Lecture 10: Intermediate macroeconomics, autumn 2009

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Topics

- **Government debt**
- **Fiscal sustainability**
- **The relationship between budget deficits and long-run debt**
- **The Swedish fiscal policy framework**
- **Sustainability indicators**
- **The golden rule of public finance**

Literature: Mankiw-Taylor, chapter 15;
Swedish Fiscal Policy, chapters 2-3 and Appendix 1;
OECD Economic Outlook, pp 52-61.

Different measures of the financial position of the public sector

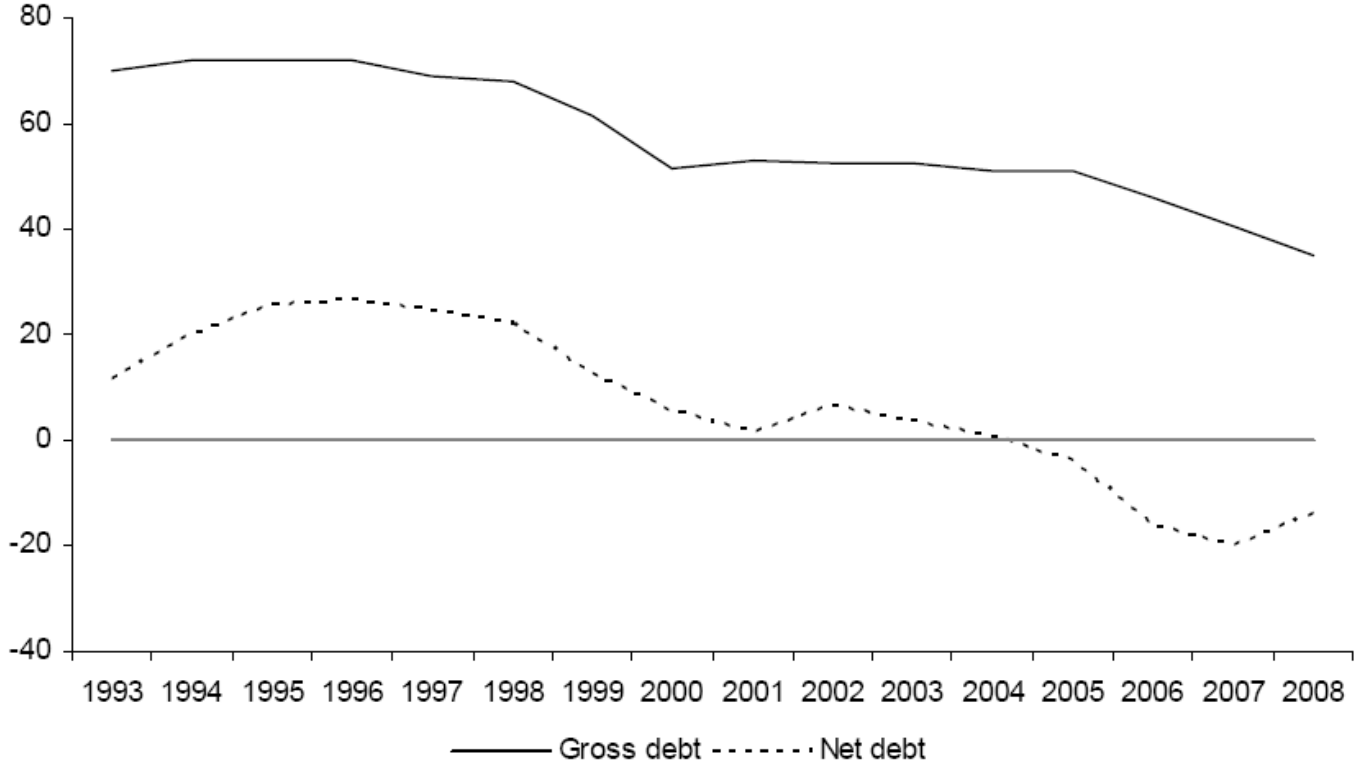
1. **Public sector gross debt (*den offentliga sektorns bruttoskuld*): public sector debt after internal claims and debts have been netted out within the public sector (mainly the pension funds' holdings of government bonds). The debt concept used by the EU.**

2. **Public sector net debt (*den offentliga sektorns nettoskuld*): total public sector debt less claims on the private sector.**

3. **Net worth (*nettoförmögenhet*). Real capital assets minus all financial debt.**

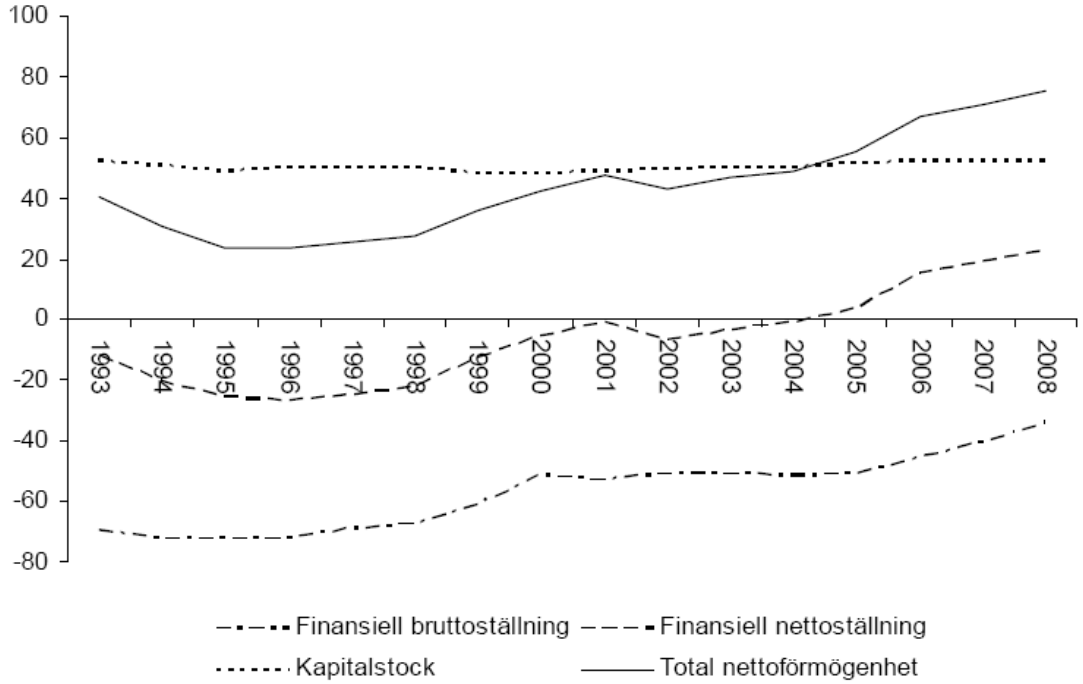
4. **Also implicit debt – including e.g. pension commitments – could be included.**

Figure 1.7 General government gross and net debts as percentages of GDP



Note: See Box 3.1 for a definition of gross and net debts.
Source: National Institute of Economic Research.

