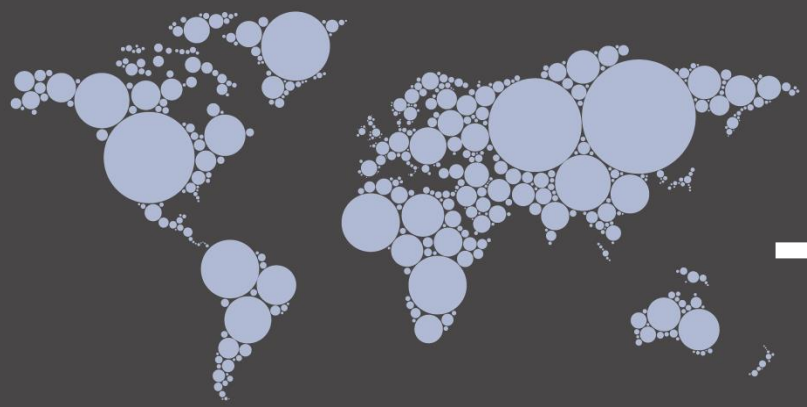

# On the Effects of GATT/WTO Membership on Trade:

## They are Positive and Large After All

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World Trade Organization

# ⚠ Spoiler alert!

- Previous studies have underestimated the impact of GATT/WTO membership by ignoring the non-discriminatory nature of GATT/WTO
- On average, GATT/WTO membership has increased:
  - trade between members by 171%
  - trade between members and non-members by about 88%
- Weakening or moving away from the multilateral trading system may have larger adverse consequences than previously estimated

WORLD TRADE ORGANIZATION

# Motivation

## Beyond tariff reductions

# Advanced Trade Policy Guide: The Structural Gravity Model

- Chapter 1: Partial Equilibrium Gravity
- Chapter 2: General Equilibrium Gravity

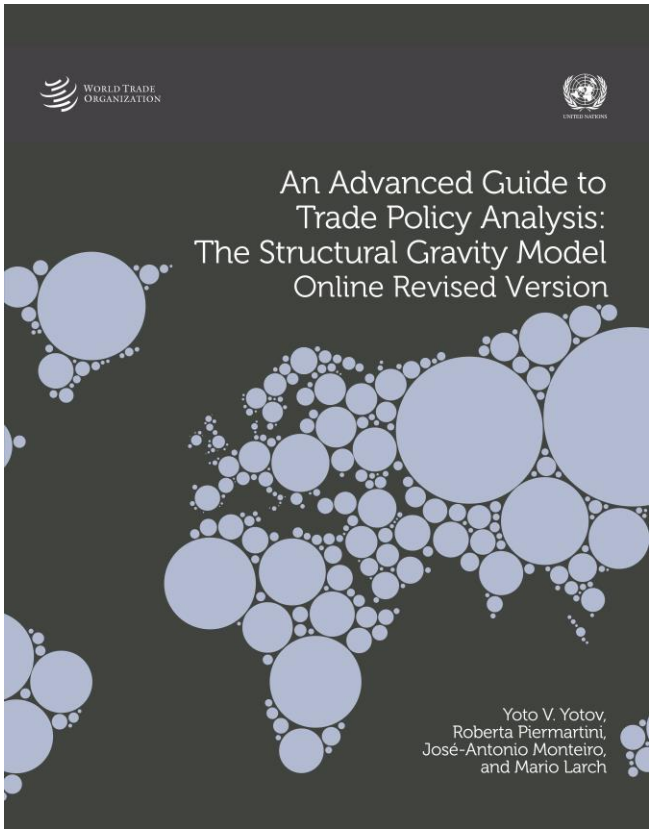
Structure of each chapter:

