

International Trade: Lecture 0

Preliminaries

Carlos Góes¹

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Outline

- About me
- Course objectives and organization
- Some initial topics for debate

About me

I'm originally from Brazil...



- Education:

- Ph.D.: University of California, San Diego
- M.A.: Johns Hopkins SAIS
- B.A.: University of Brasilia

- Professional:

- Economist, World Bank Group
- Research Economist, World Trade Organization
- Senior Economic Advisor, President of Brazil

- Misc:

- Twitter: @goescarlos
- Website: www.carlosgoes.com

- Research: Macro & International Trade

Course objectives

- International Trade Theory and Policy (ECON 2181).
- Course objectives:
 1. Comprehend and explain the modern trade theories and their assumptions;
 2. Illustrate each theory using standard analytical tools (e.g., PPFs, GE diagrams, gravity) and data;
 3. Solve for the equilibrium of different models, using pen-and-paper as well as a computer;
 4. Interpret policy implications and distributional effects of trade and trade policy.

What do you need to know in the beginning of this course?

- Pre-reqs: ECON 1011 and ECON 1012
- Most of you are econ majors, so I expect you to have heard of:
 1. Indifference curves
 2. Production functions / production possibility sets
 3. Equilibrium

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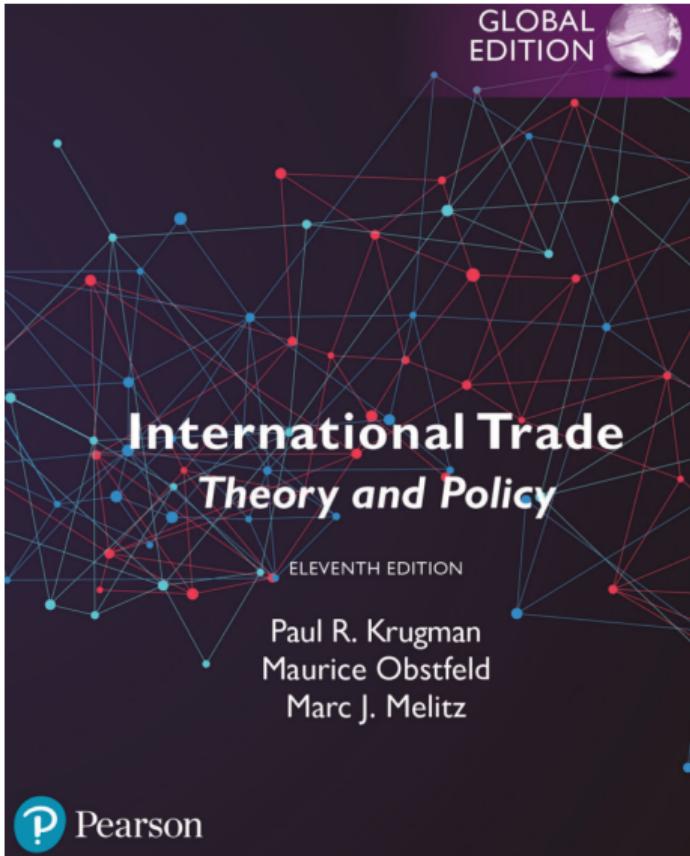
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- Most cases, I will make your life easier and write down a simple maximization problem
- This is **not** a mathematical economics course: no long, detailed, rigorous proofs
- However, math is important. And basic calculus + algebra helps with the intuition. You should be able to do it.

