset price deflation**
  - **falling wealth**
  - **falling value of collateral**
  - **deleveraging**
  - **defaults and bankruptcies**
  - **higher saving**
  - **general recession**

Rethink of economic-policy paradigm

- **Not enough with conventional stabilisation policy to stabilise output and inflation**
- **Need for *macroprudential* regulation and oversight**
  - **traditional microprudential regulation/oversight likely to underestimate systemic risks**
- **Reforms to strengthen *macroprudential* regulation/supervision**
  - **financial stability councils**
  - **stronger role for central bank**

Figure 5.3 Relationships between financial policy, monetary policy and fiscal policy, a schematic description



Note: Unbroken arrows represent primary effects, dashed arrows secondary effects. There is thus a hierarchy between the different goals for each instrument.

Design of monetary policy

- **Inflation targeting may not be enough to stabilise the economy**
  - **inflation target may be attained in the medium term at the same time as financial imbalances develop**

- **Two possible approaches**
  - **Use monetary policy (interest rate setting) to stabilise inflation/output and macroprudential regulation/ supervision to stabilise credit growth/asset prices**
  - **Monetary policy must pay greater attention to credit growth/asset prices**

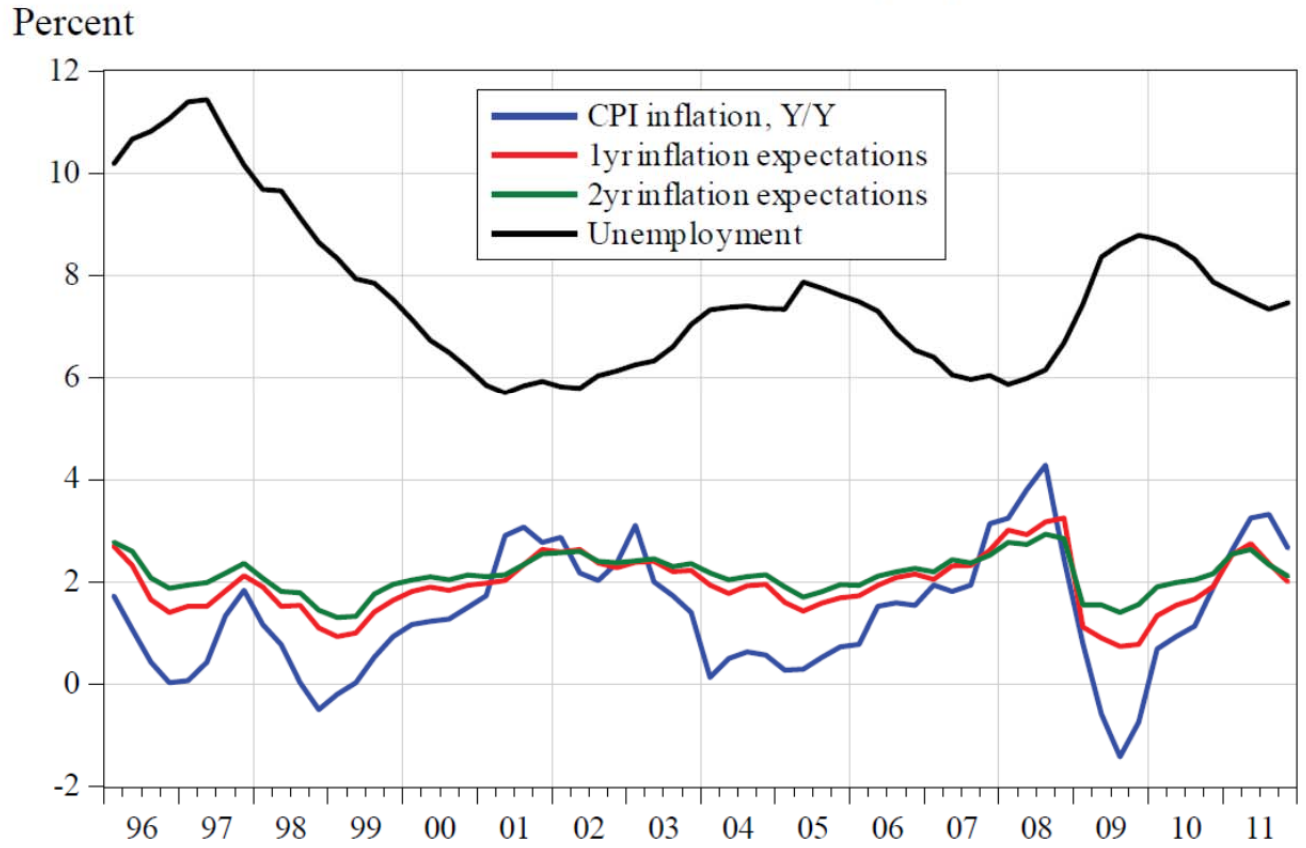
- **Common view: Macroprudential regulation/supervision will always lag financial innovations**
  - **hence monetary policy has to deal with financial developments as well**

- **If so, monetary policy becomes more complex**
  - **more difficult to evaluate monetary policy**
  - **more difficult to hold central bankers to account**
  - **potential problem for policy delegation to independent central banks**

