ECO 406
Developmental Macroeconomics

Lecture 5
Currency Appreciation and Dutch Disease
The Dutch Disease

- **Dutch disease** is the result of a permanent *overvaluation* of the currency
  - Main reason some countries lag behind in the process of *industrialization* and economic *growth*

- Main *cause* of Dutch disease is *Ricardian rents* originating in the exploitation of abundant and cheap *natural resources*

- Currency *overvaluation* does not allow *efficient* domestic firms in the tradable sector to compete

- If the Dutch disease is *neutralize*, natural resources could be a *blessing* for a country

- *Dutch disease* could be consistent with a country’s *current account* equilibrium
The classical Dutch disease model consists of three sectors:

- The booming natural resource (tradable) sector
- The lagging manufacturing (tradable) sector
- The non-tradable sector

The appreciation of the currency reflects a change in relative prices in favour of the non-tradable sector.

- The wealth shock in the natural resource sector creates an excess demand in the non-tradable sector.

Dutch disease is a market failure because it distorts a fundamental macroeconomic price: the exchange rate.

- It generates a negative externality in the non-commodity tradable sector.
Process of De-Industrialization

- The commodity and non-commodity tradable sectors are **price-takers** in the international market.

- The domestic **commodity** sector has lower production **costs** than foreign competitors.
  - Therefore, it enjoys **Ricardian rents**.
  - It’s compatible with a relatively **higher** currency value, i.e., lower exchange rate.

- The domestic **non-commodity** tradable sector has similar production **costs** to those of foreign competitors.
  - It’s compatible with a relatively **lower** currency value, i.e., higher exchange rate.
In the non-commodity tradable sector, efficient firms using state-of-the-art technologies become uncompetitive as a result of the overvaluation of the currency. Resources are thus reallocated away from the non-commodity tradable sector towards the commodity and non-tradable sectors.

If the government fails to neutralize Dutch disease:
- Ricardian rents will be distributed among commodity producers (higher profits) and all consumers (lower import prices)
- The currency will remain overvalued
- The non-commodity tradable sector will become unviable
The Equilibrium Exchange Rate

- In the absence of Dutch disease (and capital flows), there is a unique exchange rate equilibrium
  - The current account equilibrium exchange rate \( e_{cc} \)
    - This rate guarantees a reasonable profit rate to efficient firms in the tradable sector

- In the case of Dutch disease, there are two exchange rate equilibria
  - The current account equilibrium exchange rate \( e_{cc} \)
    - This rate guarantees a reasonable profit rate to those producers causing the Dutch disease
  - The industrial equilibrium exchange rate \( e_{ind} \)
    - This rate guarantees a reasonable profit rate to efficient firms in the non-commodity tradable sector
Equilibrium with Dutch Disease

- Depending on demand and supply, the market price exchange rate ($e_m$) fluctuates around the current account equilibrium exchange rate ($e_{cc}$)
  - In the long run, the market price exchange rate converges to the current account equilibrium exchange rate
  - But the industrial equilibrium exchange rate ($e_{ind}$) is the true equilibrium rate (the “competitive” exchange rate)

- The difference between the current account and the industrial exchange rates describes the severity of Dutch disease
  - The larger the Ricardian rents, the greater the severity

- The difference between the current account and the industrial equilibrium exchange rates reveals a market failure
Without **Dutch disease**, the **equilibrium** exchange rate corresponds to the equilibrium of **relative prices**

- It implies the **equalization** of **profit** rates in the long run
- The **current account** equilibrium exchange rate ($e_{cc}$) and the **industrial** equilibrium exchange rate ($e_{ind}$) are equal

**If there is Dutch disease**, the **industrial** equilibrium exchange rate ($e_{ind}$) is the **true** equilibrium rate

- It’s higher than the **current account** equilibrium rate ($e_{cc}$)
- Thus it requires exchange rate **management** to neutralize the **Dutch disease**

If there is **Dutch disease**, **efficient** firms will have a negative expected rate of **profit** and will not **invest**
The market price exchange rate \( (e_m) \) is the price of foreign currency.