A. Learning objectives

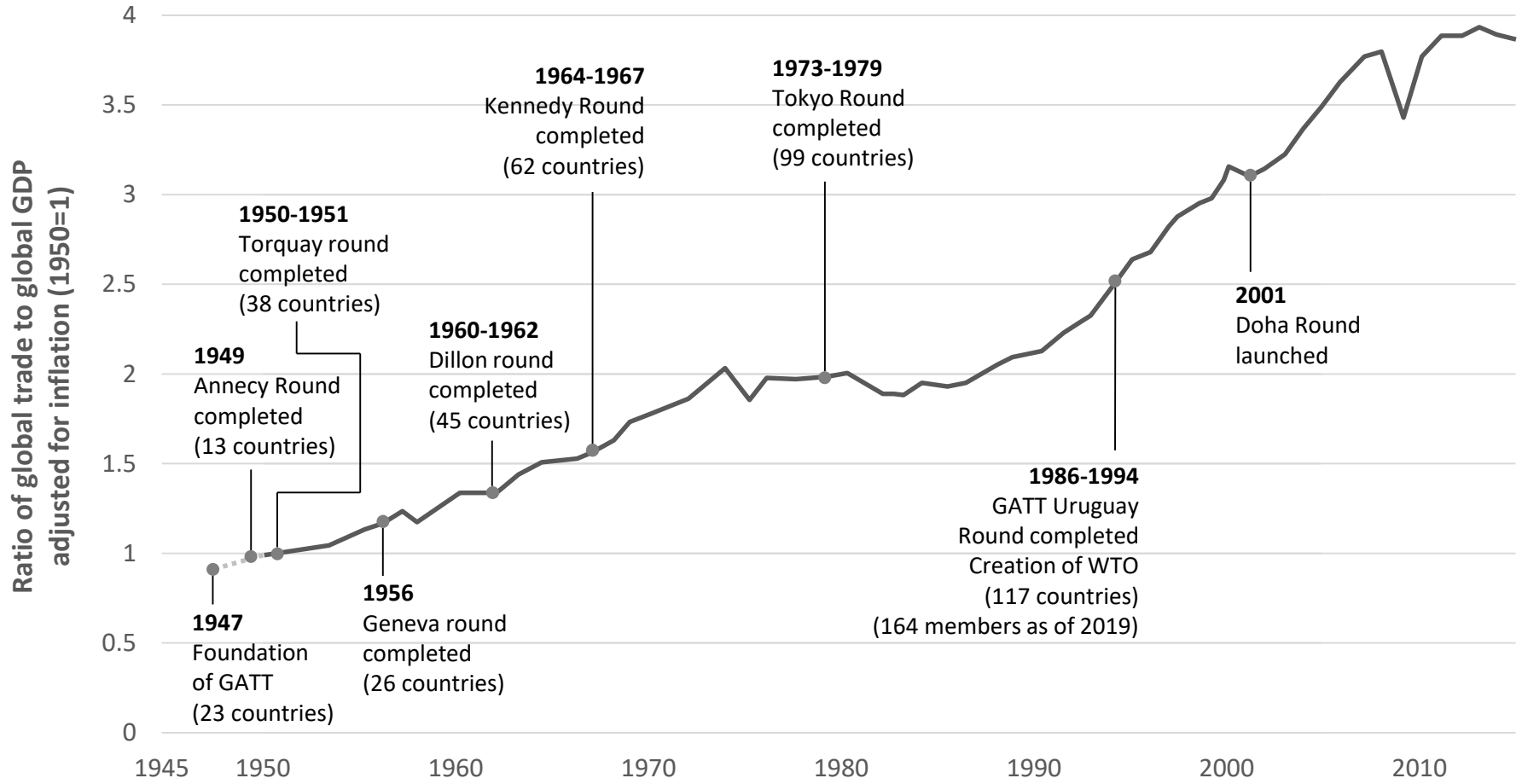
B. Analytical tools

C. Applications

D. Exercises

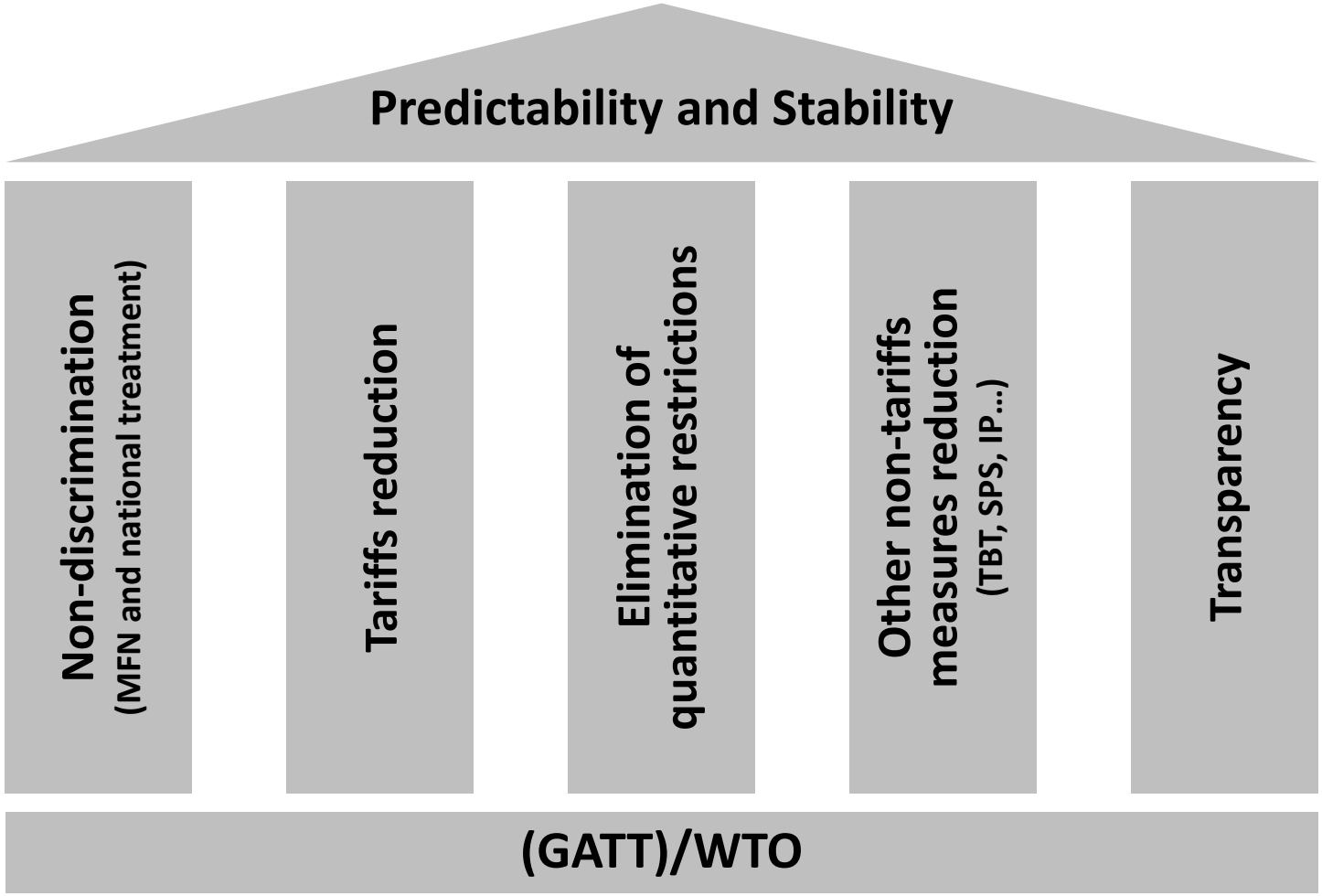