Conflict regarding the Swedish Riksbank's monetary policy

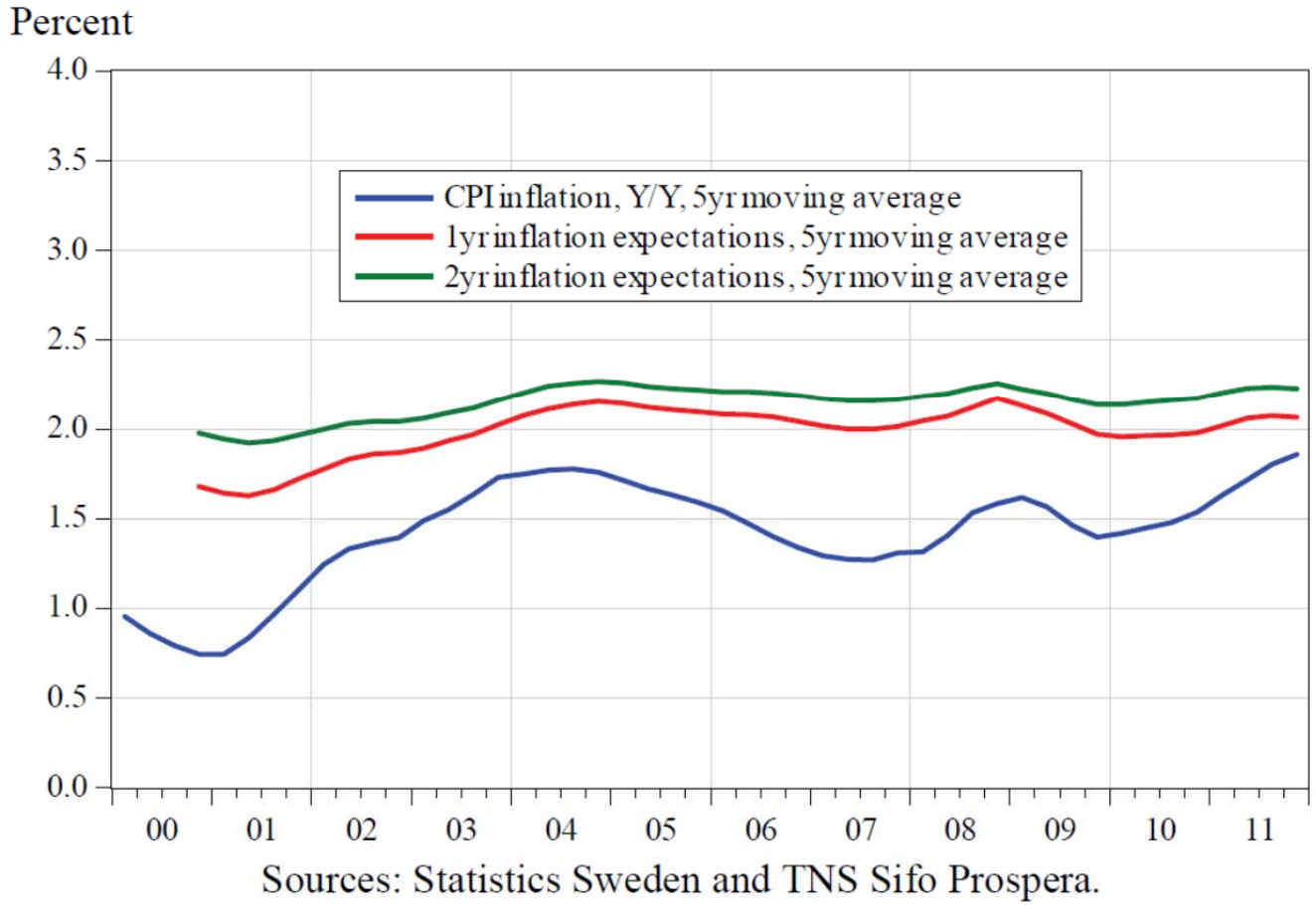
- **Repo rate decisions are taken by the six-member Executive Board ("Direktionen")**
- **Two members – Lars Svensson and Karolina Ekholm, both professors at Stockholm University, have consistently voted for a lower repo rate than the one set by the Executive Board's majority**
- **1997-2012 average CPI inflation has been 1.4 per cent, that is 0.6 percentage points below the inflation target of 2 per cent**
- **Expected inflation has on average been 2 per cent**
- **According to Lars Svensson the undershooting of the inflation target has caused average unemployment to be 0.8 percentage points higher than if the inflation target had been met**
- **The conflict is really about what role considerations regarding financial stability should play for interest rate decisions**
- **The minority argues that financial stability considerations should not influence repo rate decisions**
- **The majority lets financial stability considerations influence their repo rate decisions although this is not stated clearly**
  - **instead, for example, forecasts of future foreign interest rates are improbably high**

Figure 1. Annual CPI inflation, CPI inflation expectations one and two years ahead (all interviewees), and unemployment (15-74 age group).



Sources: Statistics Sweden and TNS Sifo Prospera.

