Imperfect Competition

Extensions based on *A Comparative Analysis of the EU-Morocco FTA vs. Multilateral Liberalization, by Aziz Elbehri and Thomas Hertel*

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Outline

- Highlights of paper by Elbehri and Hertel

- Extensions
  - Team 1: Welfare
  - Team 2: Sectoral analysis
  - Team 3: Output scaling effect

Highlights of paper by Elbehri and Hertel

- ## Why is this paper interesting?
  - Comparison of multilateral vs. bilateral liberalization

  - Innovative modeling of imperfect competition
    - Scale effects
    - Mark-ups
    - Entry/exit of firms

Scale effects

- Cost disadvantage ratio: A measure of unexploited scale economies

$$CDR = \frac{AC(x) - MC(x)}{AC(x)} = \frac{FC}{TC(x)}$$

- 1/(1-CDR) = Output elasticity

Scale Effects

Scale Economies
$$\hat{x} = \hat{Z} + \frac{CDR}{1-CDR} \times \hat{Z}$$

(all,i, OLIG_COMM)(all,r, REG)

OSCALE(i,r) = SCALE(i,r) * [qva(i,r) - firms(i,r)] − ao(i,r);

Exogenous variable
= 0

$$\frac{CDR}{1-CDR}$$

Input level on a per firm basis

$$\hat{x} - \hat{Z}$$

Endogenous "change" in CRTS technology: observationally equivalent to IRTS

Mark-ups

- Mark-ups are inversely related to output per firm:

$$\hat{M} = -\frac{\Omega_F}{1 - \Omega_\Pi} \hat{x}$$

Mark-up in supply price equation

$$ps(i,r) = to(i,r) + pm(i,r) - p\_AC\_MARKUP(i,r);$$

Power a.v. subsidy

Mark-up acts like a tax = -subsidy

1. Welfare

- Comparison of three scenarios:
  - FTA
    - Morocco eliminates all tariffs on EU manufactures
  - Multilateral (base)
    - All countries cut tariffs by 30% across all sectors.
  - Multilateral (extension)
    - All countries cut tariffs by 5% across all sectors.

- No entry/exit and full employment

Welfare components

Welfare Change

Terms of Trade Effect

Scale Effect

$$\frac{dV}{V_E} = t \times dm - m \times dp + [p + t - a] \times dX - X \times a_x \times dx$$

Trade Volume = Alloc. Efficiency Effect

Profit Shifting Effect

V: indirect utility function
V_E : marginal utility of expenditure

m: net imports;   p: prices
t: tariffs

X: industry output
x: output per firm

a: average cost; a_x: $\partial a/\partial x$

In GTAP

Equation EV_DECOMPOSITION

*EV_ALT(r) = … + [sum{i,***NSAV_COMM**, **PTAX(i,r)***[qo(i,r) - *pop(r)]*}* +

Profit shifting effect (output tax in standard model)

… + sum{i,PROD_COMM, VOA(i,r)*ao(i,r)} …

Scale effect (technical change in standard model)

Welfare effects

	FTA (Morocco industrial tariffs cut to 0)	Multilateral: Base (30%)	Multilateral: Extension (5%)
Total welfare	-189.5	414.6	64.09
Allocative efficiency	620.5	622.1	97.36
Scale economies	-313.8	-18.7	-5.88
Terms of trade	-660.3	-188.7	-27.39
Transfer from EU	164		

No entry/exit and full employment, all scenarios

Welfare effects: allocative efficiency

	Multilateral: Extension (5%)	FTA (Morocco industrial tariffs cut to 0)
Allocative efficiency	97.36	620.5
Profit-shifting	1.7	153.9
Input tax	-0.3	-27.7
Consumption tax	1.3	-74.1
Export tax	6.2	118
Import tax	88.4	450.4

No entry/exit and full employment

2. SECTORAL ANALYSIS

- GE linkages with & without perfect competition and IRS

- Sectoral analysis:
  - Motor vehicle and parts
  - Light manufacturing

PERFECT COMPETITIVE MARKET

- Manufacture's import tax has been removed.

$$pms = tm + tms + pcif$$
$$<0 \qquad 0 \qquad <0 \qquad 0$$

- Import demand (qxs) is driven by a trade creation and diversion effect. Under FTA: Morocco imports more, mostly from EU and less from ROW.

- Morocco substitutes away from domestically produced manufactures.

