MAST 2026 · WORKSHOP ON CGE MODELING AND GTAP

Session 3 · 13:30–15:00

# A Hands-on CGE Modeling Exercise

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SESSION PLAN

# 90 Minutes: Run It, Then Explain It

**13:35–14:05**

### Group work

All six groups at once

**14:05–15:05**

### Presentations

10 minutes per group: about 6 to present, 4 for questions

**14:05–14:25**

### Exercise 1 · Farm subsidies

Groups 1 and 2

**14:25–14:45**

### Exercise 2 · Immigration and wages

Groups 3 and 4

**14:45–15:05**

### Exercise 3 · Trade war

Groups 5 and 6

Each block opens with a one-minute background from the facilitator, so groups can go straight to their results.



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GROUP WORK · KEEP THIS ON SCREEN

# Your 30 Minutes: 13.35 – 14.05

**Reset**

Version, closure, shock list, parameters

**Predict**

Base rates; expected signs

**Shock and Solve**

Save, solve, verify rates

**Read**

Fill the workbook tables

**Explain**

Guiding questions; template

**14:05**

**Present**

Group 1 starts

Stuck for more than 3 minutes? Raise a hand. Facilitators are ready.



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BEFORE YOU SOLVE

# The Pre-flight Checklist

- **Version › Change**: NUS333 (Ex 1, 3) or NIMMIG (Ex 2)
- **Closure** ends with "Rest Endogenous"; nothing below it
- **Shocks**: Click "Clear shock list" first
- **Parameter file**: Default (Ex 2: your new .prm)
- **Solution method**: Gragg 2-4-6
- **Save experiment** with the workbook's name

**% Target Rate**

For taxes and tariffs: type the final rate

**% Change**

For endowments: type the percentage change

**After solving**

Check updated rates, then read "(1) Sim"



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EXERCISE 1 CARD · GROUPS 1 AND 2

# Food Fight: Removing US Farm Subsidies

NUS333 · AgrSubs

### 1 · Find base rates

View › Base Data › Tax Rates

```
RTFE: All ENDW | AGR | USA
RTFD, RTFM: All COMM | AGR | USA
```

Negative rate = subsidy

### 2 · Eight Shocks, % Target Rate = 0

```
tfe LAND | AGR | USA
tfe CAPITAL | AGR | USA
tfd AGR, MFG, SER | AGR | USA
tfm AGR, MFG, SER | AGR | USA
```

Input commodity first, then the buying activity

### 3 · Read (Table 1.2)

```
qca(AGR,AGR,USA)
ps(AGR,AGR,USA)
pfe(LAND,AGR,USA)
pfe(CAPITAL,AGR,USA)
pes(LAND,AGR,USA)
qpa(AGR,USA)
qxw(AGR,USA) · pxw(AGR,USA)
```

Check: all 8 updated rates = 0, and qca(AGR,AGR,USA) ≈ −1.42%

*Full steps: Workbook, Exercise 1*



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EXERCISE 2 CARD · GROUPS 3 AND 4

# How Immigration Can Raise Wages

NIMMIG · 3 runs

| Experiment | Parameter file (ESUBVA, USA and ROW) | Shocks (% change) |
|---|---|---|
| BORJAS | BORJAS.prm: 12 in AGR, MFG, SER | qe(UNSKILLED,USA) = 10 |
| OTTA1 | OTTA.prm: AGR 0.2 · MFG 0.5 · SER 0.5 | qe(UNSKILLED,USA) = 10 |
| OTTA2 | OTTA.prm (same as OTTA1) | qe(UNSKILLED,USA) = 10 and qe(CAPITAL,USA) = 6 |

### Make the .prm files

Start from Default · View › Parameters › Use Advanced editing › ESUBVA · edit 6 cells · File › Close › Yes · save as a new name

### Read after each run

```
pfe(UNSKILLED,AGR,USA)
pfe(SKILLED,MFG,USA)
pfe(CAPITAL,SER,USA)
qgdp(USA)
```

⚠ Never overwrite default.prm. Fill each column of Table 2.1 before the next run.

*Full steps: Workbook, Exercise 2*



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EXERCISE 3 CARD · GROUPS 5 AND 6

# The Anatomy of a Trade War

`NUS333 · TRDWAR1, 2`

## 1 · Targets

View › Base Data › Tax Rates › RTMS

```
All COMM | ROW | USA
= US tariff on ROW
All COMM | USA | ROW
= ROW tariff on US
```

**Target = base MFG rate + 5**

## 2 · Shocks, % target rate

**TRDWAR1**

```
tms(MFG,ROW,USA) = US target
```

**TRDWAR2**: keep it and add

```
tms(MFG,USA,ROW) = ROW target
```

## 3 · Read

**TRDWAR1**, predict signs first:

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

**EV Decomposition Summary**: allocative efficiency, terms of trade, I–S terms of trade, total EV

⚠ Source first, destination second. Welfare is in US$ million: USA for TRDWAR1; USA, ROW and World for TRDWAR2.