# Long and steep path to freer trade

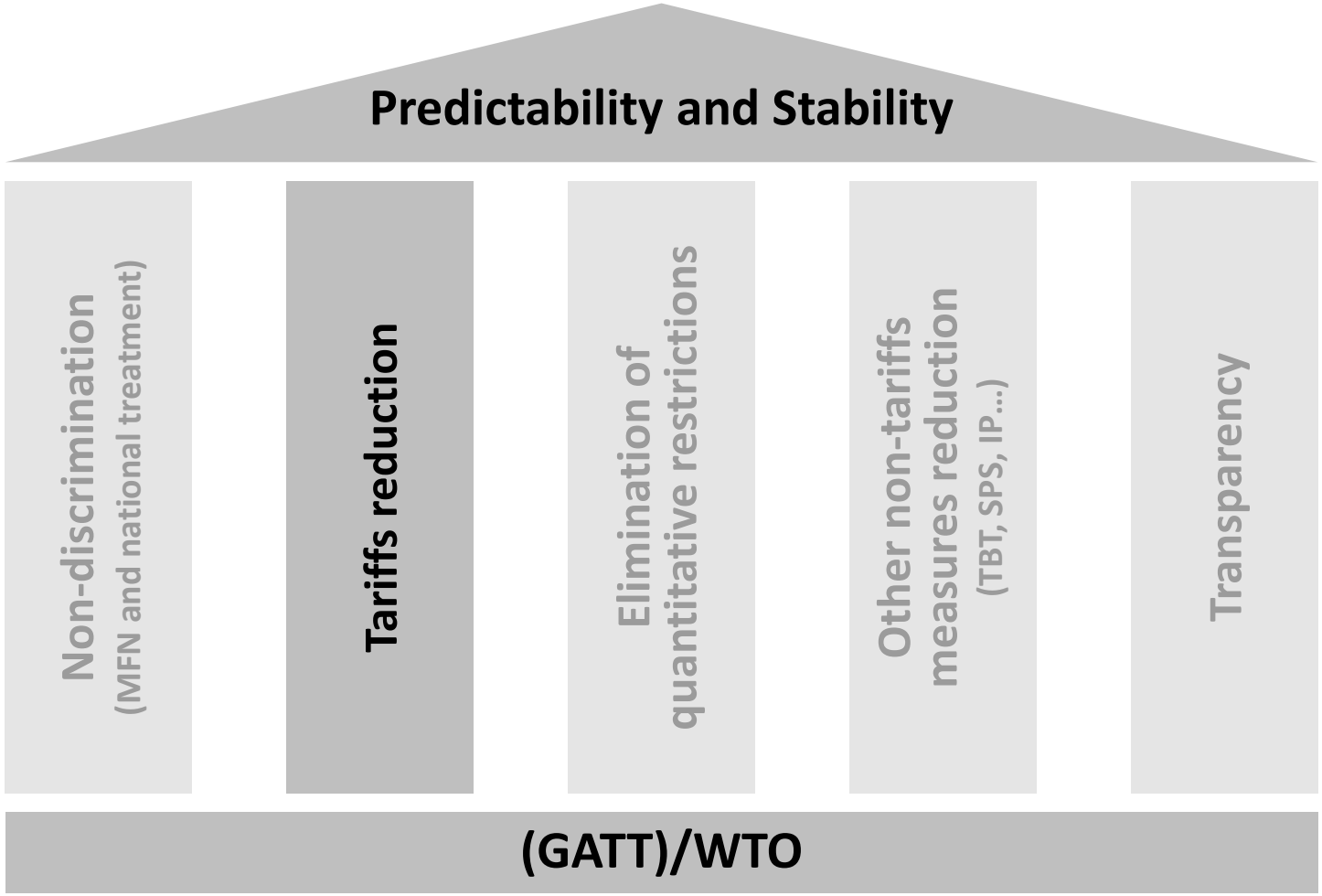



Source: Adjusted from WSJ (2015)

