# Discretionary fiscal policies and automatic stabilisers

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1. Automatic stabilisers
2. Discretionary policies
3. Non-policy effects
4. Discretionary measures
5. Policy issues
6. The structural balance

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- Assess fiscal developments:
  - how much in the change of the fiscal balance is due to changes in underlying economic activity;
  - how much is due to policy measures?

- Assess impact of fiscal policies on the economy:
  - composition of the fiscal impulse on the economy – automatic v. discretionary.

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- Economic activity fluctuates around a trend.

- These fluctuations affect the fiscal balance via fiscal revenues and expenditures.

- Quantification requires
  - assessment of deviation from output gap.
  - assessment of elasticity of fiscal components to changes in output gap.

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# The budget balance fluctuates symmetrically with GDP growth

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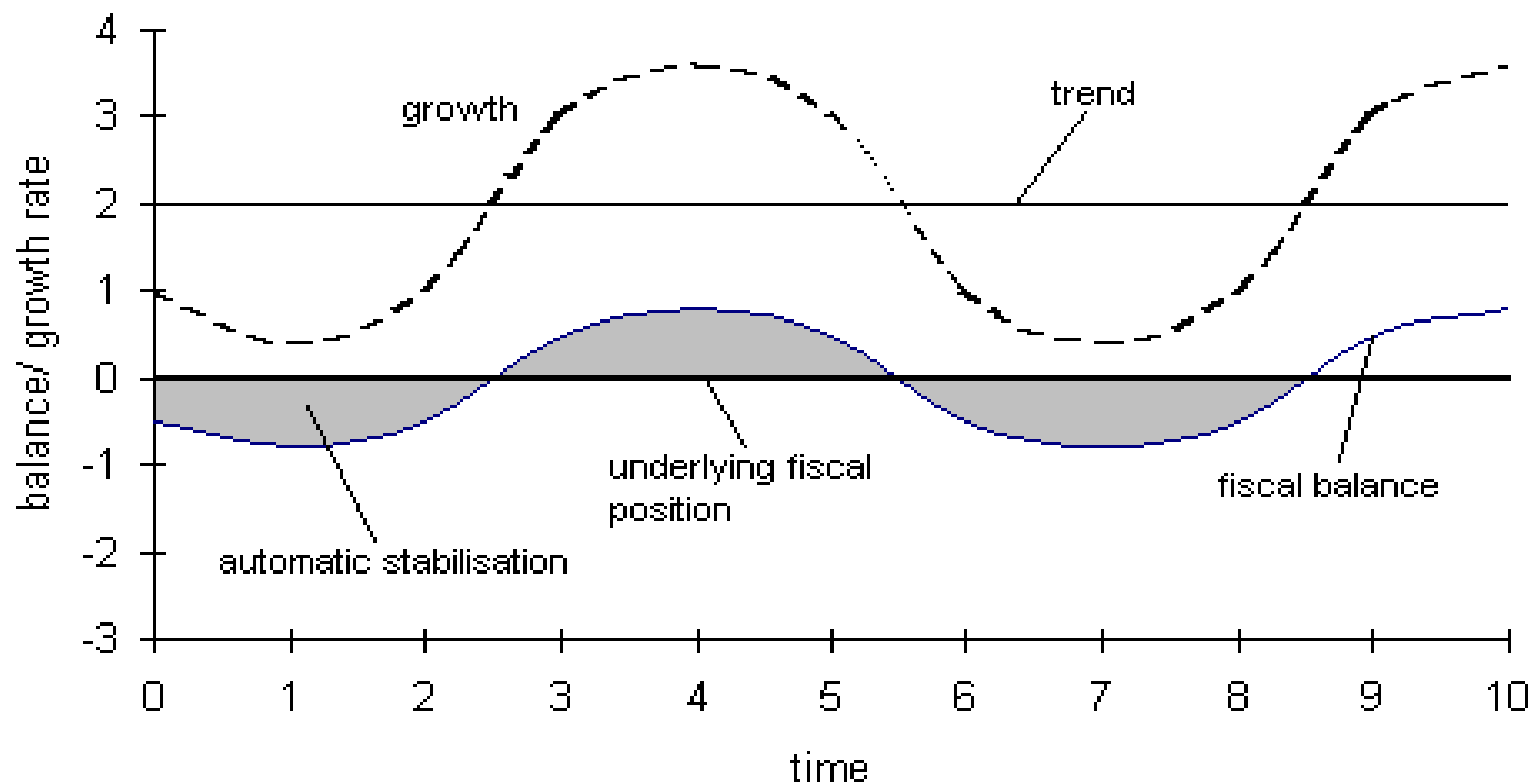
- Assume government taxes 50% of GDP in period t and plans a balanced budget, i.e. to spend all revenues.

- Actual GDP in period t turns out to be 1% lower than planned (output gap 1%).

- Revenues drop by 0.5% of GDP (50% of the change in the output gap).

- Expenditures are set by the budget and do not change in nominal terms.

- Budget balance will be -0.5% of GDP (roughly, because expenditure ratio rises due to denominator effect).

- Government uses 0.5% of GDP less resources from the economy than it provides: automatic stabilisation.

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## Discretionary measures

- **deliberate changes in fiscal policy parameters affect the budget balance and economic activity.**

Estimate of cyclical state of underlying variable (e.g. GDP; components) in real time.

Link of underlying variable to effective tax bases

- effective tax bases not synchronised with underlying variable (e.g. GDP).

Elasticities are not known

- tax elasticity,

- public expenditure (e.g. unemployment benefits).

