ECO 406
Developmental Macroeconomics

Lecture 3
Constraints to the Process of Long-Term Growth

Constraints to Long-Term Economic Growth

- An increase in ***autonomou***s Aggregate Demand is needed for equilibrium ***output*** to increase
  - This is true in both the ***short*** and the ***long run***

- But in the ***long run***, output ***growth*** could face some ***constraints***:
  - ***Capacity constraints*****:** Some factors may prevent the adjustment of the ***productive capacity*** of firms to the expected increase in sales
  - ***External constraints*****:** Some factors may prevent the maintenance of a ***balance-of-payment*** equilibrium

Capacity Constraints to Long-Run Economic Growth

- As long as ***investment*** expands, ***productive capacity*** will not become a ***constraint*** on long-run ***growth***

- ***Investment*** depends on the existence of profitable ***opportunities,*** which in turn depend on ***Aggregate Demand***
  - ***Investment*** is thus a function of the difference between the ***expected profit rate*** and the ***cost of capital***

- Therefore, ***investment*** may not occur due to:
  - The ***expected profit rate*** being too low
  - The ***cost of capital*** being too high

Economic Growth in the Absence of Capacity Constraints

- The ***output*** ($\boldsymbol{Q}$) produced at a certain point in time is:

$$\boldsymbol{Q = vuK} \qquad (1)$$

where $\boldsymbol{v = \overline{Q}/K}$ is the ***output-capital*** ratio (i.e., the maximum output that can be obtained from a unit of capital), $\boldsymbol{u = Q/\overline{Q}}$ is the rate of ***productive capacity*** utilization (and $\boldsymbol{\overline{Q}}$ is the maximum or ***potential*** output), and $\boldsymbol{K}$ is the stock of capital

- If we assume that $\boldsymbol{u}$ and $\boldsymbol{v}$ are ***constant***, then:

$$\boldsymbol{\Delta Q = vu\Delta K} \qquad (2)$$

where $\boldsymbol{\Delta K}$ is ***net investment***

Economic Growth in the Absence of Capacity Constraints (cont'd)

- ***Net investment*** (ΔK) is the difference between ***gross investment*** (I) and the ***depreciation of the capital stock*** (δK):

$$\Delta K = I - \delta K \qquad (3)$$

where δ is the rate of ***depreciation*** of the capital stock

- In the long-run equilibrium, u is equal to the level desired by firms (i.e., the ***normal*** level of capacity utilization, u_n):

$$\begin{aligned} \Delta Q &= v u_n \Delta K \\ &= v u_n (I - \delta K) \end{aligned} \qquad (4)$$

The Warranted Rate of Growth

$$\Delta Q = v u_n (I - \delta K)$$
$$= u_n (vI - v\delta K)$$

- Dividing equation (4) by $\bar{Q}$ (the ***potential*** or ***maximum*** output that can be produced with the existing K), we obtain:

$$y^* = \frac{\Delta Q}{\bar{Q}}$$
$$= u_n \left(v \frac{I}{\bar{Q}} - v\delta \frac{K}{\bar{Q}}\right) \qquad (5)$$

- And since $v = \frac{\bar{Q}}{K}$

$$y^* = u_n \left(v \frac{I}{\bar{Q}} - \delta\right) \qquad (6)$$

But if $y < y^*$, then $u < u_n$

- y^* is the ***warranted rate of growth***, i.e., the growth rate that would keep u at its long-term normal level (u_n)

The Long-Run Rate of Profit and the Exchange Rate

- The ***profit rate*** ($\boldsymbol{R}$) can be expressed as:

$$\boldsymbol{R = \frac{P}{K} = \frac{P}{Q} * \frac{Q}{\bar{Q}} * \frac{\bar{Q}}{K} = muv} \qquad (7)$$

where $\boldsymbol{P}$ is aggregate profit, $\boldsymbol{\bar{Q}}$ is potential output, and $\boldsymbol{m}$ is the share of profits in production (or national income)

- Note that $\boldsymbol{R}$ depends critically on the ***real exchange rate***, which defines access to ***foreign*** and ***domestic*** markets
  - For instance, an ***overvalued*** currency would increase foreign competition and ***reduce*** the ***rate of profit***
  - Therefore, equation (7) presupposes a ***closed economy*** or an ***exchange rate*** in ***equilibrium***

