Lecture 9: Intermediate macroeconomics, spring 2016

Lars Calmfors

Literature: *Mankiw, Chapters 16, 18 and 20*

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**

- **The Great Moderation**

- **The Great Recession and the financial crisis**

- **The controversy about the Swedish *Riksbank's* monetary policy**

- **Consumption and forward-looking households**

- **The life-cycle hypothesis for consumption**

Stockholm University

<u>Stabilisation policy in practice: problems</u>

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**

   - **Example: the Phillips curve**

   $$\pi = a - bU$$

   $$\pi = E\pi - \phi\,(u - u_n)$$

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).**

Stockholm
University

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!**

Stockholm University

<u>Economic policy paradigms: Conventional wisdom before the financial crisis</u>

- **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**
  - **Automatic variations in tax revenues and government expenditures over the cycle**

- **Budget objective over the business cycle**
  - **Sweden: budget surplus of 1 per cent of GDP over the cycle; the government wants a balanced-budget objective instead**
  - **EU: deficit and debt ceilings; now also balanced budget requirement for the structural (cyclically adjusted) budget balance**

- **Government expenditure ceiling (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 may be needed**
  - **but this requires that government debt is not too high**

Stockholm
University

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)**

Stockholm
University

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

Surprise supply function

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

Loss (disutility) function

$$L = u + \gamma\pi^2$$

Substitution of supply function into loss function:
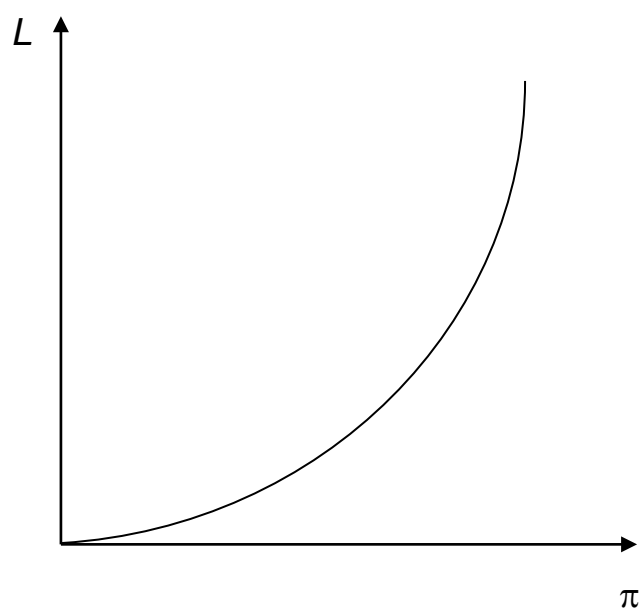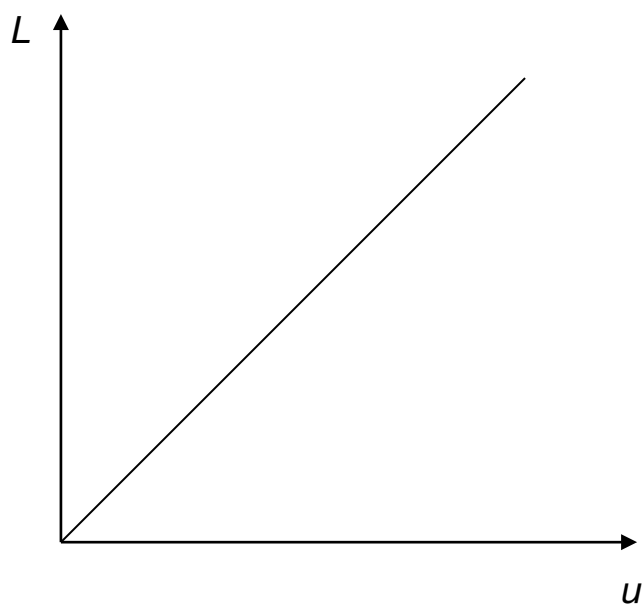
$$L = u^n - \alpha(\pi - E\pi) + \gamma\pi^2$$

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

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

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

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

Loss function

Rules are better than discretion in the model

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

$L = u + \gamma\pi^2$

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

  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** $\pi = E\pi = 0$ **(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.

<u>Methods of commitment</u>

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**

<u>Central bank independence</u>

- **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**

- **How to combine central bank independence with accountability:**
  - The Riksbank has been criticised for not attaining its inflation target
  - Public hearings in Parlament's Finance Committee
  - External evaluations

Figure 18-2: Inflation and central-bank independence
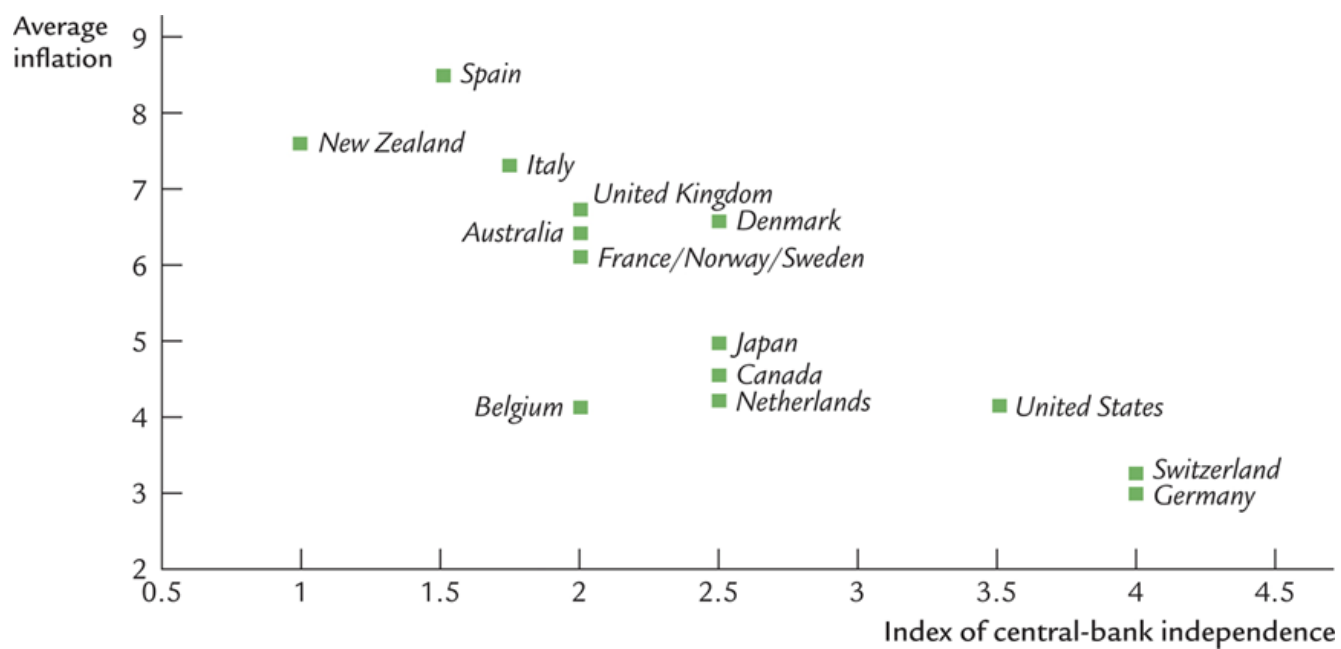
Fiscal policy before the financial crisis

- **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**

Stockholm
University

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).**

Stockholm
University

# Diagram 110 Offentliga sektorns faktiska och strukturella finansiella sparande

Procent av BNP respektive potentiell BNP

Faktiskt sparande
Strukturellt sparande
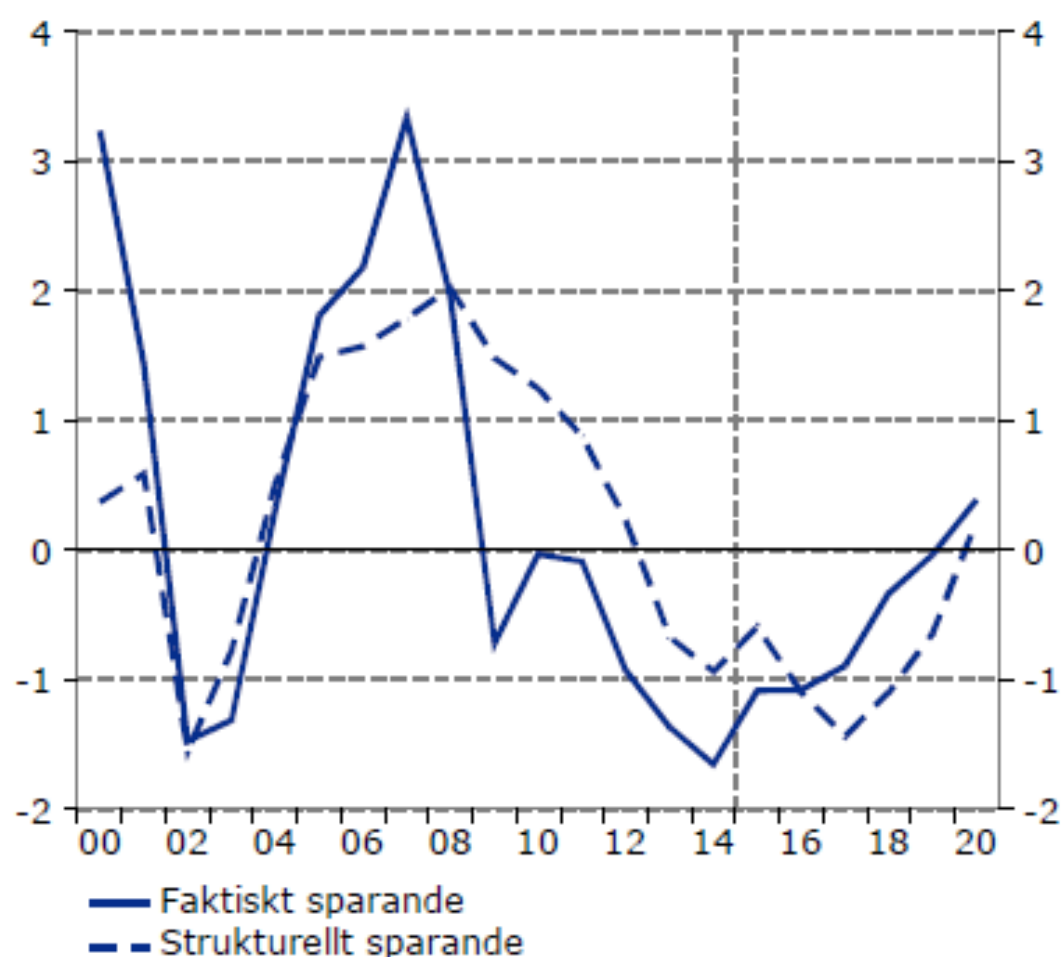
Källor: SCB och Konjunkturinstitutet.

