

Imperfect Competition in GTAP

**FTA with Imperfect Competition and
Increasing Returns to Scale in the Case
of Morocco and EU**

Introduction and Extension #1

Morocco extends reductions of EU import tariffs to ROW unilaterally

- Team 1

Frederick Wilhelmmson

and Ines Kapphan

Overview

Paper: “A Comparative Analysis of the EU-Morocco FTA vs. Multilateral Trade Agreement” by Aziz Elbehri and Thomas Hertel (2006)

Issue: Compare unilateral liberalization of imports to Morocco from the EU and multilateral cuts in tariffs

- Welfare effects
- Labour demand

Extensions:

1. Morocco extends reductions of EU import tariffs to ROW unilaterally
2. Termination of Morocco EU FTA
3. FTA under unemployment in skilled and unskilled labour
4. Allowing entry of firms under unemployment with multilateral liberalization

Background on Imperfect Competition

- What is **Imperfect Competition (IC)**?
 - concept of “Increasing Returns of Scale (IRS)”
- Why is it relevant for trade policy analysis?
- Expected effects of trade liberalization with IC
 - improved competition reduces market power in sectors with imperfect competition
 - More important for small economies

Model & Theory

- Increasing returns to scale due to fixed costs in production
- Oligopolistic market with homogeneous goods in the domestic market
- Firms price above marginal cost (markup)
- Markup decreases with more competition but a reduction in plant size increases costs
- Modification of standard GTAP model
 - Markup
 - The markup model as a tax transferred to the regional household
- New welfare effects with IRS and IC
 - Profit shifting
 - Scale effects

Summary of Extension #1

- In addition to the FTA with the EU, Morocco unilaterally reduce its import tariffs to the same level for imports from the ROW
- Possibility of Entry/Exit of Firms in Morocco
- No unemployment, i.e. real wages adjusts to absorb released labor
- ➔ Unilateral tariff reductions to both EU and ROW is more beneficial (in terms of welfare) than the proposed FTA with the EU

Welfare Changes for Extension #1

- Significant increase of allocative efficiency, ...
- ... while the terms of trade are deteriorating
- Note: Transfer of EU makes up large share of welfare increase

<i>Welfare after trade policy</i>	FTA with EU	FTA with EU & ROW
Allocative Efficiency	681	931
Endowments	0	0
Technology (scale)	66	42
Population	0	0
Terms of Trade	-650	-819
Investment & Sav.	-72	-87
Preferences	0	0
EU transfer	164.9	163.7
Total	189.9	230.7

Allocative Efficiency Changes of Extension #1

- Major gains from expansion of trade (imports)
- Loss from the reduction in export prices

Allocative Gains	931
pfacttax	0
Prodtax	-102
inputtax	-52
contax	-48
govtax	0
xtax	171
mtax	962

Scale and Price Effects in Morocco's Apparel Sector

- Terms of trade loss are driven by reduction in export prices
- Wearing apparel and leather sector contributes <10% to Morocco's GDP → incurs the largest ToT loss
- Number of firms is decreasing (9%)
- Production in apparel sector increases by 20%
 - Average firm size increases
 - Limited economies of scale
 - Post-simulation Mark-up indicates perfect competition after the liberalization



Termination of the Morocco-EU FTA

- Team 2

Fei Chai and David Lee

Extension: Termination of the Morocco-EU FTA

Under the existing agreement

Morocco maintained preferential access for its manufacturing exports

But restricted access for its agricultural exports

Closure

Free entry/exit

Full Employment

Shocks

Normalize EU tariffs for Moroccan goods to ROW levels.

Morocco: Impact on Exports

Reversion to previously existing patterns of trade

Agricultural exports generally increase

Manufacturing exports generally decrease

		Exports from MOR to EU	
		Comm	% Change
Primary Agriculture	1 grn		26.12
	2 vfn		-25.76
	3 osd		20.12
	4 sgr		23.49
	5 pfb		20.02
	6 oag		17.3
	7 lvk		18.94
	8 fsh		27.34
Other Primary	9 for		19.54
	10 cog		19.38
	11 mnr		6.92
Manufacturing	12 mtp		-82.99
	13 vof		433.26
	14 drp		-91.99
	15 sgp		-87.01
	16 ofp		-61.46
	17 btp		-18.16
	18 txt		-24.64
	19 wal		-44.56
	20 wdp		5
	21 pap		5.71
	22 chm		-2.9
	23 mmp		5.3
	24 mvt		-18.37
	25 lmn		1.75
	26 omn		5.79