- Pressure to reduce market price and therefore to reduce the supply price:

$$ps = to + pm$$

- Therefore: ↓ pm = ↓ ps so output likely to decline & few expand (GE effect).

IMPERFECT COMPETITION & IRS

- Manufacture's import tax has been removed.

$$pms = tm + tms + pcif$$
$$\;\;\;\;\;\;\;\;\;\;<0\;\;\;\;\;\;\;0\;\;\;\;\;\;\;<0\;\;\;\;\;\;\;0$$

- Import demand is driven by a trade creation and diversion effect.
- Moroccan consumers substitute away from domestically produced manufactures.
- Pressure to reduce market price but

$$ps = to + pm + markup$$

- Perfect comp: ↓pm = ↓ps
- Imperfect comp: markup = ↓pm − depends ps
- ps zero profit ps = weighted sum average of input prices − ao
- OSCALE = SCALE * [qva - firms] − ao

Exo vari = 0

Endogenous "change" in CRTS technology: observationally equivalent to IRTS

FTA/NOENTRY

MOTOR VEHICLES SECTOR

- PRICES:

$$pms(mvt,EU,Mor) = f(tms, pcif)$$

$$-21.2 \qquad\qquad -21.2$$

- IMPORT DEMAND OF MOROCCO:

$$qxs(mvt,EU,Mor) = \text{trade creation effect} + \text{trade diversion effect}$$

$$> 0 \qquad\qquad > 0$$

FTA/NOENTRY

MOTOR VEHICLES SECTOR

- IMPORT MARKET CLEARING COND:

$$qim(mvt,Mor) = f(qfm, qpm, qgm)$$

48.1   42.2   2.1   3.8

- DOMESTIC MARKET CLEARING COND:

$$qds(mvt,Mor) = f(qfd, qpd, qgd)$$

-46.8   -43.8   -1.6   -1.4

MOTOR VEHICLES SECTOR

- MARKET CLEARING CONDITION:

$$qo(mvt, Mor) = f(qds, qxs)$$

-39 -46.8 6.4

- SUPPLY PRICES:

$$ps(mvt, Mor) = f(pm, markup)$$

6.2 -10.2 -15.5

FTA/NOENTRY

LIGHT MANUFACTURING -Values

Variable	Value	Interpretation
tms(lmn,EU,MOR)	-10.6	tariff on EU-sourced goods removed
pms(lmn,EU,MOR)	-10.6	EU-sourced goods fall in price in MOR
pcif(lmn,EU,MOR)	.02	negligible change
qxs(lmn,EU,MOR)	27.25	increased imports from EU
qim(lmn,MOR)	12.82	increased imports into MOR
pim(lmn,MOR)	-8.66	price of imports into MOR fall
qxs(lmn,MOR,else)	43	quantity exported from MOR increases
qds(lmn,MOR)	-3.4	fall in domestic demand for dom. product
ps(lmn,MOR)	-7.03	supply price falls due to returns to scale
pm(lmn,MOR)	-6.31	MOR market price falls
p_AC_MARKUP(lmn,MOR)	.77	markup increases slightly

FTA/NOENTRY

LIGHT MANUFACTURING
Formulas

- MKTPRICES:pms(lmn,r,s)=f(tms,pcif)

- IMPORTDEMAND:qxs(lmn,r,s)=f(qim, pms, pim)

- MKTCLTRD_NMRG:qo(lmn,r) =f(qds,qxs)

- SUPPLYPRICES:ps(lmn,r)=f(pm,p_AC_MARKUP)

Tentative Conclusion (n=2)

- High markups are decimated by new competition

- With increasing returns, competitive sectors have opportunity to benefit from increased scale of production

