

**Trade and industrialization strategies  
Handout #8**

**Part I. Trade and industrialization strategies**

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

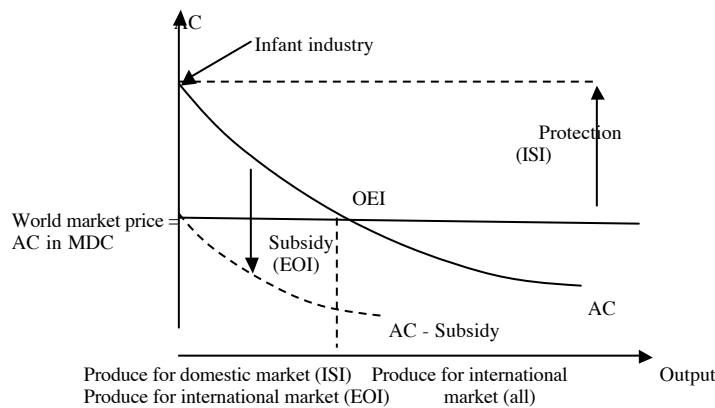
Three contrasted strategies:

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.

OEI: open the economy, create "investment climate", and call on FDI.

**Economies of scale in production and learning-by-doing**



**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:** 1<sup>st</sup> phase of ISI: protect finished products (consumer goods).

2<sup>d</sup> 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**

$p^{\$}$  = international market price in foreign currency (\$).

$p^b$  = 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.

Tradable good:  $p^d = p^b(1+t)$ ,  $p^b = ep^{\$}$

$t = t_M$  = import tariff rate

$t = -t_E$  = export tax rate

$t = s$  = domestic subsidy (+) or tax (-) rate

Domestic price	Trade policy	Border price	Exchange rate policy	World market price
$p^d = p^b(1+t_M)$	$t_M, QR$	$p^b = ep^{\$}$	Nominal $e$	$p^{\$}$
Border				
Example India:				
$4000 * 1.3 = 5200$	$t_M = 0.3$	$40 * 100 = 4000$	$e = 40$ RS/\$	100\$/MT

**2. Indicators of protection**

**(1) 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.

**(2) Effective protection coefficient = EPC**

Define:

$p$  = price = unit value of output.

$c$  = cost of intermediate goods used in production per unit of output (purchased inputs from other industries).

$VA$  = value added = cost of primary factors such as labor, land, and financial capital per unit of output.

$p = c + VA$ . Hence:  $VA = p - c$ .

$$EPC = \frac{VA^d}{VA^b} = \frac{p^d - c^d}{p^b - c^b}$$

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:  $p^d = ep^{\$}(1+t_M)$ .

Exported good:  $p^d = ep^{\$}(1-t_E)$ .

Can protect tradables through exchange rate policy: devaluation or depreciation raises  $e$ .

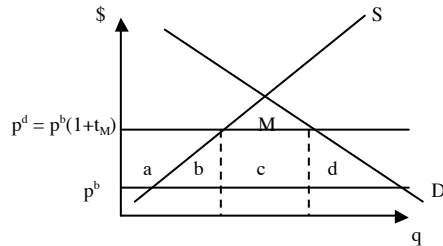
Can protect tradables through trade policy: raise import tariffs or lower export taxes.

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)

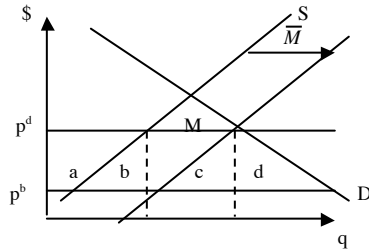
#### i) Import tariffs vs. free trade



$\Delta$  = change in  
**Compared to free trade:**  
 $\Delta CS = -a - b - c - d$   
 $\Delta PS = a$   
 $\Delta B$  (Govt budget) = c  
 $NSG$  (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.