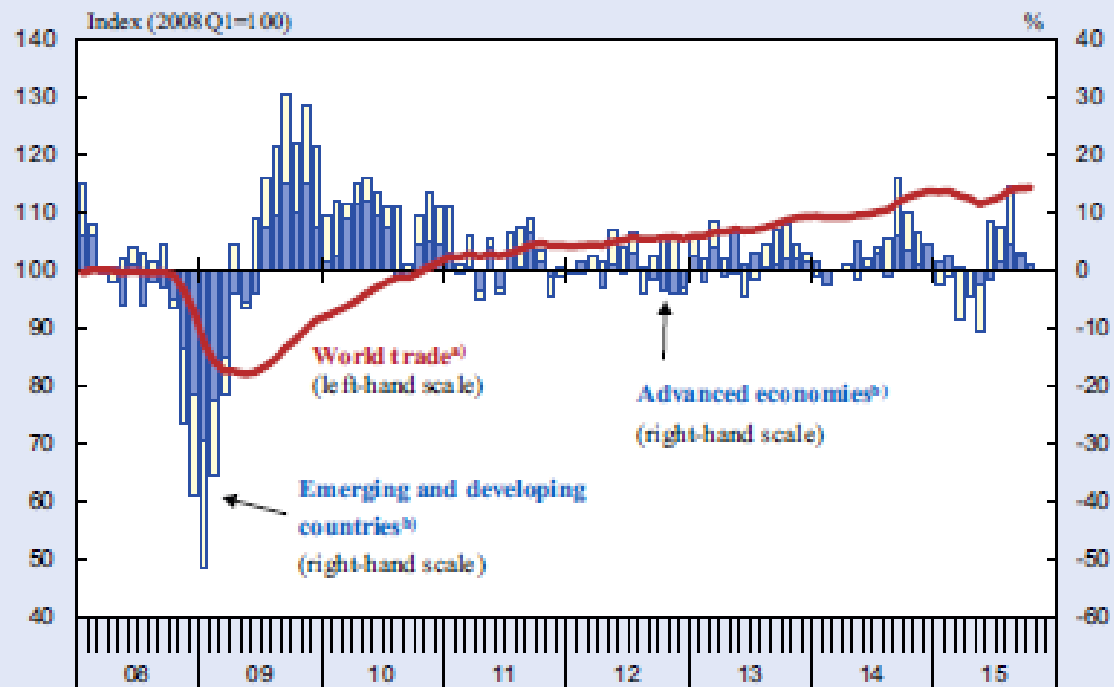**Belief in the Great Moderation before the financial crisis: lower output and inflation volatility**

- **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**
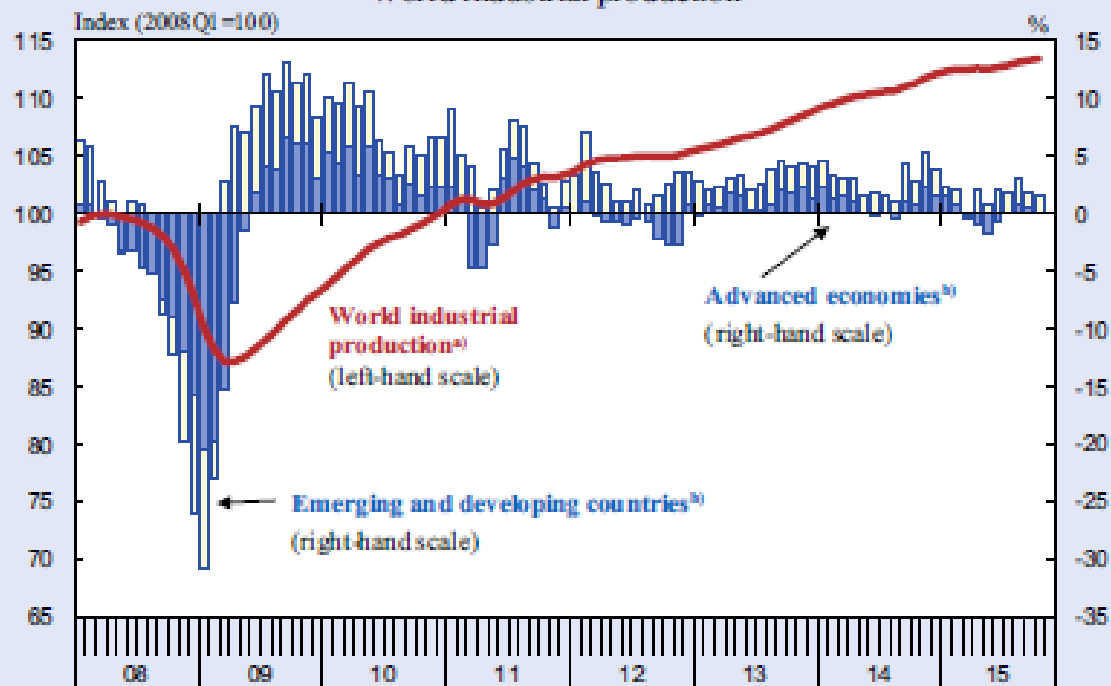
Stockholm
University

(a) Volatility of GDP Growth

(b) Volatility of Inflation
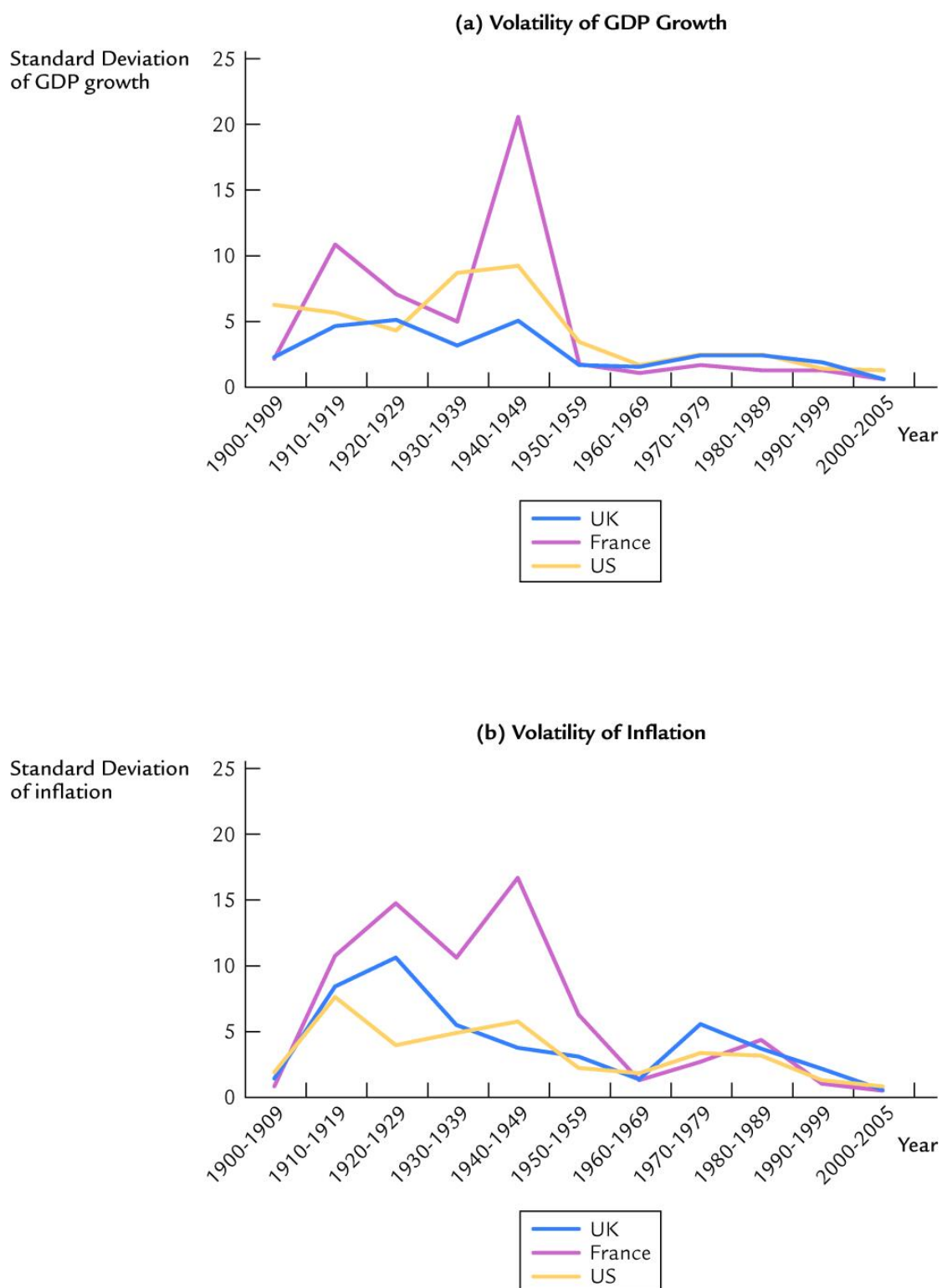
Figure 14.1 Macroeconomic volatility in the UK, France and the US since 1900.

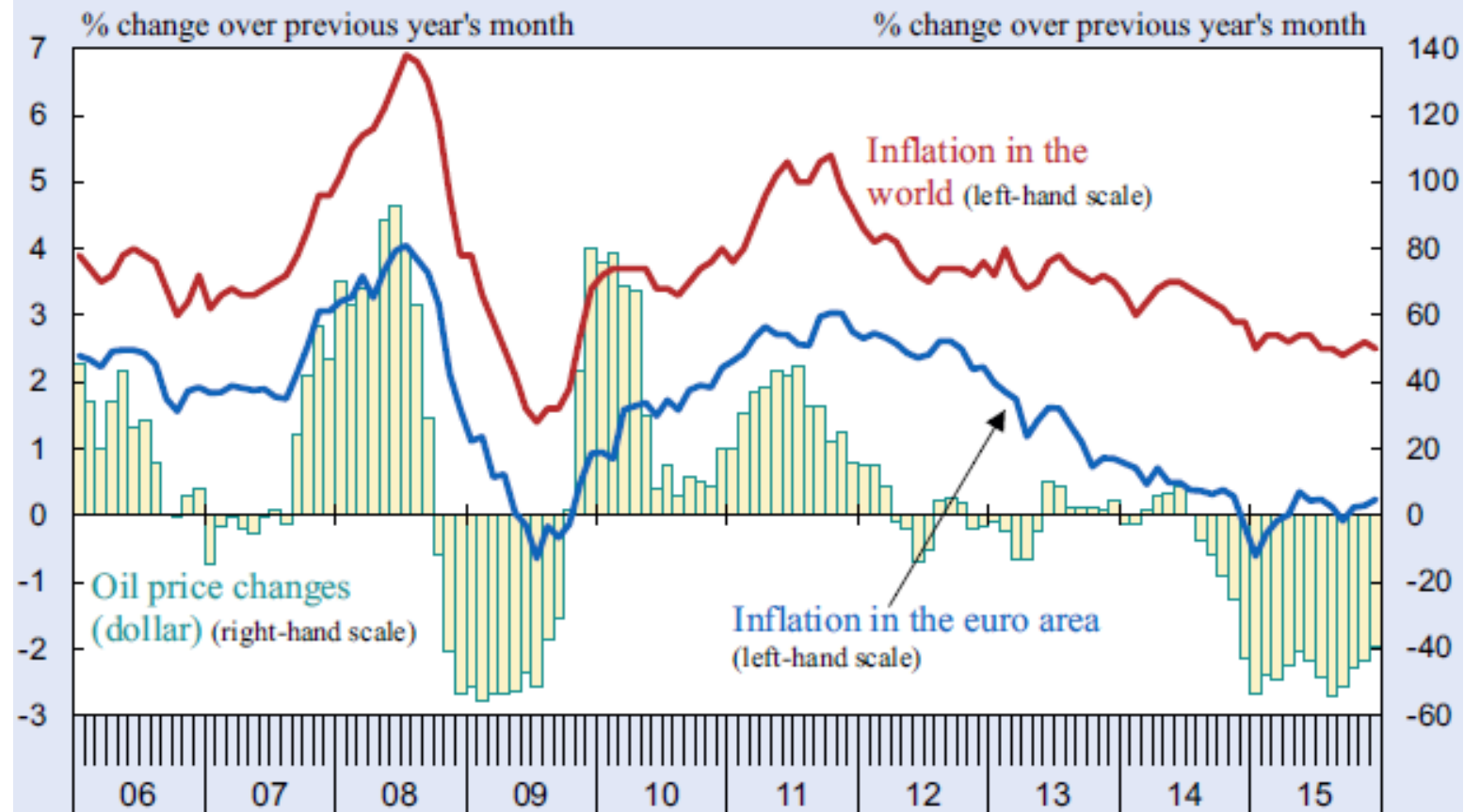## Regional contributions to world trade and industrial production

