The Welfare Effects of International Commercial Law Reform

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The aim of these slides

- What is are PE and GE impacts of reforming trade law (commercial dispute settlement) on trade?
  - Partial Equilibrium: Effects on trade flows
    - General Equilibrium: Effects of trade flows on Consumers, Producers & Welfare (GDP)
- Preliminary results

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- Preliminary results

Welfare in trade policy analysis

CHAPTER 4

Trade Theory with Numbers: Quantifying the Consequences of Globalization*

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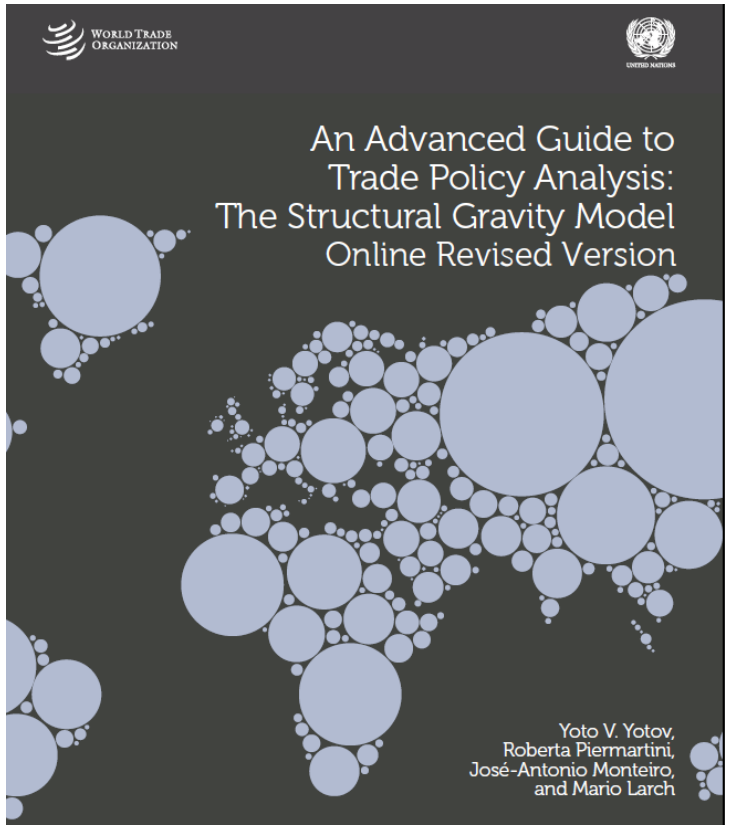
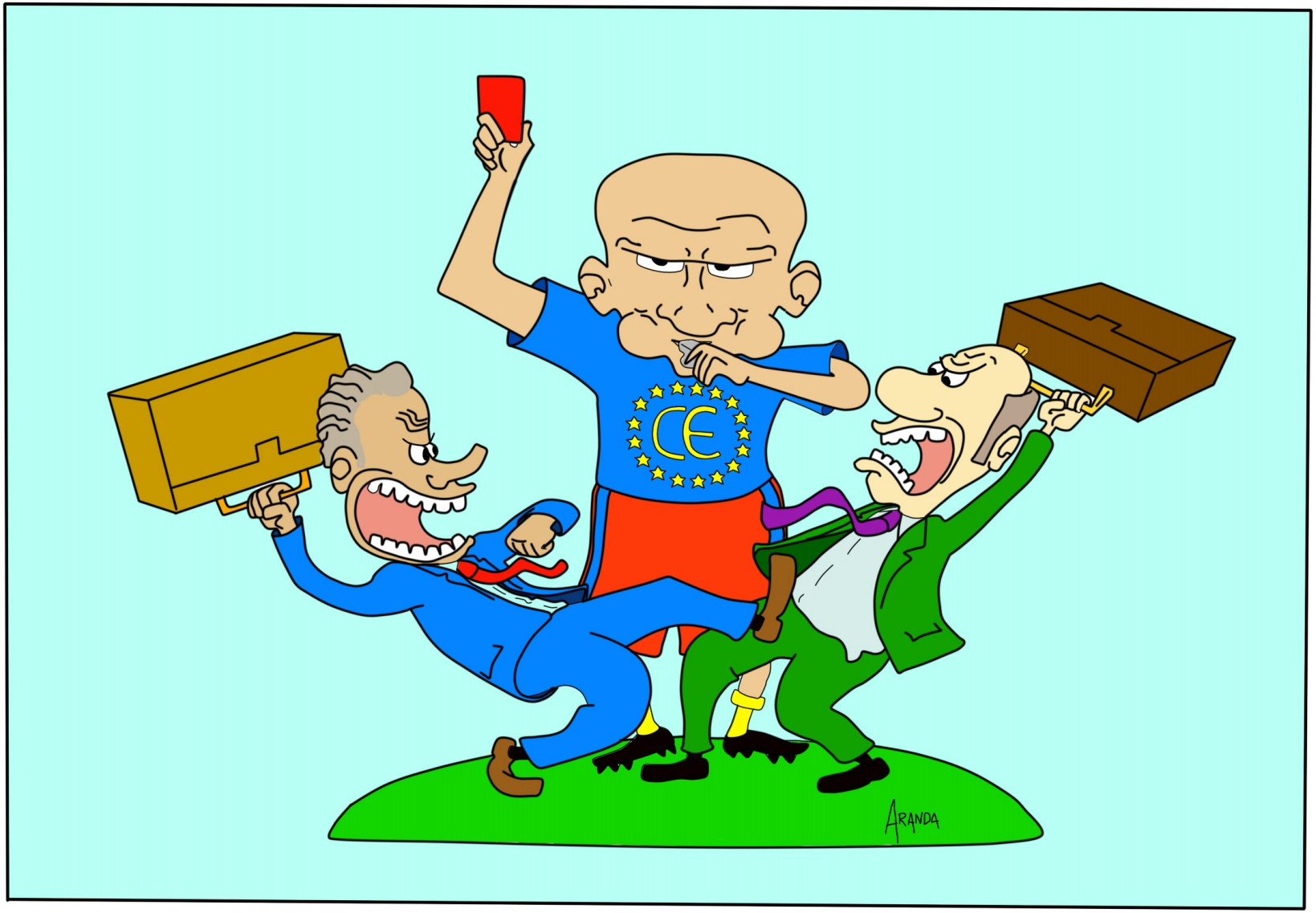
†National Bureau of Economic Research, Cambridge, MA, USA
‡University of California, Berkeley, CA, USA