Textbook



- *International Trade: Theory and Policy.*
- Edition: 11th
- Authors:
 - Paul Krugman (Nobel)
 - Maurice Obstfeld (former IMF Chief)
 - Marc Melitz (future Nobel)

Handouts

Classical Ricardian Trade: Two Countries, Two Goods

Carlos Góes
IFC, World Bank Group

August 26, 2025

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$$\max_{Y_{i,p}} \pi_{i,p} = \max_{Y_{i,p}} P_{i,p} Y_{i,p} - w_i a_{i,p} Y_{i,p} \quad (1)$$

Labor is mobile. This means that labor can be distributed for the production of either good, such that the same pool of workers can be allocated to either good. For that reason, total labor endowment must respect the following constraint:

$$\underbrace{a_{i,C} \times Y_{i,C}}_{\substack{\text{labor used in} \\ \text{production of } C}} + \underbrace{a_{i,R} \times Y_{i,R}}_{\substack{\text{labor used in } R \\ \text{production of } R}} \leq \underbrace{L_i}_{\substack{\text{total labor} \\ \text{available in } i}} \quad (2)$$

The inequality above defines set of feasible production choices. This set define potential choices of $(Y_{i,C}, Y_{i,R})$ that are "feasible." That is, if the labor input used to produce $(Y_{i,C}, Y_{i,R})$ is not larger than L_i , production is feasible:

$$\mathcal{Y}_i := \{(Y_{i,C}, Y_{i,R}) : a_{i,C} \times Y_{i,C} + a_{i,R} \times Y_{i,R} \leq L_i\}$$

A graphical representation of \mathcal{Y}_i is in Figure 1. Every choice of $(Y_{i,C}, Y_{i,R})$ in the cyan triangle is feasible. In English, being feasible means that there is enough labor in i to produce the combination of output that falls within the triangle. If the choices $(Y_{i,C}, Y_{i,R})$ fall on the blue line (the boundary of set), then *total production exhausts available labor*. This means that the weak inequality in (2) holds equality. In other words, the blue line is defined by the equation $a_{i,C} \times Y_{i,C} + a_{i,R} \times Y_{i,R} = L_i$, which can be rearranged to solved for $Y_{i,C}$ as $Y_{i,C} = \frac{L_i}{a_{i,C}} - \frac{a_{i,R}}{a_{i,C}} \times Y_{i,R}$. We call the blue line the **production possibilities frontier (PPF)**.

Since labor is the only type of labor (mobile across sectors), there is a single wage w_i . In equilibrium, if production for good p happens, **prices equal marginal cost** (take the derivative of (1) above with

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- They are *too complete* in the sense that they cover *more* than what is required to do well in this course
- But they are a great resource, especially if you are in doubt or want to go deeper
- I also prepared them from scratch! You are the first to use them. If you find typos, let me know.

Grading

- Course grades are based on two midterms, one final, code assignments, and two mini-projects:

Code assignments	15%
Mini-Project 1	5%
Mini-Project 2	5%
Midterm	30%
Final Exam (cumulative)	45%

Details, rubrics, and deadlines will be posted online. Limited extra credit may be awarded for *constructive, regular class participation*.

Policies (i)

- Attendance

- I do not require attendance
- You are an adult and I will treat you as such
- If you skip all the classes and do well in my class, congrats (low probability)
- If you attend all classes and follow the slides, you will get a good grade (high probability)

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- **Honesty and regrading policy**
 - The main rule is: do not be dishonest (you will get caught)
 - If you have a problem, let me know in advance – I am reasonable
 - Regrade policy: arithmetical error (I summed scores wrong); or full exam regrade (your score might go up or down)
 - You cannot appeal on a single question

Policies (ii)

- Exams

- No make-up exams are offered.
- You can choose to skip the midterm and increase the weight of your final exam.
- Late homework is not accepted without a qualifying emergency.
- Religious exceptions also follow GW policy.
- Final exam scheduling follows the official GW schedule.

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- Collaboration

- You are encouraged to discuss problem sets conceptually with peers
- The work you submit must be your own.
- All submitted work must reflect your independent understanding.
- tl;dr work together. don't copy. it's a waste of your family's (or the govt's, or your future self's) money.

