

How do Agricultural Subsidies in Major Economies Affect Brazilian Export Competitiveness?

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Context

USD 842 billion/year

agricultural support in 54 economies (2021–2023)

China 37% + U.S. 15% + EU 13% = 65%

of global producer support (2021–2023)

Brazil: Producer Support Estimates (PSE) = 3.3%

of gross farm receipts, vs OECD average = 13.7% (2021–2023)

Problem and objectives

Problem

- ▶ What is the cost of foreign agricultural subsidies for Brazil?
- ▶ Why do major economies keep policies that appear costly at the aggregate level?

Objectives

- ▶ Simulate strategic interactions in **Brazil–U.S., Brazil–China, Brazil–EU.**
- ▶ Quantify effects on **exports, real GDP,** and **welfare.**
- ▶ Explain why observed policy often diverges from model predictions.

Method at a glance

Economic model

- ▶ PAEG CGE model (GTAP-consistent), benchmark year 2017.
- ▶ Shocks to **domestic support** and **import tariffs**.
- ▶ Brazil is split into five macroregions (NOR, NDE, COE, SDE, SUL). Today: national aggregates. Next: regional and sectoral incidence.

Strategic-choice setup

- ▶ Three bilateral games (Brazil vs partner).
- ▶ Five strategies per player.
- ▶ $5 \times 5 = 25$ outcomes per game, 75 simulations total.
- ▶ Payoff for stable choice: welfare (EV, USD bn).

Policy strategies (what each side can choose)

Each player chooses one of five policy packages combining domestic support and import tariffs.

Strategy	Domestic subsidies	Import tariffs
Status Quo (SQ)	Maintain	Maintain
Doha Moderate (DM)	Reduce 50%	Reduce 50%
Agricultural Liberalization (AL)	Eliminate	Reduce 50%
Selective Liberalization (SL)	Maintain	Reduce 50%
Total Liberalization (TL)	Eliminate	Eliminate

How to read the results later

We will compare (i) the export-maximizing corner (TL, TL) with (ii) the welfare-based stable policy pair in each bilateral game.

A key message

Competitiveness vs welfare

- ▶ Export gains can be large under full liberalization.
- ▶ But the **welfare** payoff can move differently due to terms of trade, consumer prices, and fiscal effects.

What we call a stable policy pair

- ▶ A pair of strategies is **stable** if neither side would raise its **own welfare** by switching alone.
- ▶ We report that stable pair for each bilateral game and compare it with the export-maximizing outcome.

Result 1: the export opportunity under (TL, TL)

Change in total exports (USD bn, 2017 prices), shown as (Brazil; partner).

Bilateral game	Exports at (TL, TL)	Brazil export growth (approx.)
Brazil vs U.S.	(13.3509; 3.7995)	+1.68%
Brazil vs China	(13.7938; 2.4725)	+1.73%
Brazil vs EU	(14.0337; 5.2758)	+1.76%

Interpretation

These pay-offs are a benchmark for the **export** cost of the status quo: around **USD 13–14 bn** per year for Brazil (in 2017 prices), depending on the partner.

Result 2: three non-obvious patterns in the simulations

1) Europe-wide gains vs farm-level losses

Across many reforms, the EU's **aggregate welfare** can rise, even when some farm groups lose.

2) Subsidies and tariffs interact

Cutting tariffs while keeping subsidies often delivers weaker outcomes than coordinated reform of both instruments.

3) The asymmetry is large

Export growth for Brazil is about **10–25×** larger than for partners in proportional terms under (TL, TL).

We document these patterns across Brazil–U.S., Brazil–China, and Brazil–EU simulations.

Result 3: exports can rise while welfare falls

Example (Brazil vs EU). Compare the export-maximizing outcome with the welfare-focused stable outcome.

Outcome	Exports BR	Welfare BR	Exports EU	Welfare EU
Stable pair (AL, AL)	+6.4539	+1.4386	+0.9372	+0.0911
Export-max corner (TL, TL)	+14.0337	-0.1429	+5.2758	+0.5490

Plain-language takeaway

A policy can expand exports and still reduce welfare if it worsens terms of trade or reduces fiscal revenue (tariffs) faster than it improves efficiency.

Why does the status quo persist? Three mechanisms

Information and uncertainty

Governments may underestimate cross-country spillovers and misread the aggregate costs of support.

Political organization

Producers are concentrated and organized; consumers are many and dispersed.

Non-cooperative bargaining

Real negotiations involve multiple issues, timing, credibility, and threats beyond a one-shot model.

References often used for these mechanisms include Olson (1965) and Grossman & Helpman (1994), among others.

Next steps: who wins and who loses inside Brazil?

Why the within-Brazil split matters

- ▶ Brazilian agriculture is heterogeneous across regions and sectors (e.g., soy, beef, sugarcane, poultry, food processing).
- ▶ National aggregates can hide large distributional effects.

Ongoing work (next version)

- ▶ Insert Brazil regional results (NOR, NDE, COE, SDE, SUL) for exports, welfare, and GDP.
- ▶ Identify which Brazilian regions and sectors are most affected under each scenario.
- ▶ Link the distributional results to negotiation priorities and adjustment policies.

Conclusions

- ▶ The export opportunity from coordinated reform is large for Brazil (USD 13–14 bn under TL with each partner).
- ▶ The non-obvious result is the **exports vs welfare** divergence and the distributional politics behind it.
- ▶ Next version adds the within-Brazil regional and sectoral decomposition to identify winners and losers.

Thank you.

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Appendix: Welfare payoff matrix (USD bn), Brazil vs EU

Brazil strategy	EU strategy				
	SQ	DM	AL	SL	TL
SQ	(0; 0)	(0.3885; 0.2238)	(0.3908; 0.2501)	(0.3863; 0.1953)	(0.9872; 0.0883)
DM	(0.6134; 0.0175)	(0.9976; 0.2438)	(0.9999; 0.2704)	(0.9954; 0.2152)	(1.5894; 0.1070)
AL	(1.0502; -0.1614)	(1.4363; 0.0645)	(1.4386; 0.0911)	(1.4341; 0.0359)	(2.0306; -0.0701)
SL	(0.1044; 0.1939)	(0.4868; 0.4206)	(0.4890; 0.4471)	(0.4846; 0.3920)	(1.0762; 0.2817)
TL	(-0.9180; 0.4664)	(-0.6130; 0.7172)	(-0.6115; 0.7436)	(-0.6145; 0.6887)	(-0.1429; 0.5490)

stable welfare outcome (best-response intersection).

export-maximizing corner (TL, TL), shown for comparison.