Outline

What is International Commercial Arbitration?



Mechanisms by which arbitration affects FDI & trade

- Arbitration provides an effective and predictable dispute settlement mechanism:
  1. Flexible, confidential & final:
     - Award can be executed worldwide
  2. Increases the trust between parties:
     - High cost of engaging in nuisance suits
  3. Reduces the uncertainty of litigation in domestic courts in trade disputes:
     - Choice of law

Background

Trade

- Casella, A. (1996). "On market integration and the development of institutions: the case of international commercial arbitration" *European Economic Review*
- Berkowitz et al (2006). "Trade, law, and product complexity" *Review of Economics and Statistics*
- Moenius & Berkowitz (2011) "Law, trade, and development" *Journal of Development Economics*
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Welfare Analysis in Quantitative Trade Models

Handbook of International Economics (Costinot and Rodriguez-Clare, 2014)

- Focuses on the reduction in non-revenue-raising iceberg trade costs (reduction of trade frictions)
- Welfare refers to percentage changes in real consumption that respond to prices:

$$d \ln W_j = -\sum_{i=1}^{N} \lambda_{ij} d \ln P_{ij} \tag{1}$$

where $\lambda_{ij} = P_{ij} Q_{ij} / Y_j$ is the share of expenditure on country i goods. P_{ij} s the price index of the good supplied by country i to market j.

- The welfare equation (1) is informative, but difficult to implement. Suppose we want to quantify the gains from the NYC: prices are affected by non-NYC shocks.

Price Changes in Quantitative Trade Models (i)

Handbook of International Economics (Costinot and Rodriguez-Clare, 2014)

- Prices depend on trade barriers (τ) and wages (w):

$$d\ln P_{ij}(w,\tau) = \underbrace{\frac{\partial P_{ij}(w,\tau)}{\partial \ln \tau} d\ln \tau}_{\text{Direct effect}} + \underbrace{\frac{\partial P_{ij}(w,\tau)}{\partial \ln w}\frac{\partial \ln w}{\partial \ln \tau} d\ln \tau}_{\text{GE wage effect}} \tag{2}$$

- Under certain conditions (consumer CES preferences):

$$d\ln W_j = \underbrace{\frac{1}{1-\sigma} d\ln \lambda_{jj}}_{\text{Differiented import varieties}} - \underbrace{d\ln P_{jj}}_{\text{Efficiency gains}} \tag{3}$$

A country gains from importing differentiated goods from the rest of the world and from being efficient.