Figure 2. CPI inflation expectations one and two years ahead (all interviewees) and CPI inflation, five-year moving averages.



Sources: Statistics Sweden and TNS Sifo Prospera.

$$\pi_t = \pi_t^e - \gamma(u_t - u_t^*) + \varepsilon_t$$

$$\varepsilon_t = 0$$

Then $\pi_t - \pi_t^e = -\gamma(u_t - u_t^*)$

$$\pi_t < \pi_t^e \Rightarrow u_t > u_t^*$$

Actual inflation < Expected inflation implies that
Actual unemployment > Equilibrium unemployment

Theory of consumption

The Keynesian consumption function

$C = C(Y - T)$

- **Consumption depends on current disposable income**
- **Marginal propensity to consume,** $MPC = \dfrac{\partial C}{\partial (Y - T)}$

$$0 < MPC < 1$$

- **But it is more reasonable to believe that consumption depends on forward-looking decisions (Irving Fisher, Milton Friedman, Franco Modigliani and Robert Hall).**
- **Intertemporal decisions**
- **Fisher's two period model**

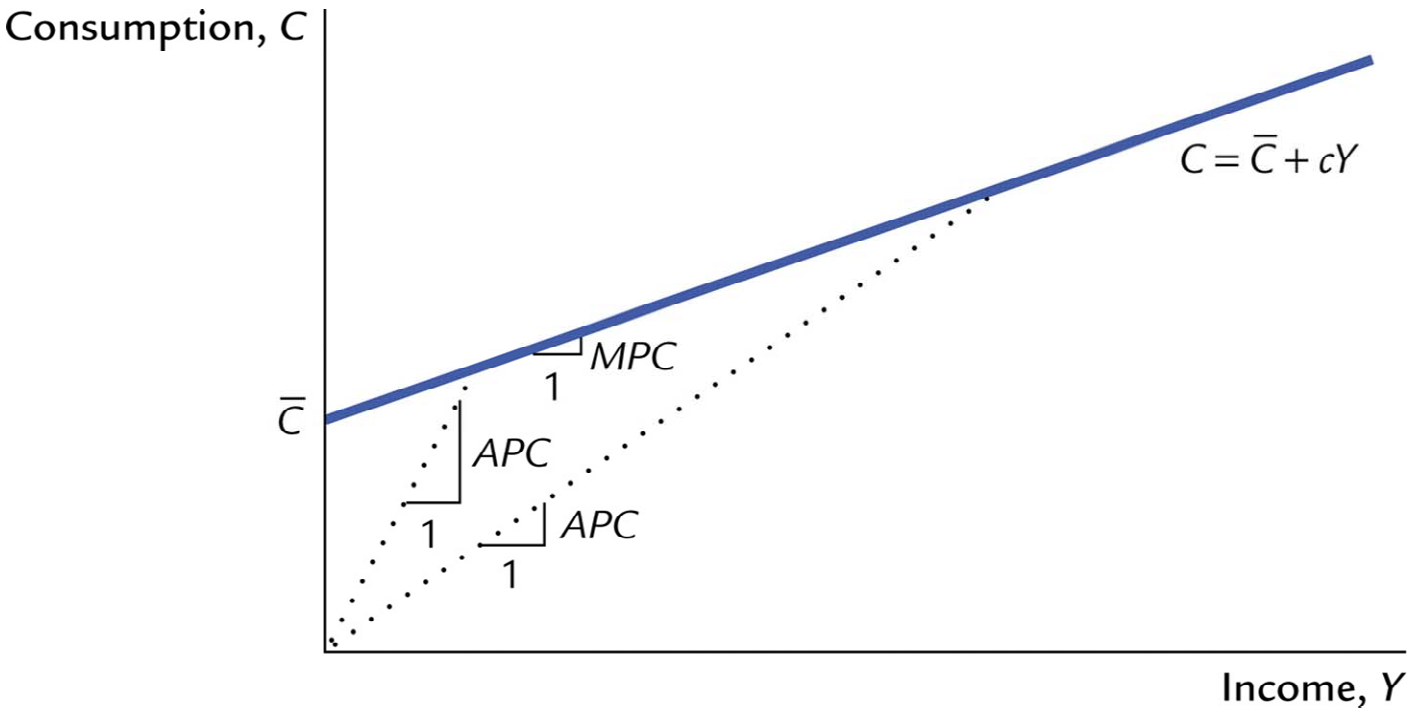


Figure 17-1: The Keynesian Consumption Function

The intertemporal budget constraint – a two-period framework

Period 1: $S = Y_1 - C_1$

Period 2: $C_2 = (1 + r)S + Y_2$

Substitution of (1) into (2) gives:

$C_2 = (1 + r)(Y_1 - C_1) + Y_2 = (1 + r)\, Y_1 + Y_2 - (1 + r)\, C_1$

$C_1 = 0 \Rightarrow C_2 = (1 + r)\, Y_1 + Y_2$

$C_2 = 0 \Rightarrow C_1 = Y_1 + Y_2 /(1 + r)$

$C_1 = Y_1$ **and** $C_2 = Y_2$ **is always possible**

- **Draw the intertemporal budget constraint in the C_2, C_1-plane.**
  - **C_2 as a function of C_1, holding Y_1, Y_2 and r constant**
  - **A negatively sloped line with slope $-(1 + r)$.**