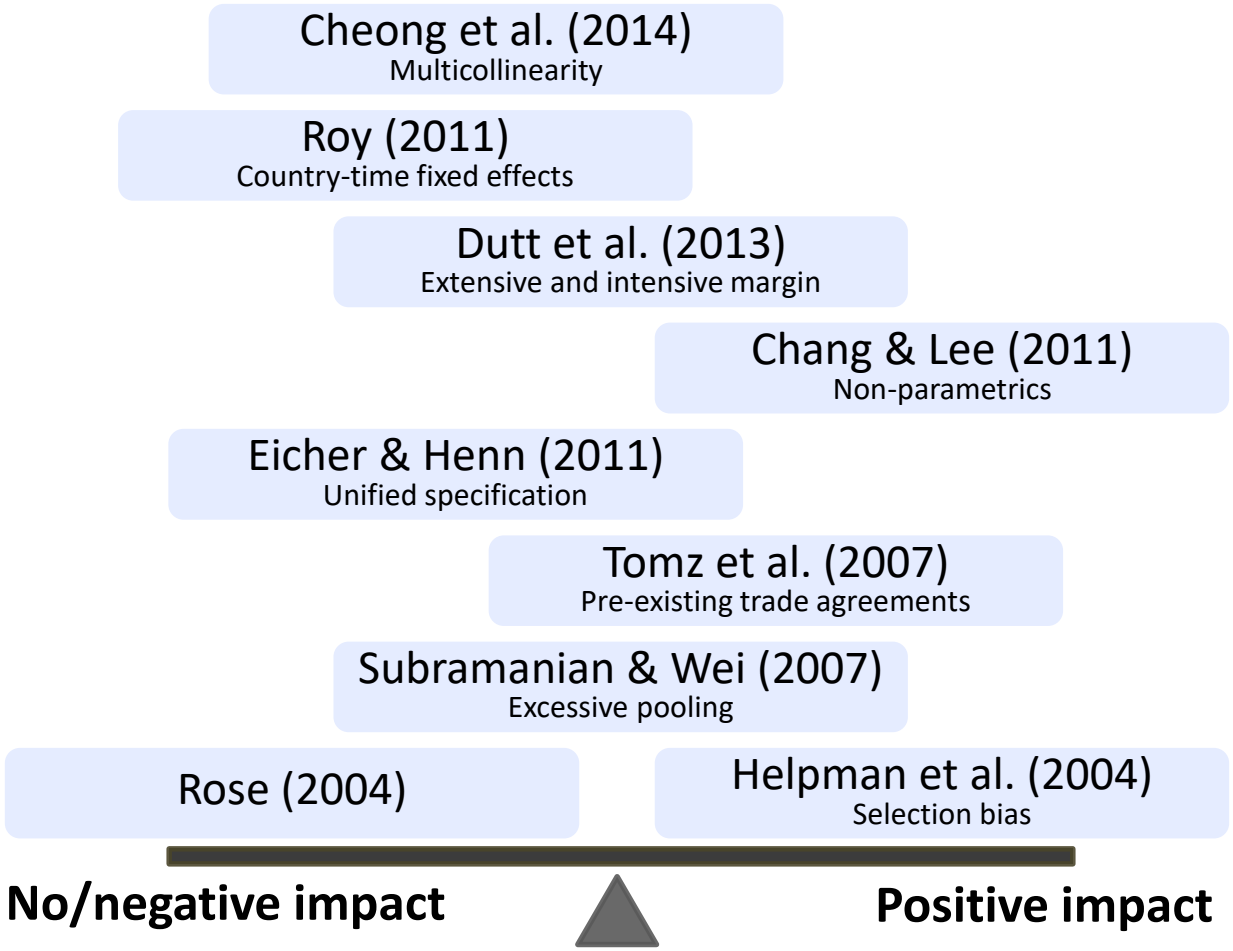
# GATT/WTO not just about tariff reduction…