Price Changes in Quantitative Trade Models (ii)

Advanced Guide to Trade Policy Analysis. UNCTAD & WTO (Yotov et al., 2016)

- Structural gravity is the new "Gold Standard" in gravity models

$$X_{ij} = \tau_{ij} \frac{Y_i E_j}{\Pi_i P_j}$$

- We can decompose prices into producer and consumer prices (due to trade barriers):

$$d \ln P_{ij}(w, \tau) = \underbrace{\frac{\partial \Pi_j}{\partial \ln \tau} d \ln \tau}_{\text{Effect on producers}} - \underbrace{\frac{\partial p_j}{\partial \ln \tau} d \ln \tau}_{\text{Effect on consumers}} \quad (4)$$

- We can use the theoretical properties of the gravity equation to evaluate the effect on consumer and producers prices and compute welfare change.

Estimation GE

GEPPML: Anderson et al (2018)

- GEPPML uses a useful property of PPML (Fally 2015) to recover consumer and producer prices from MRT
  - PPML translate the initial response of factory-gate prices into changes in the gravity fixed effects
  - Endogenizes the value of output to estimate a structural GE gravity counterfactuals
  - GEMPPL needs internal trade data (for total output and expenditure)
- The GEPPML is a procedure that consists of 3 steps with 2 stages in each one of them.
  - The first step delivers the "baseline" estimates and the "Baseline" GE indexes
  - The second step of the GEPPML procedure delivers the "conditional" gravity estimates and "Conditional" GE indexes.
  - third step of the GEPPML procedure delivers (also in two stages) the "Full endowment" gravity estimates and "Full endowment" GE indexes
    - Changes in output and expenditure.

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Structural Gravity equation

$$X_{ij} = \left(\frac{t_{ij}}{\Pi_i P_j}\right)^{1-\sigma} Y_i E_j, \tag{5}$$

$$P_j^{1-\sigma} = \sum_i \left(\frac{t_{ij}}{\Pi_i}\right)^{1-\sigma} Y_i, \tag{6}$$

$$\Pi_i^{1-\sigma} = \sum_j \left(\frac{t_{ij}}{P_j}\right)^{1-\sigma} E_j, \tag{7}$$

$$p_i = \frac{Y_i^{\frac{1}{1-\sigma}}}{\gamma_i \Pi_i}. \tag{8}$$

where P_j is the CES consumer price index given by $P_j = \left[\sum_i (\gamma_i p_{ij})^{1-\sigma}\right]^{\frac{1}{1-\sigma}}$.
Empirically (9) becomes:

$$X_{ij} = \exp(T_{ij} + \pi_i + \chi_j) \times \varepsilon_{ij} \tag{9}$$

Figure 3 Conditional general equilibrium

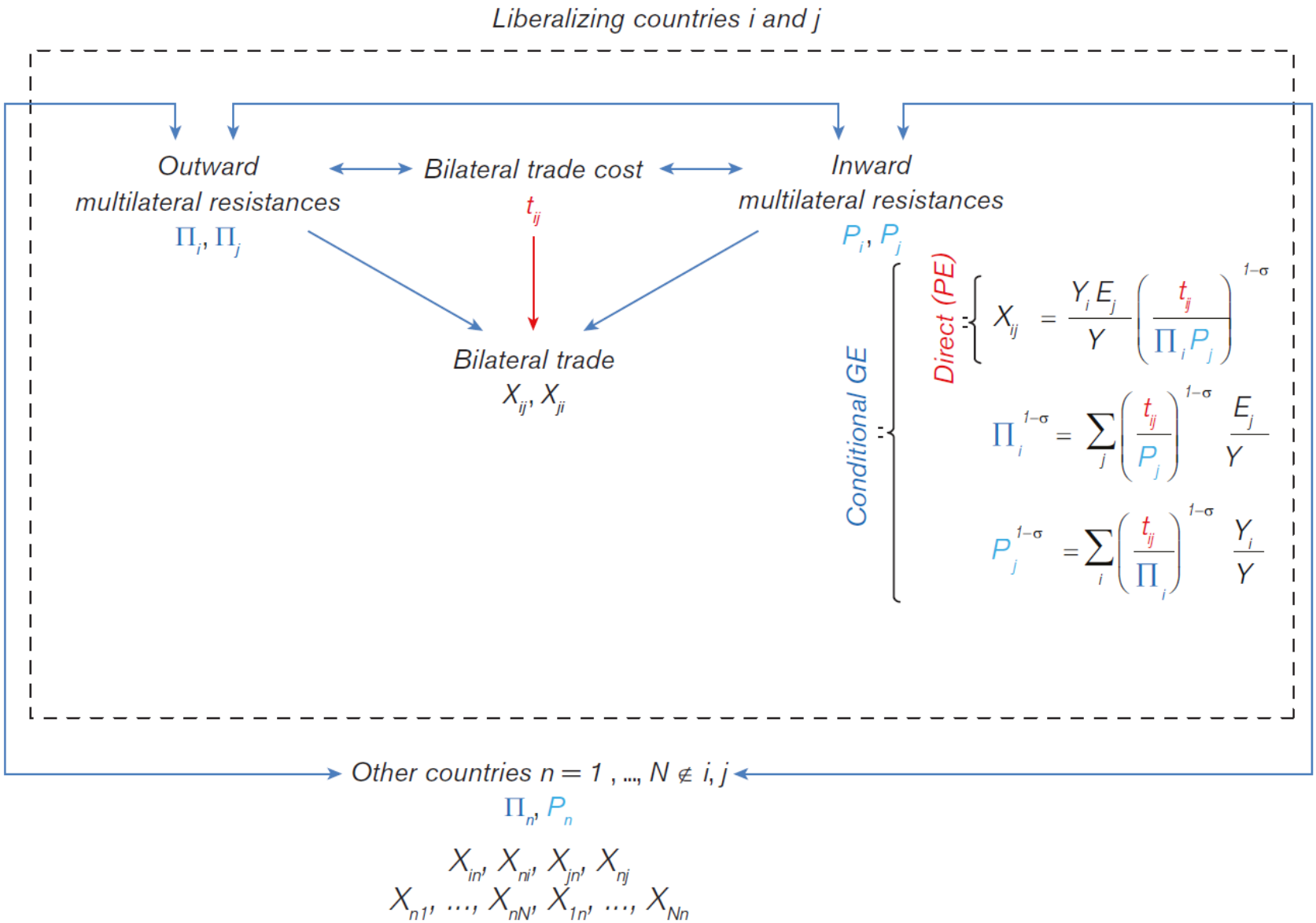
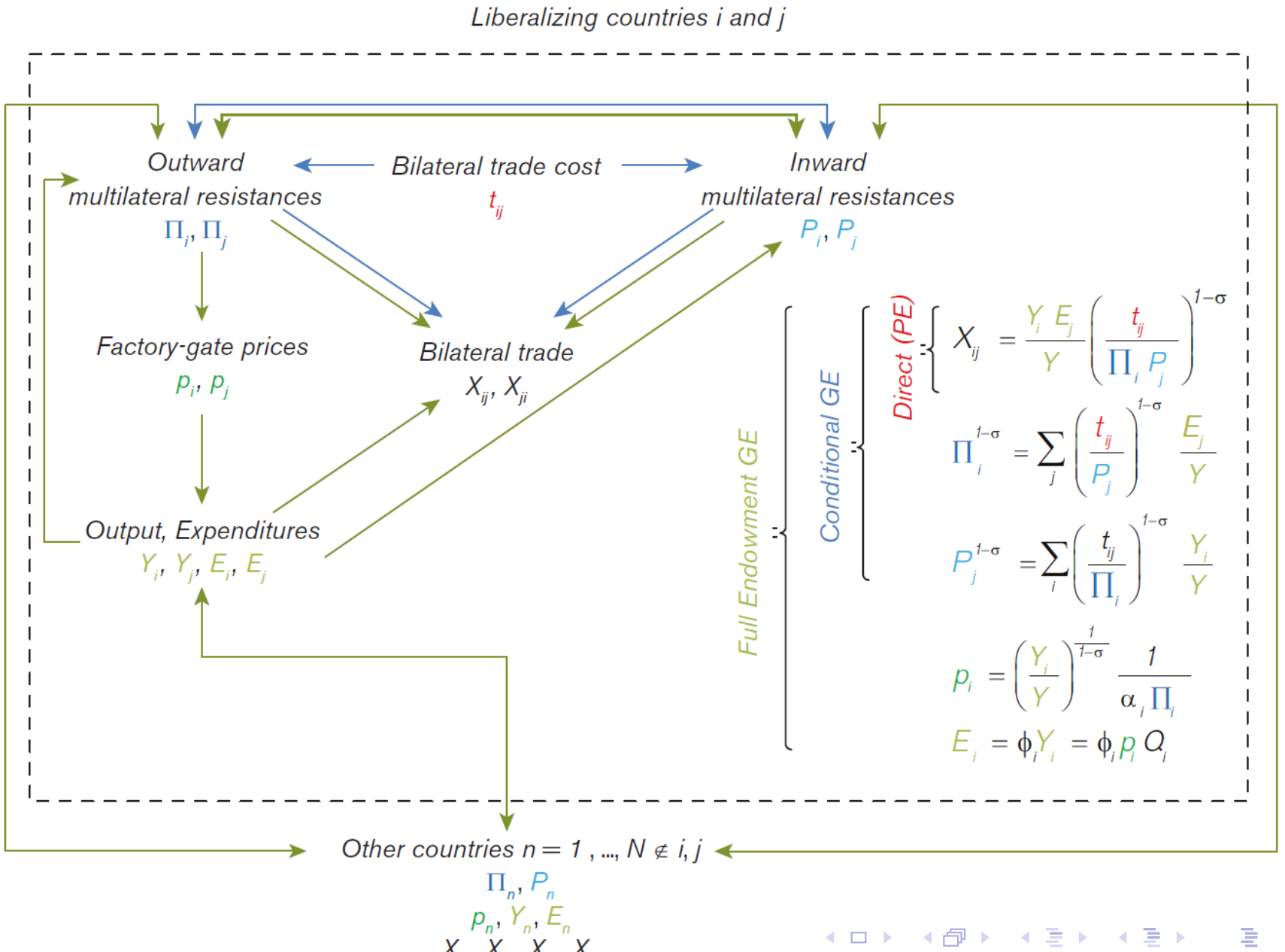