World trade

Index (2008 Q1=100)

World trade[a] (left-hand scale)

Advanced economies[b] (right-hand scale)

Emerging and developing countries[b] (right-hand scale)

World industrial production

Index (2008 Q1=100)

World industrial production[a] (left-hand scale)

Advanced economies[b] (right-hand scale)

Emerging and developing countries[b] (right-hand scale)

[a] Three month moving average level. [b] Contribution to annualised monthly growth rate thereof.
Source: CPB Netherlands Bureau for Economic Policy Analysis, World Trade Monitor: October 2015.

Inflation in the world and oil price movements

% change over previous year's month | % change over previous year's month

Inflation in the world (left-hand scale)

Oil price changes (dollar) (right-hand scale)

Inflation in the euro area (left-hand scale)

06　07　08　09　10　11　12　13　14　15

Source: IMF International Financial Statistics, last accessed on 30 January 2016.

GDP Gap and Labour Market Gap

Percentage of potential GDP and potential worked hours respectively, seasonally adjusted quarterly values

— BNP-gap
---- Arbetsmarknadsgap
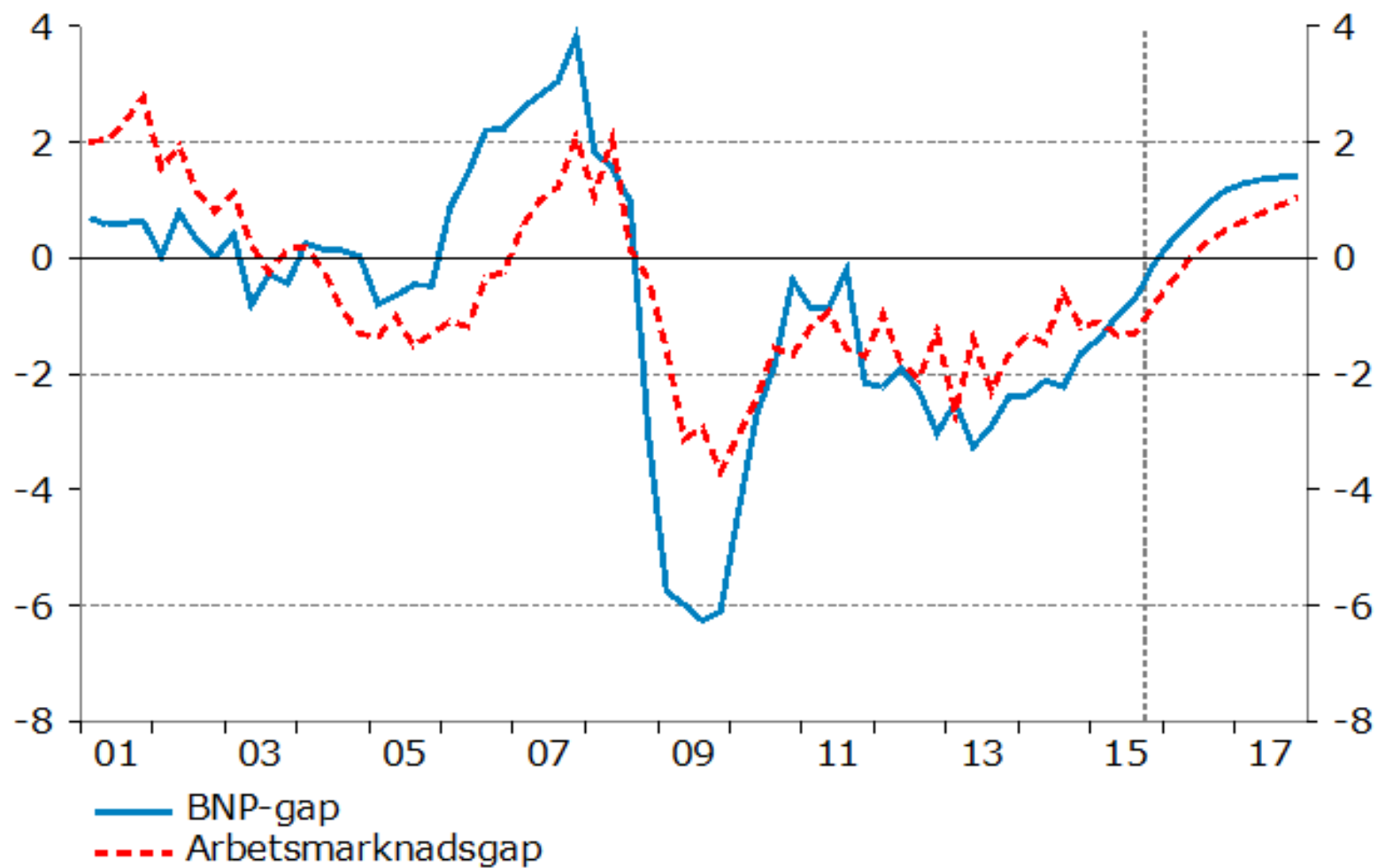
Rethink of macroeconomics

- **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**
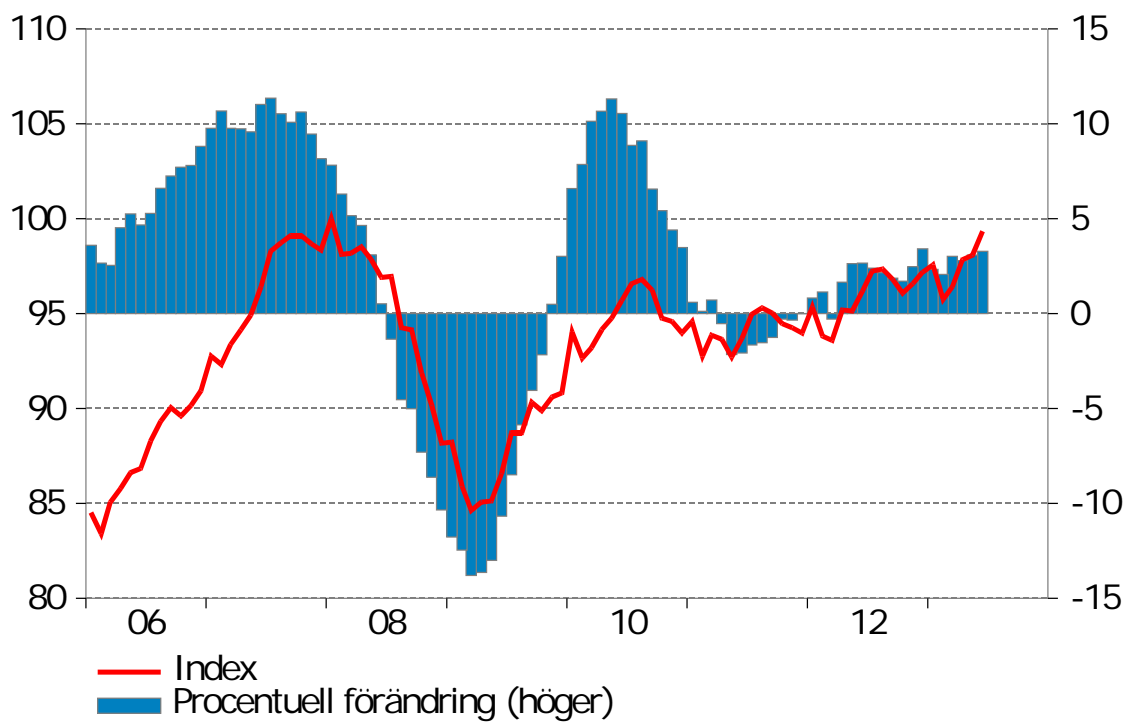
Figure 20-2: The anatomy of a financial crisis
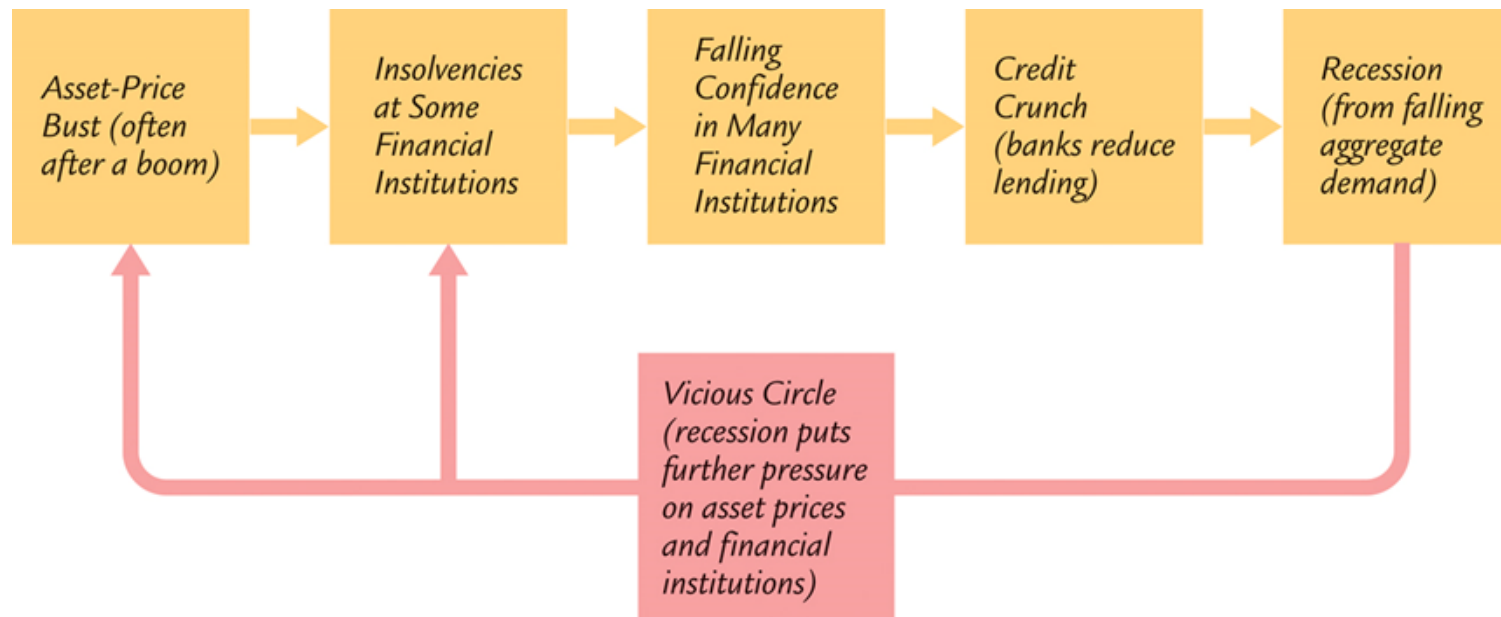
Bostadsinvesteringar och husmarknadsindex i USA