Figur 2.7 Offentlig sektors finansiella ställning och förmögenhet (procent av BNP)



Anm: Data för 2007–2008 är prognoser.
Källa: Konjunkturinstitutet.

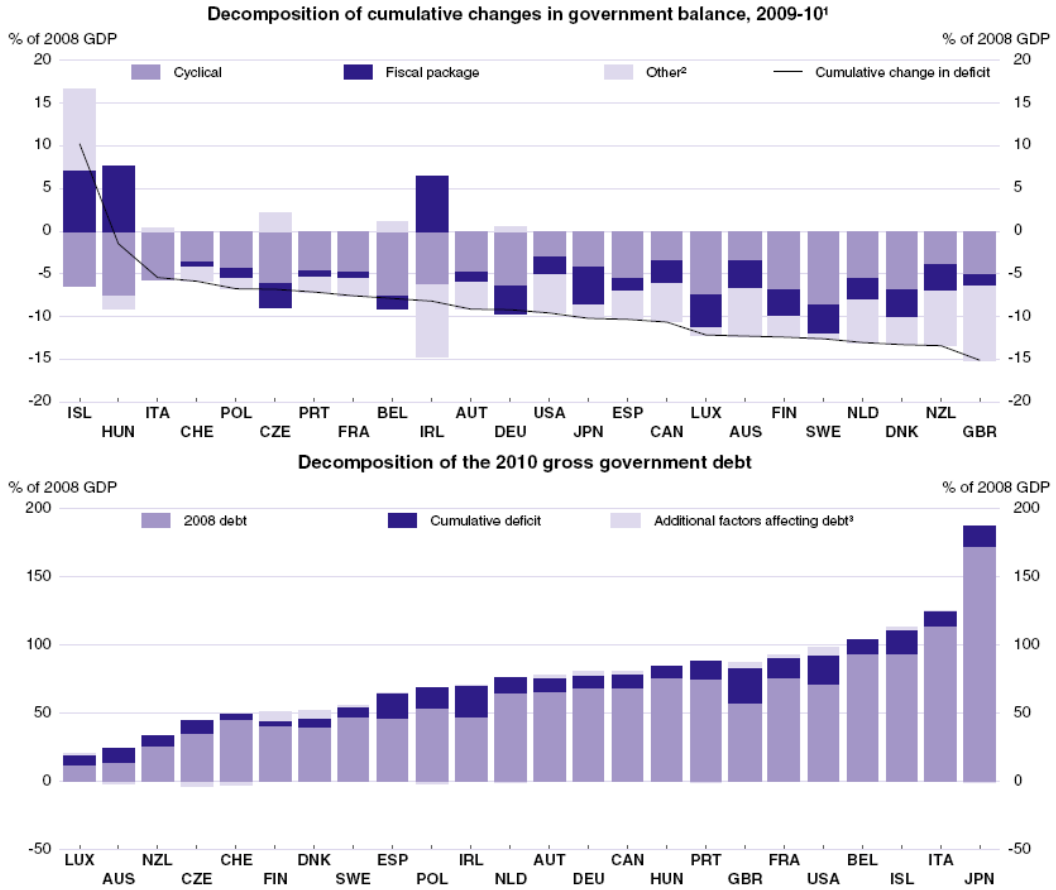
TABLE 15–1

How Indebted Are the EU-15 Governments?

Country	Government Debt as a Percentage of GDP
Greece	107.5
Italy	106.4
Belgium	93.3
Germany	67.7
France	66.8
Portugal	63.9
Austria	62.9
Netherlands	52.9
Sweden	50.3
Spain	43.2
United Kingdom	42.8
Finland	41.1
Denmark	35.8
Ireland	27.6
Luxembourg	6.2

Source: Eurostat.
Notes: Data are based on estimates of general government gross debt and nominal GDP for 2005.

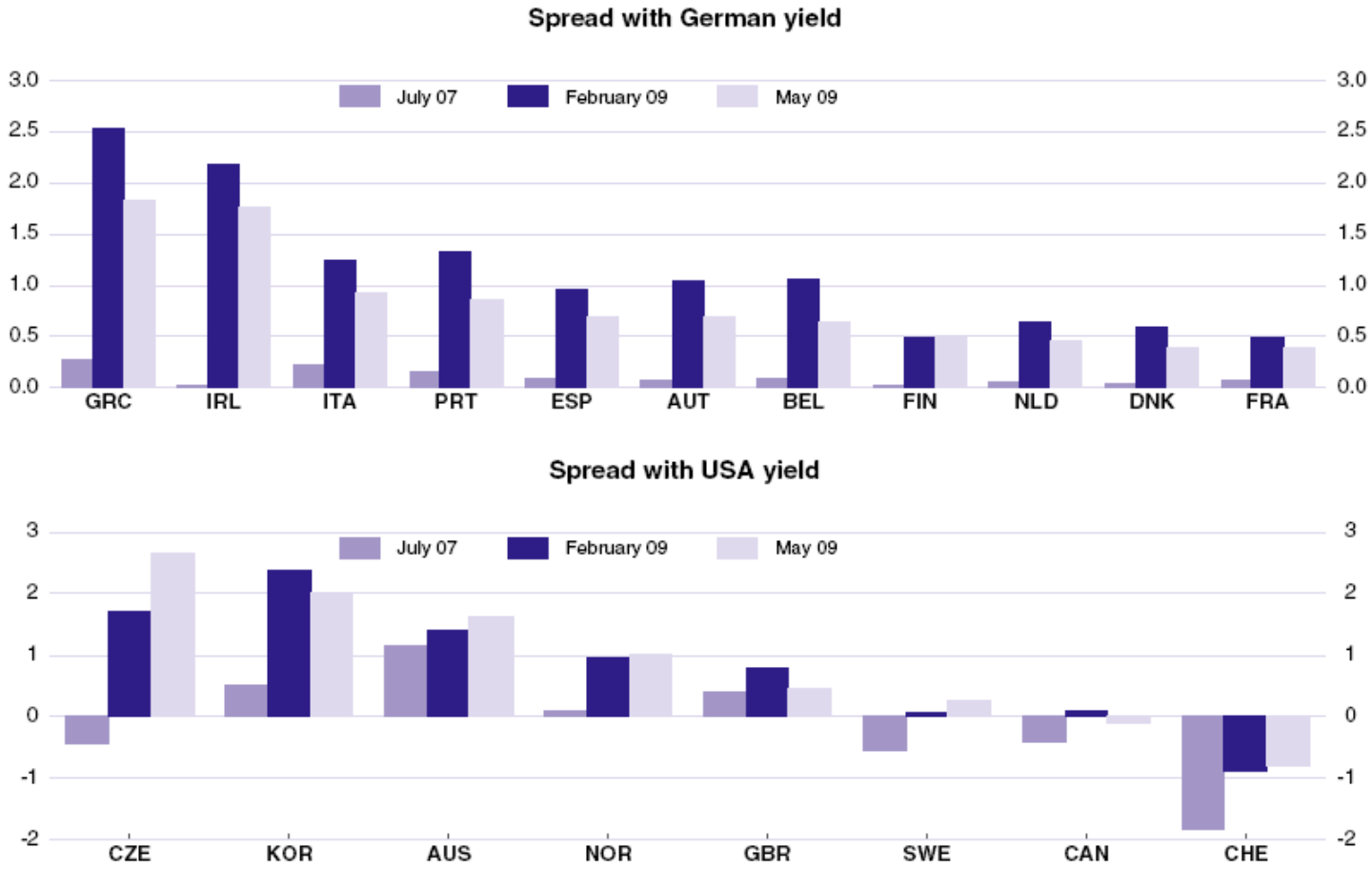
Figure 1.21. **Fiscal positions are worsening markedly**