Figure 4 Full endowment general equilibrium



General Equilibrium with Structural Gravity

- For our counterfactual analysis, we rely on the structure of the theoretical model and the property of the Pseudo-Poisson Maximum likelihood (PPML) estimator proposed by Silva and Tenreyro (2006, RES) highlighted by Fally (2015 JIE): the estimates of the fixed effects from gravity estimations are perfectly consistent with the structural gravity terms.
- The MRT $\Pi_i^{1-\sigma}$ and $P_j^{1-\sigma}$ can be recovered from the fixed effects as follows:

$$\widetilde{\Pi_i^{1-\sigma}} = E_0 Y_i \exp(-\widetilde{\pi}_i), \tag{10}$$

and

$$\widetilde{P_j^{1-\sigma}} = \frac{E_j}{E_0} \exp(-\widetilde{\chi}_j), \tag{11}$$

where $\widetilde{\pi}_i$ and $\widetilde{\chi}_j$ are the estimated fixed effects from Equation (9), and E_0 denotes the expenditure of the country chosen as numéraire.

- We obtain counterfactual values for
  - output, $Y_i^c = (p_i^c / p_i)\, Y_i$,
  - expenditures, $E_i^c = (p_i^c / p_i)\, E_i$
  - trade flows, $\widetilde{X}_{ij}^c$.
  - consumer and producer prices ($\left(\widetilde{\Pi_i^{1-\sigma}}\right)^c$ and $\left(\widetilde{P_j^{1-\sigma}}\right)^c$)
- The reported results are then the percentage changes between baseline and counterfactual values, i.e., for output
  $\text{Output}\% = (Y_i^c - Y_i)/Y_i \times 100$.