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GDP vs more realistic base

- GDP is simpler, but components more realistic.
- Composition effects: different growth rates of GDP components imply different revenue behaviour (e.g. export v. consumption driven growth).
- True tax bases difficult to establish (e.g. temporal tax shifting of corporate profits; asset transactions).

Time series (HP filter) *versus* model based

- time series approach is simpler,

- production function method (only for GDP) possibly more accurate.

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| **Macro base** | **Budget component** |
|---|---|
| consumption | indirect taxes |
| wages; employment | direct household taxes and SSC |
| | |
| operating surplus | profit taxes |
| unemployment | unemployment expenditure |

Synchronisation: do macro bases move with GDP in the short run?

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- Estimate budgetary elasticities.

- Bottom up (e.g. using progressivity from tax codes).

- Time series (how did specific tax category behave relative to fluctuations of the underlying base; but need to exclude changes in tax code).

- Risk: elasticities vary over time (see chart).

We need to:

- Decide on the macro bases

- Estimate their cyclical state

- Estimate budgetary elasticities

We can then determine the impact of the cyclical situation on the fiscal outcome.

# Euro area output gap estimates for 2000 and 2001 over the years

**Euro area output gap estimates in successive Commission's forecasts**



output gap (% of potential GDP) vs year of the estimate
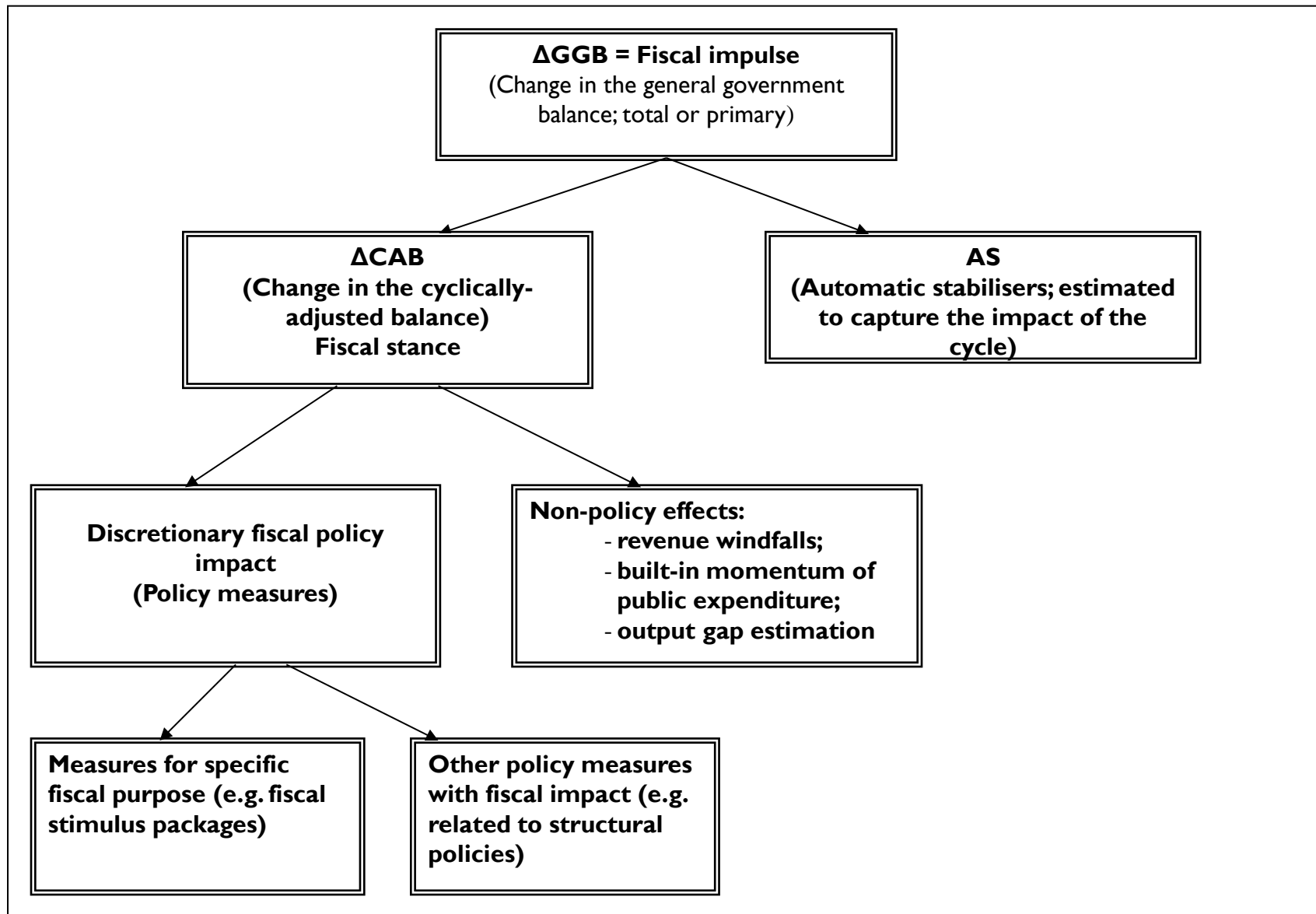
Legend: Output gap in 2000, Output gap in 2001
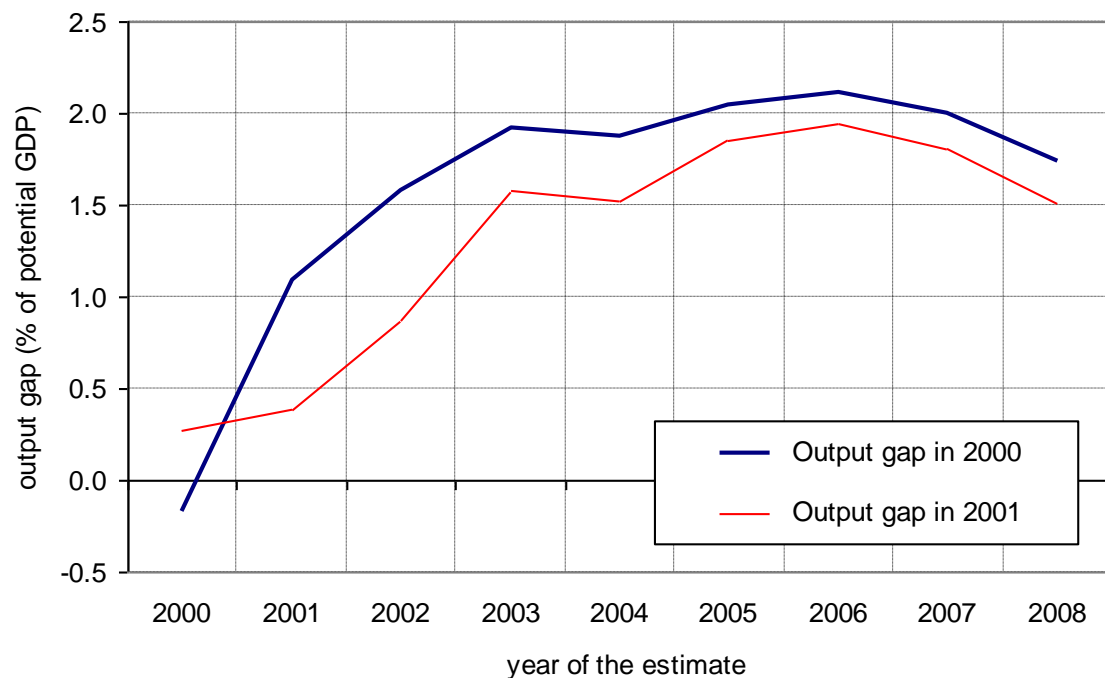
*Source: Ameco database*