*Full steps: Workbook, Exercise 3*



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TROUBLESHOOTING

# If Something Looks Wrong

| Symptom | Likely Cause | Fix |
|---|---|---|
| Updated rate ≠ your target | Wrong elements, or "% change" chosen | Check element order and "% target rate"; solve again |
| Every result is zero | Empty shock list, or 0 typed as "% change" | Check the Shocks tab |
| "Cannot view a 3D matrix" | Filter still on "Everything" | Set the top-left filter to USA |
| Numbers differ from the check value | Leftover closure, wrong .prm or version | Run the pre-flight checklist again |
| Results belong to another run | Another experiment is loaded | Solve tab › Load Experiment |
| NIMMIG missing from the list | Version not installed | Call a facilitator (NIMMIG.ZIP) |

⚠ Still stuck at 13:50? Facilitators have backup results so you can still present.



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PREPARING YOUR SLOT

# Six Minutes That Make Your Point

## Template Structure

1. Title, with a subtitle that states your interpretation
2. Your group's perspective on the experiment
3. The results tables you filled in
4. One slide per guiding question
5. Conclusions and one limitation

## Tips

- Lead with your headline result
- Use at least two numbers, with their units
- Name the mechanism behind each number
- Say where your prediction was wrong
- Hide the template slides you skip
- Skip the background: the facilitator covers it

*Templates are in the folder "RunGTAP Exercise Presentation Templates".*



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14:00 · PRESENTATIONS

# Running Order

| Time | Group | Exercise | Presenters |
|---|---|---|---|
| 14:05 | Background | 1 · Farm subsidies | Facilitator, 1 min |
| 14:06 | Group 1 | 1 · Farm subsidies | |
| 14:16 | Group 2 | 1 · Farm subsidies | |
| 14:26 | Background | 2 · Immigration and wages | Facilitator, 1 min |
| 14:27 | Group 3 | 2 · Immigration and wages | |
| 14:37 | Group 4 | 2 · Immigration and wages | |
| 14:47 | Background | 3 · Trade war | Facilitator, 1 min |
| 14:48 | Group 5 | 3 · Trade war | |
| 14:58 | Group 6 | 3 · Trade war | |

*Strict timing: the facilitator signals at the 5- and 9-minute marks.*



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# Time Starts Now!



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EXERCISE 1 · BACKGROUND

# Food Fight: What If US Farm Subsidies Are Removed?

### The Policy

US agriculture is subsidized on land, capital, and purchased inputs (negative tax rates in NUS333).

### The Dispute

Trading partners argue the subsidies raise US farm exports and depress world prices.

### The experiment

Remove all eight subsidies at once and compare with the baseline.

Listen for: who bears the cost: farm output, landowners, consumers or trading partners?



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EXERCISE 1 · FARM SUBSIDIES

# Groups 1 and 2 Present

**14:06** — **Group 1**
8 min + 2 min Q&A

**14:16** — **Group 2**
8 min + 2 min Q&A

### QUESTIONS FOR DISCUSSION

Why does the landowners' price fall more than the land price farms pay?

Why is the effect on US consumers so small?

Did the two groups tell the same story?



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EXERCISE 2 · BACKGROUND

# Does Immigration Lower Wages? It Depends on Substitution

**BORJAS · ESUBVA = 12**

### Substitutes

New workers compete with existing workers and capital, so factor prices tend to fall

**OTTA · ESUBVA = 0.2–0.5**

### Complements

New workers raise the productivity of skilled labor and capital, so their prices can rise

**OTTA2 · + CAPITAL 6%**

### Investment responds

Adds capital growth to the same immigration shock

⚠ NIMMIG cannot tell immigrants from native workers: immigration = +10% US unskilled labor.



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EXERCISE 2 · IMMIGRATION AND WAGES

# Groups 3 and 4 Present

**14:27** — **Group 3**
8 min + 2 min Q&A

**14:37** — **Group 4**
8 min + 2 min Q&A

**QUESTIONS FOR DISCUSSION**

Which comparison changes the assumption, and which adds capital?

Why can the price of capital fall when its supply grows?

Which ESUBVA values would you trust for your own economy, and why?



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EXERCISE 3 · BACKGROUND

# Trade Wars: Can a Large Country Gain from a Tariff?

### The Context

From 2018 the US raised tariffs, starting with steel and aluminum; partners including China retaliated

### The Theory

A large importer can push down foreign suppliers' prices: a terms-of-trade gain against an efficiency loss

### The Experiment

+5 points on US tariffs for ROW manufactures (TRDWAR1), then ROW retaliates (TRDWAR2)

Listen for: does the unilateral gain survive retaliation? What happens to the world as a whole?



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EXERCISE 3 · TRADE WAR

# Groups 5 and 6 Present

**14:48** — **Group 5**
8 min + 2 min Q&A

**14:58** — **Group 6**
8 min + 2 min Q&A

**QUESTIONS FOR DISCUSSION**

Did the three bilateral results have the signs you predicted?

Why can world welfare fall while one region gains?

What would you tell a minister considering a tariff?



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SESSION 3 WRAP-UP

# Thank You, All Six Groups

### Same model, different stories

Where did the two groups on one exercise differ, and why?

### Assumptions drive results

Subsidy wedges, elasticities and retaliation each changed the answer

### Numbers need a story

The mechanism is what makes a result useful to policymakers

Break until **15:25**.



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