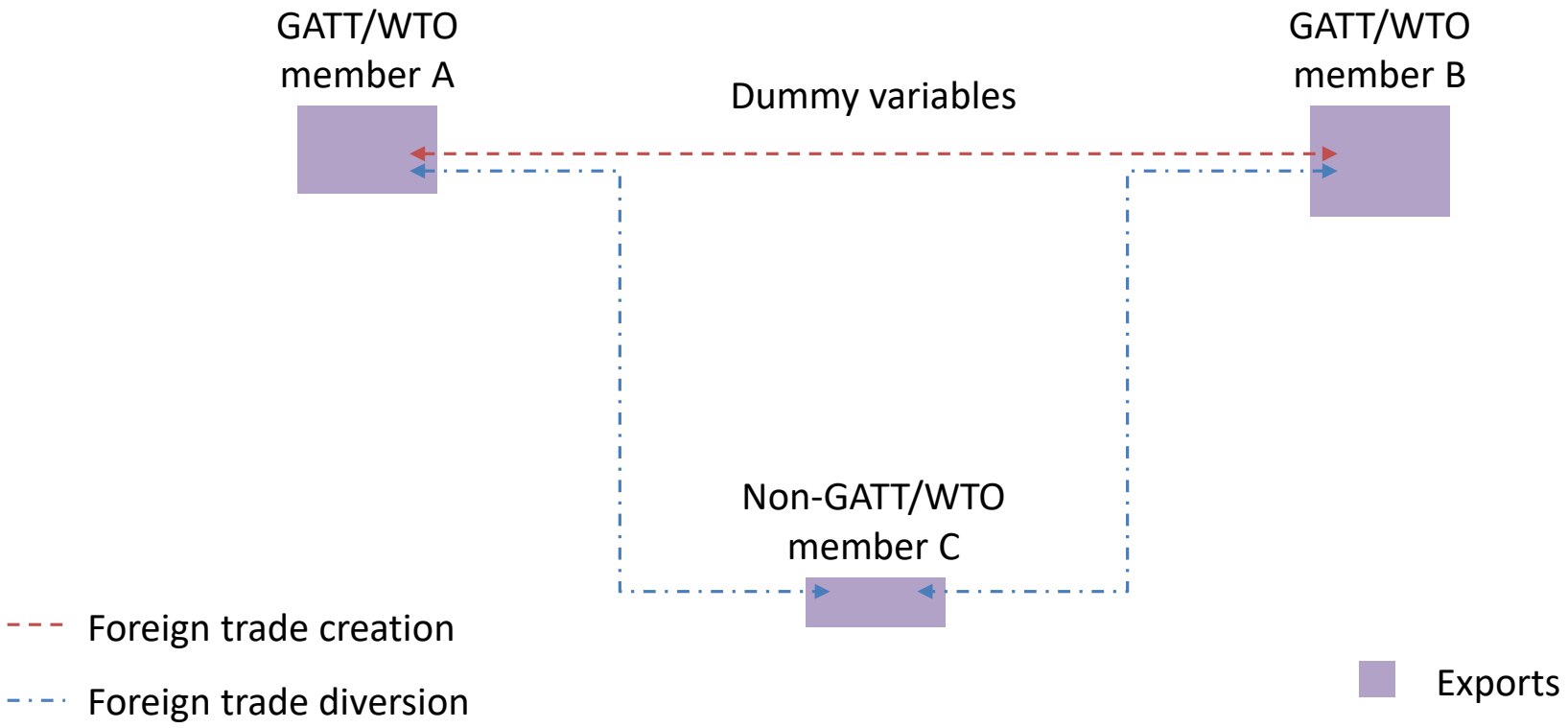
# …Yet public good nature of GATT/WTO commitments ignored or not identified



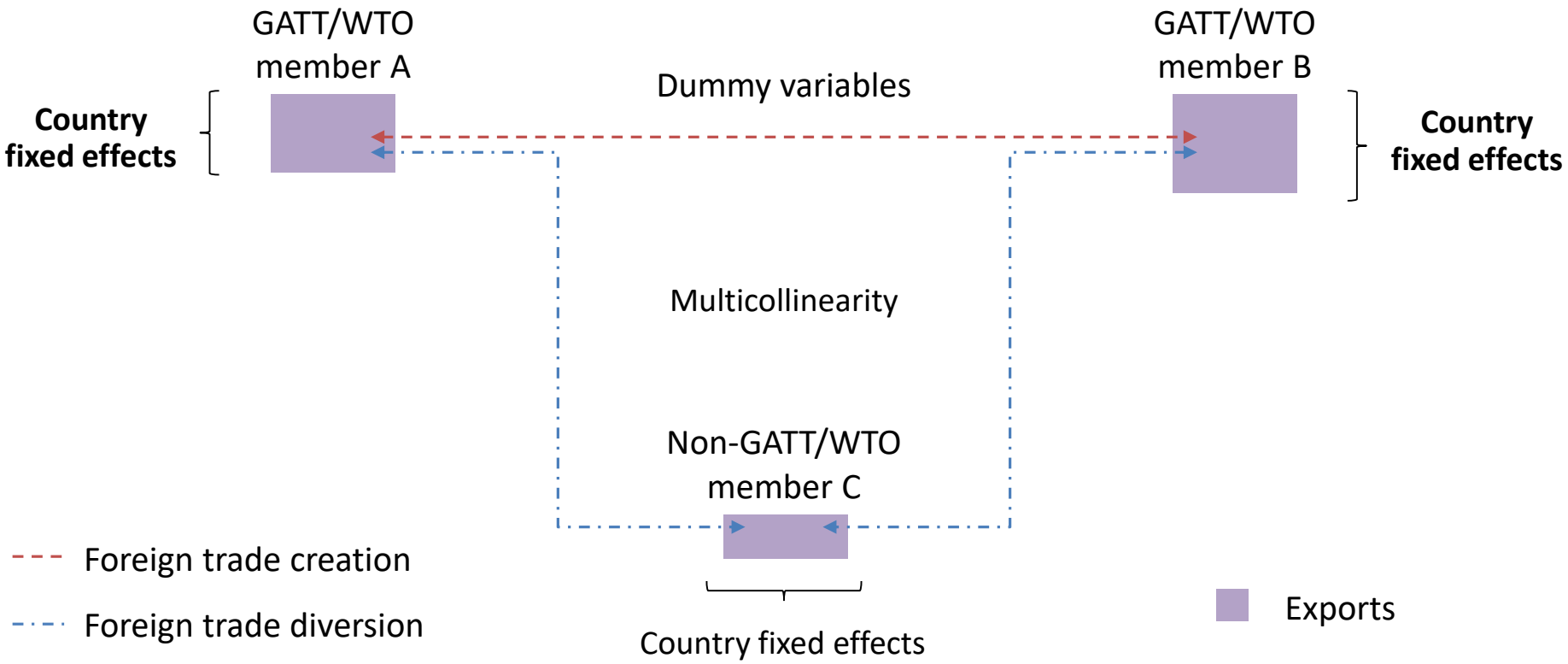
# Evidence on GATT/WTO membership is mixed