Implication:

deficit estimate in 2000: actual deficit broadly equal to cyclically. adjusted deficit.

ex post: large part of (good) fiscal outcome driven by large positive output gap.

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**ΔGGB = Fiscal impulse**
(Change in the general government balance; total or primary)

**ΔCAB**
**(Change in the cyclically-adjusted balance)**
**Fiscal stance**

**AS**
**(Automatic stabilisers; estimated to capture the impact of the cycle)**

**Discretionary fiscal policy impact**
**(Policy measures)**

**Non-policy effects:**
- **revenue windfalls;**
- **built-in momentum of public expenditure;**
- **output gap estimation**

**Measures for specific fiscal purpose (e.g. fiscal stimulus packages)**

**Other policy measures with fiscal impact (e.g. related to structural policies)**

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## Discretionary measures

• deliberate changes in fiscal policy parameters affect budget balance and economic activity.

## Non-policy effects:

• revenue windfalls/shortfalls.

• built-in momentum of expenditures.

• output gap estimation (real time versus ex post).

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## Revenue windfalls / shortfalls

- variations in tax receipts above what is explained by variations in the tax base, standard elasticities and known tax measures.

## Built-in momentum of expenditures

- actual growth slowdown combined with downward revision of trend growth estimate (i.e. unchanged output gap) leads to apparent discretionary expenditure increase.

