

Exam

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Eco 569 of QEF Master

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1 Structural reforms and macroeconomic adjustment in the euro area (10 points)

Take the following model

$$p - p^e = \kappa(y - y_n) \text{ with } \kappa = \frac{1 - \alpha}{\alpha}(\eta + 1/\sigma)$$

$$y = \bar{y} + (g - \bar{g}) - \sigma [i - (\bar{p} - p)] + \sigma \ln \beta$$

$$y_n \simeq \frac{1 + \eta}{\eta + 1/\sigma} a + \frac{1/\sigma}{\eta + 1/\sigma} g - \frac{1}{\eta + 1/\sigma} \mu$$

where α is the proportion of firms that cannot reset prices each period, η is the disutility of labor, and σ is the intertemporal elasticity of substitution. Variables with bars are period 2.

Consider 2 countries in a monetary union, that are confronted to a single interest rates. However the three countries differ as follows:

	Country A	Country B
κ	1	1
σ	1/2	1

1.1 Question (2 points)

Compute the equilibrium price p^* and output y^* as a function of $(y_n, \bar{p}, p^e, g - \bar{g})$ for each country.

1.2 Question (4 points)

Recall that α is the proportion of firms that cannot adjust prices in a given period and η is the disutility of labour. What is the effect of structural reforms of the labor market that would amount to decreasing η so much so that $\kappa = 1/2$.

1. On the equilibrium (y^*, p^*) for each country
2. On the effect of a monetary policy shock that implies a 1% reduction in the interest rate i , again for each country
3. On the effect of a fiscal stimulus that increases g by 1, for country A and for country B
4. Are structural reforms desirable?

1.3 Question (2 points)

Assume now that monetary policy follows a rule that leans against inflation with $i = 1, 5(p - p^e)$ in normal times and

$i = 0$ when the economy is at the zero lower bound.

Compare the effects of a fiscal stimulus of 1 on country B in the 2 regimes, normal times and the ZLB before and after the structural reforms of the labour market.

1.4 Question (2 points)

Consider now structural reforms of the goods market which amounts to increase y_n by 1.

Compare the effects of a fiscal stimulus of 1 on country B in the 2 regimes, normal times and the ZLB before and after the structural reforms of the good market.

2 Liquidity risk (6 points)

How much to engage into maturity transformation activities: choosing the amount of an **illiquid** investment I that will pay θI at time 2

The bank finances a fraction m of the investment with short term maturity than need to be rolled over at period 1 and $(1 - m)$ with long term debt, for an R . Instead, the roll over debt cost is only $R - \Delta$.

2.1 Question (1 point)

What is the payoff of maturity transformation?

A natural feature for the competitive equilibrium to exist is that

$$R - m\Delta < \theta < R$$

The form of liquidity risk With probability p , bad state at period 1 and some banks won't be able to service (reimburse) short-term debt.

Given that the dividends are uniform, the proportion of banks in distress in the bad state is mI/K , a proxy of short term debt to capital.

Key assumption: for any bank, the deadweight costs of distress is increasing in the fraction of banks in distress (fire sale externality)

The fraction of bank in distress in the bad state will depend on \bar{I} , the average of maturity transformation across all banks. We hence assume that for each bank, the deadweight cost is $Z = \gamma\bar{I}$.

The net expected profit for each bank is:

$$\Pi = I(\theta - R + m\Delta) - \frac{pmI\gamma\bar{I}}{K}$$

2.2 Question (1 point)

Derive the level of investment I which maximises the profit of the individual bank which ignore the effect of its decision on aggregate investment \bar{I} ?

2.3 Question (2 point)

Taking the view of the social planner, derive the level of investment I which maximises the profit, now taking into account the effect of its decision on aggregate investment \bar{I} ? Compare with the previous level of investment and discuss.

2.4 Question (2 point)

Consider now that the government wants to create incentives for banks to internalize the social costs of excess roll over risks. How can he proceed? Show how this policy would bring, by affecting the decision of individual banks, the level of investment to the one chosen by the social planner.

3 Implicit guaranties of the banking sector and sustainability of public debt (6 points)

Consider 2 countries C and D, units are billion euros

	C	D
GDP	100	20
Bank assets	100	100
Bank capital	5	5
Public debt	80	15
Pub. debt of C held by banks	30	20
Pub. debt of D held by banks	0	10

3.1 Questions (1 point each)

Assuming all non public debt assets are either loans to households/firms or loans to the banking system of the other country and all liabilities are deposits that pay the interest rate set by the central bank,

1. how much can each banking system lend to households/firms or to the other banking system?
2. if the central bank interest rate is 2% and the return on public debt is 3%, write the return on equity of each banking sector as a function of the interest rate on loans, assuming these are risk free.

3. Assume now that banks have to hold 5% of capital on each unit of loans to the private sector or to the banking sector. What is the maximum they can lend? What if capital requirements increase to 10% of the loan portfolio? What would be the effect on the demand of banks for public debt.
4. Assume now that the loan portfolio of banks in country D is subject to large losses which will be comprised between 10 and 30%. In order to prevent a run of depositors, the government of country D decides to guaranty deposits of its banks. By how much does this increase the liability of the sovereign in country D? Is it problem?
5. What happens if the banking sector of country D tries to shed assets instead? How can it impact country C? Distinguish the case where the price of public debt is not affected and when it is.
6. Assume banks have to hold 10% of bank loans as capital and that each billion of public debt sold by banks induces a decline of 0,5%. What are the effects of the banking sector of country C selling half of its public debt.