Trade, industrialization, and exchange rate policies

Handout #6

Part I. Trade and industrialization strategies

I. ISI (import substitution industrialization) vs. EOI (export oriented industrialization) vs. OEL (open economy industrialization)

Three contrasted strategies:
- **ISI**: protect sectors of industry until competitive and then open (ISTE: import substitute then export).
- **EOI**: open the economy and subsidize selected firms until they are competitive.
- **OEL**: open the economy, create “investment climate”, and call on FDI.

Economies of scale in production and learning-by-doing

- **Infant industry**
- **OEI**
- **AC**
- **Subsidy (EOI)**

World market price

AC in MDC

Produce for domestic market (ISI) Produce for international market (EOI) Produce for international market (all)

Output

II. ISI (sector protection)

1. Why protect? Arguments for protection
   - **History**: 1850s-1930s: Liberal period, open economy models. Primary export-led growth strategy (ag., mines) LDC against imports of manufactures from MDC.
   - **1930s-1970s**: Depression and WWII, ISI strategy in East Asia, Latin America.
   - **Arguments**: Infant industry: economies of scale, learning-by-doing, entry costs.
   - New entrants, infant industries not competitive: need temporary protection to achieve competitiveness.
   - **Phases of ISI**: 1st phase of ISI: protect finished products (consumer goods).
   - 2nd phase of ISI: protect intermediate and capital goods.

2. ISI is a strategy that can fail
   - Instruments: import tariffs, import quotas, overvalued exchange rate (fixed exchange rate and foreign exchange rationing), appreciated real exchange rate (decline in demand for foreign exchange due to import tariffs and import quotas).
   - **Short run impact**: raises prices of protected tradables, creates inefficiencies through protection, redistributes income from consumers to producers of protected goods, produce for domestic market to substitute for imports.
   - Bias against agriculture: industry protected but not agriculture: high industrial input costs; overvalued exchange rate: low prices for tradables (ag goods).
   - Bias against employment: imported capital goods cheap through overvalued exchange rate.
   - **Long run impact**: AC falls, can decrease protection, ISTE.

- **Strategy can fail**:
  - (i) If AC does not fall: no competitive pressures (as no foreign competition, domestic monopolies), domestic market too small (insufficient opportunities for economies of scale).
  - (ii) If protection is not removed: successful lobbying and rent seeking by entrepreneurs and workers in protected industries not to remove protection. Political pressures for protection are high if: industry is concentrated; small entrepreneurial class; limited democratic checks by farmers and consumers; strong organized labor in formal sector.
- **Conditions for success**:
  - Needs good/strong/credible governance that protection will be removed.
  - Needs large domestic market: large countries, income redistribution (e.g., land reform) to expand the domestic market.

III. Trade policy

1. Definitions
   - \( p^g \): international market price in foreign currency (S).
   - \( p^b \): border price in local currency units (LCU).
   - \( p^d \): domestic price.
   - \( e \): nominal exchange rate in LCU/$.
   - \( QR \): quantity restriction on imports or exports.
   - Tradable goods: price determined by border price and by trade and exchange rate policies.
   - Non-tradable goods: price determined by supply = demand.

\[
\begin{align*}
\text{Tradeable good:} & \quad p^d = p^b(1 + t) \quad p^b = ep^s \\
\text{Nominal } e & \quad \text{Domestic price} \\
\text{Border } & \quad \text{Trade policy} \\
\text{Exchange rate policy} & \quad \text{World market price} \\
\end{align*}
\]

Example India:
\[
\begin{align*}
\text{International price} & \quad 4000*1.3 = 5200 \\
\text{Nominal } e & \quad 40*100 = 4000 \\
\text{Border } & \quad 30 \quad (0.3) \\
\text{World market price} & \quad 100$/MT
\end{align*}
\]

2. Indicators of protection
   - **Nominal protection coefficient = NPC**
     \[
     NPC = \frac{p^d}{p^b} = 1 + t.
     \]
     - If NPC > 1, producers are protected, consumers (users) are disprotected.
     - If NPC < 1, producers are disprotected, consumers (users) are protected.
   - **Effective protection coefficient = EPC**
     \[
     EPC = \frac{VA}{p^b} = \frac{p^b - c}{c}.
     \]
     - If EPC > 1, producers are protected, consumers (users) are disprotected.
     - If EPC < 1, producers are disprotected, consumers (users) are protected.
     - Note: EPC a better measure of protection than NPC since product may be protected but inputs also protected, in which case effective protection is less than nominal protection.

(3) Real protection
Imported goods or import substitutes: \( p^I = ep^I(1 + t_M) \).

Exported good: \( p^E = ep^E(1 - t_E) \).

Can protect tradables through exchange rate policy: devaluation or depreciation raises \( e \).

Can protect tradables through trade policy: raise import tariffs or lower export taxes.