1. Sum of 2009 and 2010 deviations from 2008 levels of government balances.
2. Cumulative changes in deficit minus the sum of the fiscal package and the cyclical components. This captures effects such as discretionary fiscal policy measures other than those in response to the crisis and the disappearance of exceptional revenue buoyancy.
3. 2010 debt minus the sum of 2008 debt and the cumulative deficit for 2009-10. This includes debt-increasing equity participations in companies.

Source: OECD Economic Outlook 85 database.

Figure 1.22. **Sovereign bond spreads have increased in most countries**



Source: Datastream.

Table 1.6. **Fiscal positions are deteriorating dramatically**

Per cent of GDP / Potential GDP

	2006	2007	2008	2009	2010
United States					
Actual balance	-2.2	-2.9	-5.9	-10.2	-11.2
Underlying balance[2]	-3.0	-3.5	-5.8	-7.7	-8.5
Underlying primary balance[2]	-1.0	-1.4	-3.8	-6.2	-6.8
Gross financial liabilities	61.7	62.9	71.1	87.4	97.5
Japan					
Actual balance	-1.6	-2.5	-2.7	-7.8	-8.7
Underlying balance[2]	-4.0	-3.8	-4.3	-5.9	-6.0
Underlying primary balance[2]	-3.3	-3.1	-3.5	-5.0	-4.7
Gross financial liabilities	172.1	167.1	172.1	189.6	199.8
Euro area					
Actual balance	-1.3	-0.7	-1.9	-5.6	-7.0
Underlying balance[2]	-1.6	-1.4	-1.9	-2.6	-3.8
Underlying primary balance[2]	1.0	1.2	0.7	0.0	-1.2
Gross financial liabilities	74.6	71.2	73.4	82.5	89.2
OECD[1]					
Actual balance	-1.3	-1.4	-3.2	-7.7	-8.8
Underlying balance[2]	-2.4	-2.5	-3.8	-5.5	-6.2
Underlying primary balance[2]	-0.5	-0.6	-2.0	-3.8	-4.4
Gross financial liabilities	75.0	73.5	78.7	91.6	100.2

Note: Actual balances and liabilities are in per cent of nominal GDP. Underlying balances are in per cent of potential GDP. The underlying primary balance is the underlying balance excluding the impact of the net debt interest payments.

1. Total OECD excludes Mexico and Turkey.
2. Fiscal balances adjusted for the cycle and for one-offs.

Source: OECD Economic Outlook 85 database.

Fiscal sustainability

- **Definition of fiscal sustainability: the ratio between government debt and GDP must settle down at some constant value.**

$$\Delta D = B = iD + G - T$$

D **= Government debt**

B **= Total budget deficit**

i **= Nominal interest rate**

G **= Government expenditure**

T **= Taxes**

G – T **= Primary deficit**

Y **= Nominal GDP**

$$\frac{\Delta D}{D} = \frac{B}{D}$$

If *D*/*Y* is to be constant, it must hold that *D* and *Y* increase at the same rate:

$$\frac{\Delta D}{D} = g + \pi$$

g = real growth rate

π = inflation rate

Thus:

$$\frac{\Delta D}{D} = \frac{B}{D} = g + \pi$$

$$\frac{B/Y}{D/Y} = g + \pi$$

$$\frac{D}{Y} = \frac{B}{Y} \cdot \frac{1}{(g + \pi)}$$

- **A given deficit-to-GDP ratio, B/Y, determines the debt-to-GDP ratio, D/Y, in the long run.**

- **Assume $g = 0.02$ and $\pi = 0.02$**

$$\frac{B}{Y} = 0\,\% \Rightarrow \frac{D}{Y} = 0\,\%$$
$$\frac{B}{Y} = 1\,\% \Rightarrow \frac{D}{Y} = 25\,\%$$
$$\frac{B}{Y} = 2\,\% \Rightarrow \frac{D}{Y} = 50\,\%$$
$$\frac{B}{Y} = 3\,\% \Rightarrow \frac{D}{Y} = 75\,\%$$
$$\frac{B}{Y} = -1\,\% \Rightarrow \frac{D}{Y} = -25\,\%$$
$$\frac{B}{Y} = -2\,\% \Rightarrow \frac{D}{Y} = -50\,\%$$
$$\frac{B}{Y} = -3\,\% \Rightarrow \frac{D}{\mathrm{Y}} = -75\,\%$$

$$\frac{B}{Y} < 0 \quad \text{implies a budget surplus}$$

$$\frac{D}{Y} < 0 \quad \text{implies positive financial wealth}$$

Fiscal sustainability and the primary budget deficit

$$\frac{D}{Y} = \frac{B}{Y} \cdot \frac{1}{(g + \pi)}$$

$$\frac{B}{Y} = (g + \pi)\frac{D}{Y}$$

$$\frac{iD + G - T}{Y} = (g + \pi)\frac{D}{Y}$$

$$\frac{G - T}{Y} = (g + \pi)\frac{D}{Y} - \frac{iD}{Y}$$

$$\frac{G - T}{Y} = (g + \pi - i)\frac{D}{Y}$$

$$r = i - \pi \Leftrightarrow i = r + \pi$$

i = nominal interest rate

r = real interest rate

π = inflation rate

Thus:

$$\frac{G-T}{Y} = (g + \pi - r - \pi)\frac{D}{Y}$$

$$\frac{G-T}{Y} = (g - r)\frac{D}{Y}$$

If we aim for $\frac{D}{Y} = d > 0$, it must hold that:

$$\frac{G-T}{Y} = (g - r)d$$

The primary deficit must equal the difference between the real growth rate and the real interest rate times the target debt-to-GDP ratio.