FTA/NOENTRY

3. Output scaling effect

Clothing and Metal Industries
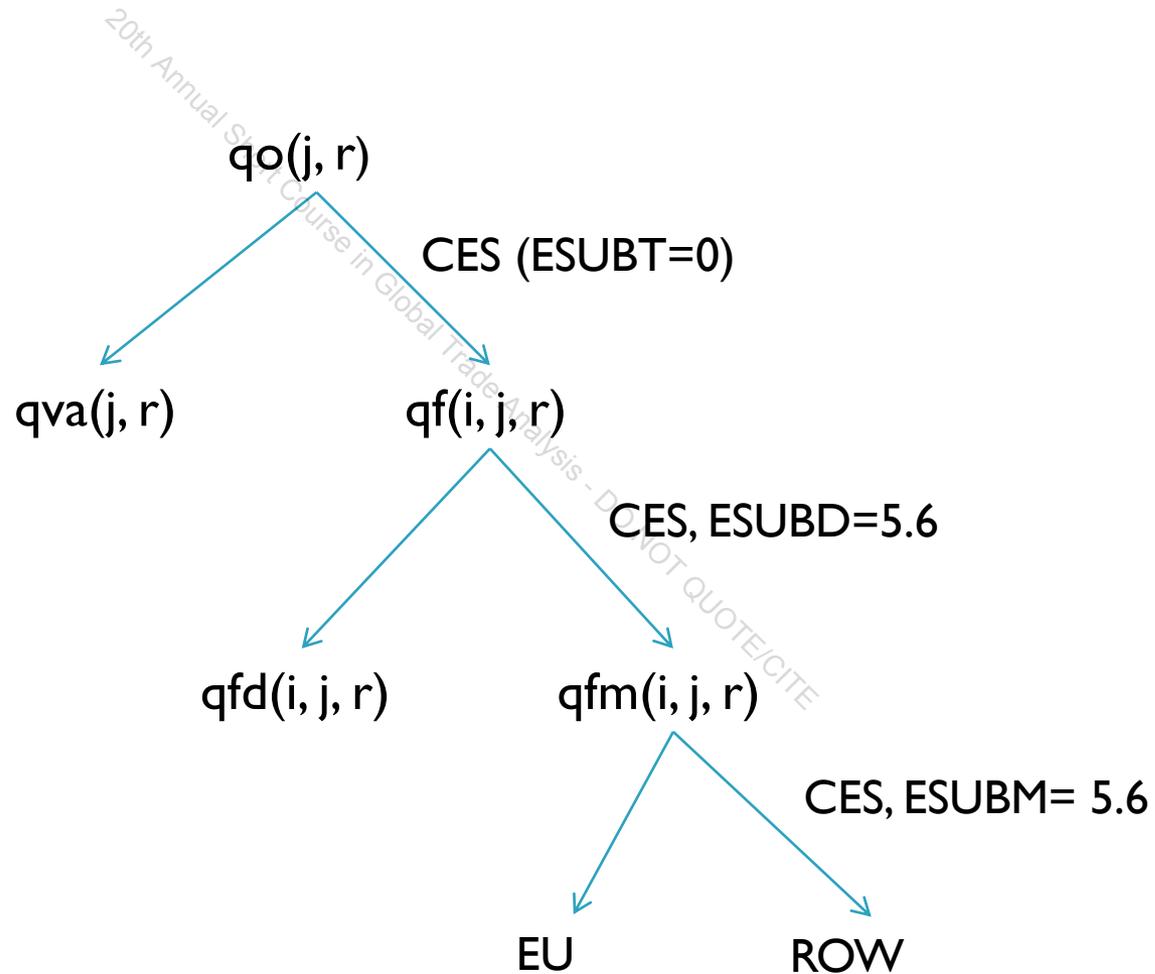*No Entry/Exit vs Entry/Exit*

3. Output scaling effect

Clothing and Metal Industries
No Entry/Exit vs Entry/Exit

Production structure

Moroccan Metal sector

Scale Economies

SE equation in TAB

OSCALE(i, r) = SCALE(i, r) * [qva(i, r) - firms(i, r)] - ao(i, r),

where SCALE: CDR/(1-CDR)

firms: % change in # of firms,

ao: Returns to scale measured by % change in output per firm, % change in composite input level per firm

Changes in Industry output

Percent changes in qo with No Entry/Exit

MOR		EU	
Clothing	**Metal**	**Clothing**	**Metal**
7.71	-13.18	0.07	0.05

Input Analysis

Moroccan Side Entry/Exit vs No Entry/Exit

	No Entry/Exit		Entry/Exit	
	Clothing	**Metal**	**Clothing**	**Metal**
qo (Change in total output)	7.71	-13.18	14.36	-18.8
qva	7.615	-12.024	14.046	-19.059
Input per Firm	7.615	-12.024	26.6481	2.67592
Change in No. of firms	0	0	-12.602	-21.735
ao (returns to scale)	0.08446	-1.31211	0.27888	0.31744

Industry Cost Shares

Clothing and Metal Industries

	Clothing	Metal
UnSkLab	0.589	0.418
SkLab	0.09	0.074
Capital	0.321	0.508