MAST 2026 · WORKSHOP ON CGE MODELING AND GTAP



Session 2 · 10:30–12:00

Inside the GTAP Model: Agents, Markets, and Results

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SESSION 2 ROADMAP

From the SAM to a Working Model: Who Decides What?

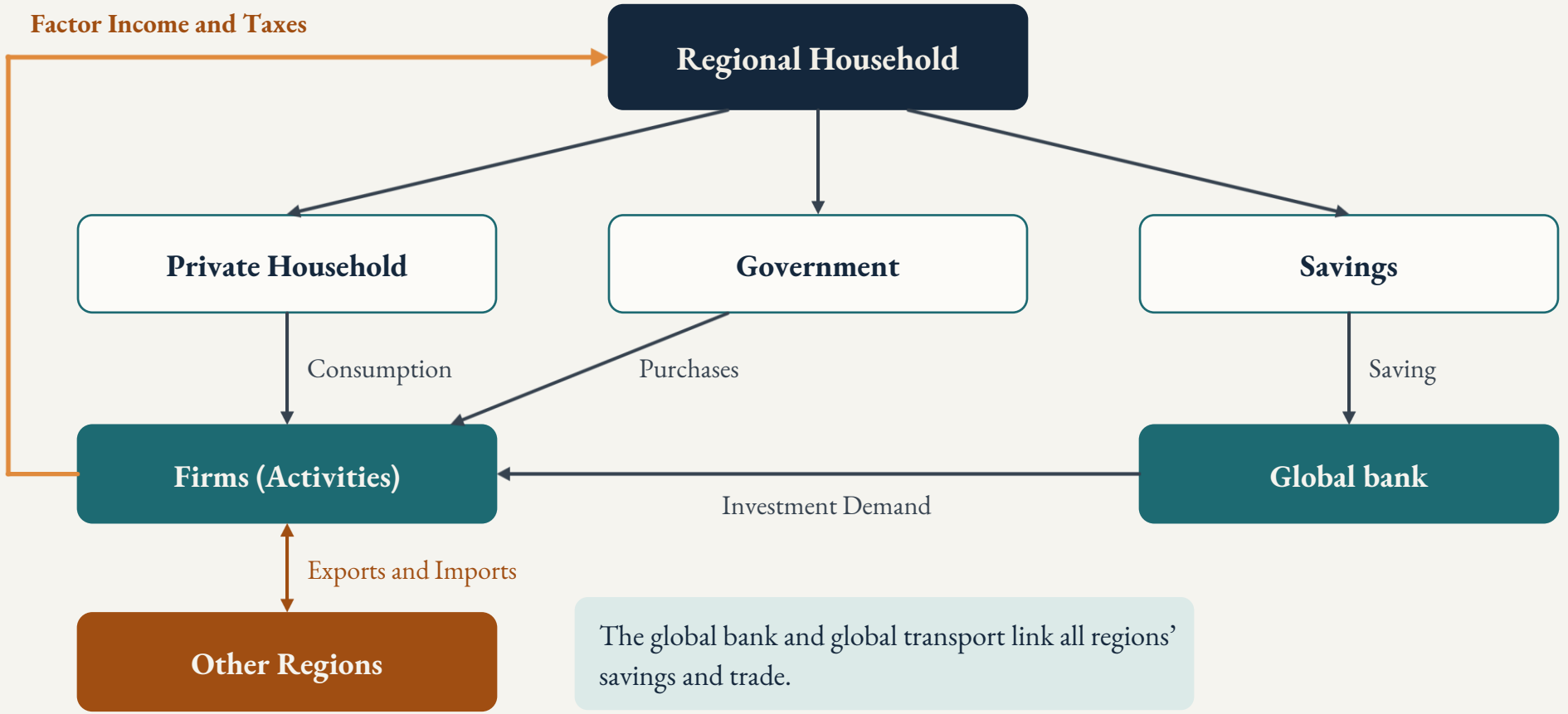
10:30	The model at a glance	**11:10**	4 · International Trade
10:35	1 · Households and Final Demand	**11:22**	5 · Savings and Investment
10:45	2 · Firms and Factor Markets	**11:30**	6 · Closing the Model, Reading Results
11:00	3 · Government and Taxes	**11:45**	Exercise Briefing and Groups

Listen for the variables you will use this afternoon. They are flagged in **teal code** throughout.

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THE MODEL AT A GLANCE

The Agents of One GTAP Region and How They Connect



The global bank and global transport link all regions' savings and trade.

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THE MODEL AT A GLANCE

GTAP Equations Are Written in Percentage Changes

IN LEVELS

$$P \times Q = s \times Y$$

Spending on food is a fixed share s of income Y.

IN % CHANGES

$$q = y - p$$

Lowercase letters are % changes from the base.