- **If $g = r$, then $\frac{G-T}{Y} = 0$**
- **If $g < r$, then $\frac{G-T}{Y} < 0$, i.e. we must have a primary surplus.**
- **If $g > r$, then $\frac{G-T}{Y} > 0$, i.e. we must have a primary deficit.**

Sweden's fiscal rules

- **Surplus target**
  - **fiscal balance (net lending) should be one percent of GDP over the business cycle**

- **Ceiling for central government expenditures**
  - **all expenditures including pensions but excluding interest payments**

- **Balanced budget for local governments**
  - **municipalities (*kommuner*) and regions (*landsting*)**

Considerations regarding government debt

- **Fair distribution among generations**
  - **a deficit now means a redistribution of consumption in favour of current generations**
  - **we consume now; "our children" pay for that by paying the interest on the accumulated government debt**
  - **crowding out of investment: if the current generation accumulates financial claims on the government, it has less reason to accumulate physical capital**

- **Tax smoothing for efficiency reasons**
  - **higher tax rates imply progressively higher distortionary costs: distortionary costs increase more than proportionally**
  - **argument for constant tax rates over time**
  - **if temporarily high government expenditures, optimal to run deficits**
  - **if future government expenditures will rise, it is optimal to run surpluses now**

Unclear motives for surplus target

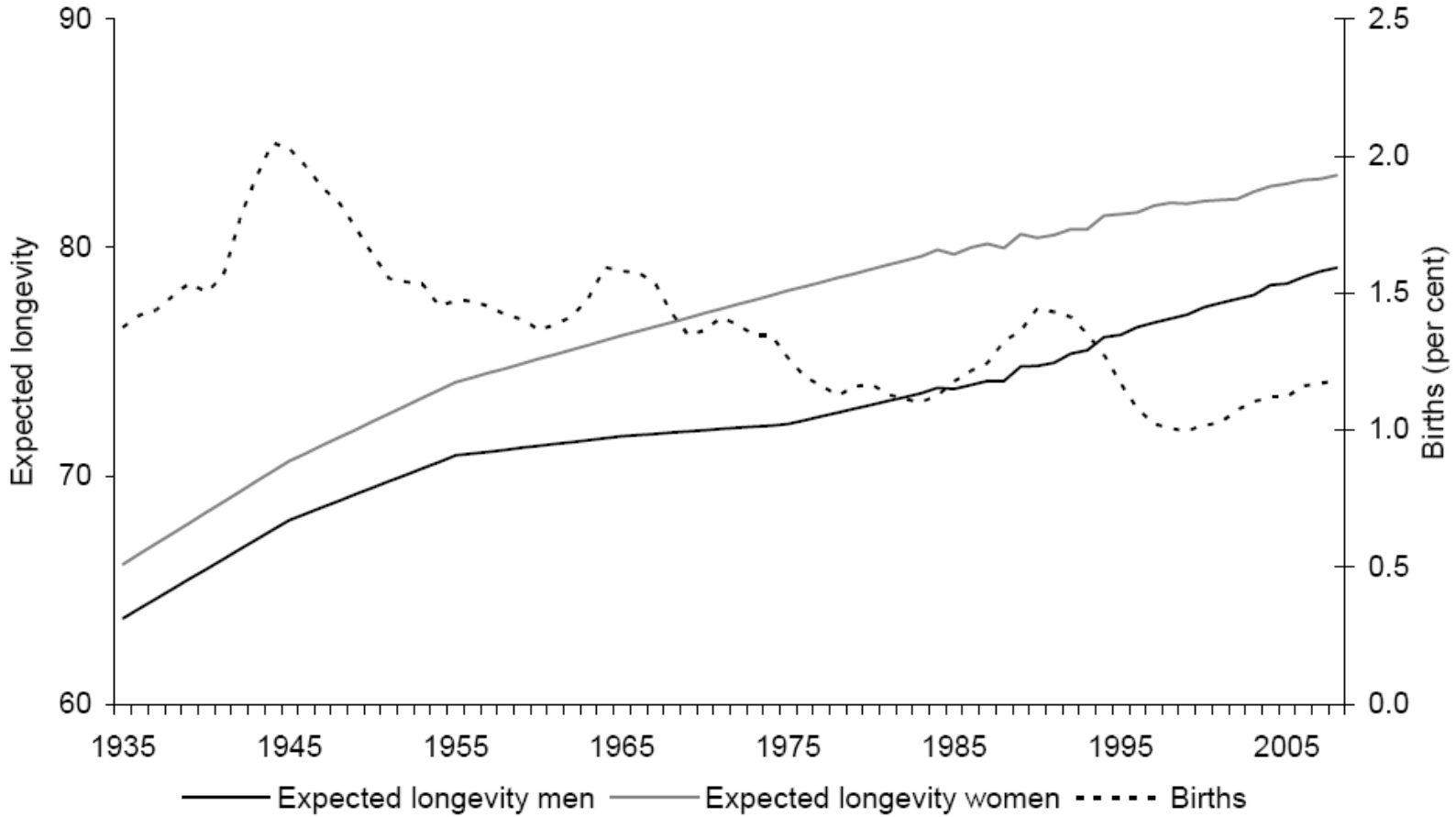
- **Good to have benchmark such that short-run considerations do not overtake long-run considerations**
- **But what does the target actually mean?**
- **But why should the target be surplus of one per cent of GDP?**
- **Future demographic cost pressures because of lower birth rates and increased longevity**
  - **intergenerational equity?**
  - **tax smoothing?**
  - **precautionary savings?**