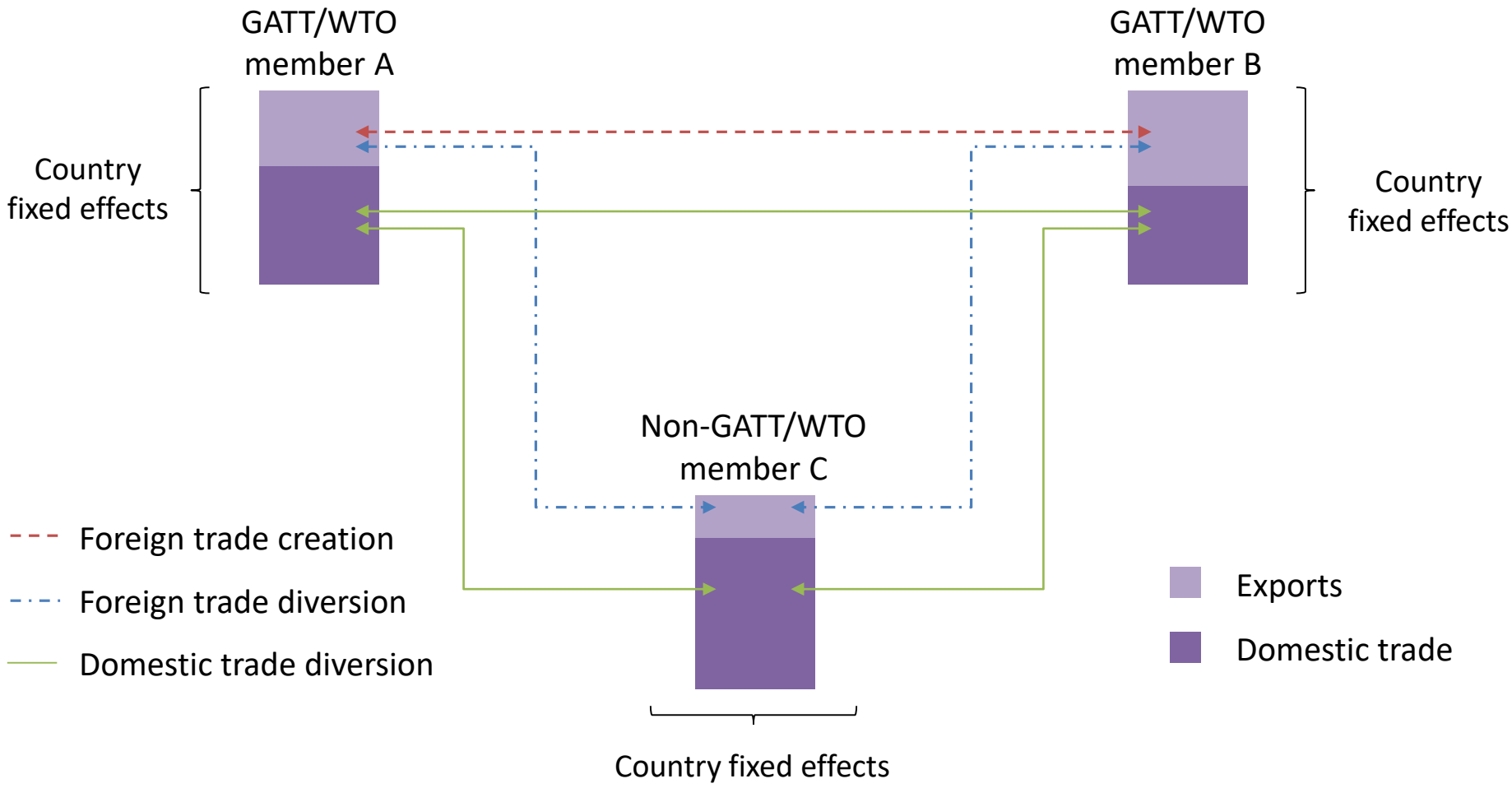
# Focus of bilateral impact of GATT/WTO on exports …