Significant Shifts	
1 grn	26.12
2 vfn	-25.76
3 osd	20.12
4 sgr	23.49
5 pfb	20.02
6 oag	17.3
7 lvk	18.94
8 fsh	27.34
9 for	19.54
10 cog	19.38
12 mtp	-82.99
13 vof	433.26
14 drp	-91.99
15 sgp	-87.01
16 ofp	-61.46
17 btp	-18.16
18 txt	-24.64
19 wal	-44.56
24 mvt	-18.37

Morocco: Impact on Imports

Import demand contracts

Morocco: Imports from World [qxs]			
		2 EU	3 ROW
Primary Agriculture	1 grn	-15.66	-15.66
	2 vfn	-20.19	-20.15
	3 osd	-12.07	-12.09
	4 sgr	-17.88	-17.86
	5 pfb	-11.84	-11.85
	6 oag	-7.7	-7.7
	7 lvk	-22.03	-22.02
Other Primary	8 fsh	16.49	16.28
	9 for	-16.81	-16.81
	10 cog	0.17	0.18
	11 mnr	-0.74	-0.78
Manufacturing	12 mtp	-3.04	-3.03
	13 vof	-13.46	-13.44
	14 drp	-13.33	-13.31
	15 sgp	-13.69	-13.67
	16 ofp	-14.64	-14.61
	17 btp	-17.02	-16.99
	18 txt	-10.37	-10.31
	19 wal	-26.84	-26.72
	20 wdp	-14.3	-14.28
	21 pap	-9.48	-9.46
	22 chm	-6.87	-6.86
	23 mmp	-11.8	-11.78
	24 mvt	-13.82	-13.78
	25 lmn	-8.84	-8.82
	26 omn	-13.89	-13.86

Morocco: Imports from EU [qxs]	
1 grn	-15.66
2 vfn	-20.19
3 osd	-12.07
4 sgr	-17.88
5 pfb	-11.84
7 lvk	-22.03
8 fsh	16.49
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16 ofp	-14.64
17 btp	-17.02
18 txt	-10.37
19 wal	-26.84
20 wdp	-14.3
21 pap	-9.48
23 mmp	-11.8
24 mvt	-13.82
26 omn	-13.89

Morocco: Output

6 grn	2.8
7 vfn	-3.48
8 osd	6.24
9 sgr	-0.72
10 pfb	5.72
11 oag	11.52
12 lvk	-2.42
13 fsh	3.44
14 for	2.18
15 cog	2.95
16 mnr	6.45
17 mtp	4.48
18 vof	96.07
19 drp	3.39
20 sgp	0.68
21 ofp	-6.54
22 btp	-1.51
23 txt	-7.33
24 wal	-15.3
25 wdp	5.69
26 pap	4.31
27 chm	5.44
28 mmp	7.34
29 mvt	23.9
30 lmn	9.65
31 omn	5.54

8 osd	6.24
10 pfb	5.72
11 oag	11.52
16 mnr	6.45
18 vof	96.07
21 ofp	-6.54
23 txt	-7.33
24 wal	-15.3
27 chm	5.44
28 mmp	7.34
29 mvt	23.9
30 lmn	9.65
31 omn	5.54

1. Overall Welfare

welfare	1 alloc_A1	2 endw_B	3 tech_C1	4 pop_D1	5 tot_E1	6 IS_F1	7 pref_G1	Total
MOR	-381.795	0	3.1912	0	-330.088	-28.6845	0	-737.377

Welfare: Allocation Efficiency Effect,
Terms of Trade Effect,
Profit Shifting Effect,
and Scale Effect

2. Allocation Efficiency Effect Decomposed by Tax

cntalleffk	1 pfacttax	2 prodtax	3 inputtax	4 contax	5 govtax	6 xtax	7 mtax	Total
MOR	-0.0001	-48.3946	3.0554	-35.2949	0	-1.7739	-299.382	-381.791

- 3. Profit Shifting Effect (prodtax)

output	1 welcnt	2 dvol	3 taxrateb	4 taxrateu
vof	-8.8266	200.6025	-4.5484	-4.5484
ofp	15.9719	-253.795	-6.3109	-6.3107
txt	16.7658	-84.0692	-19.896	-19.896
mmp	11.5424	361.3734	3.2097	3.2097
btp	-2.8432	-7.7989	36.4395	36.4395
lmn	-13.3521	228.1059	-5.8809	-5.881
mvt	-71.6296	267.1726	-26.9073	-26.9077
Total	-48.3954	237.9456	-14.1337	-14.1378

4, Allocation Efficiency Effect from Import Volume (mtax)

trade	1 welcnt	2 dvol	3 taxrateb	4 taxrateu
grn	-37.4358	-46.175	151.9999	151.9999
fsh	0.254	0.7006	35.1532	35.1531
for	-0.2916	-7.1916	11.3055	11.3054
cog	0.0577	1.7696	24.3689	24.3689
txt	-46.7876	-149.217	52.262	52.262
wal	-41.4637	-120.262	61.4591	61.4591
Total	-299.383	-1061.37	2080.404	2080.404

