

**Public Finances in the Economic and Monetary Union (PFEMU)**  
 ISEG - School of Economics and Management

Exam, 17 January 2018 - **Duration: 2h**

1. The exam has two groups. The points for each question are mentioned alongside.
2. ALL the questions in group ONE need to be answered.
3. Choose ONLY 2 questions from group TWO.
4. Only non-graphical calculators are allowed. It is not possible to use any reading material. During the exam no clarifications can be made. It is not allowed the use of mobile phones or computers. Improper use will lead to cancellation of the exam.

**I**

1. In the unpleasant monetarist arithmetic framework, consider the per capita government budget constraint

$$\frac{B_t}{N_t} = \left( \frac{1+R_{t-1}}{1+n} \right) \frac{B_{t-1}}{N_{t-1}} + \frac{D_t}{N_t} - \frac{H_t - H_{t-1}}{N_t P_t}$$

where the notation and the variables are the ones used in class. Assuming a constant growth rate,  $\theta$ , for the monetary base, and its proportionality to prices,  $P_t = (1/h)(H_t / N_t)$ , determine and show how the growth rate of monetary base impacts on the per capita government debt stock. [3.00]

Using the growth rate of monetary base,

$$H_t = (1+\theta)H_{t-1},$$

and its proportionality to prices, we have:

$$b_t = \left( \frac{1+R_{t-1}}{1+n} \right) b_{t-1} + \frac{D_t}{N_t} - \frac{h\theta}{1+\theta}$$

Hence, the smaller the growth rate of the monetary base,  $\theta$ , the higher the per capita debt stock  $b_t^\theta$

$$\frac{\partial b_t^\theta}{\partial \theta} = -\frac{h}{(1+\theta)^2} < 0$$

and

$$\nabla \theta \rightarrow \Delta b_t^\theta$$

2. “The Sargent and Wallace analysis is a general case of the Leeper-Sims-Woodford analysis”. Comment the previous sentence and justify your answer. [3.00]

- The statement is incorrect since the SW case is a mitigated one of the more general LSW assertion of the FTPL.
- Unpleasant monetarist arithmetic: inflation is still a monetary result.
- FTPL is less orthodox, price level would be determined via the fiscal behaviour regardless of changes in the money stock.
- Orthodox view of the price level, prices grow on a one-to-one basis with money.
- “weak form” of FTPL: Sargent and Wallace (1981), fiscal policy is exogenous, impinges on the price level via the money supply;
- “strong form” of FTPL: Leeper-Sims-Woodford, fiscal policy affects the price level independently of the money supply.

### Leeper-Sims-Woodford

- in a non-Ricardian regime, the government budget constraint determines a unique price level
- $B_t$  – nominal government liabilities (including debt and money base);
- $s_t$  – real primary government budget surplus (with seigniorage revenue);
- $r$  – real interest rate, constant by hypothesis;

$$\frac{B_t}{P_t} = \sum_{s=0}^{\infty} \frac{s_{t+s}}{(1+r)^{s+1}}$$

- Direct effects of fiscal policy on the price level.
- The price level is determined via the intertemporal government budget constraint.
- The price level ( $P$ ) adjusts to ensure that the current real value of outstanding government debt ( $B$ ) is equal to the actual real value of future primary budget balances.

3. Explain the characteristics of the so-called preventive and corrective arms of the Stability and Growth Pact. [3.00]

#### Preventive arm: monitoring and surveillance

- Stability and convergence programmes;
- Annual programs submitted by Member States;
- Outline macroeconomic projections and fiscal policy plans for the next and the following 2 years;
- Peer review process, discussed by all Member States in Brussels;
- ECOFIN Council conclusions;
- MTO: medium-term objective (by country).

#### Corrective arm: the excessive deficit procedure

- European Commission initiates excessive deficit procedure (mostly ex post, ex ante less frequent);

- Ecofin Council decides on i) existence of excessive deficit; ii) recommendation to correct the excessive deficit situation;
  - deadline for correction (usually 1 year after identification);
  - correction path (annual adjustment of 0.5% in structural terms);
  - implement corrective measures;
  - regular monitoring.
- Debt path adjustment: 1/20 of the excess over 60%.