Bostadsinvesteringar
Husmarknadsindex (höger)
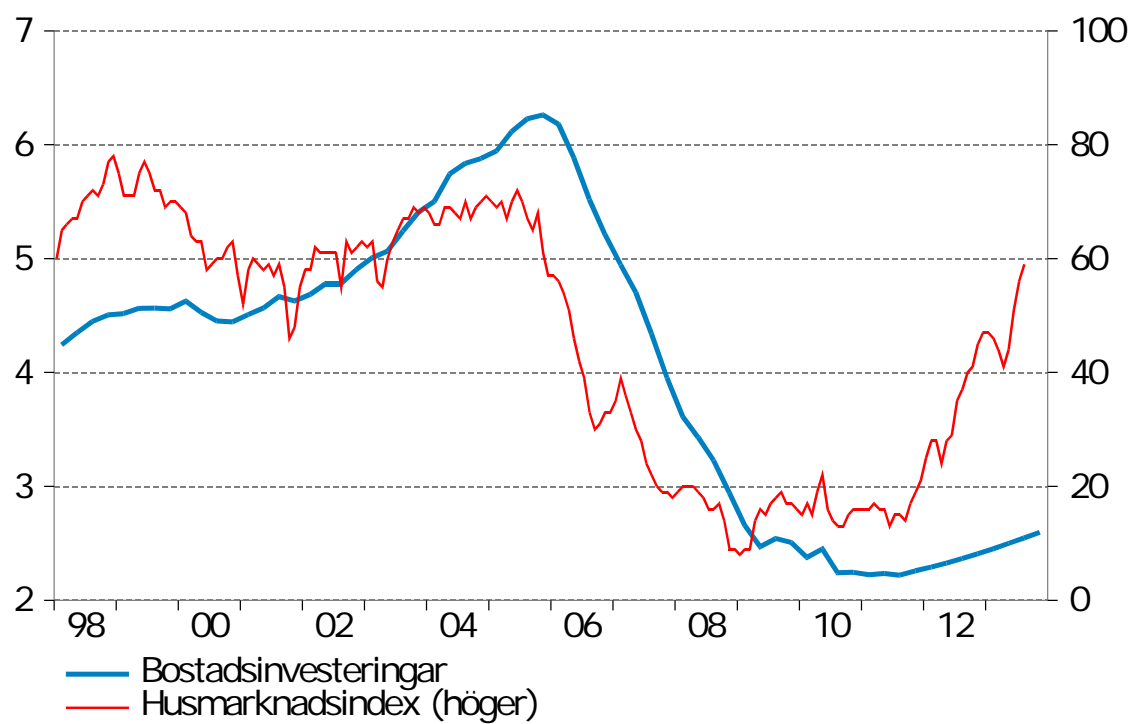
Huspriser i Storbritannien

Index januari 2008=100 respektive årlig procentuell förändring, månadsvärden

- Index
- Procentuell förändring (höger)

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**
    - **stronger role for central bank (UK, Euro area)**
    - **Financial Supervisory Authority (Finansinspektionen in Sweden)**
    - **financial stability councils**

- **New macroprudential tools**
    - **Regulation of traditional banks (deposit insurance and anticipated government bail-outs create moral hazard problems)**
    - **Regulation of shadow banks (investment banks, hedge funds, insurance companies, private equity firms)**
    - **Rules on resolution of banks (including bail-in rules, i.e. rules on how some loans to banks can be transformed into equity)**
    - **Restrictions on the size of banks**
    - **Restrictions on risk taking of commercial banks**
    - **Capital adequacy ratios**
    - **Loan-to-value regulations for borrowers**
    - **Amortization requirements**

Stockholm University

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 develop- ments as well**

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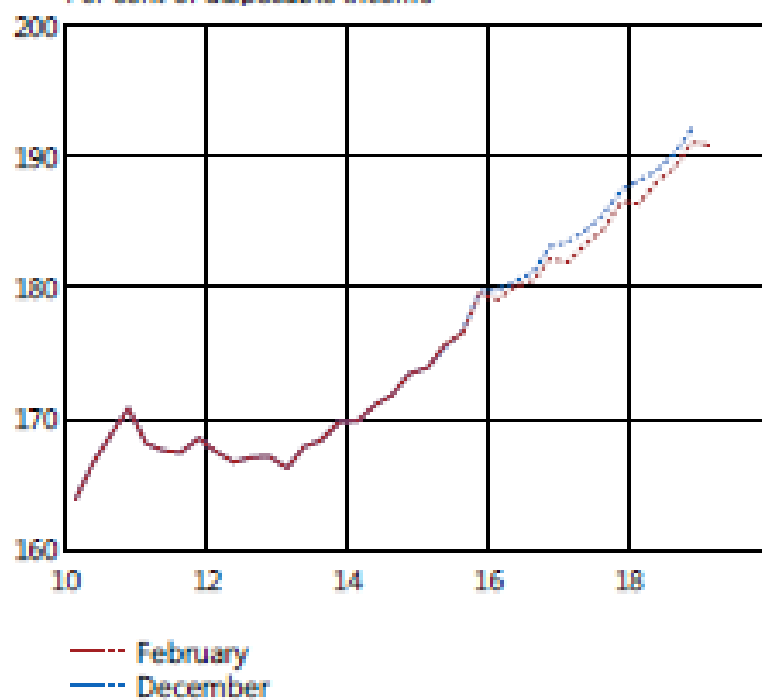   - **potential problem for policy delegation to independent central banks**

Stockholm University

Figure 1:13. Housing prices
Annual percentage change

— Total
— Tenant-owned apartments
— Single-family dwellings

Source: Valueguard

Figure 1:14. Household debt ratio
Per cent of disposable income
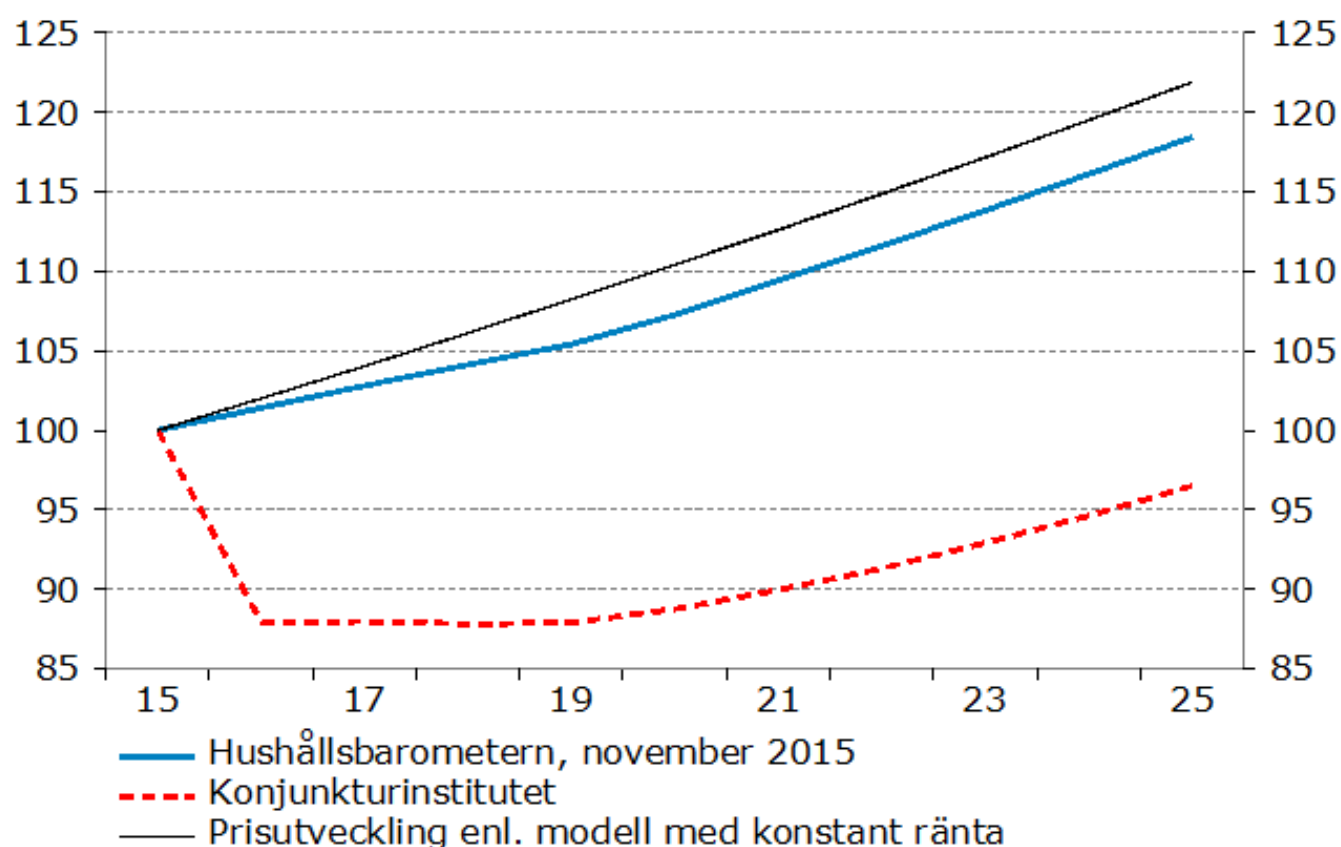

--- February
--- December

Note. Households' total debts as a share of their disposable incomes totalled over the past four quarters.

Sources: Statistics Sweden and the Riksbank

Modellsimulerade bostadspriser – 20 procent prisfall inte orimligt om bostadsräntan stiger till 6 procent

Reala bostadspriser med olika ränteförväntningar

— Hushållsbarometern, november 2015
--- Konjunkturinstitutet
— Prisutveckling enl. modell med konstant ränta

Anm. Med konstant ränta antas reala bostadspriser stiga med 2 procent per år, dvs. med 4 procent nominellt per år om inflationen blir 2 procent.