5, Scale Effect(ao)

cnttech	1 output	2 primfac	3 v_added	4 ininput	5 transp	6 import	Total
1 MOR	3.1912	0	0	0	0	0	3.1912

	lvk	fsh	vof	chm	lmn	ofp	btp
VOA	0.0544	0.0036	0.0025	0.0445	0.0283	0.0467	0.0037
ao	0	0	4.5149	0.3303	0.3451	-0.5352	-0.6089

6. Terms of Trade Effect (tot)

tot	1 pworld	2 pexport	3 pimport	Total
\$million	-0.9806	-328.44	-0.6671	-330.088
price	pxwwld	pxwreg	piwreg	
%change	0.0015	-3.46	0.01	
volume	qxwwld	qxwreg	qiwreg	
%change	-0.0191	-6.646	-10.358	

Composition of % change of pfob

	pfob	shr of EXP	pfob%chg
vof	-7.97108	0.005075	-0.04045
wal	-3.46313	0.27209	-0.94228
ofp	-3.35303	0.09249	-0.31012
fsh	3.274654	0.007967	0.026089
ofp	-3.35303	0.09249	-0.31012



Labor Market Analysis; Allowing For Unemployment In The Skilled Labor Market

- Team 3

Selin Gokten and Noha Khalifa



Experiments in the paper replicated:

A- FTA, no entry/exit, full employment, tax replacement.

B- FTA, no entry/exit, unemployment in unskilled labor, tax replacement

Results of experiments in the paper

FTA Scenarios		
	No Entry, full employment	No Entry & Unemployment (unskilled)
Total Welfare	-190	-1736 ↓
Allocative Efficiency	621	469
Labor Endowment	0	-1327 ↓
Scale Economies	-314	-413
Terms of trade	-660	-627
Transfers from EU	164	164*



-Despite the income transfer from the EU, Morocco has welfare losses.

-As a consequence of the FTA the loss to the Moroccan economy, in terms of trade effects, is high. In order to offset the *increase in imports*, this tends to *drive down export prices*. Morocco's TOT deteriorate significantly. Adverse scale effects are also substantial due to decrease in output.

-*Allowing for unemployment*; firms do not exit, output per firm falls, and aggregate employment contracts (-8.4%).

-The welfare loss is nearly 10 times as large compared to the no entry full employment case, with the loss in labor endowments substantially high.

Results of experiments in the paper

FTA Scenarios		
	No Entry, full employment	No Entry & Unemployment
Allocative Efficiency	621	469 
Profit shifting	154	179 
Input Tax	-28	-35
Consumption Tax	-74	-187
Export Tax	118	111
Import Tax	450	401

-Profit shifting effect is positive in both scenarios as a result of the contraction of the loss making motor vehicles and parts sector.

Selected Sectoral Effects

- **Motor vehicle and parts** suffered from decrease in production and hence economies of scale that was caused by both increased competition from lower priced imports and an increase in inputs price, which further drove the mark-ups down.
- **Wood & paper products** also suffered from a decrease in market prices which drove down the markups and offset the slight decrease in it's input price.

	% Change Input Price	% Change Market Price	% Change in import price	% Change Markup
Motor Vehicles	8.1	-10.14	-18.62	-16.87
Wood & paper	-2.06	-11.4	-27.49	-9.6

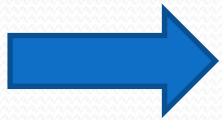
● Extensions #3

- To make the policy analysis more realistic we allowed for unemployment among both skilled and unskilled labor, and thus fixing real wage rates.



Why allow for unemployment among skilled labor???

According to the UN the unemployment rate in Morocco is high, particularly among young qualified people, exceeding 20% in 2005.



Why fix the wage rate???

The Moroccan government has 2 mechanisms that support this extension;

A- Wage fixing mechanism through a “wages committee”.

B- Minimum Wage scheme and yearly raises, ensured through regular inspections of workplaces

Results Of Extension #3

Welfare Decomposition Comparison

	No Entry & Unemployment in unskilled labor	No Entry and Unemployment in both skilled and unskilled labor
Total Welfare	-1736	-3023 ↓
Allocative Efficiency	469	353
Labor Endowment	-1327	-2290 ↓
Scale Economies	-413	-503
Terms of trade	-627	-583 ↑
Transfers from EU	164*	164



- Total welfare losses increased when accounting for unemployment in both skilled and unskilled labor, and aggregate employment decreases by 11% in unskilled and 13% in skilled labor.

- Terms of trade slightly improve due to the decline in increase in imports, putting less pressure on export price.