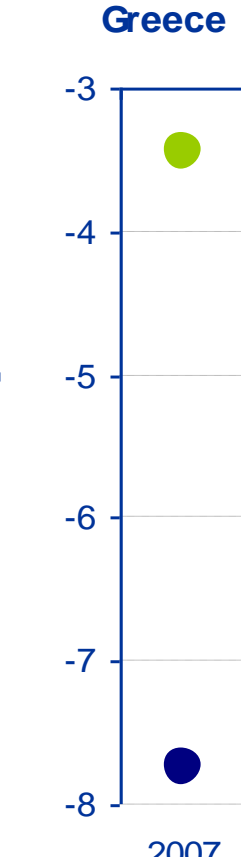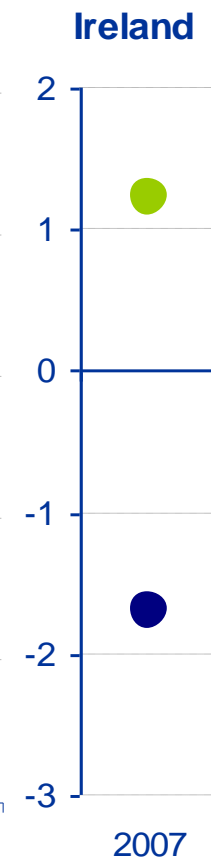## Output gap estimation (real time versus ex post)
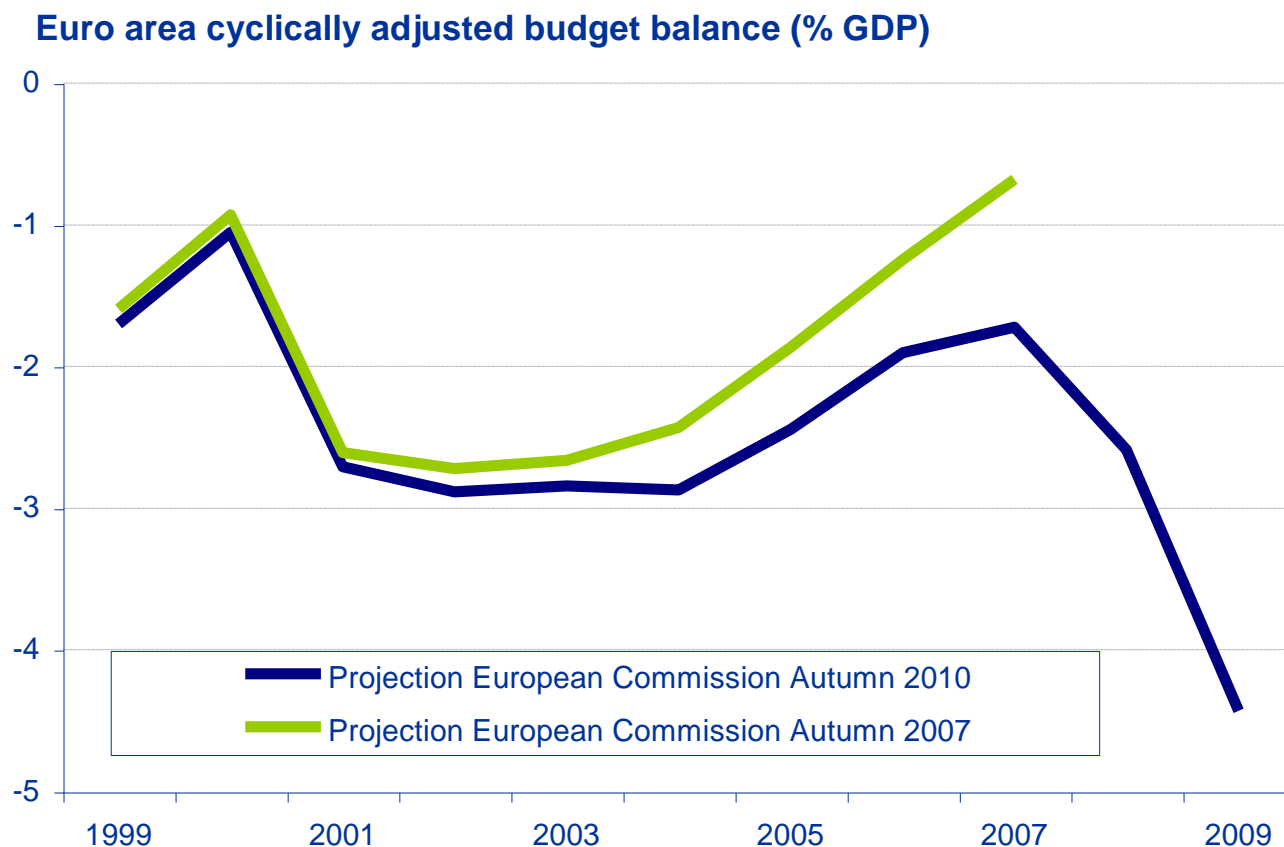
- ex-post revision of estimates of output gap changes lead to different assessment of changes in CAB.

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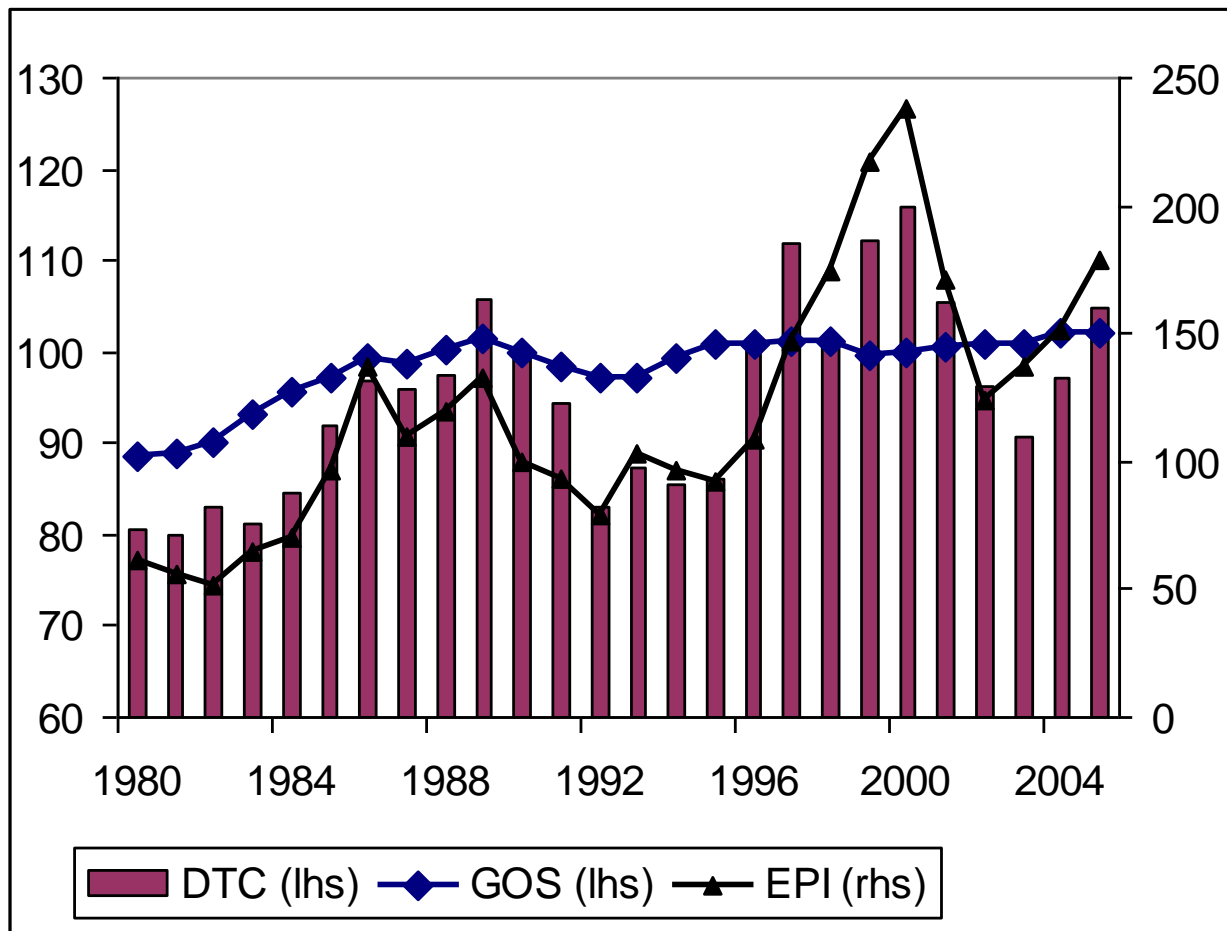
Example with corporate profits: relation between gross operating surplus, GOS (tax base) and tax collection (DTC) relatively weak;