**Compared to free trade:**  
 $DCS = -a - b - c - d$   
 $DPS = a$   
 $D$  importers' rent = c  
 $NSG = -b - d$   
 If auction of  $\bar{M}$ :  $DB = c$

#### 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)  
 $p^d = 466$  \$/ton  
 $p^b = 280$  \$/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:

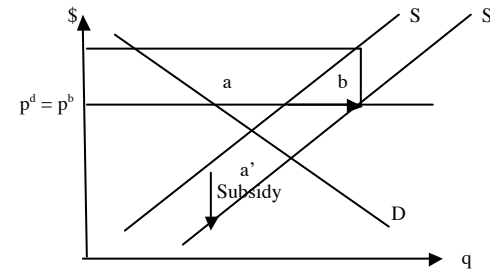
Sector	Tariff (%)	Consumer cost per job (\$)	Consumer cost per capita (\$)
Ceramic tiles	19	401,000	0.5
Frozen concentrate OJ	30	57,000	1.02
Women shoes	10	102,000	1.37
Sugar	66	137,250	6

### 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).



**Compared to no subsidy:**  
 $DCS = 0$   
 $DPS = a'$  (=a)  
 $DB = -a - b$  (cost of subsidy)  
 $NSG = -b$

**EOI: export subsidy** (to unit costs)

Advantages of subsidy:

$NSL = b < NSL$  with tariff or quota (no impact on domestic price).

Better targeting than tariff: subsidy per firm conditional on performance.

But, need:

**i. Budget for subsidies and credit** (vs. ISI that creates government revenues): costly, but less incentives to excessive subsidies; less possibilities to surrender to rent seeking for continued protection.

**ii. Good, non-venal bureaucracy** for information and monitoring of firms; for credibility of rules (but dangers of cronyism and collusion between government officials and managers).

**iii. Need** be able to enter the world market under subsidies from the beginning, especially if small domestic markets (quality of products, advertising, trade missions, contracts with distributors).

#### 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  $\rightarrow$  EOI  $\rightarrow$  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 $e$

$e$  = current price of a dollar (or a foreign currency unit) in 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 price is a price relative to a numéraire. The numéraire of the exchange rate (measured in pesos/\$) is hence

$$RER = \frac{e(\text{pesos}/\$)}{p^{\text{pesos}}/p^{\$}} = \frac{ep^{\$}}{p} = \frac{\text{price of tradable goods}}{\text{price of nontradable goods}} = \frac{p_T}{p_{NT}}$$

Hence, the  $RER$  is the relative price of tradable and non-tradable goods.

Define: Tradable ( $T$ ) = good with domestic price determined by  $e$  and  $p^{\$}$  (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 ( $t_M, t_E$ ):

$$REER \text{ for imports: } REER_M = RER(1 + t_M).$$

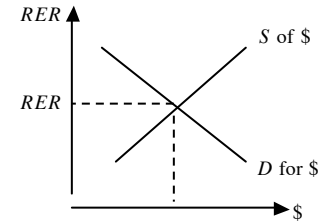
$$REER \text{ for exports: } REER_E = RER(1 - t_E).$$

## 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)).



$S$  of \$ comes from export earnings, FDI and FPI capital inflows, remittances, aid, and new debt.  $D$  for \$ is for imports, profit repatriation, debt service, debt repayment, capital outflight.

### 2. Mechanisms of change in the nominal exchange rate (types of exchange regimes)

- i) **Flexible exchange rate regime  $e$** : adjustment by depreciation/appreciation of the nominal exchange rate as the  $S$  and/or  $D$  of \$ shift.
- ii) **Fixed/pegged exchange rate regime ( $\bar{e}$ )**: adjustment to domestic inflation (prices of all goods rise except the price of the dollar) by periodic devaluation. Examples: African countries in the CFA Franc zone.
- iii) **Dollarization/currency board**: the country has a fixed  $e = 1\text{LCU}/\text{US\$}$  (e.g., Panama, Argentina until 2001). This is risky if the country has more inflation than the U.S., leading to appreciation of the  $RER$ .

