# ECO 403 – L0301
# Developmental Macroeconomics

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## 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 Dutch Disease Model

- The ***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

# Process of De-Industrialization (cont'd)

- 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 ***manufacturing*** sector will become ***unviable***

# The Equilibrium Exchange Rate

- In the absence of ***Dutch disease***, 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***

# Dutch Disease and 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 Exchange Rate

- 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 or Necessary Price of the Exchange Rate

- The market ***price*** exchange rate ($e_m$) fluctuates around its ***value*** (or ***necessary price***)

- Without ***Dutch disease***, the ***value*** (or ***necessary price***) 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

- Therefore, without ***Dutch disease***, the ***value*** (or ***necessary price***) for the exchange rate is the ***current account*** equilibrium exchange rate ($e_{cc}$)

# The Value or Necessary Price of the Exchange Rate (cont'd)

- If there is ***Dutch disease***, then there are two ***equilibria*** corresponding to two ***values*** (or ***necessary prices***)

- 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*** (or current ***necessary price***) 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 (or industrial ***necessary price***) is $e_{ind}$

# The Value or Necessary Price of the Exchange Rate (cont'd)

- In the absence of ***Dutch disease***, then:

$$e_{cc} = e_{ind}$$

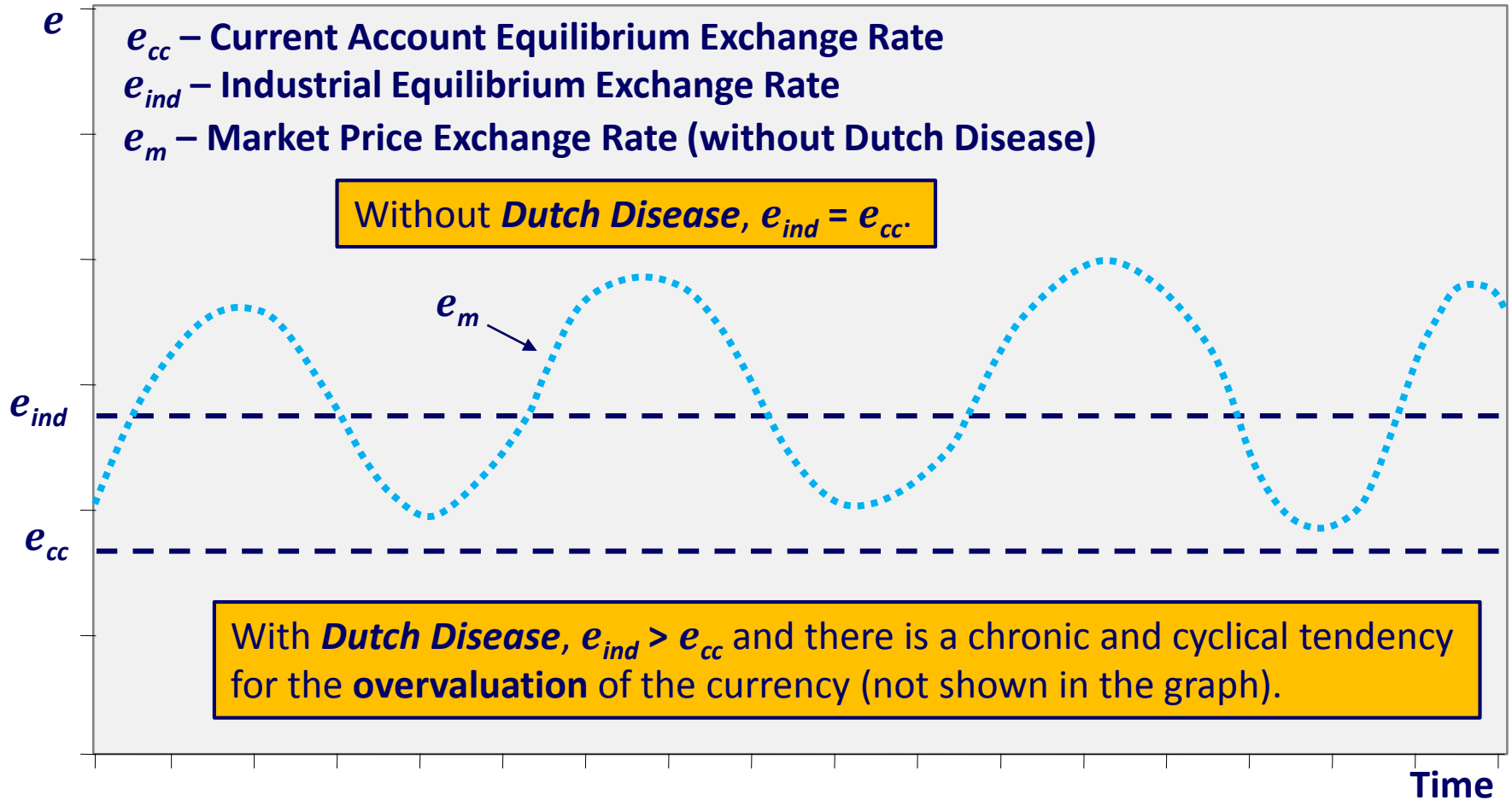
- If there is ***Dutch disease***, then:

$$e_{cc} < e_{ind}$$

- 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



# 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 $\boldsymbol{e_{cc}}$) or other ***tradable*** goods (in the case of $\boldsymbol{e_{ind}}$)
  - 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:
  - $g = (e_{ind} - e_{cc})/e_{ind}$

- 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

# Extended Concept of the Dutch Disease

- 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 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
  - 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 larger 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

# The Dutch Disease and Deindustrialization (cont'd)

- ***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***

# The Dutch Disease and Deindustrialization

- 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 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