<u>Conflict regarding the Swedish Riksbank's monetary policy</u>

- **Repo rate decisions are taken by the six-member Executive Board ("Direktionen")**

- **Disagreement in the Executive Board on interest rate policy 2010-2013: a minority - Lars E.O. Svensskon and Karolina Ekholm, both former professors at Stockholm University - consistently voted for a lower repo rate than the one set by the majority**

- **1997-2014 average CPI inflation has been 1.0 per cent, that is 1 percentage point 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 around 1 percentage point 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 was not stated clearly**
  - **instead, for example, forecasts of future foreign interest rates were improbably high**
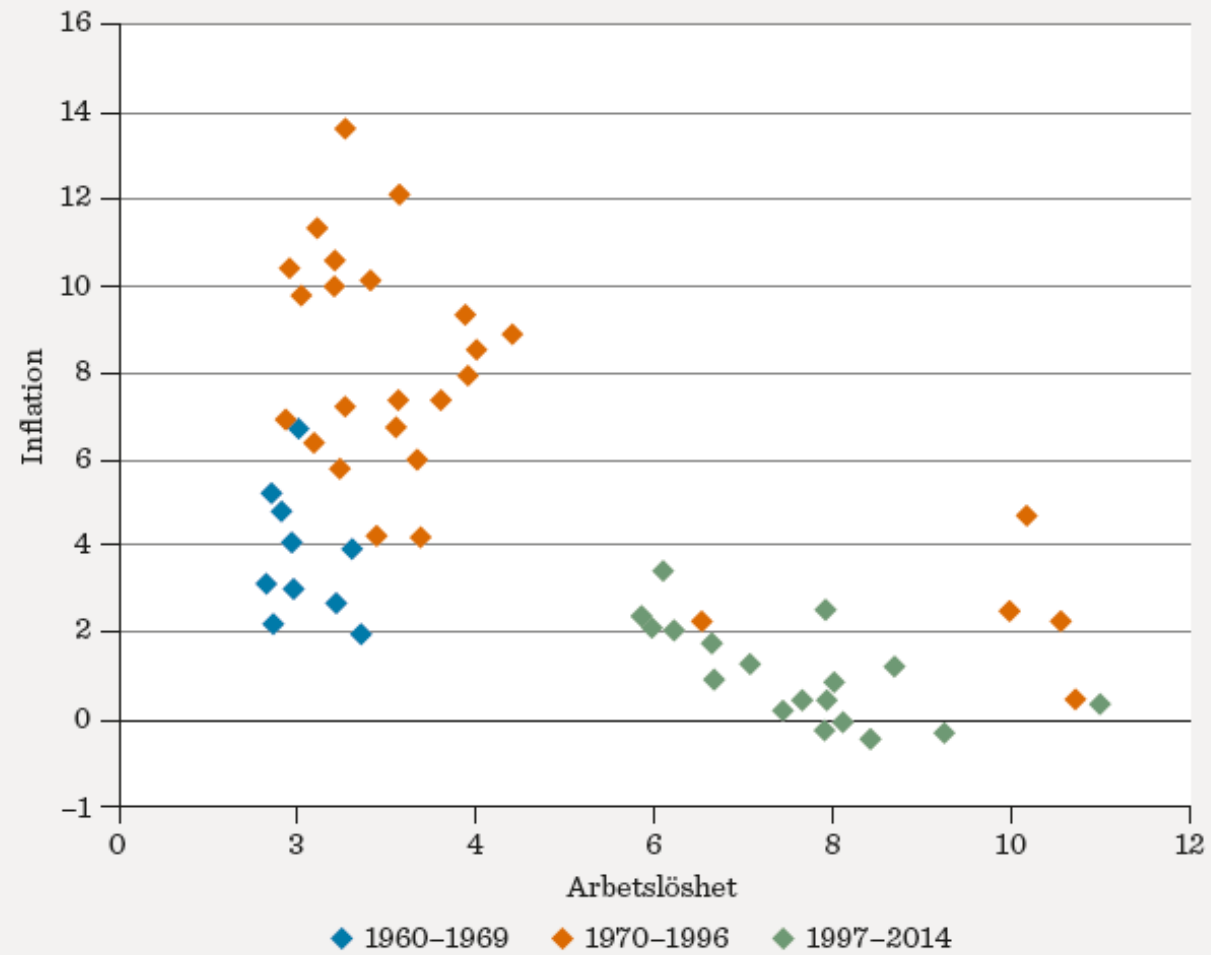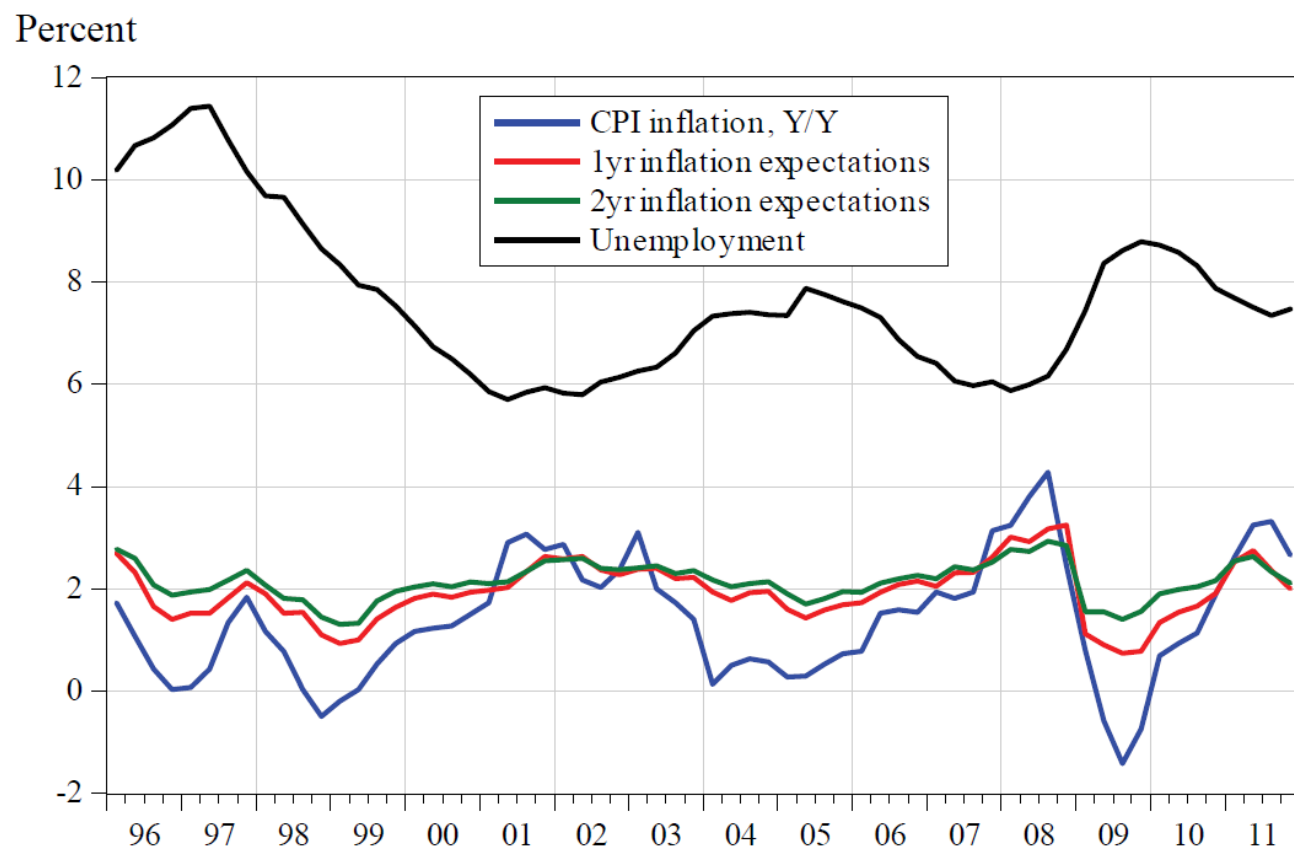
Figure 1. Annual CPI inflation, CPI inflation expectations one and two years ahead (all interviewees),
and unemployment (15-74 age group).

Percent

Sources: Statistics Sweden and TNS Sifo Prospera.

Unnecessary unemployment?

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

$$\varepsilon_t = 0$$

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**

<u>Theory of consumption</u>

<u>The Keynesian consumption function</u>

$C = C(Y - T)$

- **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**

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:

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

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

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

$$C_1 = Y_1 \text{ and } C_2 = Y_2 \text{ is always possible}$$

- **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 16-3: The consumer's budget constraint

Second-period consumption, C_2

$(1 + r)Y_1 + Y_2$

B

Consumer's budget constraint

Saving

A

Y_2

Borrowing

C

Y_1 $Y_1 + Y_2/(1 + r)$

First-period consumption, C_1
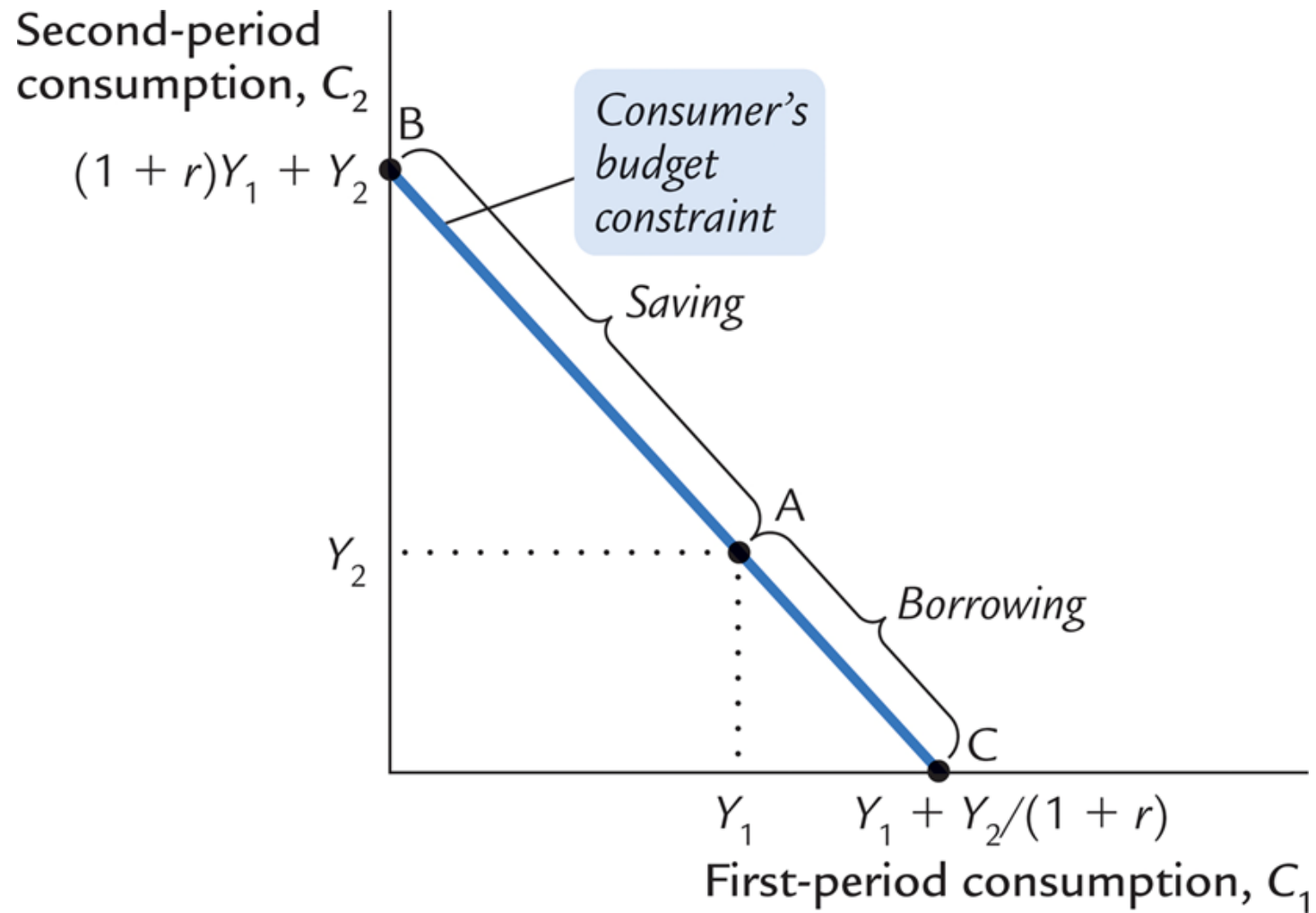
The budget constraint in present-value terms