External Constraints to Long-Run Economic Growth

- The ***income elasticity*** of demand for ***primary*** goods tends to be less than one while that for ***manufactured*** goods tends to be greater than one

- Many developing countries ***export*** mostly ***primary*** goods and ***import*** mostly ***manufactured*** goods
  - Thus for these countries the ***income elasticity*** of ***imports*** is greater than one while that of ***exports*** is less than one
  - Therefore, these countries would face a ***shortage*** of ***hard currency***

- This is the basic idea behind Chenery-Bruno's ***two-gap*** model and Prebisch's ***centre-periphery*** model

The External Constraint and Exports

- The problem of the ***external constraint*** came to be associated with the need for an increase in ***exports***

- The growth rate of ***export*** demand is seen as the fundamental motor of long-term economic ***growth***
  - ➢ This requires a condition of ***equilibrium*** in the ***balance of payments***

- Thirlwall argued that the expansion of ***exports*** would cause ***income*** to increase, thus causing ***imports*** to rise even faster than exports
  - ➢ Thus a ***deficit*** in the ***trade account*** would arise

- Therefore, the long-run ***growth*** rate should be the rate compatible with ***equilibrium*** in the ***balance of payments***

The External Constraint and the Rate of Growth

- The growth rate of ***exports*** ($\dot{x}$) is:

$$\dot{x} = \dot{y}_m * \epsilon \qquad (8)$$

where $\dot{y}_m$ is the growth rate of ***world income*** and ϵ is the ***income elasticity*** of the demand for ***exports***

- The growth rate of ***imports*** ($\dot{m}$) is:

$$\dot{m} = \dot{y} * \pi \qquad (9)$$

where $\dot{y}$ is the growth rate of ***domestic income*** and π is the ***income elasticity*** of the demand for ***imports***

- Note that it is assumed that both the ***real exchange rate*** and the country's ***share of world exports*** are ***constant***

The External Constraint and the Rate of Growth (cont'd)

$$\dot{m} = \dot{y} * \pi$$
$$\dot{x} = \dot{y}_m * \epsilon$$

- For the ***current account*** to remain in ***balance***, $\dot{m} = \dot{x}$

$$\dot{y} * \pi = \dot{y}_m * \epsilon$$

- And the domestic ***rate of growth*** consistent with $\dot{m} = \dot{x}$ is:

$$\dot{y}_{cce} = \frac{\dot{x}}{\pi} = \dot{y}_m * \frac{\epsilon}{\pi} \qquad (10)$$

  - This relationship is known as ***"Thirlwall's Law"***
  - Note that international ***capital flows*** are assumed to be nil

- Therefore, if $\pi > 1$ and $\epsilon < 1$, then $\dot{y}_{cce}$ will be less than the ***warranted*** growth rate (y^*) allowed by the current rate of ***investment*** and ***output-capital*** ratio
  - In this case the ***external constraint*** is ***"binding"*** and justifies the adoption of a ***policy*** to overcome it

Policies Used to Overcome the External Constraint

- The ***two-gap*** model → obtaining ***foreign savings***
  - Financing a ***current account deficit*** with ***international loans*** and ***foreign direct investment***
  - But this implies ***currency appreciation***, which discourages ***investment***
  - So it provokes a high rate of ***substitution*** of ***foreign*** for ***domestic*** savings

- The ***centre-periphery*** model → reducing ***imports***
  - Implementing ***import-substitution industrialization*** (***ISI***) policies
  - While reducing imports of ***consumer*** goods, ***ISI*** also expanded imports of ***intermediate*** and ***capital*** goods

Introduction of Capital Flows into the Model

- ***Moreno-Brid*** extends the model to include ***capital flows***
- Now the ***balance of payments*** would be in ***equilibrium*** when:

$$M = X + CF \qquad (11)$$

where M is ***imports***, X is ***exports***, and CF is ***capital inflows*** (or ***current account deficit***)

- The dynamics of ***foreign indebtedness*** must fulfill the condition of long-term ***solvency***
  - The relationship between the ***current account deficit*** and ***domestic income*** must remain ***constant*** in the long run
  - The rate of growth of the ***current account deficit*** ($\dot{f}$) must equal the rate of growth of ***domestic income*** ($\dot{y}$)