# …but public good nature of GATT/WTO ignored or not identified

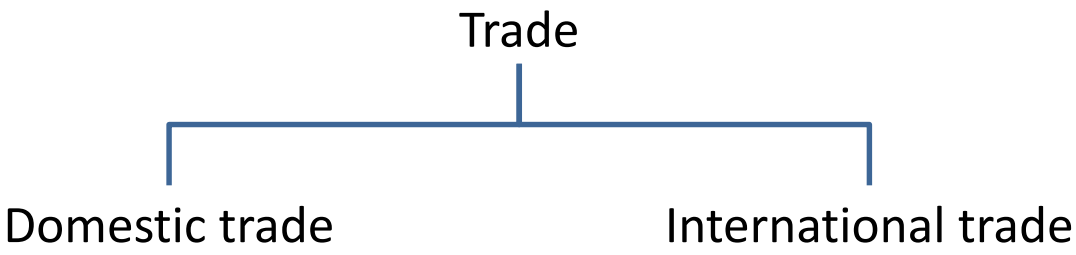


# Solution: Including domestic trade in the analysis



# Two contributions to the literature

- Identification for the first time of the effects of GATT/WTO membership on international trade relative to domestic sales




- Failure to account for the public good nature of GATT/WTO, including reduction in trade policy uncertainty, may lead to severe biases in gravity estimations of the impact of GATT/WTO membership

# Structural Gravity Model

## Accounting for public good feature of GATT/WTO

# Structural Gravity Model

**Structural gravity equation:**

$$X_{ij} = \frac{E_j \times Y_i}{Y} \times \left( \frac{t_{ij}}{P_j \times \Pi_i} \right)^{1-\sigma} \qquad i, j = 1 \ \ldots \ N \text{ countries}$$

**Multilateral Resistance Terms:** (MRT)

$$P_j^{1-\sigma} = \sum_i \left( \frac{t_{ij}}{\Pi_i} \right)^{1-\sigma} \times \frac{Y_i}{Y}, \qquad \Pi_i^{1-\sigma} = \sum_j \left( \frac{t_{ij}}{P_j} \right)^{1-\sigma} \times \frac{E_j}{Y}$$

(Outward MRT) (Inward MRT)

where $X_{ij}$: trade flows from exporter *i* to destination *j*

$Y_i = \sum_i X_{ij}$: output in country *i*

$E_j$: total expenditure at destination *j*

$t_{ij} > 1$: trade frictions for shipping goods from *i* to *j*

$\sigma > 1$: constant elasticity of substitution

# Capitalization on latest developments in empirical structural gravity literature

- **Intra-national and international trade flows data**
  - Consistent with gravity theory
  - Identification of bilateral policies and non-discriminatory policies
- **Time-exporter and time-importer fixed effects**
  - Control for multilateral resistance terms
- **Country-pair fixed effects**
  - Control for endogeneity of trade policies
  - Control for all time-invariant bilateral trade costs
- **Poisson Pseudo Maximum Likelihood estimator**
  - Control for heteroscedasticity
  - Control for zero-trade flows

# Structural Gravity Model Specification with Domestic Trade

$$X_{ij,t} = \exp\left[\alpha_0 + \alpha_1 ONE_GATTWTO_{ij,t} + \alpha_2 BOTH_GATTWTO_{ij,t}\right] \times \exp\left[\mathbf{GRAV}_{ij,t}\psi_{ij,t} + \mu_{ij} + \pi_{i,t} + \chi_{j,t}\right] + \varepsilon_{ij,t}$$

where $ONE_GATTWTO_{ij,t} \equiv GATTWTO_{i,t} \times BRDR_{ij,t}$

$GATTWTO_{i,t}$: 1 if country *i* is GATT/WTO member; 0 otherwise

$BRDR_{ij,t}$: 1 for international trade; 0 for domestic trade

$BOTH_GATTWTO_{ij,t} \equiv GATTWTO_{i,t} \times GATTWTO_{j,t} \times BRDR_{ij,t}$

$\mathbf{GRAV}_{ij,t}$: RTAs and time-varying international border dummies $BRDR_{ij,t}$

$\mu_{ij}$: Time-invariant country pair fixed effects

$\pi_{i,t}$; $\chi_{j,t}$: Exporter- and importer-time fixed effects

# New database

- **Bilateral international manufacturing trade**
  Export data from UN Comtrade, expressed in free on board (FOB), and complemented by mirrored import data after adjusting for cost, insurance and freight (CIF) costs

- **Domestic manufacturing trade**
  Difference between gross manufacturing output and exports, with gross manufacturing output constructed from UN UNIDO INDSTAT; CEPII and WB's Trade, Production and Protection databases