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

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 $X/(1+r)^T$.
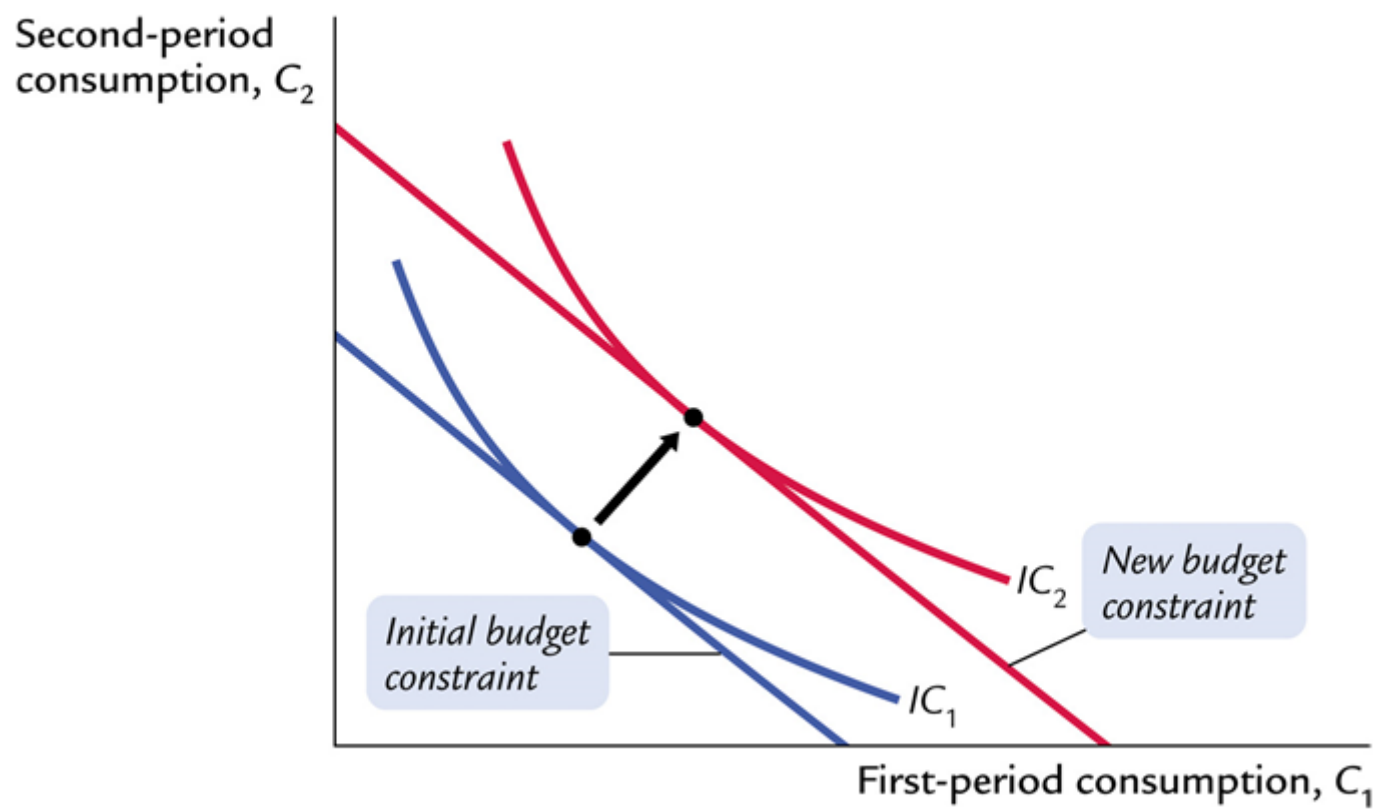
Figure 16-4: The consumer's preferences
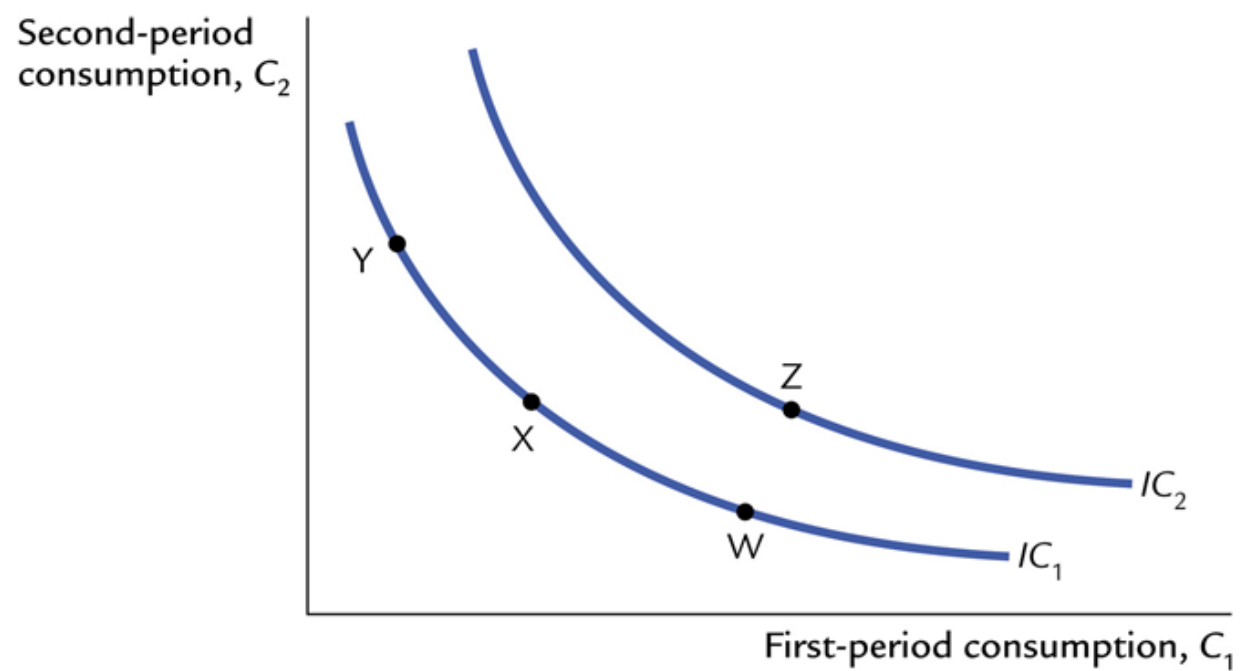
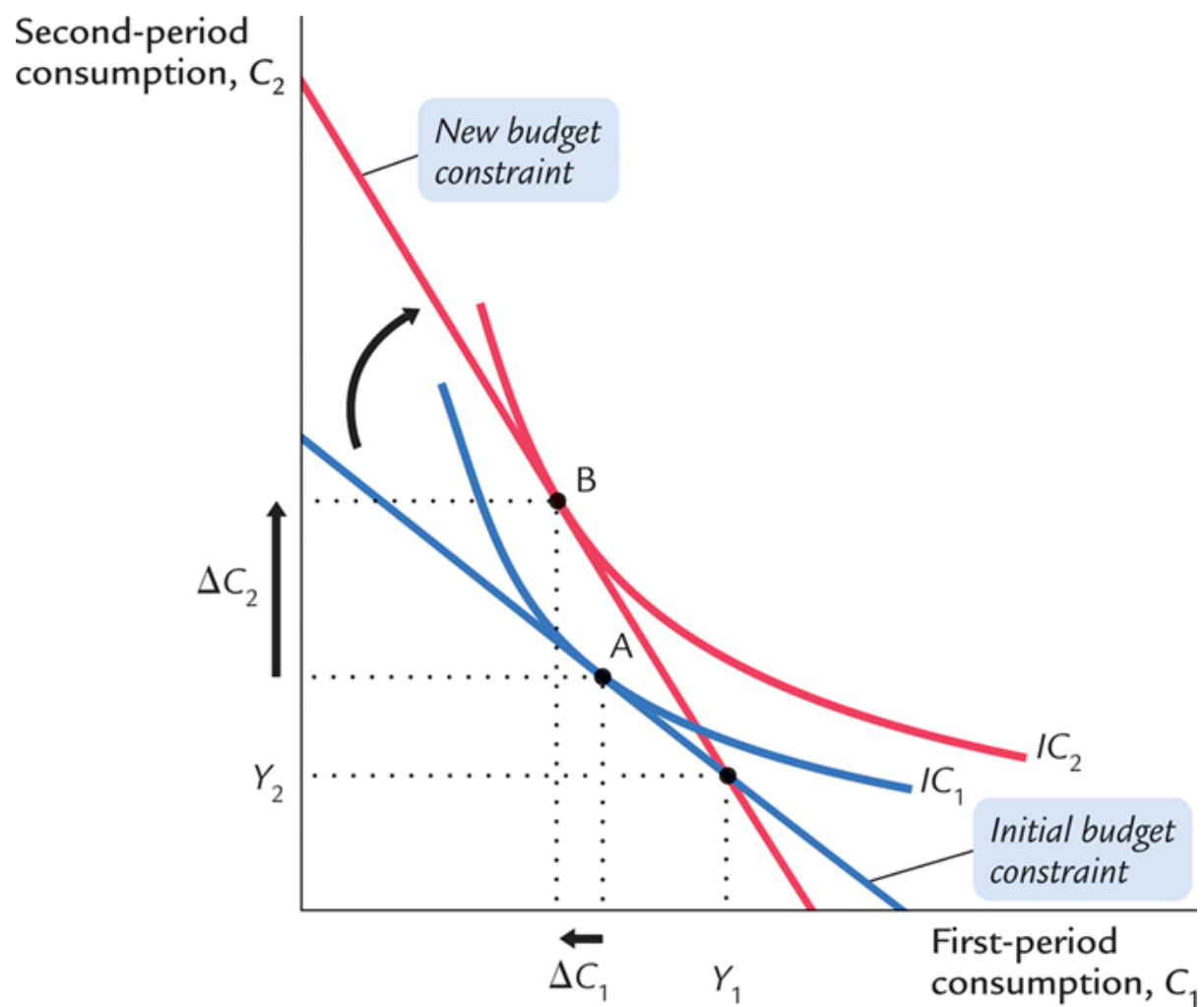**Figure 16-5: The consumer's optimum**
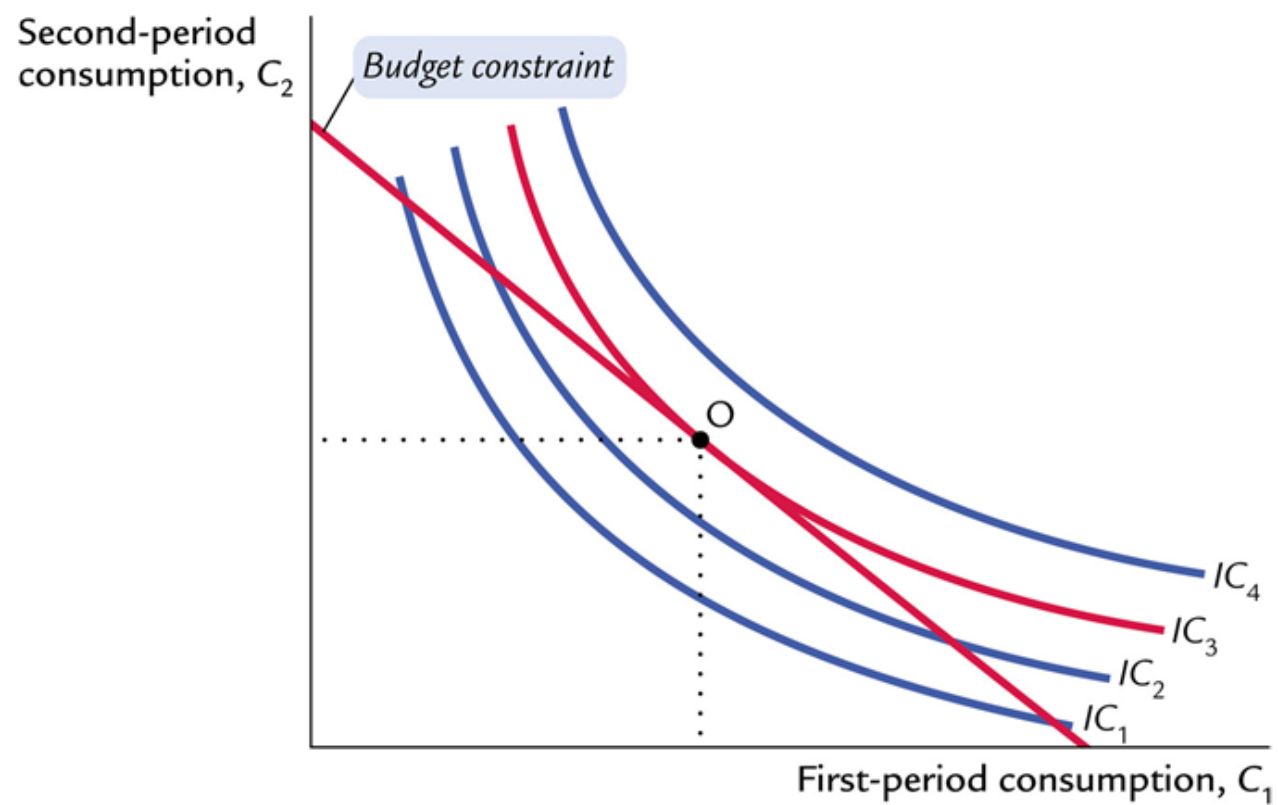
**Figure 16-6: An increase in income**