EXAMPLE

$$5 - 2 = 3\%$$

Income +5%, Price +2% → Quantity +3%

Results come out as **% changes**, except a few in US$ (like EV).

The solver splits big shocks into small steps, so results stay accurate.

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Part I:
Households and Final Demand

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HOUSEHOLDS AND FINAL DEMAND

Final Demand Decides Where Output Ends Up

Private Consumption

Households buy goods and services

`qpa`

Government Consumption

Public services and purchases

`qga`

Investment

New capital goods, financed by savings

`qia`

Exports

Demand from other regions

`qxw, qxs`

Each final user buys a composite of domestic and imported goods: the Armington choice (Part 4).

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HOUSEHOLDS AND FINAL DEMAND

The Regional Household Collects and Allocates National Income



In the SAM from Session 1: 175 + 75 = **250** of Income → 150 Private, 75 Government, 25 Savings.

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Regional Income Supports Consumption and Saving

BASE EXAMPLE: REGIONAL INCOME = 250 (Session 1 SAM)



Private Consumption 150 · 60% | **Government 75 · 30%** | **Saving 25 · 10%**

The Regional Allocation

Regional income is divided among private consumption, government consumption, and saving. In this example, 100 units of income are allocated as 60 to private consumption, 30 to government consumption, and 10 to saving.

How Households Spend Their Consumption Budget

Households then divide their private consumption budget among goods and services. These spending shares can change as income and prices change.

Regional income allocation and household spending shares across commodities are different decisions.

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Households Respond to Income and to Relative Prices

Income Effect

Income rises

↓

Purchasing power rises

↓

More of most goods: food, services, manufactures

Relative Price (Substitution) Effect

Tea gets cheaper; coffee price unchanged

↓

Consumers compare the alternatives

↓

Spending shifts toward tea, without buying more overall

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Private Demand: Necessities, Luxuries, and the CDE System

The Problem

People do not spend each extra dollar the same way. As income rises, the **share spent on food falls (a necessity), and the share spent on services** rises (closer to a luxury).

Fixed shares (Cobb–Douglas) cannot capture this.

GTAP's answer: CDE

Constant Difference of Elasticities in demand allows each good to have its own income and price elasticities.

Calibrated with **INCPAR** (income) and **SUBPAR** (substitution).

`qpa(c,r)` = Price (Substitution) Effects + Income Elasticity × Income Change

qpa = % change in private household demand for composite good c in region r

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Part II:
Firms, Production, and Factor Markets