Different indicators of the surplus target

Budget Bill for 2010, per cent of GDP

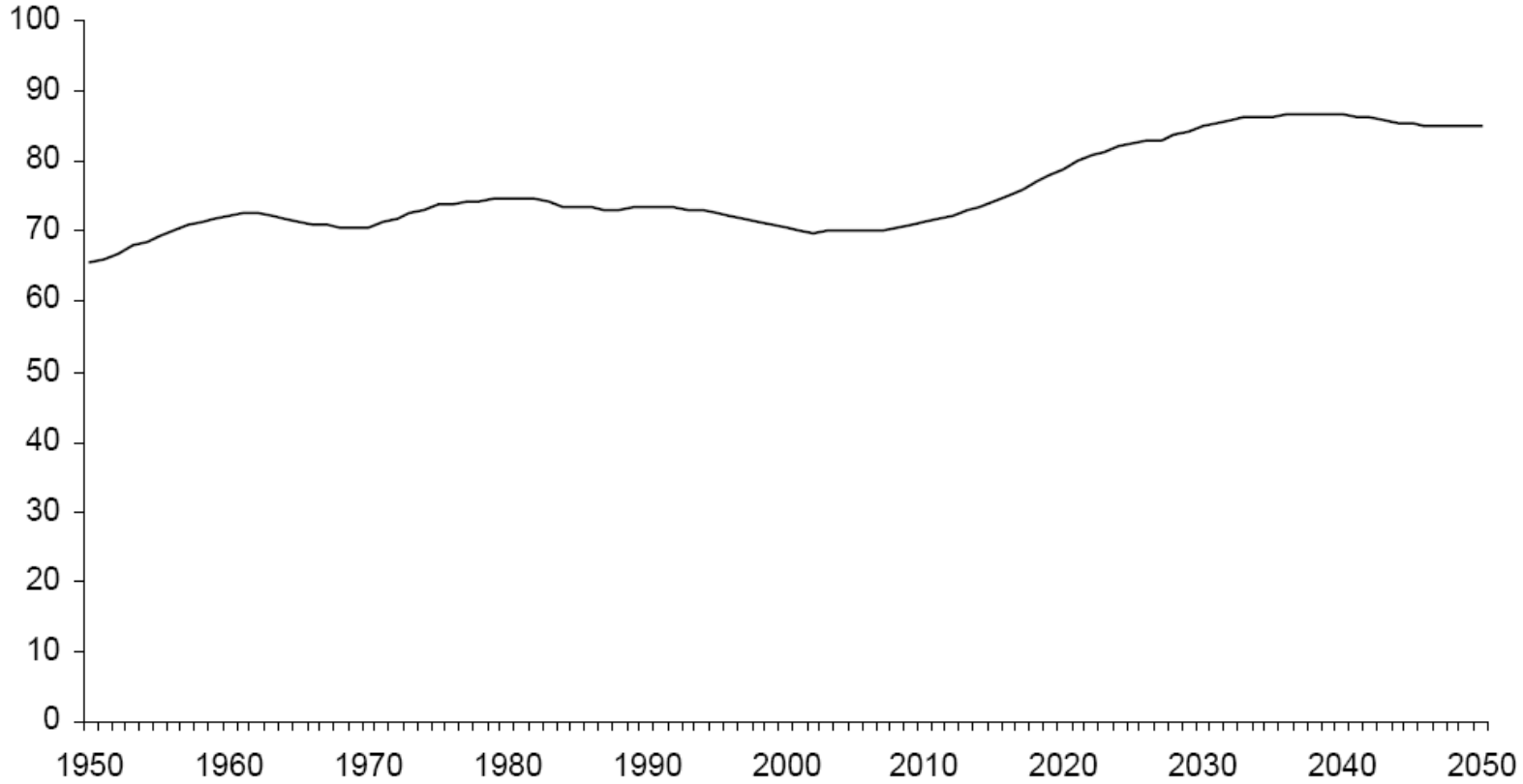
	2008	2009	2010	2011	2012
Actual fiscal balance	**2.5**	**-2.2**	**-3.4**	**-2.1**	**-1.1**
Historical average	**1.6**	**1.2**	**0.8**	**0.5**	**0.4**
Moving average	**0.3**	**-0.1**			
Cyclically adjusted balance	**2.3**	**1.4**	**0.2**	**0.7**	**0.6**
Historical average of cyclically adjusted balance	**1.2**	**1.2**	**1.1**	**1.1**	**1.0**
Moving average of cyclically adjusted balance	**1.2**	**1.2**			

Figure 6.2 Birth rates (per cent) and expected longevity



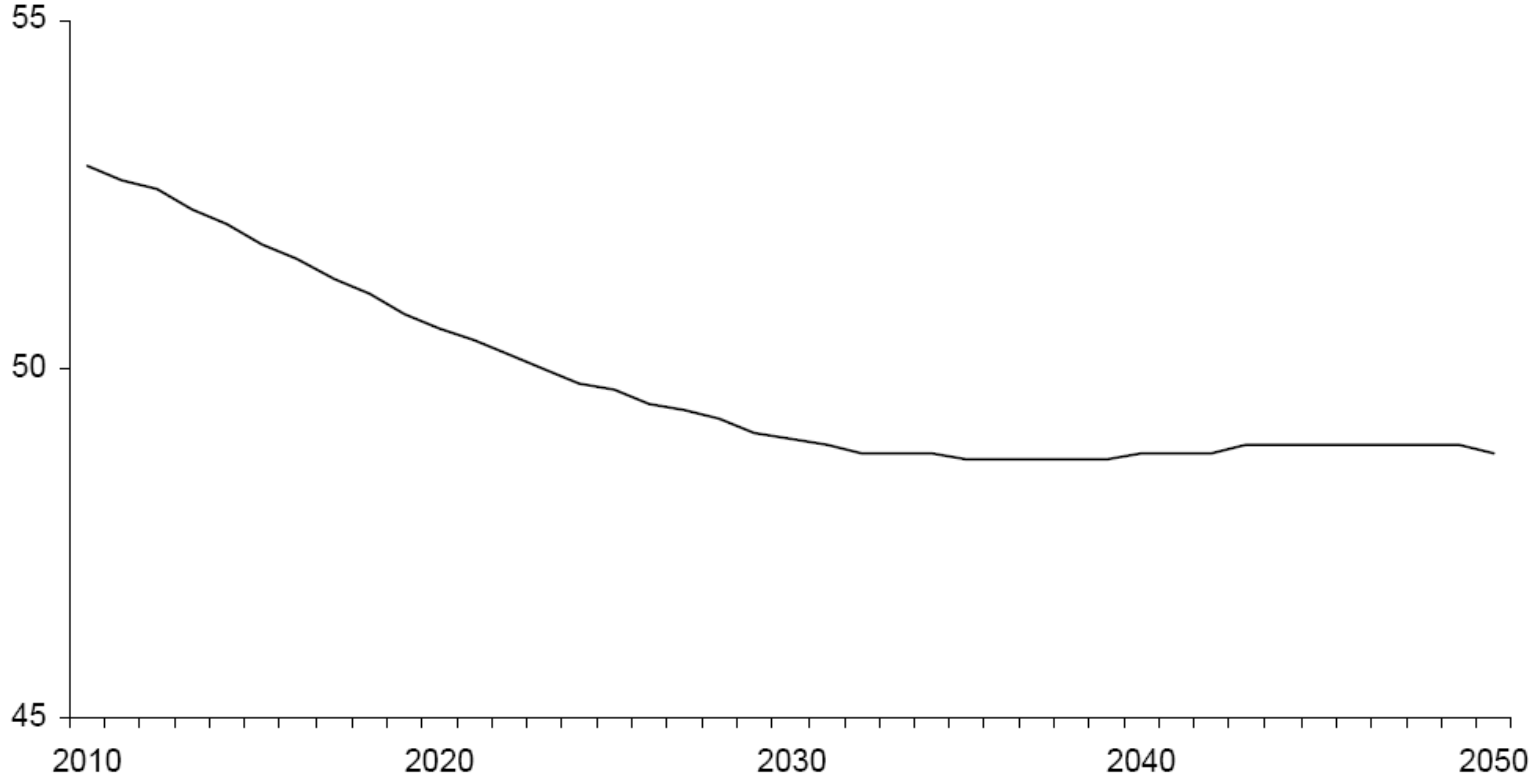
Note: The number of births as a percentage of the population and expected longevity at birth.
Sources: Statistics Sweden and the Fiscal Policy Council.