Higher correlation between equity prices (EPI) and tax collection (but theoretical link uncertain (Schuknecht, Morris, 2007).

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# Cyclically adjusted deficits were distorted by revenue windfalls and difficulty to fully correct deficits for the cycle

**Euro area cyclically adjusted budget balance (% GDP)**

**Ireland**

**Greece**

— Projection European Commission Autumn 2010
— Projection European Commission Autumn 2007

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Legend:
- cyclical component
- revenue windfalls/shortfalls
- structural expenditure
- other structural revenues
- temporary measures
- change in budget balance
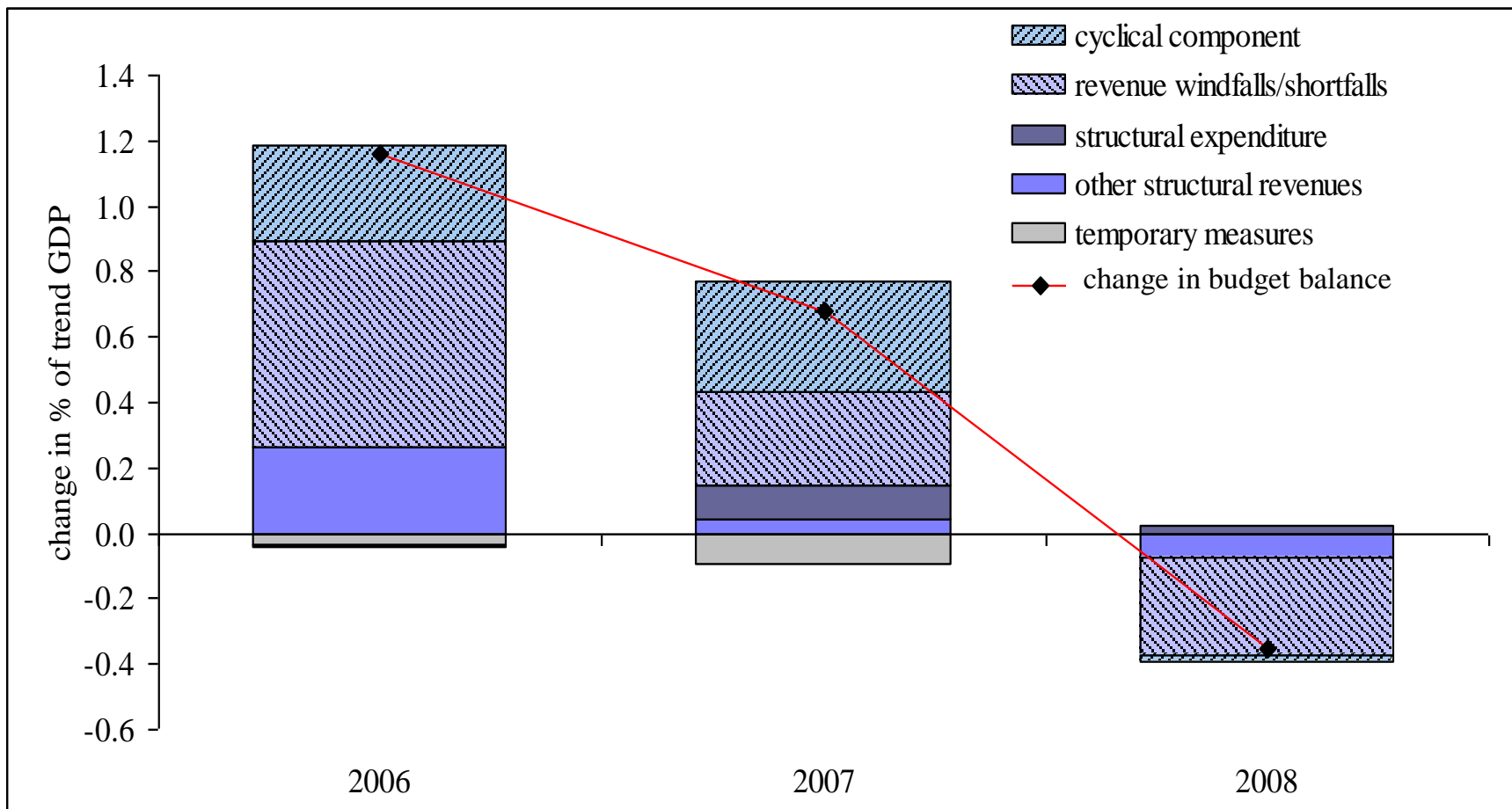
| Memo items | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| Budget balance | -2.5 | -1.3 | -0.6 | -1.0 |
| Δ Budget balance | … | 1.2 | 0.7 | -0.4 |

Source: European Commission;  ESCB calculations.

