

Assignment 1

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International Trade I at ITAM

1. Data Part

- (a) This exercise is meant to show the importance of trade in the Mexican economy. To proceed, go to the World Bank's World Development Indicators database¹. For Mexico, download data on GDP (current US \$), Merchandise exports (current US\$), Merchandise imports (current US\$), Exports of goods and services (current US\$), and Imports of goods and services (current US\$).
- i. Plot the ratio of Merchandise exports to GDP, Merchandise imports to GDP, and ratio of Merchandise trade (sum of merchandise exports and merchandise imports) to GDP on the same graph. How does the impact of NAFTA show up in this graph?
 - ii. Compute the average of the three ratios above for 1960-1993 and 1994-2011. How large is the 1994-2011 average relative to the 1960-1993, i.e. how has the importance of merchandise exports, imports and trade changed between these two time periods?
 - iii. Compute (i) Exports of services as Exports of goods and services minus Merchandise exports to GDP, (ii) Imports of services as Imports of goods and services minus Merchandise imports, and (iii) Trade of services as Trade of goods and services (sum of exports of goods and services and imports of goods and services) minus Merchandise trade (sum of merchandise exports and merchandise imports). Plot Exports of services to GDP ratio, Imports

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¹The relevant data can be downloaded at <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>

of services to GDP, and Trade of services to GDP? Explain how export, import and trade in services relative to GDP has changed over time? What does this tell you about importance of services in Mexico's trade with the world? Is there something odd going in the graph?

- (b) In this exercise we explore what does Mexico import and export in the world markets. To analyze this question go to the World Integrated Trade Solutions (WITS) webpage² and create your account (username and password). Once you login, under 'Advanced Query' select 'Trade Data (UN Comtrade)'. Fill out 'Query Name', 'Query Description', choose 'Comtrade' as Data Source and then press 'Proceed'. On the next page do the following: (1) for Reporters select Mexico; (2) under Products choose SITC Revision 3 as the 'Nomenclature', and then from 'Clusters' choose ALL3 – Group (3-digit); (3) for Partners choose World; (4) for Years choose 1993 and 2007; (5) for Trade Flows choose Exports and Imports. When you download the data you will have the option to select a file format (excel or csv is best), and also an option to add more columns. You should add 'Product Description' to Selected Columns. Then Download the data.
- i. Rank the commodity groups, highest to lowest, according to their share in total exports in year 1993. Do the same for 2007. List the top 10 exported commodities of 1993 and compare their rank in 1993 with their rank in 2007. What are the top 10 exported commodities of 2007, and how does their 2007 rank compare with their 1993 rank. How has NAFTA affected the export composition of Mexico?
 - ii. Now do the exercise of the previous part for imports. How has NAFTA affected the import composition of Mexico?
 - iii. For each commodity group compute the percentatge change in exports from 1993 to 2007. Rank them highest to lowest in terms of percentatge change. What are the top 10 commodities that experienced greatest growth in exports? Now, repeat the exercise for imports.
 - iv. Make a scatter plot with share in total exports in year 1993 on the x-axis and the percentatge change in exports from 1993 to 2007 on the y-axis. Interpret what you see in this graph. Compute the correlation between the share in

²Which can be found on <https://wits.worldbank.org/WITS/>

total exports in year 1993 and the percentage change in exports from 1993 to 2007 across commodity groups.

v. Repeat the exercise of the previous part for imports.

2. Theoretical part

(a) Consider a world with 2 countries home (h) and foreign (f). Both countries produce final goods x and y using the following technologies ($i = h, f$):

$$\begin{aligned}x_i &= k_{ix}^\alpha l_{ix}^{1-\alpha} \\y_i &= k_{iy}^\beta l_{iy}^{1-\beta}\end{aligned}$$

where $\beta > 0$, $\alpha > 0$, $\beta > \alpha$ and k, l are factors of production. Assume that these factors of production are perfectly mobile across sectors.

- i. Under autarky, set up firms maximization problem and obtain the first order conditions for countries $i = h, f$.
- ii. Using the first order conditions, express the capital-labor ratio of each sector as a function of the ratio of the wage rate and rental rate of capital (w_i/r_i).
- iii. Under the same assumptions what are the equilibrium price ratios p_{xi}/p_{yi} as a function of the ratio of the wage rate and rental rate of capital?
- iv. What forces explain the differences in comparative advantage between these two countries?
- v. Under free trade and when both countries produce both goods, will factor price equalization hold? Why or why not?