1 Current Account (weight 50%)

Suppose the Norwegian economy is in steady state and there are no shocks hitting the economy, that is all aggregate variables are constant.

- Assume now that we suddenly learn that output increases in 3 years. What happens to the current account today, in 3 years and in 10 years?.
- Suppose the Norwegian government wants to keep the current account constant. How can it use government expenditure to do so?

Hint: It is fine to make specific assumptions on the utility function, e.g. CES. Explain your results. Keep your answer concise. There is no benefit from long but imprecise answers.

2 Global Risk-sharing and Market Incompleteness (weight 50%)

Consider a complete market model with Arrow-Debreu securities (ADS). There are Θ contingencies in the next period. Denote the probability of each state as $p(\theta)$, and the corresponding price of ADS as $q(\theta)$.

1. How many ADS exist in the contingent market?
2. Write down the no-arbitrage condition of ADS, and explain the intuition.
3. Consider a risky asset with expected return $(r_1, r_2, ..., r_\Theta)$. Can it be replicated by ADS, if yes, write down how to construct the portfolio.

In an open economy with home country (H) and foreign country (F). There are two periods: t, $t+1$. Period $t+1$ has uncertainties. The contingent claims market and ADS can be described as aforementioned. Output Y_t^i and Y_{t+1}^i are endowments ($i = H, F$). Take the following notation: saving as $S_t(\theta)$, consumption as $C_t(\theta)$, and β as discount factor.

1. Write down the optimization problem for H (thus F is symmetric).
2. Do countries choose $C_t(\theta)$ or $S_t(\theta)$ for maximization problem?
3. Derive the Euler Equation, and use it to explain global risk sharing. (Hint: What is the relationship between $u'(C_{t+1}(\theta))$ and $u'(C^*_{t+1}(\theta))$.)
4. Suppose that households have log-utility: $U(C_\tau) = log(C_\tau(\theta))$, ($\tau = t, t+1$). What is the relationship between consumptions in H and F?
5. Do countries share the idiosyncratic and (or) aggregate risks?

Now suppose there is market incompleteness. Consider an I-country model in which each country holds claims on other countries' output. Countries i can also hold risk-free bond B_t^i. Output Y_τ^i ($\tau = t, t+1$) is endowment. $w(i,n)$ is the share of country $n's$ wealth held by country i.

1. Write down the maximization problem and budget constraints for country i in period t and $t+1$.

2. Does the previous Euler Equation hold? Explain why.

3. Explain how the incompleteness lead to the "Equity Home Bias Puzzle". *(Hint: discuss the solution to the problem in question 1.)*

4. Suppose the source of market incompleteness is limited enforceability. Let us consider a sovereign debt problem.

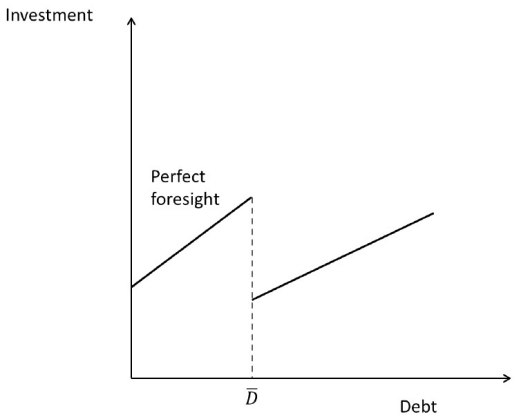

Figure 1: Debt ceiling with investment

(a) For Figure 1, explain why investment level suddenly drops at $\bar{D}$.

(b) Suppose the debtor country accumulate large amount of sovereign debts. The creditor country would like to provide more incentive for its debtor country not to default on the future debts. What should creditor country do?