Figure 6.1 Age dependency ratio



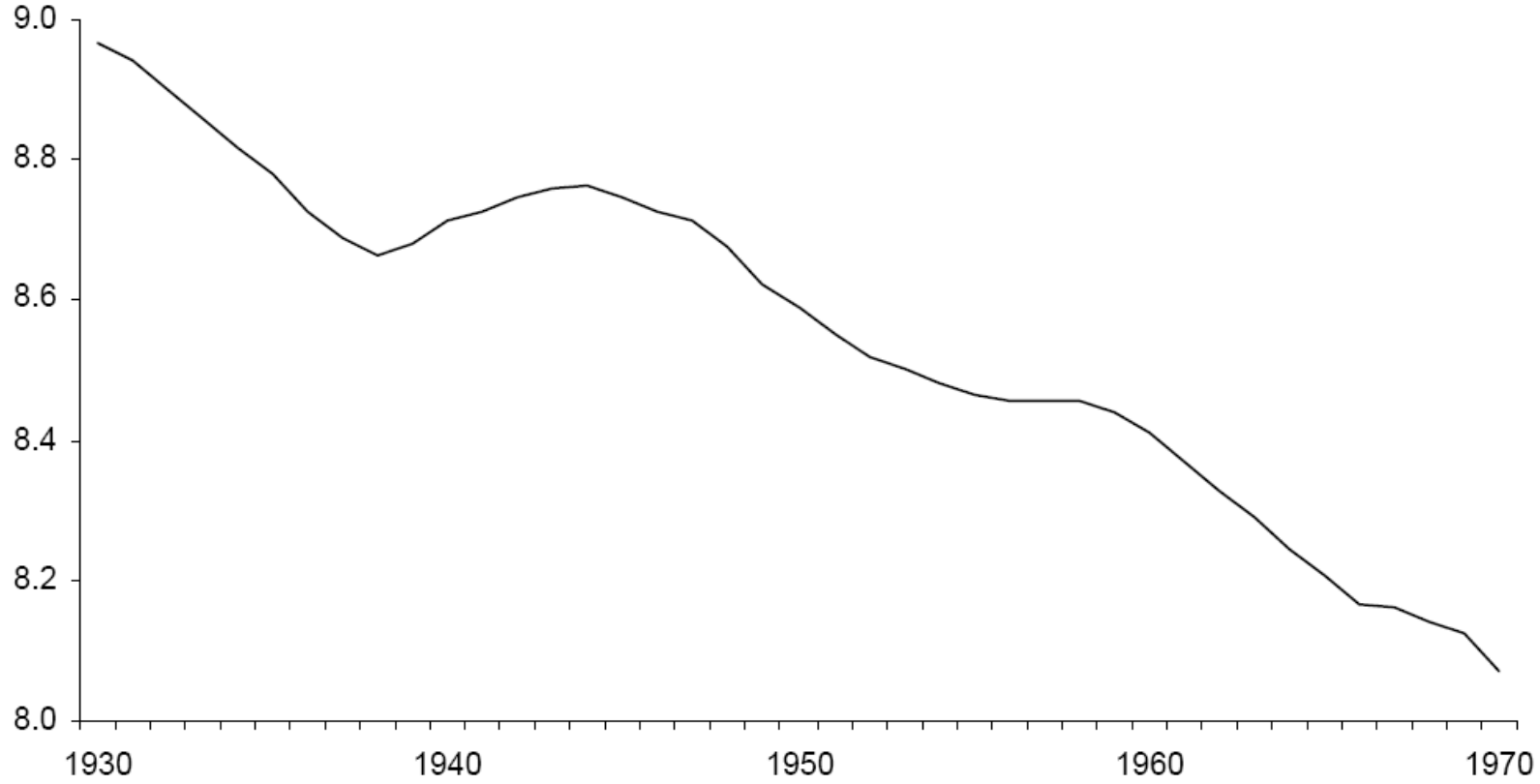
Note: The age dependency ratio shows the ratio of the number of children (people under 20) and older people (people over 64) to the number of people aged 20-64.
Sources: Statistics Sweden.

Figure 6.3 Projected labour force participation, percentage of the population



Note: The figure shows the labour force as a percentage of the population, assuming that labour force participation in each age group remains unchanged.
Sources: Statistics Sweden and the Fiscal Policy Council.

Figure 6.7 Percentage of lifetime in work by year of birth



Note: The percentage of work over the life cycle has been estimated with the help of historical data on population, deaths, employment and hours worked. A number of simplified assumptions have been made for years lacking data. This means that the figure should be interpreted with particular caution.
Source: Fiscal Policy Council calculations.

Calculations of fiscal sustainability

- **Given assumptions about future growth, interest rates and employment and assuming unchanged transfer systems and unchanged public consumption per capita, one can calculate how much taxes must rise relative to GDP to fund the costs of an ageing population.**

- **Intertemporal budget constraint: Net financial worth of the government $\geq$ the discounted value of future primary deficits (= the discounted value of future primary expenditures minus future primary revenues)**
  - **otherwise it would be possible to borrow to cover future interest payments**

- **S2-indicator: the annual permanent tax increase in percent of GDP that would be needed to meet the intertemporal budget constraint**
  - **S2-indicator $\geq 0 \Rightarrow$ non-sustainable fiscal policy**
  - **S2-indicator $\leq 0 \Rightarrow$ sustainable fiscal policy**

- **Intertemporal net financial worth = (current net financial worth) – (discounted value of future primary deficits)**