The Model with Capital Flows

- Given $\boldsymbol{M = X + CF}$ and assuming ***constant real exchange rates***, equilibrium in the ***balance of payments*** implies:

$$\dot{m} = \theta\dot{x} + (1 - \theta)\dot{f} \qquad (12)$$

  - $\dot{m} = \pi\dot{y}$ is the rate of growth of ***imports***
  - $\dot{x}$ is the rate of growth of ***exports***
  - $\dot{f} = \dot{y}$ is the rate of growth of the ***current account deficit***
  - $\theta = X/M$ (i.e., the percentage of the ***imports bill*** covered by ***exports***)
  - $1 - \theta = CF/M$ (i.e., the percentage of the ***imports bill*** covered by ***foreign indebtedness***)

The Model with Capital Flows (cont'd)

- Therefore, given $\dot{m} = \theta\dot{x} + (1-\theta)\dot{f}$ and assuming θ constant, the rate of ***growth*** ($\dot{y}_e$) consistent with ***balance of payment*** equilibrium is:

$$\pi\dot{y} = \theta\dot{x} + (1-\theta)\dot{y}$$

since $\dot{m} = \pi\dot{y}$ and $\dot{f} = \dot{y}$

$$[\pi - (1-\theta)]\dot{y} = \theta\dot{x}$$

$$\dot{y}_e = \frac{\theta\dot{x}}{\pi - (1-\theta)} \qquad (13)$$

- Note that if $\theta = 1$ (i.e., if there is no ***current account*** deficit), then equation (13) would collapse into equation (10):

$$\dot{y}_e = \dot{y}_{cce} = \frac{\dot{x}}{\pi}$$

Implications of the Model

- Note that an increase in the ***current account*** deficit reduces $\boldsymbol{\theta}$
  - Therefore, it reduces $\dot{y}_e$

- While foreign ***indebtedness*** solves the ***foreign constraint*** problem, it reduces the ***growth*** rate

- Moreno-Brid underestimates this reduction because the service of a greater external ***debt*** contributes to increase the ***current account*** deficit further

- To start with, a ***current account*** deficit corresponds to an ***overvalued*** currency (which reduces the ***growth*** rate)
  - Therefore, the key explanation for the ***external constraint*** is the ***tendency*** for the ***currency*** to become ***overvalued***

The Competitive / Industrial Equilibrium Exchange Rate

- The crucial thing is to set the ***exchange rate*** at its ***competitive*** or ***industrial*** equilibrium level
- The ***competitive*** or ***industrial*** equilibrium exchange rate is the rate that would allow domestic firms using ***state-of-the-art*** technologies to compete in the market
- Therefore, the real solution is to ***neutralize*** the tendency to the ***overvaluation*** of the ***currency*** due to:
  - ***Dutch disease***
  - Capital ***inflows***
- Since $\boldsymbol{\pi > 1}$ and $\boldsymbol{\dot{y}_e = \frac{\dot{x}}{\pi}}$, growing with a ***balanced*** foreign account implies that $\boldsymbol{\dot{x} > \dot{y}_e}$

Import/Export Elasticities as Endogenous Variables

- If a country exports ***manufactured*** goods, π needs not be higher than ϵ

- If the currency is ***overvalued***, the country's productive structure is affected:
  - It would induce a process of perverse ***specialization*** in the production of ***resource-intensive*** goods
  - It would cause low ***growth*** due to ***deindustrialization***

- Therefore, a country's ***productive structure*** and both π and ϵ depend on the ***exchange rate***
  - Thus both π and ϵ are ***endogenous*** variables

Exchange Rate Equilibria

- In the absence of ***capital flows***, there are two ***exchange rate*** equilibria:
  - The ***current account*** equilibrium exchange rate (e_{cc}), which balances the current account
  - The ***competitive*** or ***industrial*** equilibrium exchange rate (e_{ind}), which makes tradable industries utilizing state-of-the-art technologies economically viable

- If the ***currency*** is ***overvalued*** (i.e., $e < e_{ind}$), then:
  - $\dot{y}_{cce}$ would be decreasing
  - The ***foreign constraint*** would intensify
  - A process of ***deindustrializing*** would be underway