Exchange rate and trade policies can be substitutes or complements in protecting. For example, when there is a devaluation in Argentina, typically the country raises export taxes on agriculture to redistribute income from agriculture to the urban sectors.

3. Who gains and who loses from protection?
Recall definitions of consumer surplus (CS) and producer surplus (PS)

**i) Import tariffs vs. free trade**

\[ \Delta = \text{change in trade} \]

\[ \Delta CS = -a - b + c - d \]

\[ \Delta PS = a \]

\[ \Delta B (\text{Gvt budget}) = c \]

\[ \text{NSG (net social gain)} = -b - d \]

ISI: c invested?

SR loss \( \rightarrow \) LR gain?

**ii) Quantity restrictions: import quotas (licenses) vs. free trade**

Note: this remains a non-tradable in spite of trade (licenses). Price determined by \( S = D \) after administered trade.

\[ \Delta = \text{change in trade} \]

\[ \Delta CS = -a - b + c - d \]

\[ \Delta PS = a \]

\[ \Delta B (\text{Gvt budget}) = c \]

\[ \text{NSG (net social gain)} = -b - d \]

ISI: c invested?

SR loss \( \rightarrow \) LR gain?

**iii) Advantages of tariffs over quantity restrictions: tariffication (WTO, NAFTA)**

Rent goes to government (c).

Easier to administer.

Use uniform tariffs on protected sectors: easy signal, easier to resist rent seeking.

**iv) Example:** U.S. sugar quotas

Production = 6.3 million tons
Import quotas = 2.1 million tons (25% of domestic supply)
\( p^I = 280 \) $/ton
Implicit tariff = NPC equivalent = 1.66 (66% nominal protection)
DPS = $1066 million for 12,000 workers = $90,000 per job
DCS = $1647 million for 275 million consumers = $6 per consumer
Rent to foreigners (Voluntary Export Restraint (VER)) = $396 million
Efficiency loss = $185 million

Conclusion: large distributive gains for producers (workers), small cost per capita for consumers, small efficiency loss relative to distributional effects.

Other examples:

### IV. EOI (firm subsidies)

Selective incentives to firms: subsidies and credit lines to potential exporters: “pick the winners”.

International prices at equilibrium exchange rate.
Active support for “potential winners”. Not laissez-faire: active role of the state (production targets for selected firms, monthly checks on decline in costs, trade missions to promote exports).

### V. OEI (WTO/IMF rules)

Open economy and equilibrium exchange rate: no price distortions.
Key role of FDI, FPI.

FDI brings modern, low AC technology directly competitive on the world market.

### Conditions for success:

- Good “investment climate”: stability, law and order, property rights, commitment to open trade regime (role of WTO membership as commitment device).
- Stable e and free movement of capital.
- Public investment complementary to FDI: infrastructure, education
- Skilled reliable labor force, flexible labor market.

But Dani Rodrik’s critique:

OEI may not promote domestic industry (although it does in China).
Trade policy is not a substitute for a national industrial policy.
Unique formula not desirable: adjust to local conditions.
Most MDC/NIC have used protection and subsidies and continue to use them!
China, Mauritius combine intervention/ regulation and public enterprises with OEI.
Sequence most logical strategy: ISI → EOI → OEI

VI. Debate on trade: Why is it a heated political issue?
There are net social gains, but there are gainers and losers, both short run (price effect) and long run (investment, employment responses)
Compensations can be paid, but is it credible that they will (time consistency problem, commitment device)?
Will smallholders and small and medium enterprises have an equal chance to adapt to the new comparative advantages? Transitions need to be managed: aid-for-trade agendas.
Who drives the globalization agenda and trade negotiations? Is there democratic participation to decisions?
Role of multinationals: Positive: higher wages, technology transfers. Negatives: polluting industries, limited spillovers on national firms, less child labor if international pressures (Nike).

Part II. Exchange rate policy
Define tradable (T) and non-tradable (NT) goods: tradables have prices determined by the international market price; non-tradables have prices determined by domestic supply and demand.
Price policy for tradable goods has two instruments:
- **Trade policy** instruments: affect domestic prices through \( t_M, t_E, \) QR, subsidies.
- **Exchange rate policy** instruments: affect domestic prices through the exchange rate \( e \).
These two policy instruments can be substitutes or complements.

I. Definitions: nominal, real, and real effective exchange rates
- **Nominal (official) exchange rate** \( e \)
  \[ e = \frac{\text{current price of a dollar (or a foreign currency unit)}}{\text{terms of domestic currency units}}. \]
  \( e \) measured in LCU/foreign currency, e.g., pesos/US$ (LCU = Local Currency Unit).
  Note: a currency is devalued when a fixed nominal exchange rate is raised. A currency appreciates when a floating nominal exchange rate falls; it depreciates when a floating nominal exchange rate rises.