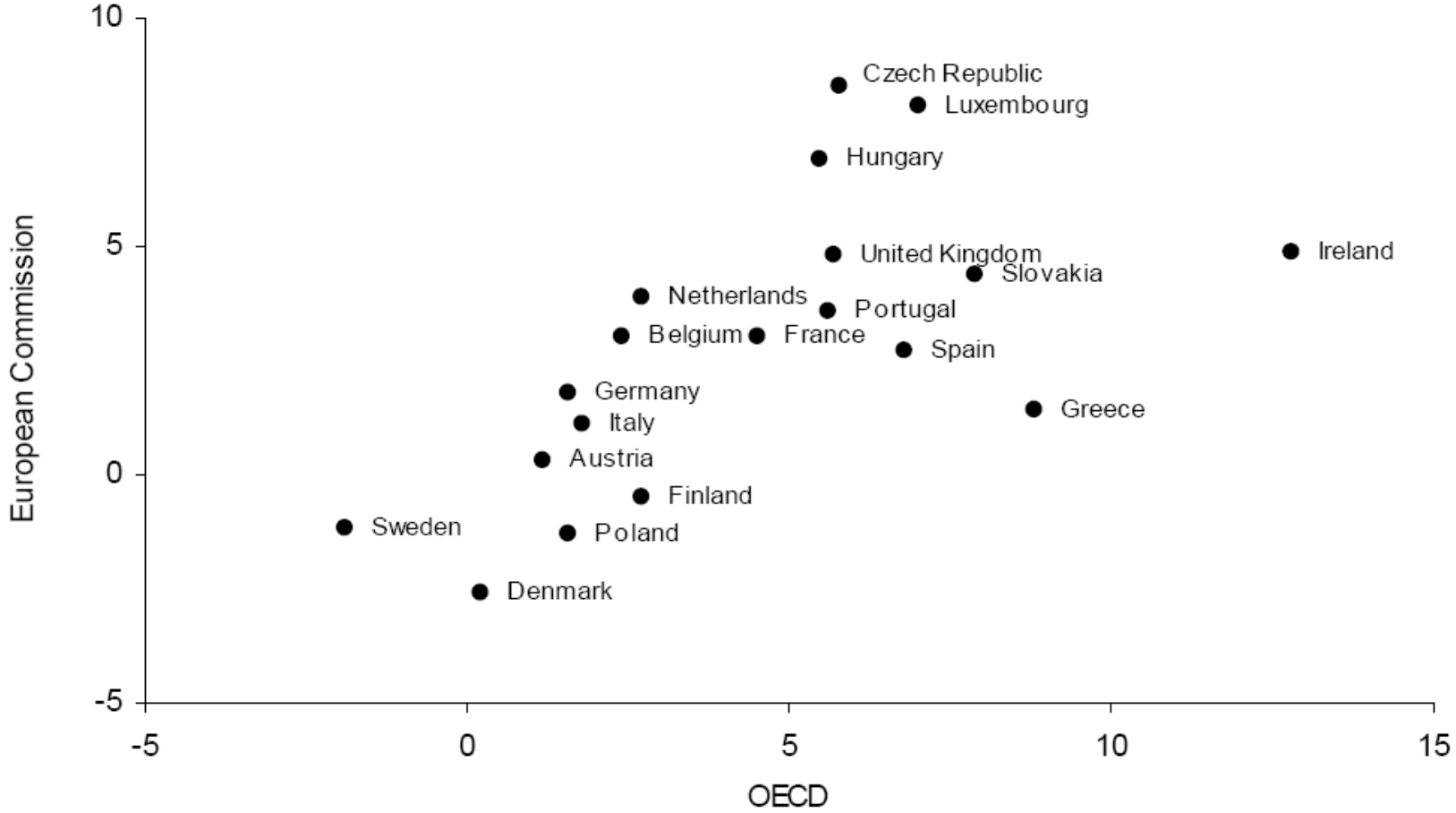
Primary deficit = Government expenditures (excluding interest payments) – Government revenues (excluding interest income)

Table 3.1 The S2 indicator and intertemporal financial net worth, per cent of GDP

	S_2	Intertemporal financial net worth
Base scenario	0.5	-52.5
Higher exit age	-0.8	84.0
Higher health care costs	8.2	-861.0

Note: The nominal interest rate is expected to be 5 per cent and the nominal GDP growth rate 4 per cent (2 per cent real growth and 2 per cent inflation).
Sources: The 2009 Spring Fiscal Policy Bill and the Council's own calculations.

Figure 1.9 Long-term sustainability of public finances (S2 indicator)



Note: The European Commission figures refer to 2007 and the OECD's to 2008.
Sources: European Commission (2008) and OECD (2009).

Figure 6.15 Average labour market exit age

Source: SOU 2008:105.

Table 6.2 Labour force participation in 1994 and 2007 among men and women aged 55-64

Country	Men		Women	
	1994	2007	1994	2007
Denmark	63.8	66.9	43.1	55.7
Finland	43.9	59.2	38.9	58.3
Iceland	95.9	90.4	80.5	80.7
Norway	71.5	74.7	55.4	64.6
Sweden	70.5	76.4	62.6	69.6
France	42.1	42.6	30.1	38.0
Netherlands	41.8	63.3	18.5	41.1
Switzerland	82.9	78.4	47.2	60.3
UK	64.0	68.9	40.7	50.1
Germany	53.1	66.5	28.3	49.8
Austria	41.3	51.3	18.4	28.9
United States	65.5	69.6	48.9	58.3
Canada	59.5	67.1	36.9	53.3
Japan	85.0	84.9	48.1	52.5

Source: OECD (2008a).

Strategies to deal with demographic cost pressures

- **Prefunding**
  - presaving to build up financial assets is the current strategy

- **A more natural strategy would be to let the retirement age increase with longevity**

  - the pension system gives some incentives

  - defined contributions instead of defined benefits imply that pensions fall when more people are retired

  - but the incentives may be too weak

  - Denmark: automatic adjustment of retirement age to longevity

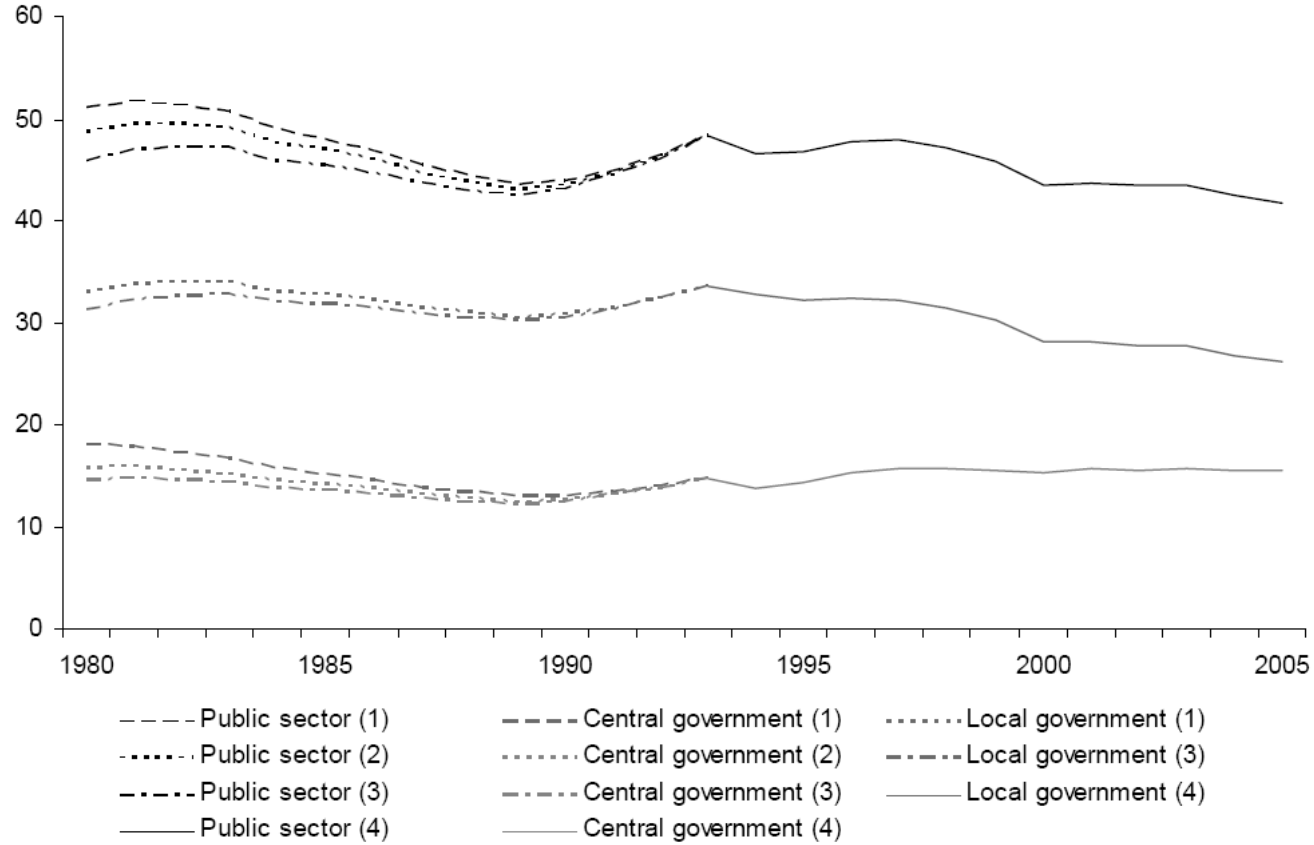
Golden rule for fiscal policy?