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FIRMS AND PRODUCTION

Firms Minimize Costs under Perfect Competition

Cost Minimization

Choose the cheapest input mix for a given output and technology

Constant Returns to Scale

Double all inputs and output doubles; cost per unit does not change with size

Perfect Competition

Price = unit cost, so profits are zero: costs pass straight into prices

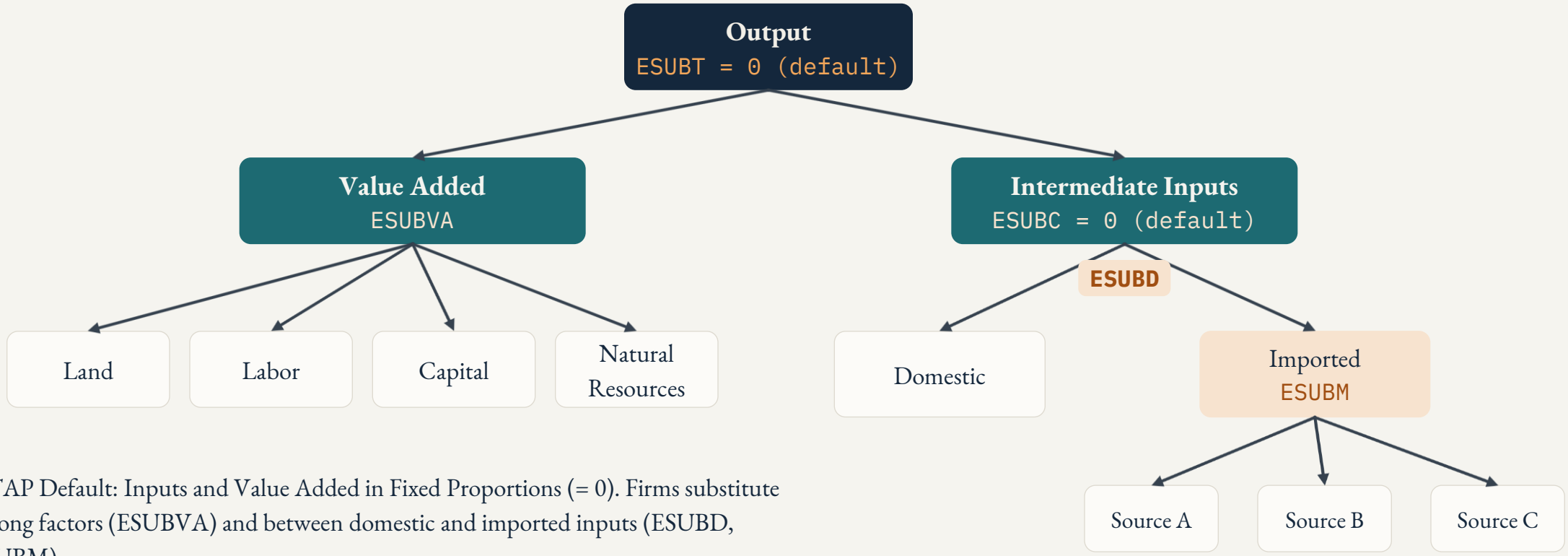
Demand Sets the Scale

How much a sector produces is driven by demand for its output

Version 7 lets one activity make several commodities; in NUS333 each activity makes one. Output: **qo**, **qca** · producer price: **ps**

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Production Is a Nest of Decisions



GTAP Default: Inputs and Value Added in Fixed Proportions (= 0). Firms substitute among factors (ESUBVA) and between domestic and imported inputs (ESUBD, ESUBM).

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Example: Wages Rise 20%. What Does the Firm Do?

BASE COST = $100



Labor's cost share = 60%

No substitution possible (ESUBVA = 0)

Same input mix; cost rises by 0.6 × 20% = **12%**

Substitution possible (ESUBVA > 0)

Use less labor and more capital; cost rises by **less than 12%**

Either way

Zero profit means the higher cost passes into the price, so sales and output fall.

Relative Input Prices + Technology + Substitution Elasticity → Firm's Response

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FACTOR MARKETS

Primary Factors (Endowments) Create Income and Capacity

Labor

Used in all sectors. NIMMIG splits it into unskilled and skilled.

Capital

Machinery, buildings, equipment; heavy in manufacturing and services

Land

Used only in agriculture

Natural Resources

Oil, gas, minerals, fish, forests

VARIABLES YOU WILL READ

qe(e,r) endowment supply

qfe(e,a,r) factor used by activity a

pfe(e,a,r) price firms pay

pes(e,a,r) price owners receive

Factor payments flow to the regional household.

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FACTOR MARKETS

Factor Mobility Decides How Resources Move After a Shock

Type	Default Factors	What it Means
Mobile	Labor, Capital	Moves freely between sectors; one price across all sectors.
Sluggish	Land	Moves only partly (CET, ETRAE); prices can differ by sector.
Sector-specific	Natural Resources	Stays in its sector; its price absorbs the shock.

TWO PRICES FOR ONE FACTOR

pfe = Price the firm pays · **pes** = Price the owner receives

The gap between them is the factor tax or subsidy (**tfe**)

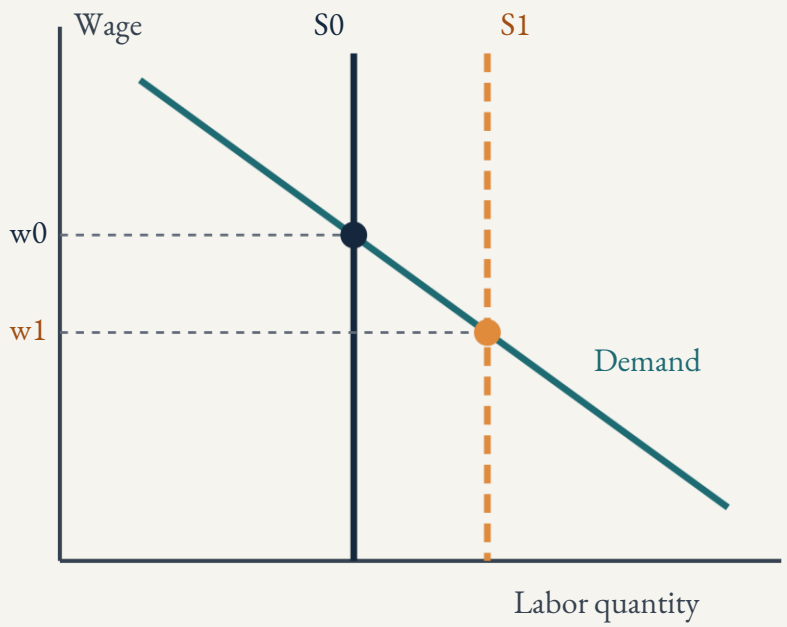
Exercise 1 compares both prices for land in US agriculture

Mobility is set in the data (ENDWT) and the parameter file; it can be changed.

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FACTOR MARKETS

Standard Assumption: Fixed Endowments, Full Employment



Quantities fixed, prices adjust

Each region's endowments **qe** are exogenous; wages and rents move until all factors are employed.