- **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**
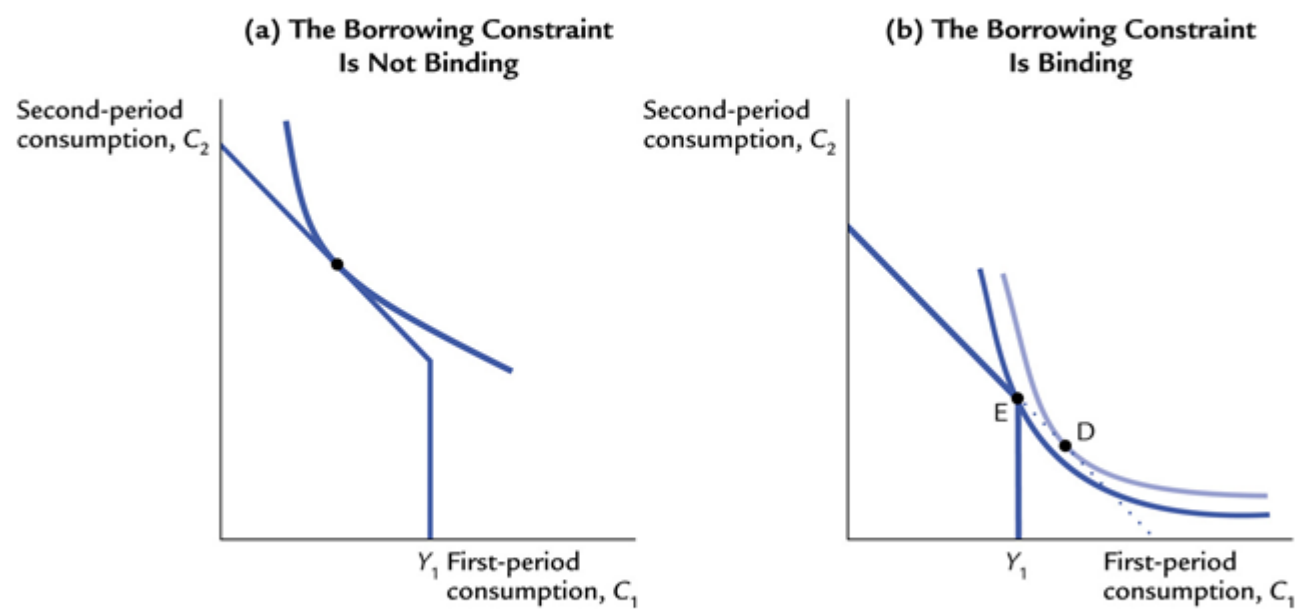   - **The same consumption level each period if subjective discount rate = market interest rate**

Figure 16-7: An increase in the interest rate

Figure 16-8: A borrowing constraint
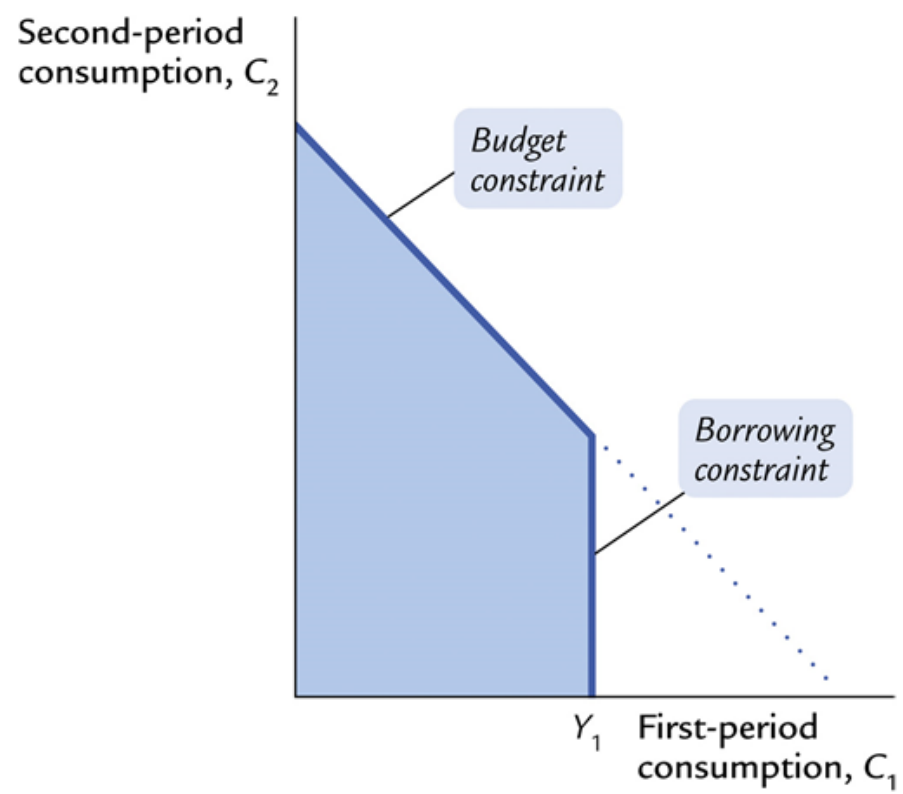
Figure 16-9: The consumer's optimum with a borrowing constraint

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 $MPC = ¼ \cdot 1 + ¾ \cdot r \approx ¼$**