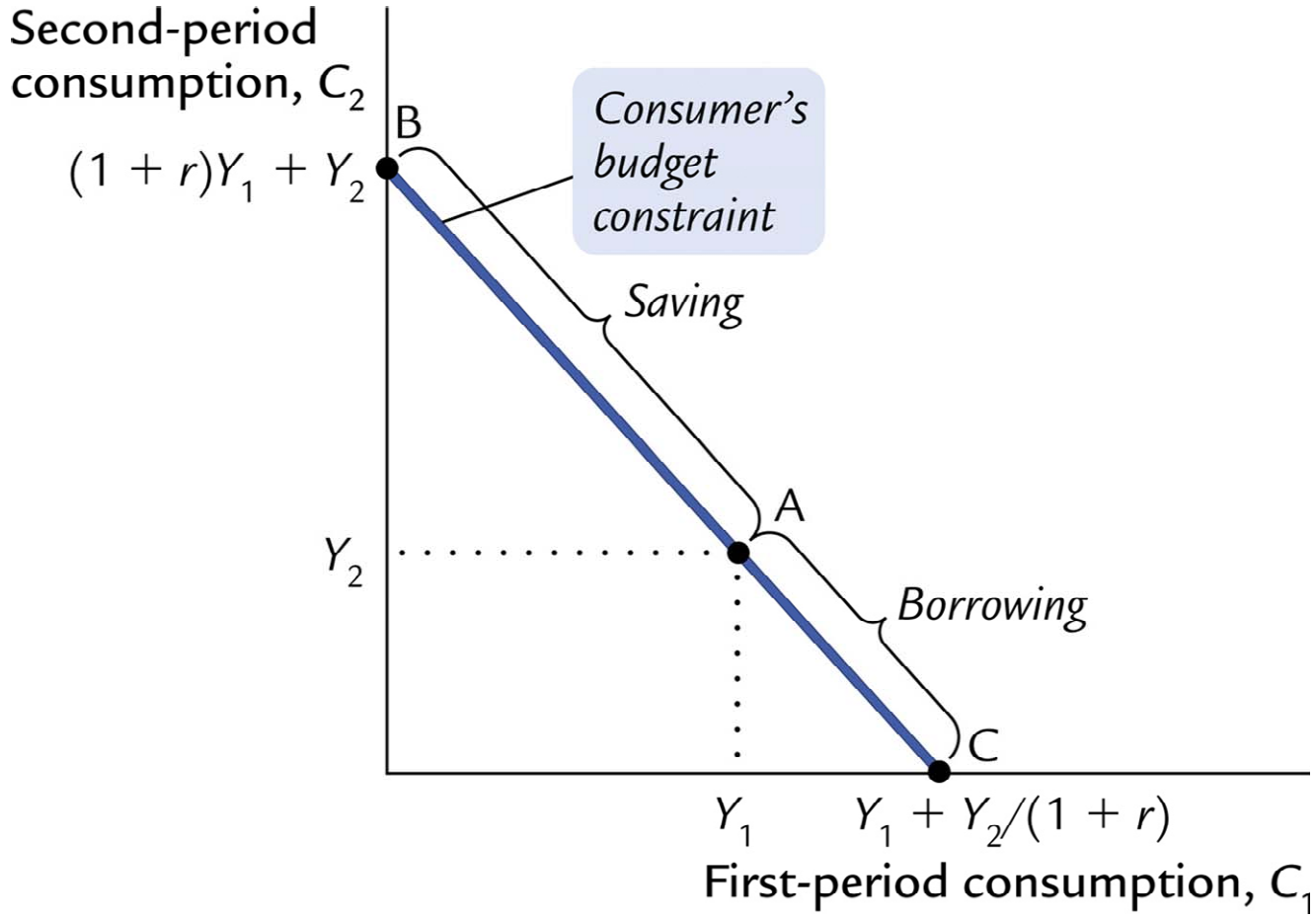


Figure 17-3: The Consumer's Budget Constraint

The budget constraint in present-value terms

$$C_2 = (1 + r)\, Y_1 + Y_2 - (1 + r)\, C_1$$

The budget constraint can be rearranged to:

$$C_1 + C_2/(1 + r) = Y_1 + Y_2/(1 + r)$$

$(1 + r)$ is the price of consumption in period 1 in terms of lower consumption in period 2. It is thus always more expensive to consume in period 1 than in period 2.

Present value of consumption = Present value of income.

The present-value concept is used to compare amounts of money received at different points of time.

The present value of any amount in the future is the amount that would be needed today, given available interest rates, to produce that future amount.

If you are going to be paid X € in T years, and the interest rate is r, the present value of X is $X/(1+r)^T$.