- **Real exchange rate** \( RER \)
  A real exchange rate is a price relative to a numéraire. The numéraire of the exchange rate (measured in pesos/$) is hence
  \[ RER = \left( \frac{p^T}{p^S} \right) = \left( \frac{e^T}{e^S} \right) \]
  Hence, the \( RER \) is the relative price of tradable and non-tradable goods.
  Define: Tradable \( T \) = good with domestic price determined by \( e \) and \( p^T \) (goods that are imported or exported).
  Non-tradable \( NT \) = good with domestic price determined by \( S \) and \( D \) on the domestic market (such as construction and services) (Note there can be an import or an export quota that shifts supply, without making the good a T-good).
  Note: A currency depreciates when the \( RER \) increases; it appreciates when the \( RER \) decreases.

- **Real effective exchange rate** \( REER\)
  Measure of protection that combines exchange rate policy (\( RER \)) and trade policy (\( t_M, t_E \)):
  \[ \text{REER for imports: } REER_{im} = RER(1 + t_M) \]
  \[ \text{REER for exports: } REER_{e} = RER(1 - t_E) \]

II. Equilibrium real exchange rate

1. Definition

The equilibrium level of the RER is determined by equality between the \( S \) of dollars and the \( D \) for dollars in the country (balance of payments equilibrium).
The RER equilibrium is sustainable when the \( S \) and \( D \) of dollars can be maintained (vs., e.g., a \( S \) of dollars based on high levels of debt, temporary aid inflows, temporary export boom (Dutch disease cannot be maintained)).
III. Analyses of three types of real exchange rate shocks

1. ISI policies and import tariffs on industry

\[
\text{ISI restricts import demand, and hence the demand for US$, and appreciates the RER.}
\]

\[
\text{Impact on industry: } \text{REER}_{id} = \text{RER}_1 + t_M (\cdot) \text{ and indirect disprotection through } \text{RER}_1 \downarrow \text{ resulting in net protection if trade protection large enough.}
\]

\[
\text{Impact on agriculture and other tradable sectors which are not protected: no direct protection on product and direct disprotection through higher industrial input costs (effective disprotection). Indirect disprotection through } \text{RER}_1 \downarrow \text{. Strong disprotection.}
\]

Policy to mitigate the effect of ISI on agriculture: Invest in technological change in agriculture to lower AC and make it competitive in spite of disprotection.

2. Dutch Disease (temporary export boom)

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\text{Export boom: gas in Holland, oil in Norway and Ecuador, high price of exports (coffee price boom), foreign aid inflow (Africa), unsustainable debt (IOUs), short term inflows of FDI & FPI.}
\]

\[
\text{$ boom creates an appreciation of the RER.}$
\]

\[
\text{Appreciation is a disease only if not sustainable.}
\]

\[
\text{Effect of boom on the real economy: Tradable sectors decline (ag., ind.). Non-tradable sectors expand (services, construction). At end of boom, agriculture and industry have been destroyed.}
\]

\[
\text{Policies to prevent the Dutch Disease:}
\]

i) Sterilize $ earnings abroad (deposit in foreign account instead of repatriating). Hard politically, except if very short run (Cameroon oil, China).

ii) Invest abroad: Japan in SEAsia, Taiwan in China. Re-export $ earned to avoid domestic impact.

iii) If $ boom is due to FDI/FPI, tax on foreign capital to reduce inflow, or require that a % of FDI be deposited at the Central Bank (Chile).

iv) Increase efficiency of the T sectors to compensate for falling domestic prices (technical change).

v) Avoid short term booms (e.g., avoid short term aid and large debt): “socially responsible macropolicy” (Lustig and Kanbur).

3. Speculative attacks (Brazil, South-East Asia, Russia)

\[
\text{Loss of confidence, expectations of devaluation leading to capital outflight: demand for$ increases.}
\]

\[
\text{Dilemma: either let the RER depreciate (surrender, which is bad to attract foreign capital in the future as it undermines confidence on the value of the domestic currency) or intervene to protect the domestic currency (which is expensive).}
\]

\[
\text{Policies on the supply side to counterattack a speculative attack}
\]

Types of defensive interventions to shift the supply of dollars from S to S’ and avoid depreciation of the RER.

i) Increase interest rates to attract foreign capital: risk of creating a recession to avoid deprecation, of inducing bankruptcies of domestic firms. Hence, there is a devaluation vs. recession dilemma.

ii) Borrow from abroad (IMF balance of payments loan, US loan to Mexico 1994). But size of loan limited by poor “investment climate” and conditionalities will be attached.

iii) Central Bank sells dollar reserves limited by size of the reserves.

iv) US Federal Reserve Bank buys LCU (pesos): US sells dollars to Mexicans (i.e., buys pesos in exchange for dollars). But limited by extent of solidarity!

\[
\text{Policy on the demand side to deter speculative attacks (no possible devaluation)}
\]

Peg the local currency to the US$ = dollarization, currency board (Argentina). But, if there is a run on $, will need to create a huge recession (unemployment, falling consumption, falling demand for imports) to decrease the demand for dollars.