More supply → lower price...

...unless demand for the factor also rises. In Exercise 2, **qe(UNSKILLED,USA)** rises 10%.

Alternative (Session 4)

Fix the real wage and let employment adjust: an unemployment closure.

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FIRMS AND PRODUCTION

Technology Shocks: Variables That Start with “a”

`aoall(a,r)`

Output-augmenting

All inputs become more productive in activity a.

`afeall(e,a,r)`

Factor-augmenting

One factor (e.g., labor) becomes more productive.

`avaall(a,r)`

Value-added-augmenting

All primary factors together become more productive.

Productivity +10% → Fewer Inputs per Unit → Lower Cost and Price → More Demand and Output → Jobs in the sector: up or down?

The last step depends on how much demand responds. That is a question for the elasticities.

Version 7 names; check exact definitions in RunGTAP > View > Variables and subsets

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Elasticities Set How Strongly Agents Respond

Decision	Parameter	Where you meet it today
Substitution among Factors	ESUBVA	Exercise 2: high vs low values
Domestic vs Imported Goods	ESUBD	Exercises 1 and 3
Between Import Sources	ESUBM	Exercise 3
Land Moving between Sectors	ETRAE	Exercise 1
Household Income and Price Responses	INCPAR, SUBPAR	All exercises

High Elasticity → Easy Substitution, Large Quantity Response

⚠ Mostly they change the **size** of results, but they can change the **sign** of factor prices.

Parameters live in the parameter file (default.prm); Exercise 2 saves new .prm files.

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Part III:
Government and Taxes

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GOVERNMENT

Government Is Funded through the Regional Household

Revenue

All taxes, net of subsidies, flow into regional income, not into a separate government budget.

Spending

A fixed share of regional income, spent on domestic and imported goods like any buyer (**qga**).

No Budget Target

By default, the model does not hold the deficit fixed or replace lost revenue.

Cut a tax → regional income falls → private, government, and savings shares all shrink.
Want revenue-neutral reform? Change the closure (Session 4).

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TAXES

A Tax Is a Wedge between What the Buyer Pays and the Seller Gets

SELLER RECEIVES

$1.00

→

TAX RATE 10%

Power of the tax = 1 + rate = **1.10**

→

BUYER PAYS

$1.10

On **output** of an activity

On **factor use** (land, labor, capital)

On **intermediate inputs** (domestic or imported)

On **consumption** by households and government

On **imports**: tariffs, by source

On **exports**, by destination

In version 7, a **negative rate is a subsidy**. Every policy that changes a price can be written as one of these wedges.

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TAXES

The Tax Variables You Will Shock

Wedge	Variable	Base rate	Used in
Output Tax or Subsidy	to(c,a,r)	RTO	
Tax on Factor Use by an Activity	tfe(e,a,r)	RTFE	Exercise 1
Tax on Domestic Inputs used by an Activity	tfd(c,a,r)	RTFD	Exercise 1
Tax on Imported Inputs used by an Activity	tfm(c,a,r)	RTFM	Exercise 1
Private Consumption Taxes	tpd(c,r), tpm(c,r)		
Bilateral Import Tariff, Source s → Destination d	tms(c,s,d)	RTMS	Exercise 3
Bilateral Export Tax or Subsidy	txs(c,s,d)		

Find base rates in RunGTAP: **View › Base Data › Tax Rates**. After solving: **View › Updated Data › Updated Tax Rates**.

Index order: first the input or commodity, then the user or source, then the region

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TAXES

Shocking a Tax: “% target rate” vs “% change”

% Target Rate

You enter the **final rate**; RunGTAP works out the change in the power of the tax.

Remove a subsidy: −5% → type **0**

```
power 0.95 → 1.00 = +5.26%
```

Add a 5-point surcharge: 1.23% → type **6.23**

% Change

The variable changes by the **percentage you type**. Use it for quantities such as endowments.

Exercise 2: qe(UNSKILLED,USA) = 10

Trap: a zero “% Change” on a tax does nothing at all

Always verify after solving: the updated rate should equal your target.

Tax variables are % changes in the power of the tax, 1 + rate.

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TAXES

Taxes and Subsidies Distort Choices: Allocative Efficiency

A wedge pushes a quantity away from its efficient level. In GTAP's welfare results, the **allocative efficiency** effect is roughly the sum of **Tax Rate × Change in the Taxed Quantity**.

Volume of an already **taxed** activity **rises**	**Gain**
Volume of an already **taxed** activity **falls**, e.g., imports under a higher tariff	**Loss**
Volume of a **subsidized** activity **falls**, e.g., when a subsidy is removed	**Gain**

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Part IV:
International Trade

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INTERNATIONAL TRADE

Trade Links Markets across Sectors and Countries

- Consume Goods not Produced at Home
- Access Cheaper or Better Products
- Specialize by Comparative Advantage
- Sell Output to Foreign Markets

EXAMPLE: A TARIFF ON IMPORTED STEEL REACHES…

Domestic Steel Makers | Car Makers Using Steel | Consumers | Trading Partners

Question for the room: How do you choose between a local and an imported product?