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How to measure the size of discretionary policies

Bottom up: sum of individual policy measures (changes in taxes, entitlements, investment etc.) reflects the total discretionary impulse on the economy.

problem: need for information (central government, state, local, social security).

Top down: total change in the budget balance minus cyclically induced change is equal to the discretionary part.

problem: assumes an accurate and comprehensive assessment of the cyclical reaction.

Discretionary measures (2/2)

- **EU Recovery Plan: EUR 170 bn (1.2% of GDP) by MS; EUR 30 bn (0.3% of GDP) by EU**

- **EC assesses the fiscal stimulus announced by euro area countries since Sept. 2008 to be 1.0% of GDP in 2009 and 0.7% in 2010 (+0.4% extra-budgetary support for the private sector).**

**EC assessment of 2009 fiscal stimulus packages**

% of GDP

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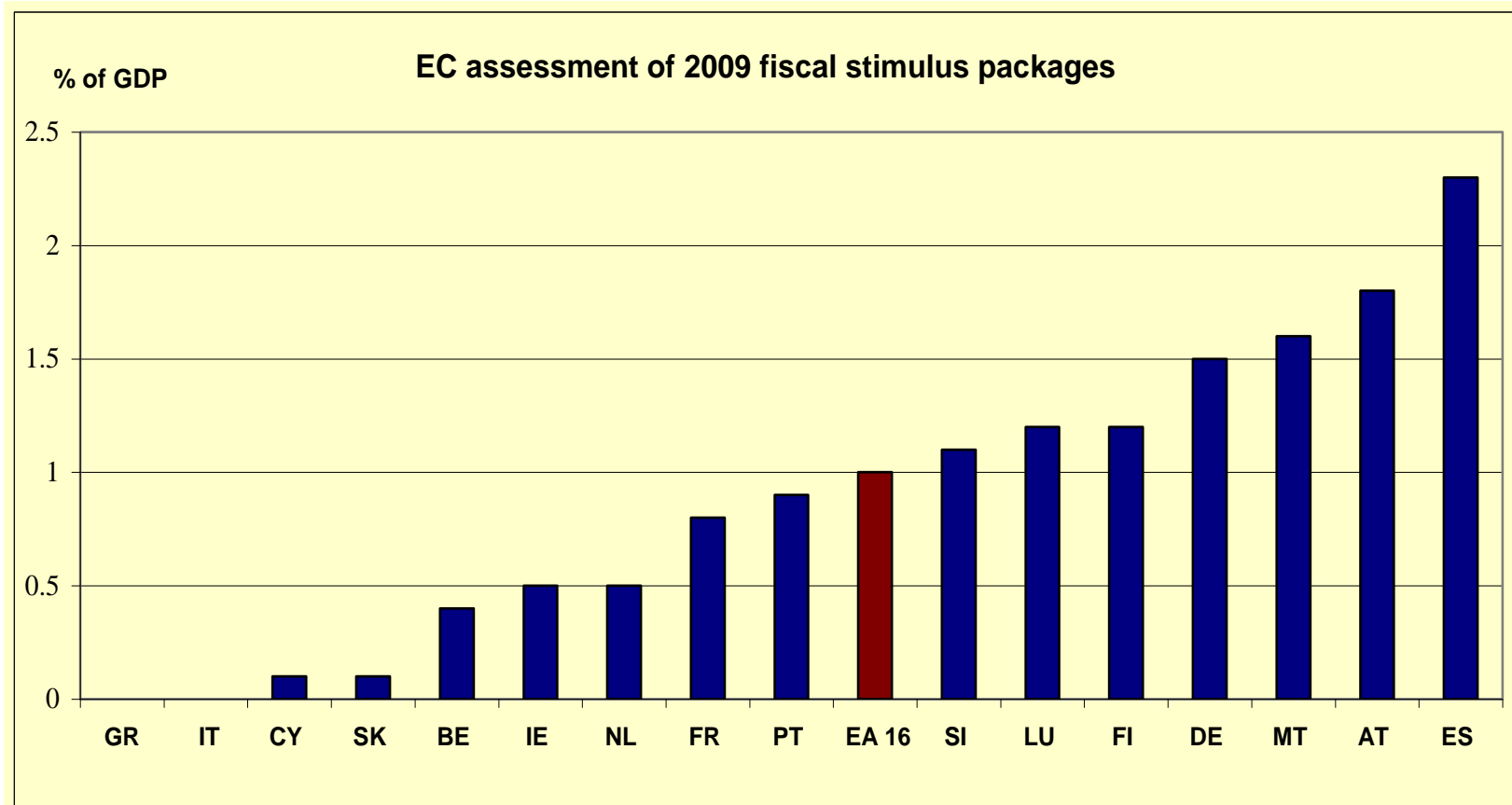
## Why stabilisation

- According to Musgrave, stabilisation is one of the functions of the government's fiscal policies (in addition to redistribution, and allocation).

- assumes that governments can reduce unwarranted economic volatility (Keynesian demand policies).

## What type of policy

- discretionary measures or reliance on automatic stabilisers?

