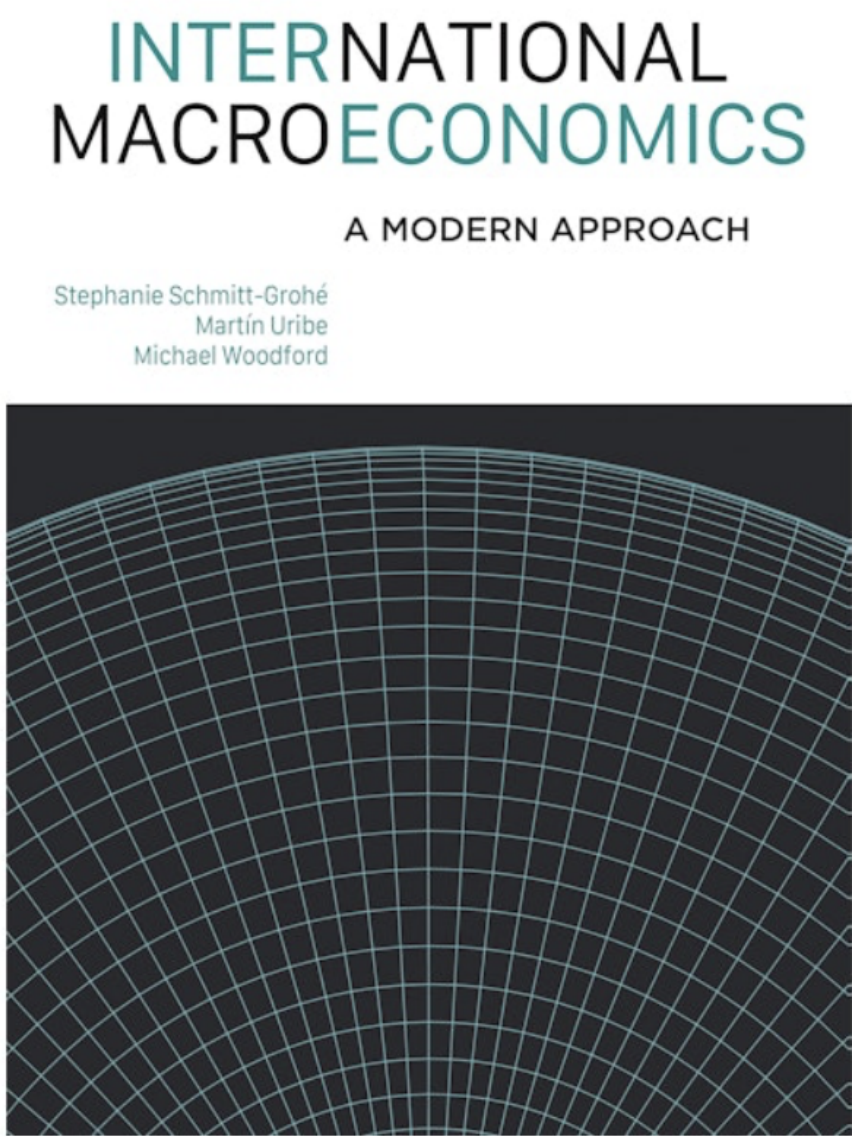

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Slides EC201

Chapter 4 Summary

Terms of Trade, World interest rate Shocks and Tariffs

Last week analysed the effects of:

- Terms of trade shocks
- Changes in the world interest rate
- Import Tariffs

We introduced small changes to the model studied in week 3.

Terms of trade shocks

Terms-of-Trade Shocks

Two goods: allows for differences in the type of goods exported and imported.

The **terms of trade** (TT) is the relative price of exports in terms of imports:

$$TT_t = \frac{P_t^X}{P_t^M}$$

Endowment good must be exported while consumption good must be imported! This is different from chapter 3 where we had the same endowment and consumption good (bananas).