- It’s the result of the interaction between the demand for foreign currency and the supply of foreign currency.

Measured in domestic currency, the exchange rate \( (e_m) \) is equal to the price in domestic currency of the representative good \( (P_x) \) divided by its price in foreign currency \( (P_x) \).

- Since \( P_x = e_m P_x \), then \( e_m = P_x / P_x \).

In the absence of capital flows, the exchange rate is usually in equilibrium when the current account is balanced.

- Market forces cause the market price to fluctuate around the current account equilibrium exchange rate \( (e_{cc}) \).
The Value of the Exchange Rate and Necessary Price

- The market price exchange rate \((e_m)\) fluctuates around its value.

- Without Dutch disease, the value of the exchange rate is the rate that allows efficient firms in the non-commodity tradable sector to cover costs plus a reasonable profit rate.

  ➢ The value of the exchange rate allows the necessary price efficient firms need to remain producing.

- Therefore, without Dutch disease, the value of the exchange rate is the current account equilibrium exchange rate \((e_{cc})\).
The Value of the Exchange Rate and Necessary Price (cont’d)

- If there is Dutch disease, then there are two equilibria corresponding to two values.

- The current account equilibrium exchange rate \( (e_{cc}) \) is the rate that allows firms in the commodity tradable sector to cover costs plus a reasonable profit rate.
  - The value of the exchange rate is \( e_{cc} \).

- The industrial equilibrium exchange rate \( (e_{ind}) \) is the rate that allows efficient firms in the non-commodity tradable sector to cover costs plus a reasonable profit rate.
  - The value of the exchange rate is \( e_{ind} \).
In the absence of Dutch disease, then:

\[ e_{cc} = e_{ind} \]

If there is Dutch disease, then:

\[ e_{cc} < e_{ind} \]

In both cases, the market price exchange rate \( e_m \) fluctuates around the current necessary price \( e_{cc} \) according to the supply and demand for foreign currency.

If there is Dutch disease, efficient firms in the non-commodity tradable sector will become unviable.
Market and Equilibrium Exchange Rates without Capital Flows

\[ e_{cc} \] – Current Account Equilibrium Exchange Rate
\[ e_{ind} \] – Industrial Equilibrium Exchange Rate
\[ e_m \] – Market Price Exchange Rate (without Dutch Disease)

Without **Dutch Disease**, 
\[ e_{ind} = e_{cc} \]

With **Dutch Disease**, \[ e_{ind} > e_{cc} \] and there is a chronic and cyclical tendency for the **overvaluation** of the currency (not shown in the graph).
What Determines the Values or Necessary Prices?

- The two *necessary prices* or *values* depend on:
  - The average *productivity* of firms producing either *commodities* (in the case of $e_{cc}$) or other *tradable* goods (in the case of $e_{ind}$)
  - The average *wages* these firms pay relative to other countries’ *productivity* and *wages*

Therefore, necessary prices or values depend on the *unit labour cost* (i.e., *wages* divided by *productivity*) relative to the unit labour costs of the main trading partners.
The Severity of the Dutch Disease

- The difference between the current account equilibrium exchange rate \( e_{cc} \) and the industrial equilibrium exchange rate \( e_{ind} \) indicates the severity of the Dutch disease.
  - Note that the difference between these equilibrium exchange rates must be large enough to characterize Dutch disease.