- **The surplus target applies to financial saving (net lending) of general government**
  - **risk that this lowers government investment**
  - **benefits apply partly to future generations; current generations pay via taxes**
  - **easier to reduce government investment than government transfers**

- **Could the fiscal target instead apply to total saving of the general government (the golden rule of public finance)?**
  - **equivalent to distinguishing between current budget and capital budget with fiscal target only for the current budget**
  - **loan financing of capital expenditures**

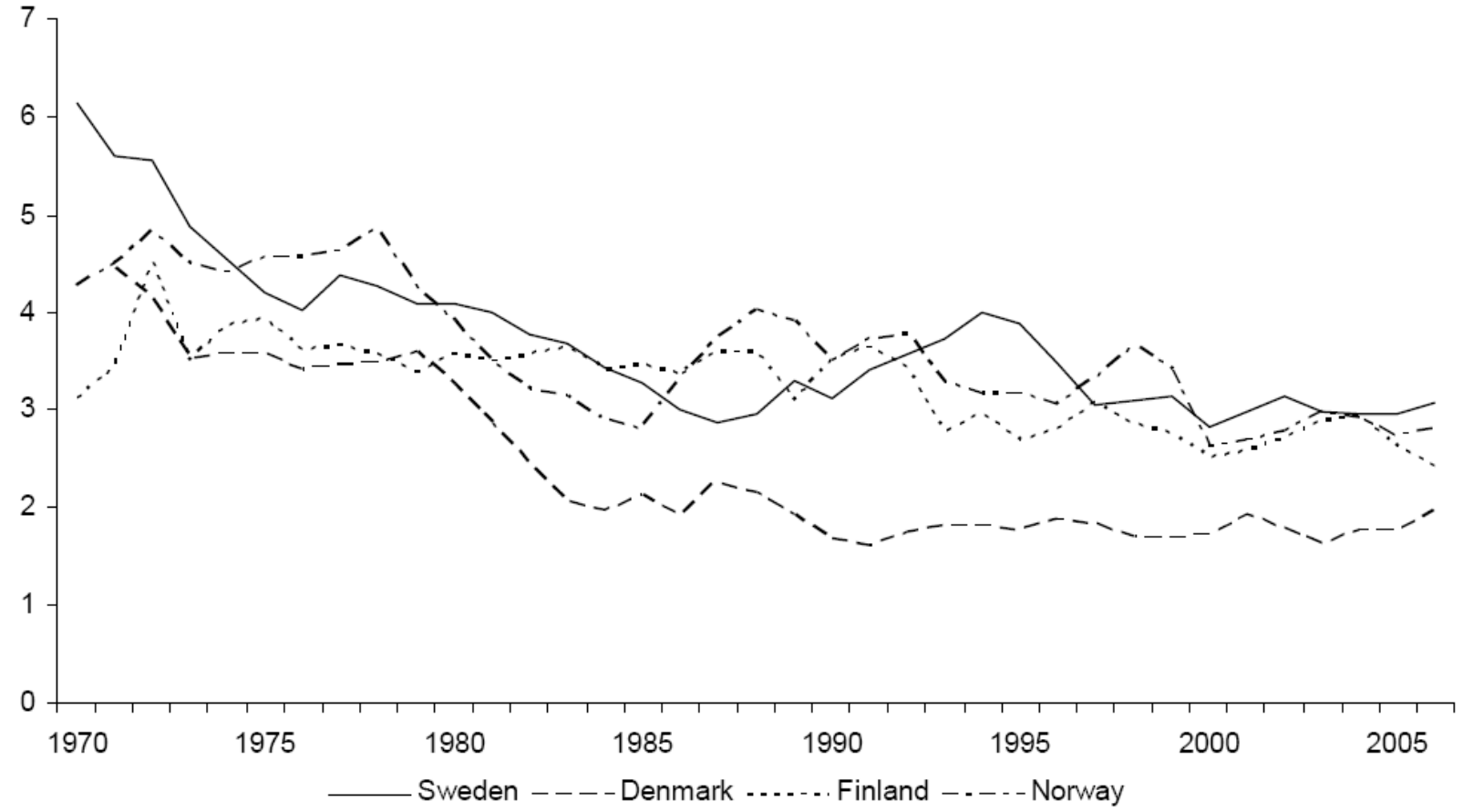
- **Example of golden rule**
  - **UK**
  - **Germany**
  - **New Zealand**
  - **US states**
  - **Swedish local government**
  - **Sweden in the 1950s**

Figure 4.5 Public sector capital stock, per cent of GDP



Note: All series are in constant prices, reference year 2000. The series prior to 1993 are estimated using the method described in Appendix 2. (1)-(3) indicate different methods of estimation, which are presented in Appendix 2. (4) are from the National Accounts.
Sources: Statistics Sweden, National Institute of Economic Research and the Fiscal Policy Council.

Figure 4.6 Public investment, per cent of GDP



Note: Series for both investment and GDP are in current prices.
Sources: OECD, Statistics Sweden and the National Institute of Economic Research.

The golden rule of public finance

F = net lending (financial saving) of the government

T = tax revenue

G = government expenditure

I = government gross investment

D = depreciation of government capital

N = government net investment

S = total saving of the government

Current surplus target

$$F = T - G - I$$

$$I = D + N$$

Golden rule target

$$S = F + N = T - G - I + N = T - G - D - N + N = T - G - D$$

Problems with golden rule

- **What government investment should be included?**
  - **not all investment gives a pecuniary return**
  - **intergenerational equity or tax smoothing?**
  - **human capital investment: R&D, education, health care?**

- **Risks of manipulation**
  - **current expenditures could be reclassified as capital expenditures**
  - **cheating with the amount of depreciation**

- **Combination with other fiscal rules as in the UK?**
  - **borrowing only to finance net investment**
  - **ceiling for government net debt (40 percent of GDP)**

- **External auditing?**