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INTERNATIONAL TRADE

The Armington Assumption: Goods Differ by Origin

Is a locally assembled car the same as an imported Japanese one? Would you switch brands for a slightly lower price?

Usually not.

GTAP treats domestic and imported varieties of the same good as **imperfect substitutes**.

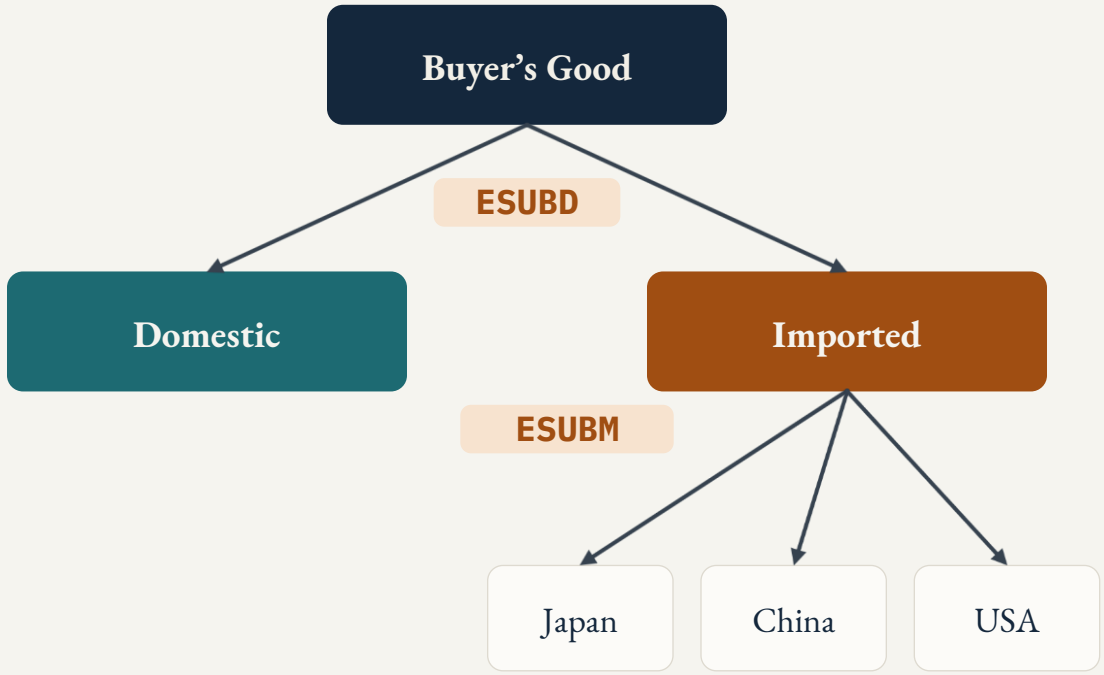
WITHOUT ARMINGTON	WITH ARMINGTON
Perfect substitutes	Imperfect substitutes
The cheapest supplier takes all.	Domestic and imported goods coexist.
Small price change, huge trade swing.	Gradual shift as relative prices change.
A country can't both export and import a good.	Two-way trade in the same good, as in the data.

Named after Paul Armington (1969).

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INTERNATIONAL TRADE

Import Demand Is a Two-stage Decision



Stage 1 · Each Buyer

Domestic or imported? Depends on relative prices and **ESUBD.**

Stage 2 · At the Border

Which supplier? Depends on import prices by source and **ESUBM.**

Rule of Two

ESUBM ≈ 2 × ESUBD: Suppliers compete harder with each other than with domestic goods.

Source regions shown for illustration.

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INTERNATIONAL TRADE

GTAP Tracks Every Bilateral Trade Flow

Each Commodity, Each Pair of Regions

Every export by one region is an import by another. Variable names put the **source first**, the **destination second**.

```
qxs(MFG,ROW,USA)
```

= MFG shipped from ROW to the USA

Why it Matters

Example: Car imports into the Philippines are recorded separately from Japan, Korea, China, the USA, and others.

A tariff on one partner shifts purchases to others: **trade diversion**, not only lower imports.

⚠ Exercise 3: **tms(MFG,ROW,USA)** is the US tariff; **tms(MFG,USA,ROW)** is ROW's. Order matters.

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INTERNATIONAL TRADE

How an Imported Good's Price Reaches the Buyer



A Tariff Applies to CIF Value

CIF Price * (1 + Tariff Rate) = Import Price after Tariff.
Freight and insurance are included in CIF.