- The severity of the Dutch disease \( (g) \) can be defined as:
  \[
g = \frac{e_{ind} - e_{cc}}{e_{ind}}
\]

- The severity of the Dutch disease depends on the Ricardian rents involved.
  - The Ricardian rents are not constant but vary depending on the international price of the commodity.
There are different sources of Dutch disease:
- Exploitation of abundant and cheap natural resources
- High levels of remittances
- High levels of foreign aid

Another important source:
- Abundance of cheap labour and a large difference between average salaries of skilled and unskilled workers
- Note that the skill-wage differential must be greater than in rich countries
- Low value-added per capita industries play a role here similar to that of the commodity industry
Cheap Unskilled Labour and Dutch Disease

- It assumes a country with **two** manufacturing *sectors*:
  - A *low value-added* sector employing *unskilled* labour and paying *low* wages
  - A *higher value-added* sector employing *skilled* labour and paying *higher* wages

- The *equilibrium* exchange rate is determined by the *low-value added* sector hiring *unskilled* labour and paying *low* wages

- The *higher value-added* sector hiring *skilled* labour and paying *higher* wages will not be competitive with $e_{cc}$
  - It requires a *higher exchange rate* to be competitive
Cheap Unskilled Labour and Dutch Disease (cont’d)

- If *skill-wage* differential same as in rich countries, this country would produce the *low* and the *higher* value-added goods

- But if *skill-wage* differential much greater than in rich countries, *Dutch disease* would arise
  - Not due to *Ricardian rents* but to the *skill-wage* differential

- This explains why middle-income countries need to *manage* their exchange rates so firmly
  - The exchange rate should be maintained at the level of the *industrial* equilibrium rate (*e*$_{ind}$)
  - Thus these countries should have a *surplus* in the current account
Technological progress causes what it’s called “non-premature” process of deindustrialization
- Labour is transferred to the service sector
- Simple manufacturing jobs are transferred to developing countries

With Dutch disease, a “premature” process of deindustrialization takes place
- This is due to the exchange rate not being kept at the industrial equilibrium level ($e_{ind}$)

Therefore, Dutch disease needs to be neutralized
If Dutch disease is not neutralized, productivity must grow faster than in competing countries for sector to survive

- But overvalued currency will gradually damage firms in tradable sector

Higher value-added sector might increase share of imported components to reduce costs

- It might eventually become a mere importer and assembler of the good (maquila)
- While the value of output might increase, the value added will fall

Therefore, the manufacturing sector might become a large maquila if Dutch disease is not neutralized
Why Not to Specialize in the Production of Commodities?

- **Neoclassical** economists see nothing wrong for a country to specialize exclusively in the exploitation of *natural resources*
  - It will benefit from its *comparative advantage*

- Economic *development* is characterized by *industrialization*
  - Therefore, *Dutch disease* is an obstacle to *development*

- *Industrialization* takes place whenever labour is transferred to sectors with higher *value-added* per capita
  - *Productivity* increases when labour is transferred to more *sophisticated* sectors (i.e., higher *value-added* sectors)
  - And *productivity* increases is synonymous with economic *development*
Dutch Disease and the Natural Resource Curse

- **Dutch disease** involves a contradiction:
  - Natural resources represent a huge benefit to a country
  - But *natural resources* may give rise to **Dutch disease** and prevent *industrialization*

- The *natural resource curse* is believed to result from **weak institutions** that facilitate *corruption* and *rent-seeking* behaviour

However, the main obstacle to **development** is not *corruption* but the **overvaluation** of the currency
  - So **Dutch disease** and *natural resource curse* should be seen as synonyms
Dutch Disease in Canada?

- Between 2003-08, oil prices increased from about $28/b to $91/b and oil exports rose from about $16B to $60B
  - Canadian dollar *appreciated* by about 60% (from US$0.63 to over US$1.00)
  - According to Beine et al. (2012), the increase in oil-prices explains about 42% of this appreciation

- Canada experienced a process of *de-industrialization* over that period
  - *Employment* in the *manufacturing* sector was reduced by more than 500,000 jobs

- The Canadian experience suggests that the *natural resource curse* might not necessarily be the result of *weak institutions* that facilitate *corruption* and *rent-seeking* behaviour
Dutch Disease in Canada? (cont’d)

REAL GDP, BUSINESS SECTOR AND MANUFACTURING

Dutch Disease in Canada? (cont’d)

Dutch Disease in Canada? (cont’d)

SHARE OF NORTH AMERICAN PRODUCTION OF TRANSPORTATION VEHICLES