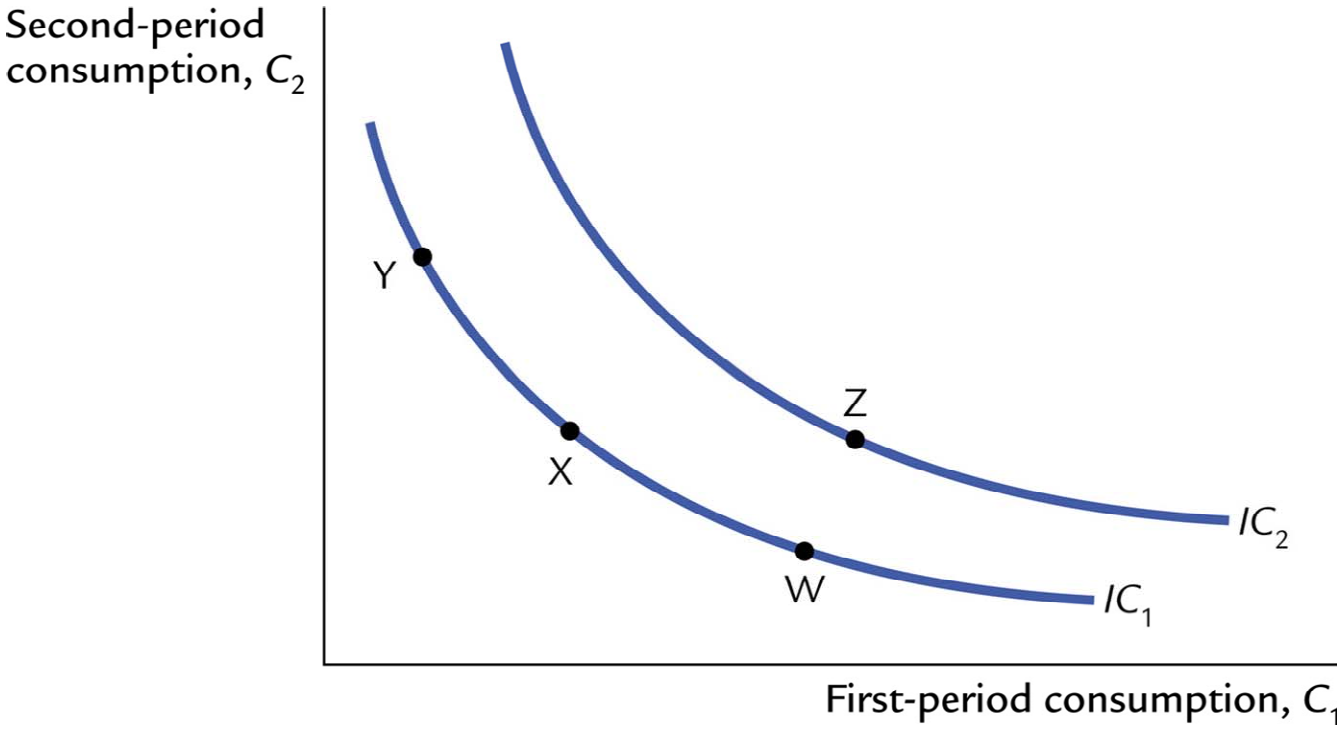


Figure 17-4: The Consumer's Preferences

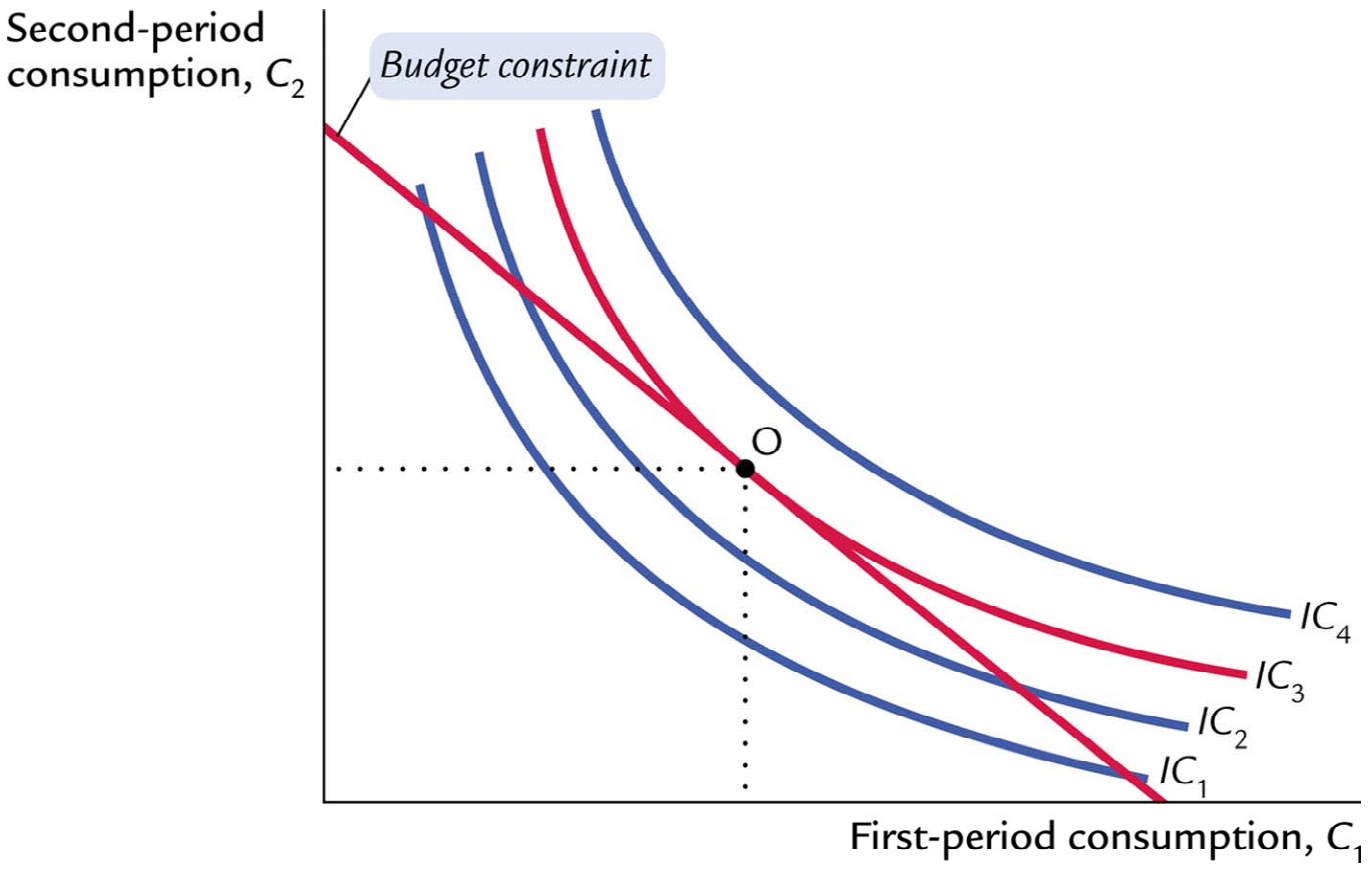


Figure 17-5: The Consumer's Optimum

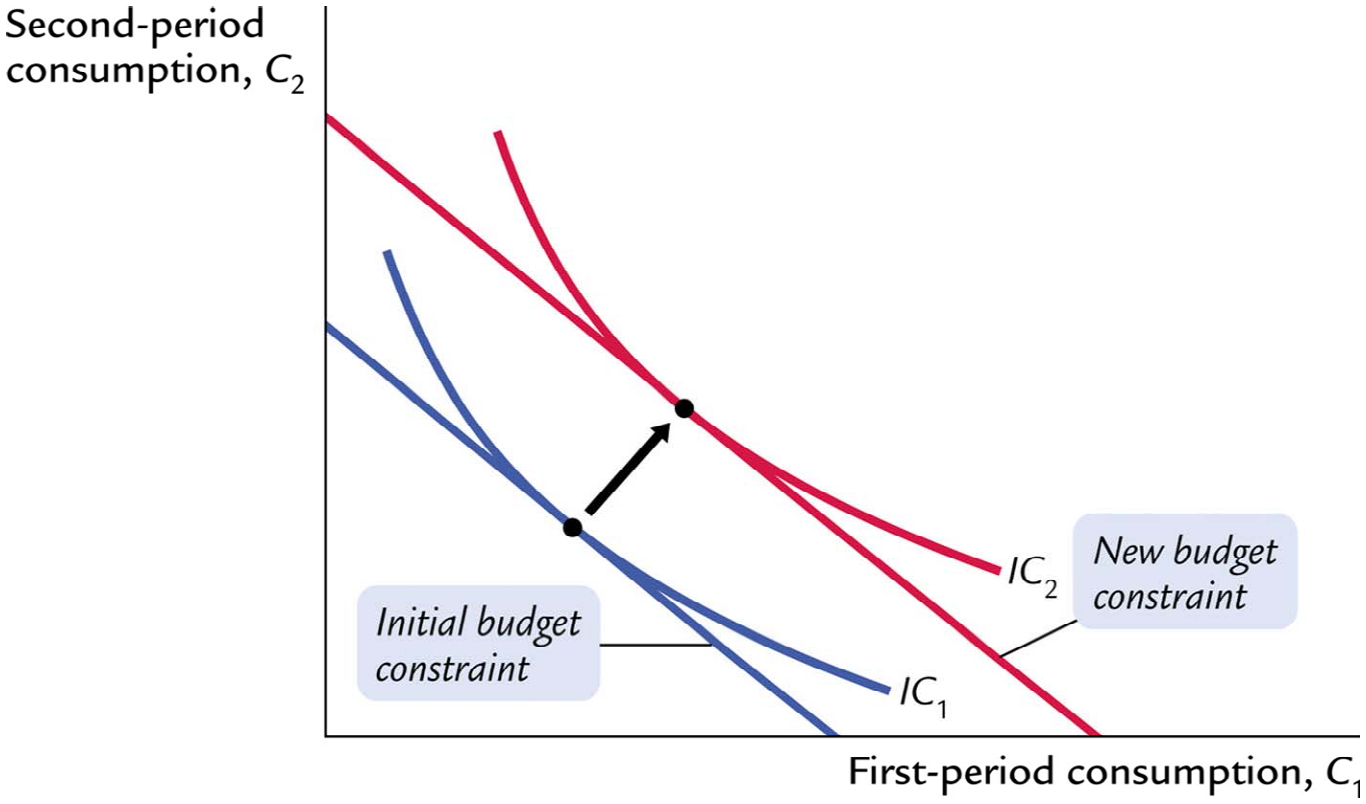


Figure 17-6: An Increase in Income

- **Expected future income changes influence consumption already now**
  - **Oil revenues in Norway**
  - **Future pensions**
  - **Earlier anticipated future productivity increases in the US: explanation of low savings and large current account deficits**