Intertemporal Budget Constraint

With two goods (exports and imports), the period-budget constraints:

Period 1:

$$P_1^M C_1 + P_1^M (B_1 - B_0) = P_1^M r_0 B_0 + P_1^X Q_1.$$

Divding both sides by P_1^M

$$C_1 + (B_1 - B_0) = r_0 B_0 + \frac{P_1^X}{P_1^M} Q_1.$$

Similarly, the budget constraint in period 2 is

$$C_2 + B_2 - B_1 = r_1 B_1 + TT_2 Q_2.$$

Intertemporal budget constraint then becomes:

$$C_1 + \frac{C_2}{1 + r_1} = (1 + r_0) B_0 + TT_1 Q_1 + \frac{TT_2 Q_2}{1 + r_1}$$

Effects of Terms-of-Trade Shocks

Terms-of-trade shocks behave identically to endowment shocks:

- **Temporary improvement** ($TT_1 \uparrow$, TT_2 unchanged):
  - Current account improves ($\text{CA}_1 \uparrow$)
  - Country saves to smooth consumption
- **Permanent improvement** ($TT_1 \uparrow$, $TT_2 \uparrow$ by the same amount):
  - Consumption increases in both periods
  - Little change in current account

Interest Rate shocks

Two Effects of Interest Rate Changes

Relax the assumption of constant interest rate from Chapter 3.

An increase in the world interest rate ($r^* \uparrow$) has:

1. Substitution Effect:

- Bonds become more attractive relative to consumption
- $C_1 \downarrow$, $TB_1 \uparrow$, $\mathsf{CA}_1 \uparrow$

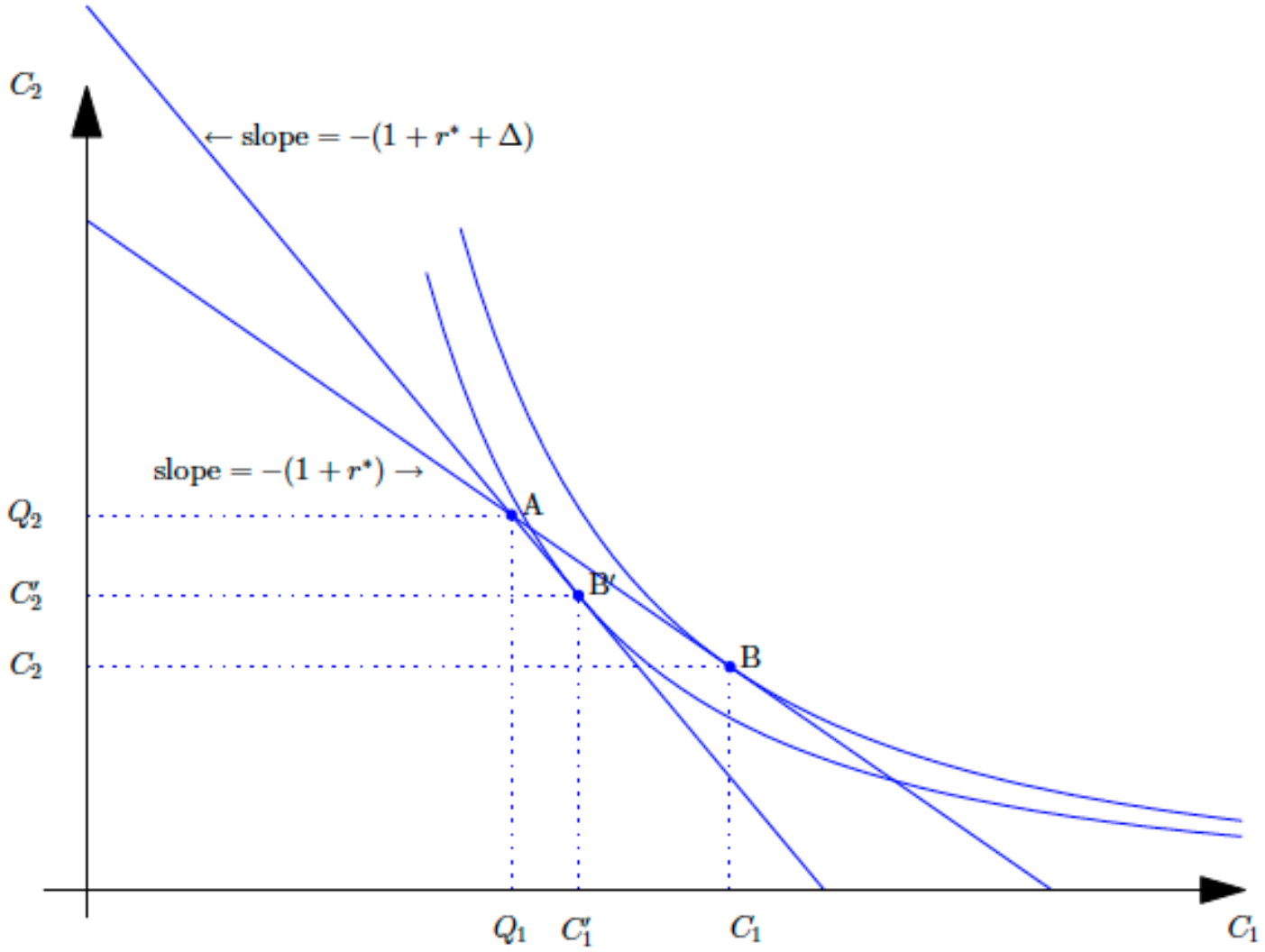
2. Income Effect (depends on borrowing/lending position):