- Similar to the previous simulation the decrease in labor endowments have the largest contribution to the loss in welfare after allowing for unemployment in both skilled and unskilled labor.

Results Of Extension #3

- Allocative efficiency comparison:

FTA Scenarios		
	No Entry & Unemployment in unskilled labor	No Entry & Unemployment in both skilled and unskilled labor
Allocative Efficiency	469	350
Profit shifting	179	206 
Input Tax	-35	-42
Consumption Tax	-187	-274 
Export Tax	111	102
Import Tax	401	358

• Profit shifting increased due to the contraction of loss making sectors, with 87% of this increase resulting from the motor vehicle sector .

• As a result of the decrease in imports , and thus the decrease in tariff revenue , the government compensates for this by the increase in consumption tax (tax replacement), and thus decreases welfare further.

Insights from extension #3

- Killing an industry is not always bad !!
- Allowing for unemployment in unskilled and skilled labor had positive profit shifting effects due to the contraction of loss making sectors, yet the overall welfare effect was negative due to the negative effect of labor endowments .
- When allowing for unemployment in the skilled labor the decrease in aggregate labor endowments was more for the skilled than the unskilled labor.



Allowing entry of firms to affect unemployment with multilateral liberalization

- Team 4

Samantha Brady and Le Chen

Simulation specification

- Multilateral vs FTA
 - Regions: Morocco, EU, ROW
 - FTA → specialization in labor-intensive industry
 - Alternative for Morocco: WTO (multilateral)
- Comparable in trade volume
- 30% tariff cut

- Simulation in the paper: (sim1)

- Multilateral
- Entry & exit
- Tax replacement
- **Fixed labor endowment**

- Extension simulation (sim2):

- Multilateral
- Entry & exit
- Tax replacement
- **Fixed real wage**

Sectors	EU import tariff rate from MOR		MOR import tariff rate from EU	
	Before	After	Before	After
Meat	4.83	3.38	172	120.4
Veg. oil	50.6	35.42	14.8	10.36
Dairy	1.27	0.89	54.34	38.04
Sugar	7.09	4.96	148	103.6
Other food	1.5	1.05	42.33	29.63
Beve. & Toba.	2.3	1.61	52.57	36.8

Welfare decomposition

	Multilateral, Entry, tax, fixed labor endowment	Multilateral, Entry, tax, fixed real wage
Total Welfare	528.0	963.36
Allocative Efficiency	656.7	695.57
Labor Endowment	0.0	387.10
Scale Economies	83.1	96.31
Terms of Trade	-211.8	-215.32
Allocative Efficiency	656.7	695.57
Profit Shifting	-8.7	-14.12
Input Tax	-4.8	-1.94
Consumption Tax	17.8	35.49
Export Tax	49.4	-50.01
Import Tax	603.1	625.83
Aggregate Unskilled Labor	-	2.5

Unskilled labor increases 2.5%

- Endowment variable
- Real wage rate fixed, but relative price decreases
- Input increases the most in Service sector with 2.2%
- Service sector has the largest market share in labor market
- The remaining increase in labor input is absorbed by labor-intensive sectors

Profit shifting effects

- Sectors make
 - Profit + expanding → positive contribution
 - Loss + contracting → positive contribution
 - Profit + contracting → negative contribution
 - Loss+ expanding → negative contribution

sim2	Markup (%)	Sectoral output (%)	Profit shifting effect \$ mil
Sugar	1.257	-14.52	-32.31
Motor vehicles	0.788	-14.3	42.89

What have we learned?

- Extension 1
 - Unilateral tariff reductions to both EU and ROW is more beneficial (in terms of welfare) than the FTA with the EU
- Extension 2
 - Eliminating the FTA results in a drop in exports for the manufacturing sectors
- Combined with Extension 1, this suggests multilateral trade negotiations may be a better alternative (in terms of welfare) for Morocco's economy.

What have we learned?

- Extension 3
 - Contraction of loss making sectors has a positive profit shifting effect and thus increases welfare
 - Allowing for unemployment among both skilled and unskilled labor has stronger effects on the skilled labor sector

What have we learned?

- Extension 4
 - Multilateral liberalization increases exports leading to a drop in export prices, causing an overall decrease in the terms of trade value
 - The magnitude of scale effects is revealed in the technical change (a_0), which is assumed exogenous in the standard closure
 - Endogenizing labor endowment has positive contribution to welfare change

What have we learned?

- Extension 4
 - No entry + endogenize labor endowment \longrightarrow welfare decrease
 - Entry + endogenize labor endowment \longrightarrow welfare increase
 - Perfect competition
 - Homogenous product
 - Perfect information
 - Free entry
 - Many buyers/sellers



Thank you !

谢谢 !

Tesekkurler !

Shokran!