

## Quantitative Policy Analysis: Spread-sheet based model exercises

NOTE: All Excel-based models are solved with the "Tools/Solver" tool reached off the main excel menu.

### Partial Equilibrium Exercises

#### I. Identical Products Model (perfect.xls)

A. Consider the data on North American textiles & clothing trade in the attached Table 1. Assume that the tariff equivalent of textile and clothing imports of existing quotas is, on average, 15% and 25% respectively. ASSUME for clothing that:  $M=36,888$  and  $SHIPMENTS=121,915$

1. What would be the impact of replacing the existing quota regime with one of "identical" tariffs on both products?
2. What difference does the linearization of the problem make?
3. What would be the impact of simply eliminating the quotas?
4. What would be the impact of replacing the tariff with an "identical" quota?

#### II. Partial Equilibrium Exercise – Armington products (Ar\_model.xls)

A. Divide import sources for North America into Latin America, and Rest-of-World. Assume identical quota wedges, like those described above for exercise I (15% and 25%).

1. What are the implications of a preferential removal of quotas for Latin American imports? What happens to demand for outside suppliers.
2. What are the implications of a preferential removal of tariffs and quotas?

B. Working with the COMPAS model, assume that clothing exports from China are the subject of an antidumping investigation. Further assume that the dumping margin is 50%.

1. What are the effects of the alleged dumping on the domestic industry?
2. What are the likely effects of imposing dumping duties?
3. What is missing from the COMPAS-based assessment that might be relevant?

#### III. PE Cournot model with import quotas (quotas.xls)

For the PE Cournot model, assume a domestic telecomms market as described in Table 3.

A. What is the effect of allowing increased market access, in the form of a 100% increase in the import quota.

B. What is the effect of allowing local establishment, such that the number of firms increases to 10? (Assume "trade" is held fixed, but foreign service firms can establish locally).

### General Equilibrium Exercises

#### IV. Sector-focused Armington CGE (Ar\_cge.xls)

A. Using the same data as in II.A above, examine the effect of shifting from a tariff regime to an "identical" set of quotas. Under the PE specification, there will be no change in imports. This is not the case in GE, because the income loss feeds back, in general equilibrium, to total demand in the protected sector. How do the results differ between the two models?

B. Compare the results of exercise II.A.1-2 with the results using the GE version of the same model. In what ways do the results differ?

- V. The 123-Model (CGE123.xls and SSCG123.xls)  
 NOTE: After each experiment, either re-benchmark the model (i.e. recalculate it) with the original data, or otherwise reopen the original model for the next experiment.
- What are the effects of an increase in Government spending (change cell F15 for this experiment to .125).
  - What is the effect of a deterioration in the terms of trade ? (change cell F6 to 1.0)
  - What is the effect of a foreign exchange windfall? (change cell F19 to .12).
  - Repeat exercises 1-3, working with the steady-state version of the model.

**Table 1**  
**North American textile & clothing imports and production -- 1995**  
 (millions of dollars, and percent)

	imports		duties		production	
	textiles	clothing	textiles	clothing	textiles	clothing
<i>OECD</i>						
Asia-Pacific	1,821	2,119	11.26	14.21	136,524	111,183
Europe	3,108	2,235	10.02	13.20	169,865	133,586
North America	5,362	5,479	0.00	0.00	133,554	121,915
<i>Asia</i>						
East Asia	603	5,559	11.40	14.73	20,129	24,216
China	1,314	4,604	10.05	12.09	84,695	42,281
Hong Kong	210	210	9.80	13.37	7,570	12,707
South Asia	2,192	7,057	9.06	14.26	79,886	25,218
<i>Latin America</i>	575	6,535	8.24	11.99	68,205	46,716
<i>Europe</i>						
Central & Eastern Europe	118	286	10.47	14.17	21,681	14,937
Turkey	229	625	11.58	13.56	6,372	8,221
<i>Africa &amp; Middle East</i>	351	1,653	6.28	13.14	25,729	23,684
<i>Rest of World</i>	125	1,279	10.78	14.33	21,920	15,843
Total	16,007	42,367	6.61	11.68	776,127	580,506
Total excluding NAFTA	10,645	36,888	9.94	13.41	642,573	458,591

source: GTAP database, version 4

**Table 2**  
Data for the 123 CGE Model

	N	O	P	Q	R	S	T	U
4	<b>Data - Sri Lanka, 1991</b>							
5			Rs Billion	Output=1			Rs Billion	Output=1
6	<b>National Accounts</b>				<b>3 Fiscal Account</b>			
7	1	Output (Value Added)	324.69	1.00	Revenue	76.18	0.23	
8		Wages	163.32	0.50	NonTax	8.02	0.02	
9					Current Expenditure	83.76	0.26	
10		GDP at market prices	375.34	1.16	Goods & Services	35.58	0.11	
11		Private Consumption	291.69	0.90	Interest Payments	22.07	0.07	
12		Public Consumption	35.58	0.11	Transfers & Subsidies	26.10	0.08	
13		Investment	86.38	0.27	Capital Expenditure	35.77	0.11	
14		Exports	106.39	0.33	Fiscal Balance	-43.35	-0.13	
15		Imports	144.70	0.45				
16								
17	<b>Tax Revenue</b>				<b>4 Balance of Payments</b>			
18	2	Sales & Excise Tax	32.03	0.10	Exports - Imports	-38.32	-0.12	
19		Import Tariffs	18.62	0.06	Net Profits & Dividends	-0.78	0.00	
20		Export Duties	1.14	0.00	Interest Payments	-8.82	-0.03	
21		Payroll Tax	0.00	0.00	Net Private Transfers	11.60	0.04	
22		Personal Income Tax	3.54	0.01	Net Official Transfers	7.90	0.02	
23		Capital Income Tax	12.84	0.04	Current Account Balance	-28.42	-0.09	
24		Total	68.16	0.21				
25					External Debt	260.50	0.80	
26					Debt Service Payments	20.21	0.06	
27								
28								

	B	C	D	E	F
4	<b>Parameters</b>		<b>Exogenous Variables</b>	Base Year	Current
5					
6	Elasticity for CET (st)	0.60	World Price of Imports (wm)	0.89	0.89
7	Elasticity for CES/Q (sq)	0.60	World Price of Exports (we)	1.01	1.01
8					
9	Scale for CET (at)	2.22	Import Tariffs (tm)	0.13	0.13
10	Share for CET (bt)	0.77	Export Duties (te)	0.01	0.01
11	Rho for CET (rt)	2.67	Indirect Taxes (ts)	0.08	0.08
12			Direct Taxes (ty)	0.03	0.03
13	Scale for CES/Q (aq)	1.97			
14	Share for CES/Q (bq)	0.38	Savings rate (sy)	0.17	0.17
15	Rho for CES/Q (rq)	0.67	Govt. Consumption (G)	0.10	0.10
16			Govt. Transfers (tr)	0.12	0.15
17			Foreign Grants (ft)	0.02	0.02
18			Net Priv Remittances (re)	0.01	0.01
19			Foreign Saving (B)	0.08	0.08
20			Output (X)	1.00	1.00
21					
22					
23					
24					
25					
26					
27					
28					

**Table 3 – partial equilibrium quota exercise**

Insurance market:

Total market size:	\$300 million
Sales of domestic firms:	\$290 million
Sales of foreign firms:	\$ 10 million
Markup rate	35%
Number of domestic firms	5