# The decomposition of the budgetary support (fiscal impulse) in the euro area

| Fiscal variable (pp GDP) | Δ General Government balance (Fiscal Impulse) | | | Automatic stabilisers (Impact of the cycle) | | | Δ Cyclically adjusted balance (Fiscal stance) | | | Fiscal stimulus package (expansionary measures) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| **EURO AREA** | 1.2 | 3.1 | 0.5 | 0.7 | 2.1 | 0.5 | 0.5 | 1.0 | 0.0 | 0.5 | 0.9 | 0.7 |
| GERMANY | 0.1 | 3.9 | 1.1 | 0.4 | 2.2 | 0.5 | 0.0 | 1.7 | 0.6 | 0.0 | 1.4 | 1.9 |
| FRANCE | 0.4 | 2.9 | 0.2 | 0.5 | 2.4 | 0.7 | -0.1 | 0.5 | -0.5 | 0.0 | 0.7 | 0.0 |
| SPAIN | 6.0 | 3.7 | 0.0 | 1.7 | 3.0 | 1.0 | 4.3 | 0.7 | 1.0 | 3.1 | 1.1 | 0.3 |
| ITALY | 1.2 | 2.1 | 0.4 | 1.1 | 2.2 | 0.2 | 0.1 | -0.1 | 0.2 | 0.0 | 0.2 | 0.1 |

*Source: IMF WEO 2009 and ECB calculations*

# Overall fiscal impulse and fiscal indicators in selected industrial economies

| % of GDP | Fiscal impulse/ stimulus (2010 compared to 2007) | | | General government deficit/surplus (2008) | General government gross debt (2008) |
|---|---|---|---|---|---|
| | Overall | Automatic stabilisers | Fiscal stimulus packages (cum. 2008 - 2010) | | |
| Euro Area | 4.8 | 3.3 | 2.1 | -1.8 | 69 |
| US | 5.9 | 1.2 | 4.8 | -6.1 | 71 |
| UK | 6.9 | 2.3 | 1.5 | -4.6 | 50 |
| Japan | 4.7 | 3.4 | 2.2 | -5.0 | 200 |
| China* | 4.5 | - | 4.4 | -0.3 | 18 |

Automatic stabilisers typically play a more important role in European economies compared to the US due to larger public sectors

*Source: ECB calculations based on IMF January 2009 World Economic Outlook projections. Fiscal stimulus data are from IMF-FAD (February 2009) "The size of the fiscal expansion: an analysis for the largest countries". Fiscal impulse (overall and the automatic stabilisers) is expressed in percentage points of GDP. * Data for China refer to the central government only*

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# Criteria for effective stimulus

- **Three criteria for a fiscal stimulus to be effective:**

  1. **Timely:** may be hampered by the difficulty to identify downturns in real time and by decision and implementation lags;
     risk of pro-cyclical fiscal policy (ex-ante less concern in crisis).

  2. **Targeted:** targeting fiscal policies to e.g. liquidity and credit-constrained beneficiaries (higher share in crisis) may be difficult distortions of competition, preventing the adjustment process.

  3. **Temporary:** temporary measures may prove difficult to reverse risks to fiscal sustainability may lead agents to save rather than spend the fiscal stimulus.

- **Combining any fiscal stimulus with credible fiscal exit and consolidation strategy crucial to ensure longer-term sustainability of public finances and to anchor expectations and confidence in financial stability.**

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**Problems with discretionary fiscal policies**

- Asymmetric incentives for policy makers: expenditure benefits favour few, tax burden falls on many.

- Identification of the cycle: uncertainty over current cyclical state and outlook.

- Lags in design, decision, implementation of measures: politicians need to agree, find parliamentary support, and time for administrative realisation.

- Limited absorption capacity, e.g. in specific sectors (construction).

- Decision on measures is subject to political influence.

- The behaviour of firms and households.

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**Possible unwanted results of discretionary fiscal policies:**

- pro-cyclical discretionary fiscal measures: destabilising effect on the economy.

- expansionary measures: either not reversed (higher deficits, and debt) or financed by higher taxes (trend increase in the tax burden).

There is a contrast with automatic stabilisers, which are:

- countercyclical,

- symmetric.

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**Discussions on need for fiscal stimulus measures**

- Temporary, targeted, timely

- Different effectiveness of fiscal measures; revenue versus expenditure measures

- Need to address the underlying problems: financial sector

- Limits to fiscal stimulus

  – Ricardian behaviour,

  – government financing constraints.

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## OECD, Cobb-Douglas production function (Giorno et al. 1995)

$$Y_t = AN_t^{\alpha} K_t^{(1-\alpha)} E_t \qquad \alpha > 0$$

$A$ − technical progress; $Y$ − output; $N$ − labour; $K$ − stock of capital, $\alpha$ − income elasticity to labour; $E$ − TFP.

$$\ln Y_t = \ln A + \alpha \ln N_t + (1-\alpha) \ln K_t + \ln E_t$$

$$y_t = a + \alpha n_t + (1-\alpha)k_t + e_t$$

$y*$ − potential GDP

$$y_t^* = a + \alpha n_t^* + (1-\alpha)k_t + e_t^*$$

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$B^e$ – structural budget balance,

$T_i^e$ – strucutural component of public revenue $i$,

$G^e$ – structural component of current current spending.

$$B_t^e = \sum_{i=1}^{n} T_{i,t}^e - G_t^e - \text{capital spending}$$

$$T_{i,t}^e = T_{i,t}\left(\frac{Y_t^*}{Y_t}\right)^{\gamma_i} \qquad G_t^e = G_t\left(\frac{Y_t^*}{Y_t}\right)^{\beta}$$

$g_i$ , $b$ - income elasticities of budgetary items.