Franco Modigliani's life cycle hypothesis

R = **Remaining years of work**

Y = **Annual income**

W = **Wealth**

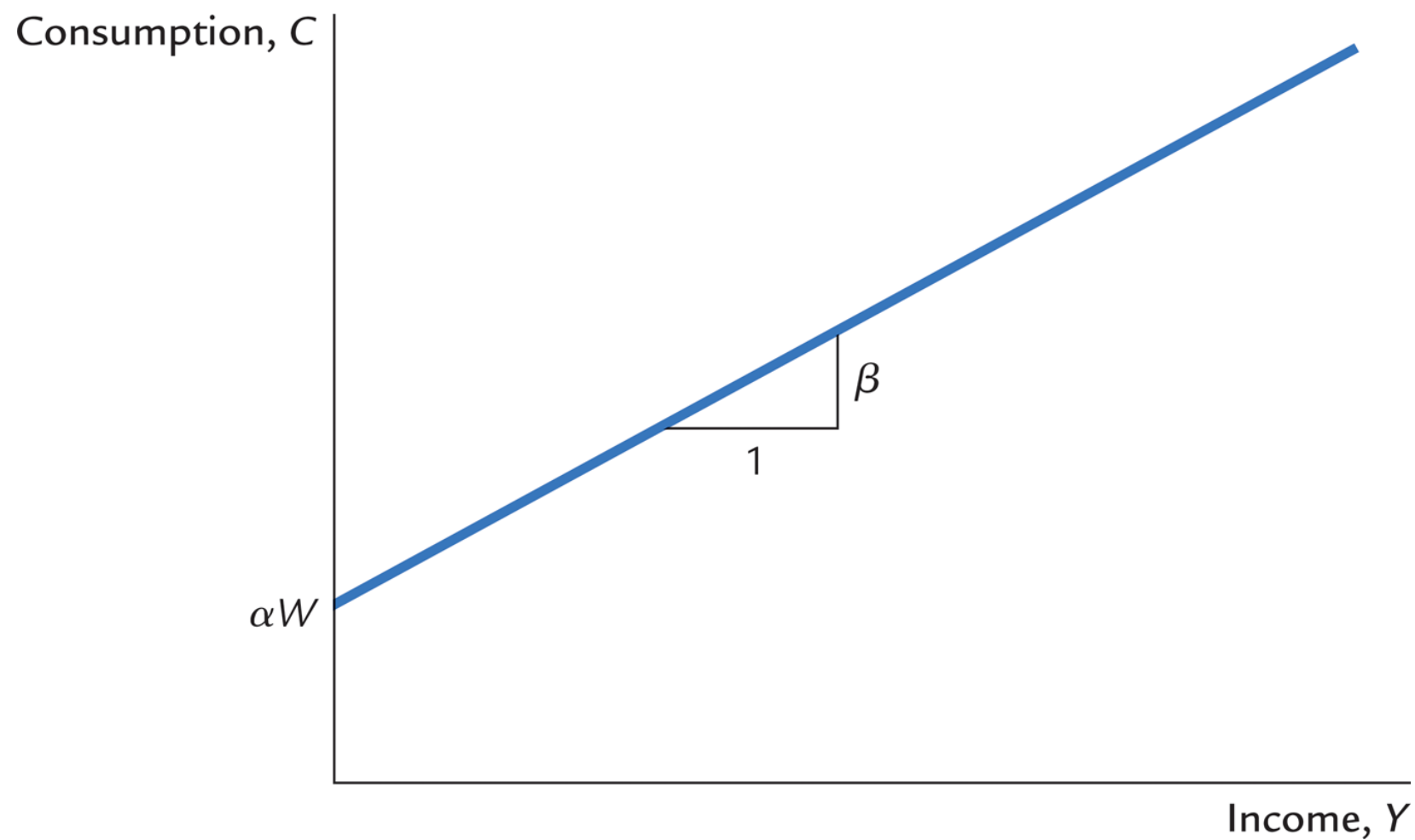T = **Remaining years of life**

$C = (W + RY)/T$

$C = W/T + RY/T$

$T = 50, R = 30 \Rightarrow C = W/50 + 30/50Y = 0{,}02W + 0{,}6Y$
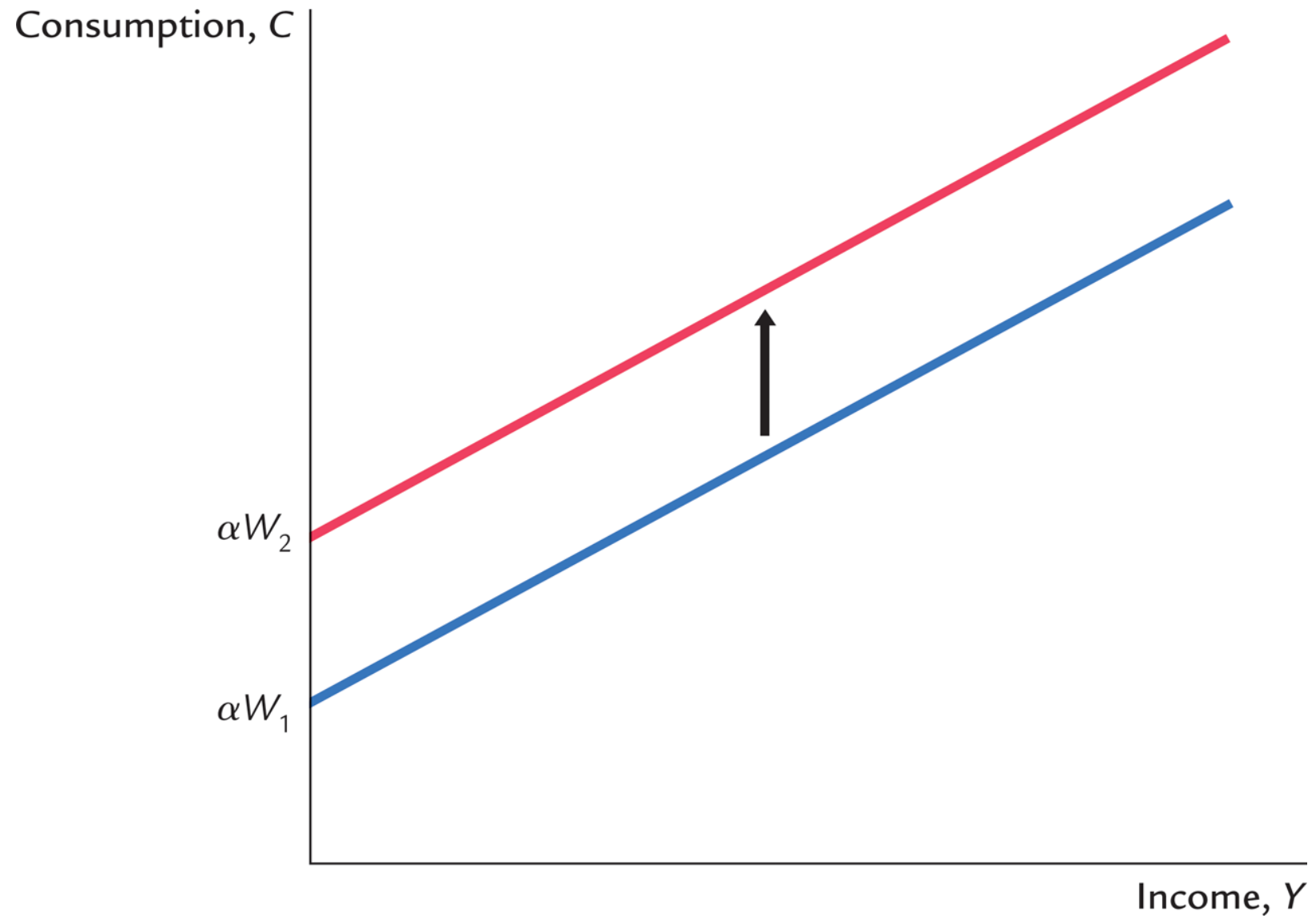
$MPC_W = 0{,}02$

$MPC_Y = 0{,}6$

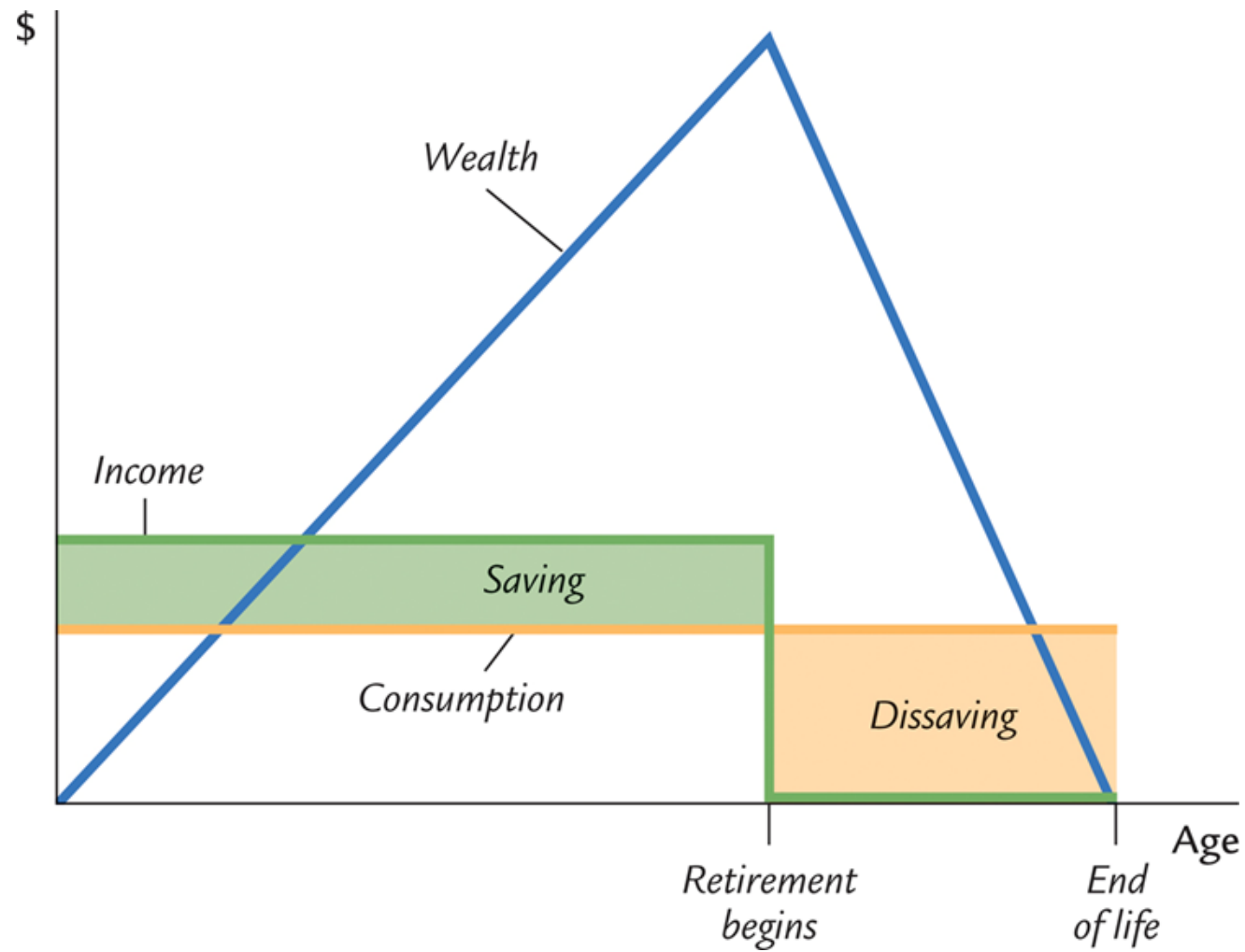$T = 21, R = 1 \Rightarrow C = W/21 + 1/21Y \approx 0{,}05W + 0{,}05Y$

Figure 17.10 The Life-Cycle Consumption Function
Mankiw: Macroeconomics, Seventh Edition
Copyright © 2010 by Worth Publishers

Figure 17.11 How Changes in Wealth Shift the Consumption Function
Mankiw: Macroeconomics, Seventh Edition
Copyright © 2010 by Worth Publishers

Figure 17.12 Consumption, Income, and Wealth Over the Life Cycle
Mankiw: Macroeconomics, Seventh Edition
Copyright © 2010 by Worth Publishers

Aspects of consumption

- **Changes in asset prices (shares, houses) nowadays play a large role for the development of private consumption**

- **Risks of "boom-bust cycles" – sudden "asset price reversals" tend to reinforce cyclical variations**

- **Is there a bubble in the Swedish housing market?**

Stockholm
University