

Problem Set 2

The 123 Model:

I. The basic data for the 123 model exercises are provided below. Note that these have already been loaded into the spreadsheet for you:

	Rs Billion	Output=1
National Accounts		
Output (Value Added)	324.6940	1.0000
Wages	163.3200	0.5030
GDP at market prices	375.3390	1.1560
Private Consumption	291.6940	0.8984
Public Consumption	35.5830	0.1096
Investment	86.3760	0.2660
Exports	106.3860	0.3277
Imports	144.7010	0.4457
Tax Revenue		
Sales & Excise Tax	32.0270	0.0986
Import Tariffs	18.6170	0.0573
Export Duties	1.1370	0.0035
Payroll Tax	0.0000	0.0000
Personal Income Tax	3.5390	0.0109
Capital Income Tax	12.8370	0.0395
Total	68.1570	0.2099
Fiscal Account		
Revenue	76.1790	0.2346
NonTax	8.0220	0.0247
Current Expenditure	83.7560	0.2580
Goods & Services	35.5830	0.1096
Interest Payments	22.0730	0.0680
Transfers & Subsidies	26.1000	0.0804
Capital Expenditure	35.7710	0.1102
Fiscal Balance	-43.3480	-0.1335
Balance of Payments		
Exports - Imports	-38.3150	-0.1180
Net Profits & Dividends	-0.7830	-0.0024
Interest Payments	-8.8200	-0.0272
Net Private Transfers	11.6000	0.0357
Net Official Transfers	7.9000	0.0243
Current Account Balance	-28.4180	-0.0875
External Debt		
Debt Service Payments	20.2100	0.0622

INSTRUCTIONS: running the model involves the following steps:

- (1) make changes in column F to exogenous variables
- (2) use the "Tools:Solver" to run the model
- (3) Reset the model, or open up a clean version, between experiments. Resetting involves setting the column F values back to what they were, and rerunning the model.

I.A Assume that the world price of imports increases from 0.89 to 1.07. This is a 10% increase in import prices. This requires changing cell F6:

- what happens to import levels, government taxes, and exports. Notice that exports go up. Why? Use the diagrams from the readings (and discussed in class) to explain why this increase in import prices leads to more exports.

- Change the Armington elasticity of substitution (cell C7) from 0.6 to 1.2, and run the same experiment. In what ways do the results differ? Why?

I.B Now, assume that import prices are back where they were (0.89). However, now assume that we have a capital inflow equal to 10% of GDP. This involves changing cell F19 from 0.8 to 0.18.

- what happens to import levels, government taxes, and exports. Notice that exports go down. Why? Use the diagrams from the readings (and discussed in class) to explain why this increase in import prices leads to more exports.

- Change the Armington elasticity of substitution (cell C7) from 0.6 to 1.2, and run the same experiment. In what ways do the results differ? Why?

II. INVESTMENT EFFECTS

II.A Try the same as experiment I.A, except with the steady-state version of the model.

II.B Try the same experiment as I.B, but with the steady-state version of the model.

Why do the results vary? Try to explain the differences.

III. Models with Imperfect Competition:

The Tables below presents changes in output and exports by sector, for our experiment (discussed briefly in class) where

- We have 2 regions: Japan and ROW
- We have 3 sectors: primary, manufacturing, and services
- We introduce global free trade

We have run our experiment twice. In the first instance, we have assumed perfect competition. In the second, we have assumed monopolistic competition in the manufacturing sector.

changes in output (measured in percent changes)

sector	JAPAN		Rest of World	
	perfect competition	monopolistic competition	perfect competition	monopolistic competition
primary	-17.316	-16.148	0.496	0.005
manufactures	1.630	2.063	-0.249	-1.549
services	0.373	0.373	0.014	0.502

changes in exports (measured in percent changes)

sector	JAPAN		Rest of World	
	perfect competition	monopolistic competition	perfect competition	monopolistic competition
primary	21.627	17.821	32.658	32.044
manufactures	45.206	129.911	31.432	86.885
services	-0.076	10.098	8.919	19.835

III.A What difference do we see in manufacturing output changes between the two experiments? Why?

III.B What differences do we see in manufacturing and primary exports between the two scenarios? Why? (Notice that Japanese primary output falls, but primary exports go up).