Foreign Prices can also Adjust

A large importer's tariff may reduce demand sufficiently to lower foreign prices, thereby partly offsetting the rise in domestic prices.

pcif is before the tariff; pmds includes it. Imports are bundled before user-specific taxes.

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INTERNATIONAL TRADE

Freight Costs and Tariffs Affect Prices Differently

A. Exporter's FOB price rises 10%

	Before	After
FOB price	100	110
Freight	50	50
CIF price	150	160

+6.7%

B. A new 10% import tariff

	Before	After
CIF price	150	150
Tariff payment	0	15
Import price	150	165

+10%

Unchanged freight dilutes an FOB price change. A tariff applies to the full CIF value, including freight and insurance.

Illustrative calculations: freight per unit and other prices are fixed; no foreign-price response is assumed.

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INTERNATIONAL TRADE

Terms of Trade: What Your Exports Can Buy

$$\text{Terms of Trade} = \frac{\text{Price of Exports}}{\text{Price of Imports}}$$

Improves (Gain)

Each unit of exports buys more imports: real income rises.

Worsens (Loss)

Each unit of exports buys fewer imports: real income falls.

Zero-sum

One region's terms-of-trade gain is its partners' loss.

The **real exchange rate** (domestic vs foreign prices) adjusts so the trade balance stays consistent with savings and investment.

Results: tot(r), and the terms-of-trade parts of the welfare decomposition

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INTERNATIONAL TRADE

A Tariff Sets Off a Chain of Adjustments

Tariff Rises → Import Price at Home Rises → Buyers Switch to Domestic Goods → Protected Sector Expands → Other Sectors and Exports Give up Resources

WHAT TO WATCH IN THE RESULTS

Import Volumes, by Source	Domestic Production	Domestic and Border Prices
Factor Demand and Prices	Tariff Revenue	Welfare (EV) and its Parts

And if the partner retaliates? That is the second half of Exercise 3.

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Part V:
Savings and Investment

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SAVINGS AND INVESTMENT

Where Savings Come From, and Where They Go

Domestic Saving

A fixed share of regional income (top-level utility)

Foreign Saving

Equals the trade deficit: imports minus exports

Investment

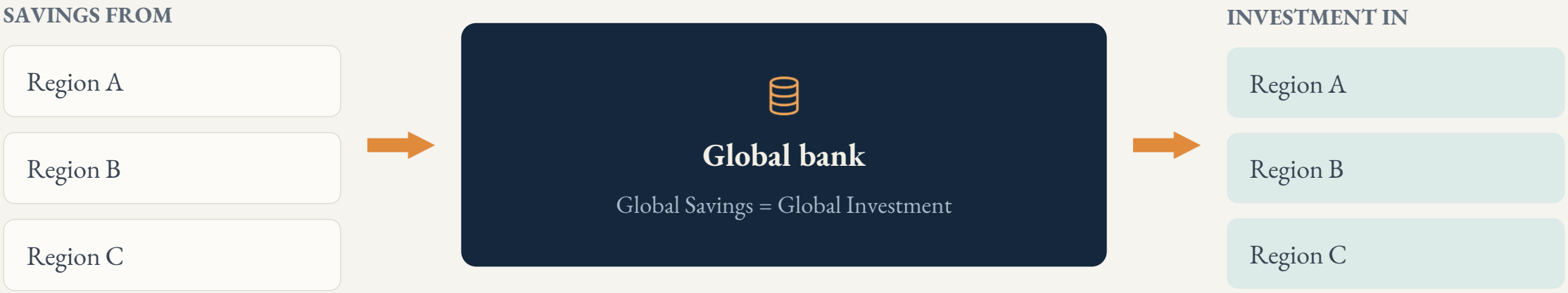
Buys capital goods: a final demand for domestic and imported commodities (**qia**)

In a static model, investment adds no capital for later. It matters as a **Source of Demand** and through the trade balance.

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SAVINGS AND INVESTMENT

The Global Bank Pools Savings and Allocates Investment



A region can invest more than it saves (borrowing from abroad) or less (lending abroad). The gap shows up as its trade balance.

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SAVINGS AND INVESTMENT

Two Rules for Allocating Investment across Regions

`RORDELTA = 1`

Follow the returns

Investment moves toward regions where the expected rate of return rises, until expected returns change by the same amount everywhere.

The usual default

`RORDELTA = 0`

Fixed Shares

Each region keeps its share of global investment; regional investment moves with the global total.

Both are parameters (with **RORFLEX**, how fast returns fall as capital grows). Check them in View › Parameters.