- **Consumption smoothing**
  - **Households try to smooth consumption over time (equalise marginal utility of consumption between periods)**
  - **Decreasing marginal utility of consumption**
  - **The same consumption level each period if subjective discount rate = market interest rate**

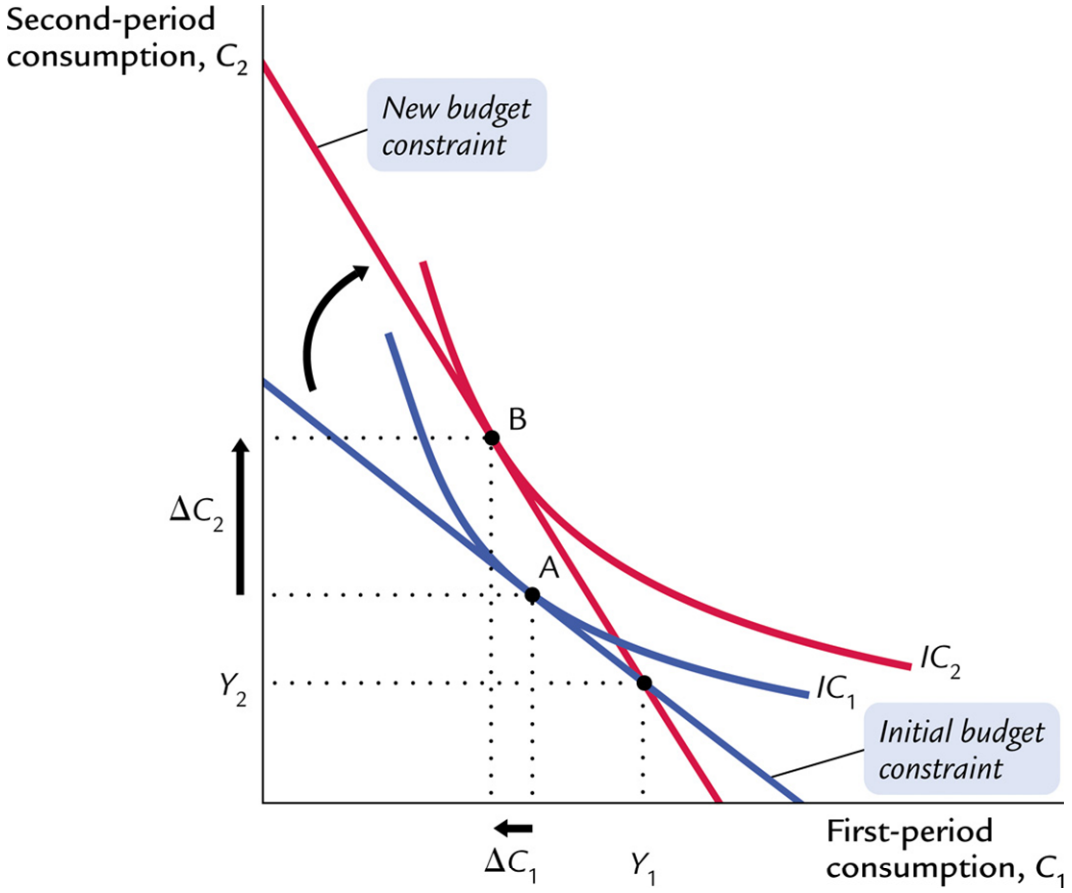


Figure 17-7: An Increase in the Interest Rate

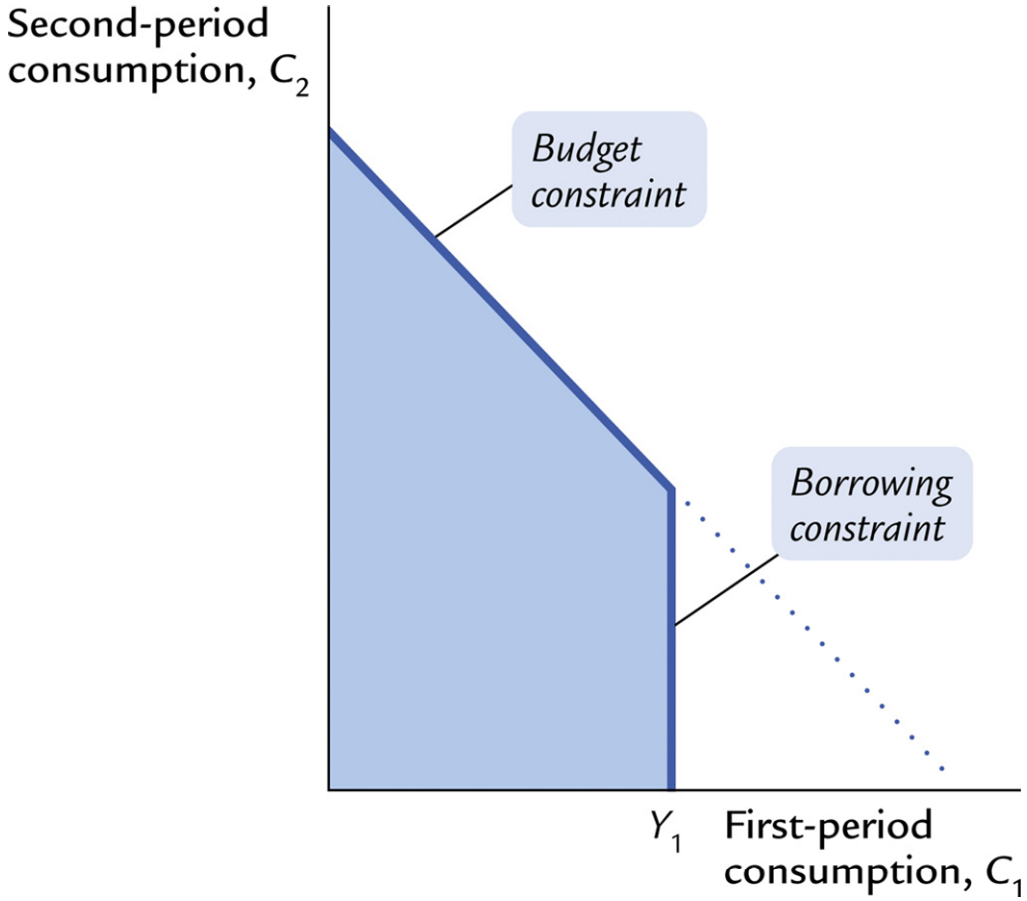


Figure 17-8: A Borrowing Constraint

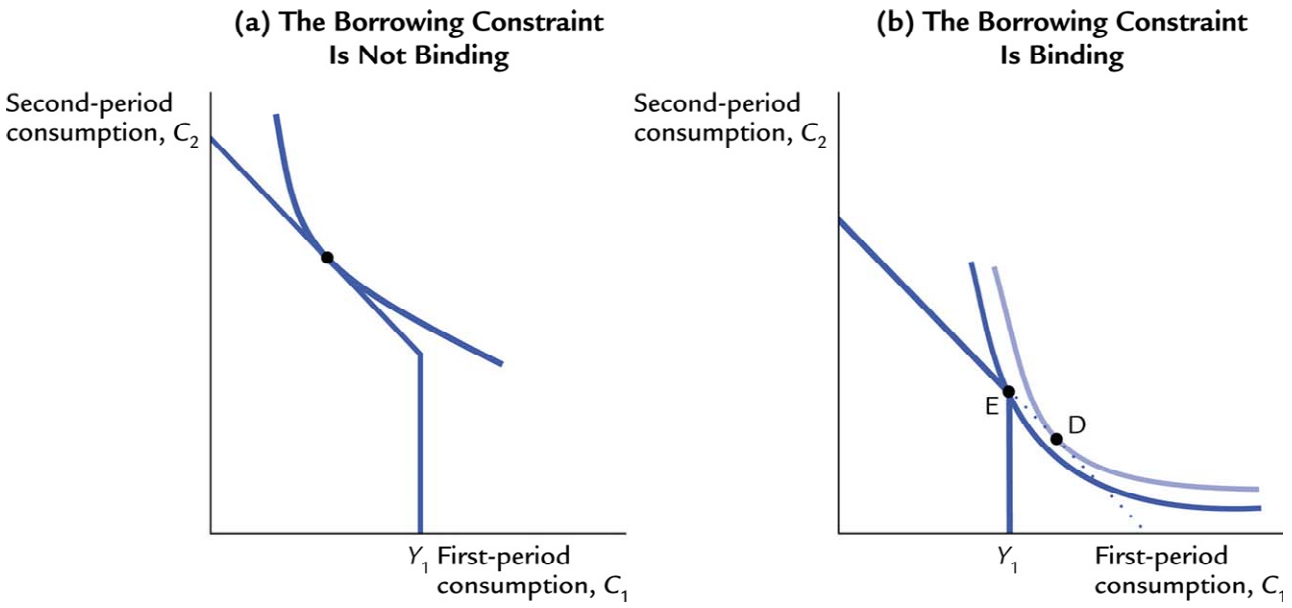


Figure 17-9: The Consumer's Optimum With a Borrowing Constraint

Borrowing constraints

- **Around ¼ of households are rationed in the credit market**
- **The MPC of rationed households is unity (one)**
- **A temporary income increase of ΔY gives a permanent income rise by $r\Delta Y$ (the permanent return if the income rise in invested in the credit market) for non-rationed households. $MPC \approx r$**
- **Hence, aggregate $MPC = ¼ \cdot 1 + ¾ \cdot r \approx 1/4$**