Lecture 9: Intermediate macroeconomics, autumn 2014

Lars Calmfors

Literature: Mankiw, Chapters 16, 18 and 20
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
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
   • 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).
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
  - 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;
  - 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
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**

\[ u = u^n - \alpha (\pi - E\pi) \]

**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 \( \pi \) 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

\[ L \]

\[ u \]

\[ L \]

\[ \pi \]
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: \( u = u^n \)

\[ L^D = \text{loss (disutility) under discretion} \]

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

- Commitment to \( \pi = E\pi = 0 \) (binding rule)

\[ L^C = \text{loss (disutility under commitment)} \]

\[ L^C = u^n + 0 = u^n \]

- 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
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
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).
Åtstramande finanspolitik väntar efter valet

Finansiellt sparande och konjunkturjusterat sparande i offentlig sektor, procent av BNP respektive potentiell BNP

![Diagram showing financial savings and cyclically adjusted savings in the public sector, as a percentage of GDP respectively potential GDP.](image-url)
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 1.29

Economic growth by region
Real GDP percentage change from previous year

Diagram 79 BNP-gap i OECD-länderna

Procent av potentiell BNP

Källor: IMF, OECD och Konjunkturinstitutet.
Figure 1.6

Unemployment rates

Source: OECD, Main Economic Indicators, last accessed on 14 January 2014.
Figure 1.7

Inflation rates

% change over previous year's month

- United States
- Japan
- China
- United Kingdom
- Euro area
- Switzerland

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

- Asset-Price Bust (often after a boom)
- Insolvencies at Some Financial Institutions
- Falling Confidence in Many Financial Institutions
- Credit Crunch (banks reduce lending)
- Recession (from falling aggregate demand)

Vicious Circle (recession puts further pressure on asset prices and financial institutions)
Bostadsinvesteringar och husmarknadsindex i USA
Huspriser i Storbritannien

Index januari 2008=100 respektive årlig procentuell förändring, månadsvärden
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
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
Diagram 88 Riksbankens prognos för hushållens skulder
Procent av disponibel inkomst, kvartalsvärden

Källa: Riksbanken
Figure 1.13 Actual and estimated real house prices in Sweden, incl. forecast 2012–2014

Natural logarithm (ln)
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
Snart 4 år med inflation under målet

Konsumentpriser, årlig procentuell förändring, kvartalsvärden
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.
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
Theory of consumption

The Keynesian consumption function

\[ C = C(Y - T) \]

- Consumption depends on current disposable income
- Marginal propensity to consume, \( MPC = \frac{\partial C}{\partial (Y - T)} \)
  
  \[ 0 < MPC < 1 \]

- 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, $C_2$:

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

First-period consumption, $C_1$:

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

Borrowing

Saving

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:

\[ C_1 + \frac{C_2}{1 + r} = \frac{Y_1 + Y_2}{1 + r} \]

\((1 + r)\) 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 \( \frac{1}{4} \) of households are rationed in the credit market
- The MPC of rationed households is unity (one)
- A temporary income increase of \( \Delta Y \) 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 \( MPC = \frac{1}{4} \cdot 1 + \frac{3}{4} \cdot r \approx \frac{1}{4} \)
Franco Modigliani’s life cycle hypothesis

\( R = \text{Remaining years of work} \)
\( Y = \text{Annual income} \)
\( W = \text{Wealth} \)
\( T = \text{Remaining years of life} \)

\[
C = \frac{(W + RY)}{T}
\]
\[
C = \frac{W}{T} + \frac{RY}{T}
\]

\( T = 50, \ R = 30 \Rightarrow C = \frac{W}{50} + \frac{30}{50}Y = 0.02W + 0.6Y \)
\( MPC_W = 0.02 \)
\( MPC_Y = 0.6 \)

\( T = 21, \ R = 1 \Rightarrow C = \frac{W}{21} + \frac{1}{21}Y \approx 0.05W + 0.05Y \)
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
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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?