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Savings, Investment, and the Trade Balance Always Agree

$$S - I = X - M$$

Saves more than it invests

Lends abroad → Trade Surplus (X > M)

Invests more than it saves

Borrows abroad → Trade Deficit (M > X)

Welfare link

If investment goods get dearer, net lenders gain, and borrowers lose: **investment–savings terms of trade**

The investment–savings term appears in Exercise 3's welfare results

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Part VI:
Closing the Model and Reading Results

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CLOSING THE MODEL

All Markets Clear at the Same Time

Market-Clearing Conditions

- Every domestic and imported good: supply = demand.
- Every factor: employment = endowment.
- World: global savings = global investment.
- International transport: supply = margin demand.
- Every agent: income = spending.

The adjustment loop

1 · A shock changes supply or demand

2 · Markets fall out of balance

3 · Prices adjust

4 · Households and firms respond

5 · Every market clears again

The solver finds the one set of prices and quantities at which all of these hold together.

See the equations: RunGTAP › View › Tab files › Main model, then search "Market clearing"

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CLOSING THE MODEL

Two Technical Anchors: Walras' Law and the Numeraire

Walras' law

If every agent keeps its budget and all markets but one clear, the last one clears too.

GTAP leaves out the global savings = investment equation and checks it instead:

```
walraslack ≈ 0 → model is consistent
```

The numeraire

A CGE model pins down only **relative prices**. One price is fixed as the yardstick:

```
pfactwld = 0 (World Factor Price Index)
```

A "+2%" price result means +2% relative to world factor prices.

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CLOSING THE MODEL

The Standard Closure: What Is Fixed, What Adjusts

Exogenous (Fixed, can be shocked)

Endowments · qe

Technology · variables starting with a

Policy · tax and tariff variables starting with t

Population · pop

Numeraire · pfactwld

Endogenous (Solved by the model)

All prices: goods, factors, trade

All quantities: output, demand, trade

Incomes, savings, investment

Trade balance and real exchange rate

GDP and welfare (EV)

⚠ Before each experiment: the Closure tab must end with **"Rest Endogenous"**; delete anything below it.

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READING RESULTS

Results Cheat Sheet for This Afternoon

Variable	Meaning (% change unless stated)	Exercise
qgdp(r)	Real GDP	2
qca(c,a,r)	Quantity of commodity c supplied by activity a	1
ps(c,a,r)	Price the activity receives for its output	1
pfe(e,a,r)	Price the activity pays for factor e	1, 2
pes(e,a,r)	Price the owner of factor e receives	1
qpa(c,r)	Private household purchases of good c	1
qxw(c,r) · pxw(c,r)	Total exports of c · their price	1
qxs(c,s,d)	Quantity shipped from s to d	3
pmds(c,s,d)	Price in d of the import from s, including the tariff	3
pcif(c,s,d)	CIF border price, before the tariff	3
EV(r)	Welfare change, in US$ million (a level, not a %)	3

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READING RESULTS

Welfare: Equivalent Variation (EV) and Where It Comes From

EV(r)

The income change, at base prices, that would make the region as well off as the policy does.

US$ million · Positive = Better off

EV = SUM OF THESE PARTS

- **Allocative Efficiency**: Taxes and Distortions
- **Terms of Trade**: Goods and Services
- **Investment–Savings** Terms of Trade
- **Endowment**: More Factors
- **Technical Change**
- **Population** and **Preferences**

In RunGTAP: **View › Updated Data › Welfare Decomposition › EV Decomposition Summary**

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WORKED EXAMPLE · PREDICT FIRST

A 10% Output Subsidy to US Manufacturing

Model · NUS333, Standard Closure

Shock · **to(MFG,MFG,USA)**, % target rate = −10

What happens to...	Your guess	Reasoning
US MFG Output	+ / −	Lower Cost → Lower Price → More Demand?
US AGR and SER Output	+ / −	Where do MFG's extra workers come from?
US Wages and Capital Rents	+ / −	Factor Demand vs Fixed Endowments
US MFG Exports	+ / −	US goods cheaper on world markets?
US MFG Imports from ROW	+ / −	Domestic goods cheaper relative to imports?
US Government Revenue	+ / −	Who pays for the subsidy?

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WORKED EXAMPLE · EXPLAIN

Tell the Story as a Chain of Mechanisms

1. The subsidy cuts the unit cost of US manufacturing, so its price falls
2. Home and foreign buyers switch toward US MFG (Armington substitution)
3. MFG hires more labor and capital; with fixed endowments, factor prices rise
4. Agriculture and services lose resources and contract
5. The subsidy's cost lowers tax revenue and regional income; EV shows the net effect

Reference result: total US supply of MFG, **qc(MFG,USA)**, rises **4.44%**. Then check each guess in Results.

Burfisher, Model Exercise 3, base result

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SESSION 2 RECAP

Five Mechanisms to Look for in Any Result

1

Substitution

Buyers move toward what got cheaper

2

Income

Richer or poorer regions buy more or less of everything

3

Reallocation

Fixed factors: one sector's gain is another's loss

4

Terms of trade

Export vs import prices shift income between countries

5

Efficiency

Taxes and subsidies distort; changes in their volumes cost or gain

Next: your exercise. Each group will explain its results with these mechanisms.