Medium-term objective (by country), defined in terms of structural balance (cyclically adjusted, net of one-off and temporary measures)

- minimum benchmarks: need to stay away from 3% limit (dependent on GDP growth volatility and budgetary elasticities);
- make progress toward fiscal sustainability (reduction of high debt ratios); leave room for manoeuvre;
  - Adjustment path to MTO: 0.5% of GDP structural adjustment.

**4. Consider the following data for the Stability Program of Spain:**

Country A	2018	2019	2020	2021
Nominal GDP (EUR billions)	665000	668000	673000	679900
Long-term interest rate (%)	2,8	2,6	2,4	2,2
Primary spending (EUR billions)	572500	573000	573700	574000
Total revenue (EUR billions)	575000	576100	576200	575300
Government debt (EUR billions)	692800	685780	685000	677500
Total spending (EUR billions)	591898	590830	590140	588905

**a) Compute the share of interest payments in GDP in 2019, 2020, in 2021 and assess the potential fiscal sustainability implications in that context (present the calculations). [1.50]**

**b) For the period 2018-2021 assess and comment the compliance of Spain with the EU fiscal framework. [1.50]**

Interest payments (EUR billions)	19398	17830	16440	14905	a)
Debt ratio (% of GDP)	104.18	102.66	101.78	99.65	b)
Change in debt ratio (% of GDP)		-1.52	-0.88	-2.14	b)
Change in debt ratio needed		-2.21	-2.13	-2.09	b)
Interest payments (% of GDP)	2.92	2.67	2.44	2.19	a)
Total balance (% of GDP)	-2.54	-2.21	-2.07	-2.00	b)
Total balance (% of GDP)	-2.54	-2.21	-2.07	-2.00	b)
$y=(Y_t/Y_{t-1})*100$		0.451	0.749	1.025	a)
r-y		2.149	1.651	1.175	a)

**II**


Answer ONLY 2 of the following 3 questions:

5. Explain succinctly:

- a) Fiscal sustainability, its theoretical underpinnings and empirical assessment procedures. [2.00]

$$b_t - b_{t-1} = \frac{r_t - y_t}{1 + y_t} b_{t-1} + g_t - \rho_t - k \frac{\lambda_t}{1 + \lambda_t} - z_t \quad (19)$$

The development of the debt-to-GDP ratio depends of:

- the product between the accumulated stock of government debt and the difference between the real interest rate and the real growth rate; 

- the primary budget balance;

- seigniorage revenues;

- revenues from selling assets.

- Stationarity, cointegration.

- b) The relevance of rationed and non-rationed consumers for the outcome of expansionary fiscal consolidations. [2.00]

- Ricardian households: smooth consumption, can save, and have access to credit.
- Non-ricardian households (rationed): credit constrained, consume their labour income in each period.
- More rationed consumers, the lower the probability of occurrence of an expansionary fiscal consolidation event.

6. Answer the following questions:

- a) Explain the classification of fiscal impulse measures on the economy. How can one quantify the size of the individual components? [2.00]

### 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).

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.

**b) How can expansionary fiscal consolidations occur via private consumption and via private investment? [2.00]**

The idea of expansionary fiscal consolidations relates also to the possibility of non-Keynesian effects of fiscal policy.

Non-Keynesian effects via private consumption

- “trigger point” for public spending, the fiscal adjustment becomes more probable; after the adjustment there are expectations of future reduction in taxes, and consumers can consider that their permanent income has increased, which implies that private consumption may also rise. Bertola and Drazen (1993).

Non-Keynesian effects via investment

- *crowding-in* of private investment, via the real interest rate;
- wage moderation in the public sector is an example for the private sector: enterprises may choose to increase investment. Alesina and Ardagna (1998).

7. Within the framework of long-term determinants of fiscal policy:

a) Categorize succinctly government liabilities. [1.00]

- Explicit vs implicit; Contingent vs non-contingent;

b) Using that categorization how classify the liabilities in the following examples from the point of view of the government. Please give short explanations:

- 1) The government guarantees a loan given by a bank to a municipality. [0.75]
- 2) The government increases civil servants wages. [0.75]
- 3) An earthquake occurs in a region of the country. [0.75]
- 4) The government increases the forecast for future pension payments. [0.75]

- 1) Government guarantees a loan given by a bank to a municipality. Explicit, contingent.
- 2) The government increases civil servants wages. Explicit, non-contingent.
- 3) An earthquake occurs in a region of the country. Implicit, contingent.
- 4) Government increases the forecast for future pension payments. Implicit, non-contingent.