One assumes that capital spending is seldom affected by the cycle (the structural value is equal to the effective value).

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**The EC's approach** (CE, 1995)

Potential GDP is obtained with the use of the HP filter

$$
\begin{cases}
Min \displaystyle\sum_{t=1}^{T} (y_t - y_t^*)^2 \\[2em]
s.\ to\ \displaystyle\sum_{t=2}^{T\text{-}1} \left[ (y_{t+1}^* - y_t^*) - (y_t^* - y_{t-1}^*) \right]^2 \leq \varepsilon
\end{cases}
$$

$y,\ y^*$ - log of actual and potential GDP, the filter minimizes the variance of the cyclical component $(y_t - y_t^*)$

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$$Min \sum_{t=1}^{T}(y_t - y_t^*)^2 + \lambda \sum_{t=2}^{T-1}\left[(y_{t+1}^* - y_t^*) - (y_t^* - y_{t-1}^*)\right]^2$$

$\lambda$ - Lagrange multiplier.

$\lambda$=100 is suggested for annual data, $\lambda$=1600 is suggested for quarterly data, Kydland, Prescott (1990, p. 9): "with this value, the implied trend path for the logarithm of real GNP is close to the one that students of business cycles and growth would draw through a time plot of this series."

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To get the structural budget balance (% of GDP) $b^e$, one subtracts the cyclical component, $b^c$, from the total budget balance.

$$b_t^e = b_t - b_t^c$$

$$b_t^e = (t_{i,t} - g_t) - (t_{i,t}^c - g_t^c)$$

$$t_{i,t}^c = \eta_{T,t} \times \frac{T}{Y} \times \left( \frac{Y_t - Y_t^*}{Y_t^*} \right) \qquad g_t^c = \eta_G \times \frac{G}{Y} \times \left( \frac{Y_t - Y_t^*}{Y_t^*} \right)$$

$\eta_{T,t}$ – income-revenue elasticity (corporate taxes, income taxes, social security contributions, indirect taxes).

$\eta_G$ – income-spending elasticity (unemployment benefits).

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In general terms, the income elasticities are as follows:

$$\eta_G = \frac{\partial G / G}{\partial Y / Y} \qquad\qquad \eta_T = \frac{\partial T / T}{\partial Y / Y}$$

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**The Eurosystem's approach** (Bouthevillain et al., 2001)

The cyclically adjusted budget balances are computed on the basis of a so-called disaggregated method.

Both the OECD and the EC not account for composition effects as they assume that cyclical fluctuations in GDP have a constant impact on the budget balance.

The cyclical adjustment of fiscal balances is instead based upon the actual evolution of the macroeconomic bases.

The decomposition of the series into trend and a cyclical part also uses the Hodrick-Prescott filter.

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## Sensitivities of the budget balances in the EU countries in 1999

| | Budgetary sensitivities 1) | | | | European Commission 4) |
|---|---|---|---|---|---|
| | O Eurosystem | OECD | Difference with respect to OECD estimates 2) | | |
| | | | Total | Difference due to macroeconomic elasticities 3) | |
| Belgium | 0.56 | 0.61 | -0.05 | 0.00 | 0.65 |
| Germany 5), 6) | 0.45 | 0.51 | -0.06 | 0.10 | 0.50 |
| Greece | 0.38 | 0.44 | -0.06 | 0.00 | 0.35 |
| Spain | 0.40 | 0.40 | 0.00 | 0.02 | 0.40 |
| France | 0.53 | 0.42 | 0.11 | 0.18 | 0.45 |
| Ireland | 0.42 | 0.31 | 0.11 | 0.16 | 0.40 |
| Italy 6) | 0.48 | 0.48 | 0.00 | 0.10 | 0.40 |
| Luxembourg | 0.33 | NA | NA | NA | 0.60 |
| The Netherlands | 0.69 | 0.64 | 0.05 | 0.20 | 0.85 |
| Austria | 0.47 | 0.31 | 0.16 | 0.16 | 0.30 |
| Portugal | 0.50 | 0.39 | 0.11 | 0.18 | 0.30 |
| Finland | 0.55 | 0.64 | -0.09 | -0.01 | 0.65 |
| **euro area** | **0.49** | **0.48** | **0.01** | **0.11** | **0.48** |
| Denmark | 0.67 | 0.75 | -0.08 | 0.10 | 0.85 |
| Sweden | 0.75 | 0.68 | 0.07 | 0.11 | 0.80 |
| United Kingdom | 0.65 | 0.50 | 0.15 | 0.15 | 0.45 |
| **EU 15** | **0.53** | **0.49** | **0.03** | **0.12** | **0.50** |

Source: Bouthevillain et al. (2001, Table 4.3, pp. 42).

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The sensitivity is the change in the budget balance as a percentage of GDP in response to a 1% change in GDP. The latter is obtained via a calibrated shock on all private sector components of the same magnitude, so that the total shock on GDP adds up to 1%.

The Eurosystem sensitivities (Bouthevillain et al., 2001), are generally in a range of 0.4-0.6, with higher values for the Netherlands, Denmark, Sweden and the United Kingdom.

They are on average very close to the estimates published by the OECD.

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Bouthevillain, C; Cour-Thimann, P.; van den Dool, G.; Hernández de Cos, P.; Geert Langenus, G.; Mohr, M.; Momigliano, S., Tujula, M. (2001). "Cyclically adjusted budget balances: an alternative approach," ECB Working Paper 77.

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