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Exercise Briefing: The Hands-on Exercise

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EXERCISE BRIEFING

The Hands-on Exercise: Run It, Read It, Explain It

Run

Set up and solve a published GTAP experiment in RunGTAP.

Read

Find the exact results that answer the question.

Explain

Tell the economic story behind the numbers.

30 minutes of group work
13:30–14:00

10 minutes per group, with Q&A
14:00–15:00

2 groups per exercise: compare your stories

Exercises adapted from Burfisher, Introduction to CGE Models, 3rd ed.

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EXERCISE BRIEFING

Three Exercises at a Glance

EXERCISE 1 · NUS333

Food Fight: Removing US farm subsidies

Shock: set 8 US agricultural subsidies to zero: land and capital (**tfe**), domestic and imported inputs (**tfd**, **tfm**)

Read: qca, ps, pfe, pes, qpa, qxw, pxw

Ideas: Wedges, Factor Prices, Trade

EXERCISE 2 · NIMMIG

How immigration can raise wages

Shock: **qe**(UNSKILLED,USA) +10% with high (BORJAS) and low (OTTA) **ESUBVA**; OTTA2 adds capital +6%

Read: pfe for three factors, qgdp

Ideas: Substitutes vs. Complements

EXERCISE 3 · NUS333

The Anatomy of a Trade War

Shock: MFG tariff **tms** +5 points by the US (TRDWAR1), then ROW retaliates (TRDWAR2)

Read: pmds, pcif, qxs, EV decomposition

Ideas: Terms of Trade vs. Efficiency

Full step-by-step instructions are in the exercise workbook.

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EXERCISE BRIEFING

Your Group, Your Exercise, Your Slot

Group	Exercise	Presents at	Table
Group 1	1 · Food fight: farm subsidies	14:00	1
Group 2	1 · Food fight: farm subsidies	14:10	2
Group 3	2 · Immigration and wages	14:20	3
Group 4	2 · Immigration and wages	14:30	4
Group 5	3 · Anatomy of a trade war	14:40	5
Group 6	3 · Anatomy of a trade war	14:50	6

Groups were set at registration. Sit with your group after lunch, at least one laptop running RunGTAP.

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EXERCISE BRIEFING

Your 30 Minutes, Step by Step

0–5 min

Reset

Pick the version. Closure ends "Rest Endogenous". Clear shock list. Default parameters. Gragg 2-4-6.

5–10 min

Prepare and predict

Look up base rates or set parameters. Write down the signs you expect.

10–18 min

Shock and solve

Enter shocks (target rate or % change). Save with the workbook name. Solve. Verify updated rates.

18–25 min

Read results

"(1) Sim", filter USA, exact elements. Fill the workbook tables.

25–30 min

Explain

Answer the guiding questions. Fill in your group's slide template.

⚠ Exercise 2 runs three experiments. Record each column **before** changing anything for the next run.

Stuck for more than 3 minutes? Call a facilitator.

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EXERCISE BRIEFING

Finding Your Results in RunGTAP

1. Open the **Results** tab
2. Choose **"(1) Sim"**, not Pre or Post values
3. Set the top-left filter "Everything" to **USA**
4. Open the variable; find the **exact elements**, in order
5. Double-click a cell to return to the variable list

Welfare (Exercise 3)

View › Updated Data › Welfare Decomposition › EV Decomposition Summary

Check the shock

View › Updated Data › Updated Tax Rates: targeted rates should equal your targets

Sanity Check (Exercise 1)

qca(AGR,AGR,USA) ≈ −1.42% if the set-up is right

A 3-D variable needs the filter set before it will open.

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EXERCISE BRIEFING

Deliverable: A 10-minute Slot per Group

6 min presentation | **4 min** questions

Use your exercise's template

- A subtitle that states your interpretation
- Your group's perspective on the experiment
- Filled results tables
- Answers to the guiding questions, each with a number
- Conclusion, including one limitation

What makes a strong slot

- At least two numerical results
- The mechanism behind each result
- Predictions vs results: any surprises?
- A one-sentence message for a policymaker
- Hide slides you do not need

Templates: folder "RunGTAP Exercise Presentation Templates" ·

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EXERCISE BRIEFING

Share the Work: Suggested Roles

Driver

Operates RunGTAP

Navigator

Reads the workbook steps; checks element order

Analysts

Predict, then interpret with mechanisms

Presenters

Build the slides and keep to 6 minutes

Mixed Experience: New-comers drive, experienced members coach

Software trouble? Facilitators hold backup results. Keep going.

Lunch now. Back at **13:30**, seated with your group, RunGTAP open.

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