- **If borrowing** ($B_0 < 0$): Interest rate hike makes household **poorer**

- Negative income effect: $C_1 \downarrow$, $TB_1 \uparrow$, $\text{CA}_1 \uparrow$
- Income and substitution effects **reinforce**

- **If lending** ($B_0 > 0$): Interest rate hike makes household **richer**
  - Positive income effect: $C_1 \uparrow$, $TB_1 \downarrow$, $\text{CA}_1 \downarrow$
  - Income and substitution effects **oppose**
  - **Under standard preferences, substitution effect dominates because we want savings to increase with increase in the interest rate**

Adjustment to an Increase in the World Interest Rate ($B_0 = 0$)



Import Tariffs

Import Tariffs

Relax the assumption of free trade from chapter 3.

- Two goods: export good (endowment Q_t) and import good (consumption C_t)
- Import tariff: τ_t in period t
- Government rebates tariff revenue as lump-sum transfer: $L_t = \tau_t C_t$

Household Budget Constraints

$$(1+\tau_1)C_1 + B_1 = TT_1Q_1 + L_1 + (1+r_0)B_0$$
$$(1+\tau_2)C_2 = TT_2Q_2 + L_2 + (1+r_1)B_1$$

Euler Equation

$$U'(C_1) = \frac{1+\tau_1}{1+\tau_2}\beta(1+r_1)U'(C_2)$$

Economy-Wide Resource Constraint Since tariff revenues are rebated:

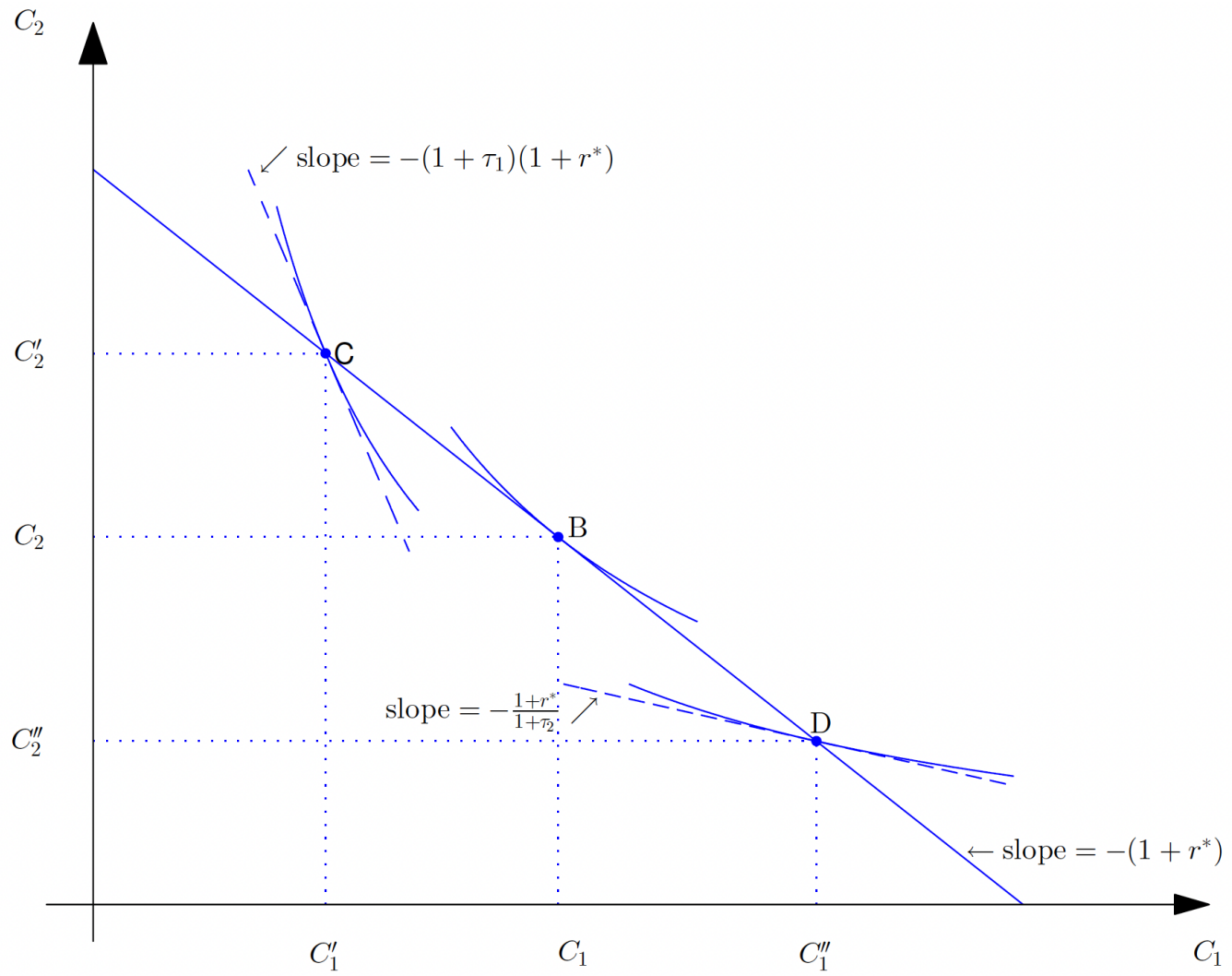
$$C_1 + \frac{C_2}{1+r^*} = (1+r_0)B_0 + TT_1Q_1 + \frac{TT_2Q_2}{1+r^*}$$

(Same as without tariffs, no red parts)

Effects of Tariff Changes

1. Temporary Tariff ($\Delta\tau_1 > 0$, $\Delta\tau_2 = 0$):
   - From Euler equation: $\frac{1+\tau_1}{1+\tau_2} > 1$ makes current consumption relatively expensive
   - $C_1 \downarrow$, $TB_1 = TT_1Q_1 - C_1 \uparrow$, $CA_1 = TB_1 + r_0B_0 \uparrow$
   - Welfare **decreases** (lower indifference curve)
2. Permanent Tariff ($\Delta\tau_1 = \Delta\tau_2 > 0$):
   - Tariffs cancel out in Euler equation: $\frac{1+\tau_1}{1+\tau_2} = 1$
   - **No effect** on consumption path or trade balance, or current account
   - Welfare is unchanged
3. Anticipated Future Tariff ($\Delta\tau_1 = 0$, $\Delta\tau_2 > 0$):
   - From Euler equation: $\frac{1+\tau_1}{1+\tau_2} < 1$ makes current consumption relatively cheap
   - $C_1 \uparrow$, trade balance **deteriorates**: $TB_1 \downarrow$
   - Welfare decreases

Adjustment to changes in import tariffs



Import tariffs affect the trade balance only if they change the **relative price** of current vs. future consumption. Permanent tariffs have no effect on the CA because they don't create intertemporal substitution incentives.