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- But... note the following:
 1. you are responsible for everything you submit;
 2. "ChatGPT" is not a source – you need to go to original sources and verify the claims;
 3. you should ground your claims on reputable sources (peer reviewed research; reports from the IMF, World Bank, WTO, OECD, etc)
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- AI can be your friend (I encourage it) but it's an assistant not a replacement for effort

When you have domain knowledge, AI can be your friend

Context

Research project that tries to understand economic networks in the context of multiple sectors and heterogeneous firms. Firms of different sizes have different constraints and optimal policy might want to focus on firms that are close to their constraints to fix market failures. Empirically, you are trying to understand how small and medium enterprises fall within supply chains and economic networks, particularly in developing countries.

Goal

Do a comprehensive literature review of:

- The economic networks literature, from a theory/modelling. Be clear on how this relates and/or differs from supply chains or global value chains (or if they are all different words for the same object). You can focus on papers that use both a partial equilibrium or general equilibrium approach;
- The empirical literature on supply chains/economic networks, focusing particularly on developing countries. Research summarize papers that take descriptive approaches to economic networks. Also research and summarize empirical papers that have a causal claim, describing both the empirical models they use and how credible is the identification strategy they might have used.
- The heterogeneous firms literature, particularly where it focuses on developing countries. This includes the main papers on heterogeneous firms (a la Aiyagari or HANK) and misallocation (a la Klenow and Hsieh). Research extensions of these canonical models to (a) multiple sectors; (b) relationships with supply chains/economic networks; and (c) developing countries.
- Relevant reports by multilateral organizations such as the World Bank, the IMF, the WTO and others on the topic of economic networks.

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- Each will be worth 5% of your grade.

Tentative deadlines: one week after each data lab that requires an assignment.

Data + coding

- Coding

- Aside from trade knowledge, I want you to get skills out of this class
- I will ask you to download data, transform it using computer code, plot charts and tables
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- Anaconda

- Free + open source distribution
- Optimized for data science
- <https://www.anaconda.com/download>
- Installing + exploring lab soon

Problem sets

- I will assign a subset of the textbooks exercises as practice problem sets.
- They will not be graded but will serve as practice for your midterm and final.
- I will use some exercises that show up in your problem sets in the exams.
- You do have to do them... but if you do, chances are you will do better in the exams.

Key dates

- Midterm: Thu, Oct 16
- Final: Per official GW exam schedule (time/place TBA on Blackboard, on Finals week)
- I might need to travel for work some days... if that happens, we will host some asynchronous remote classes + office hours by appointment.

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- What makes countries (or people) trade?

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- What makes countries (or people) trade?
 - Different skills (e.g., I am bad mechanic, so I pay Jiffy Lube instead)
 - Different endowments (e.g., Saudi Arabia has a lot of oil; Luxembourg does not);
 - Different products (e.g., both France and Italy produce wine, but trade for variety);

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- “Free trade closes the income gap between poor and rich countries.”
No. Trade raises every country’s welfare beyond autarky welfare. Per capita income differences remain, and depend on a country’s production possibilities.

How to survive political memes



Some answers

- While free trade makes society (in general) better off not everyone gains from it
 - Over the LR, all resources are mobile, economy readjusts optimally
 - Over the SR, some factors may be immobile
 - Land is scarce, if the price of agricultural goods falls with imports, landowners lose
 - Losses are concentrated in a few sectors; gains are dispersed in society
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- It's hard to collect taxes
 - You need a complicated bureaucracy like the IRS to enforce tax law
 - You need firms and households to apply complicated formulas
 - You need electronic bookkeeping to ensure sales taxes are not evaded within a country
 - Lack of state capacity means some countries (particularly poor countries) use tariffs instead
 - You only need to enforce them once goods cross borders

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- If it doesn't the outcome is:
 - harming the consumer, by preventing them from accessing cheaper and/or higher quality foreign goods
 - keeping unproductive firms in the market (misallocation)

Other topics

- Can we still trade even if a country is more productive in everything?
- Who gains and who loses with trade?
- What happens with exports after countries grow in endowment?
- Why do we trade within the same industry (e.g., cars for cars)?
- What happens with firms after trade?