- Unbalanced panel dataset covering 178 trading partners over the period 1980-2016

# Empirical Analysis

# Large, positive, and statistically significant effects of GATT/WTO membership

| | (1) Unilateral | (2) Unilateral & Bilateral | (3) No internal |
|---|---|---|---|
| *One_GATTWTO* | 0.544** | 0.631** | |
| *Both_GATTWTO* | | 0.366** | -0.214* |
| *RTA* | 0.135** | 0.113* | 0.040 |
| *BRDR_1980* | -1.164** | -1.124** | |
| *BRDR_1988* | -0.878** | -0.844** | |
| *BRDR_1996* | -0.496** | -0.459** | |
| *BRDR_2004* | -0.106* | -0.097$^{+}$ | |
| *BRDR_2012* | 0.049* | 0.051* | |
| Country pairs | 6347 | 6347 | 6286 |
| Countries | 178 | 178 | 178 |

Note: only estimates of time-varying international border dummies every 8 years reported.
+ $p < 0.10$, $p < 0.05$, $p < 0.01$

# Large, positive, and statistically significant effects of GATT/WTO membership

| | (1) Unilateral | (2) Unilateral & Bilateral | (3) No internal |
|---|---|---|---|
| *One_GATTWTO* | 0.544** } 88% | 0.631** | |
| *Both_GATTWTO* | | 0.366** } 171% | -0.214* |
| *RTA* | 0.135** | 0.113* | 0.040 |
| *BRDR_1980* | -1.164** | -1.124** | |
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Note: only estimates of time-varying international border dummies every 8 years reported.
+ $p < 0.10$, $p < 0.05$, $p < 0.01$

# Findings robust to alternative specifications

| | (1) benchmark | (2) OLS | (3) Asymmetric Pair FEs |
|---|---|---|---|
| *One_GATTWTO* | 0.631** | 0.220 | 0.631** |
| *Both_GATTWTO* | 0.366** | 0.124 | 0.376** |
| *RTA* | 0.113* | 0.217** | 0.116* |
| *BRDR_1980* | -1.124** | -1.368** | -1.126** |
| *BRDR_1988* | -0.844** | -1.230** | -0.846** |
| *BRDR_1996* | -0.459** | -0.486** | -0.461** |
| *BRDR_2004* | -0.097+ | -0.084 | -0.100+ |
| *BRDR_2012* | 0.051* | 0.104 | 0.05* |
| Country pairs | 6347 | 6347 | 6347 |
| Countries | 178 | 178 | 178 |

Note: only estimates of time-varying international border dummies every 8 years reported.
+ $p < 0.10$, $p < 0.05$, $p < 0.01$

# Underestimated GATT/WTO effects by mainly capturing the effect of new acceding countries

| | (1) benchmark | (4) Country variables | (5) Gravity variables |
|---|---|---|---|
| *One_GATTWTO* | 0.631** | 0.642** | 0.836** |
| *Both_GATTWTO* | 0.366** | 0.350** | 1.007** |
| *RTA* | 0.113* | 0.066 | 0.428** |
| *POLITY_BRDR* | | 0.021+ | |
| *ln(GDP)_BRDR* | | 0.116 | |
| *ln(POP)_BRDR* | | -0.078 | |
| *ln(DIST)* | | | -0.613** |
| *CONTIGUITY* | | | 0.655** |
| *LANGUAGE* | | | 0.347** |
| *COLONY* | | | 0.162+ |
| Country pairs | 6347 | 6167 | 6347 |
| Countries | 178 | 131 | 178 |

Note: Time-varying international border dummies not reported.
+ p < 0.10, p < 0.05, p < 0.01

# WTO more effective in promoting trade with non-members and developing members

| | (6)<br>GATT vs. WTO | (7)<br>GATT/WTO by income group |
|---|---|---|
| *One_GATT* | 0.690** | |
| *One_WTO* | 1.269** | |
| *Both_GATT* | 0.531** | |
| *Both_WTO* | 0.202** | |
| *One_GATTWTO_HighHigh* | | 0.346 |
| *One_GATTWTO_HighLow* | | 0.251* |
| *One_GATTWTO_LowLow* | | 0.742** |
| *Both_GATTWTO_HighHigh* | | -0.075 |
| *Both_GATTWTO_HighLow* | | 0.346** |
| *Both_GATTWTO_LowLow* | | 0.674** |
| Country pairs | 6347 | 6347 |
| Countries | 178 | 178 |

Note: RTA and time-varying international border dummies not reported.
+ $p < 0.10$, $p < 0.05$, $p < 0.01$

# Conclusion

# Conclusion

- Importance of accounting for non-discriminatory nature of GATT/WTO commitments
- On average, GATT/WTO membership has increased
  - trade between members by 171%
  - trade between members and non-members by about 88%
- But potential underestimated effect by mainly capturing the impact of new acceding countries
- Next step: extension to a general equilibrium gravity analysis

# Thank You for Your Attention

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