### 3. “Fundamental” determinants of the $RER$

Factors that affect the supply of dollars: Export earnings (depend on the price of exported goods and the volume of exports), foreign capital inflows (aid, debt, interest rate)

Factors that affect the demand for dollars: Import expenditures (import price and volume), capital flight and foreign capital outflow (debt service), trade policy (import tariffs restrict imports and hence the demand for \$). The demand for imports is itself influenced by domestic policy (Government fiscal deficit, increase in wages, increase in money supply (credit)).

### 4. Consequences of a change in the $RER$ on real balances

If the  $RER$  appreciates,  $p_T/p_{NT}$  falls. Hence:

Impact on the production structure ( $Q_T, Q_{NT}$ )	$Q_T \rightarrow Q_{NT}$
Impact on the structure of consumption ( $C_T, C_{NT}$ )	$C_T \leftarrow C_{NT}$
Impact on the structure of input use	$X_T \leftarrow X_{NT}$
Impact on imports ( $M$ ) and exports ( $E$ )	$M \uparrow, E \downarrow$
Impact on the balance of trade = $E - M$	$BoT \downarrow\downarrow$

Gainers and losers (incidence analysis):

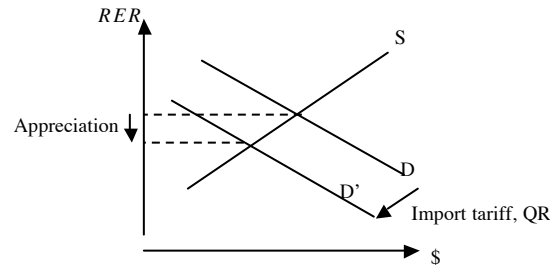
Gainers are the producers of nontradables, the consumers of tradables, and the suppliers of tradable inputs (foreign sellers, importers).

Losers are the producers of tradables, the consumers of nontradables, and the suppliers of nontradable inputs (labor, natural resources).

Note: poor may lose if they produce tradables (e.g., coffee) and consume non-tradables (e.g., cassava).

### III. Analyses of three types of real exchange rate shocks

#### 1. ISI policies and import tariffs on industry



ISI restricts import demand, and hence the demand for US\$, and appreciates the *RER*.

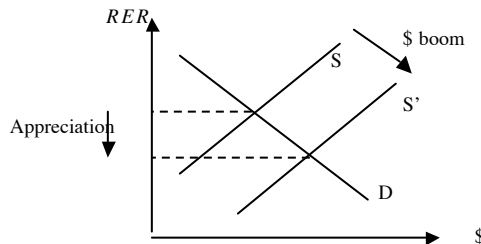
Impact on industry:  $REER_M = RER(1 + t_M)$ . Direct protection through trade policy ( $t_M \uparrow$ ) and indirect disprotection through  $RER \downarrow$  resulting in net protection if trade protection large enough.

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  $RER \downarrow$ . 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)

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.



\$ boom creates an appreciation of the *RER*.  
Appreciation is a disease only if not sustainable.

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.

Policies to prevent the Dutch Disease:

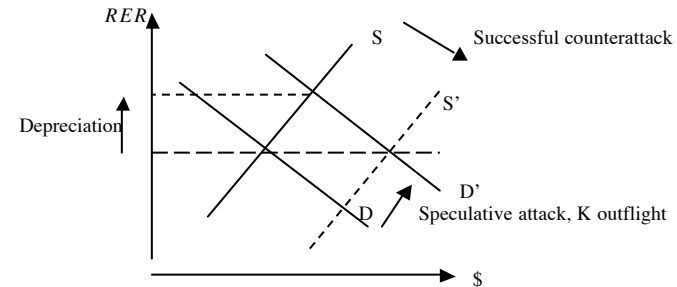
- i) Sterilize \$ earnings abroad (deposit in foreign account instead of repatriating). Hard politically, except if very short run (Cameroon oil, China).
- ii) Invest abroad: Japan in SEAsia, Taiwan in China. Re-export \$ earned to avoid domestic impact.
- iii) If \$ boom is due to FDI/FPI, tax on foreign 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)

Loss of confidence, expectations of devaluation leading to capital outflight: demand for \$ increases.



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).

#### 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 depreciation, 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!

#### 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.