Structural Gravity

- Structural gravity is the new "Gold Standard" in gravity models

$$X_{ij} = \left(\frac{t_{ij}}{\Pi_i P_j}\right)^{1-\sigma} Y_i E_j,$$

  - Y_i is the total value of production in i: $Y_i = X_{ii} + \sum_{j \neq i} X_{ij}$
  - E_j is the expenditure in country j: $E_j = X_{jj} + \sum_{j \neq i} X_{ij}$
  - Π_i and P_j are structural outward and inward multilateral resistance terms (Anderson & van Wincoop, 2003).
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Recommendations for Estimating Structural Gravity

Yotov et al. (2016)

- **Recommendation 1:** *Use Panel Data*.
- Estimation efficiency and pair-fixed-effects methods for endogeneity
- Recommendation 2: *Allow for Adjustment in Trade Flows (or not!: Egger et al., 2021)*
  - adjustment in bilateral trade flows in response to trade policy
- Recommendation 3: *Include Intra-national Trade Flows.*
  - consistency with gravity theory & identification of the effects of bilateral trade policies
  - Identification of the effects of country-specific trade policies
    - The effects on international trade are measured relative to the effects on intra-national trade
- Recommendation 4: *Use Directional Time-varying Fixed Effects*
  - importer-time and exporter-time fixed effects)
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Empirics

- We use the the Pseudo-Poisson Maximum likelihood (PPML) estimator proposed by Silva and Tenreyro (2006, RES) using Correira's et al. (2019) procedure and Beverelli et al (2018) insights:

Bilateral effects

$$X_{ijt} = \exp\left(\begin{array}{c}\left(\ BothNYC + OneNYC+\ \right)_{ijt} \times BRDR_{ij} \\ +BRDR_{ij} \times t \\ +\lambda_{it} + \lambda_{jt} + \chi_{ijt} + \chi_{ij}\end{array}\right) \times e_{ijt}$$

Country-specific effects

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Identifying country-specific effects in structural gravity

Heid et al (2020) & Beverelli et al (2018)

#	i	j	η_1	η_2	μ_1	μ_2	μ_3	$BRDR_{ij}$	$IQ_j \times BRDR_{ij}$
1	A	B	1	0	0	1	0	1	IQ_B
2	A	C	1	0	0	0	1	1	IQ_C
3	B	A	0	1	1	0	0	1	IQ_A
4	B	C	0	1	0	0	1	1	IQ_C
5	C	A	0	0	1	0	0	1	IQ_A
6	C	B	0	0	0	1	0	1	IQ_B
7	A	A	1	0	1	0	0	0	0
8	B	B	0	1	0	1	0	0	0
9	C	C	0	0	0	0	1	0	0

- BRDR is a dummy that identifies international trade
- $\mathtt{NYC}_{jt} \times \mathtt{BRDR}_{ijt}$ is not collinear with MRT and can be used to identify country-specific effects of the NYC
  - More specifically the effect of the NYC on trade relative to domestic trade
  - However not on home and host countries simultaneously
- Yotov (2022): "The Variation of Gravity within Countries (or 15 Reasons Why Gravity Should Be Estimated with Domestic Trade Flows)"

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15+1 Reasons Why Gravity Should Be Estimated with Domestic Trade (Yotov, 2021)

- The use of domestic trade flows in gravity estimations is:

1. consistent with trade theory of the intensive margin of trade,
2. available
    1. and it does not matter much which to use! (Campos et al., 2021),
3. consistent with trade theory of the extensive margin of trade.
4. The use of domestic trade flows allows:
    1. for estimation of the effects of international borders and home biases,
5. for estimation of heterogeneous domestic and regional trade costs,
6. for a systematic analysis of the determinants of domestic trade costs,
7. for country-specific asymmetries in the vector of international trade costs,
8. for identification of the trade-diversion effects of bilateral trade policies,
9. for identification of the effects of non-discriminatory trade policies on bilateral trade flows,
10. for identification of the effects of country-specific characteristics on bilateral trade flows,
11. for identification of the country-specific effects of trade policies,
12. to a solution to "The Distance Puzzle of International Trade",
13. for solving "The Missing Globalization Puzzle",
14. for solving the puzzle that "Larger Countries Should Be Richer than Smaller Countries",
15. for solving the puzzle of "The Missing WTO Effects".

USITC Graviy Portal

- International Trade and Production Database for Estimation (ITPD-E)
  - Contains international and domestic trade for 265 countries in 1986-2019. It includes data for 170 industries in agriculture, mining, energy, manufacturing, and services.
- Dynamic Gravity Dataset (DGD)
  - Describes country characteristics and relationships between trading partners. It covers the period between 1948 and 2019.
- Domestic and International Common Language Database (DICL)
  - Bilateral measures of both international and domestic language similarity for 242 countries.
- Gravity Modeling Environment (GME)
  - Python package to perform Poisson Pseudo-Maximum Likelihood (PPML) estimation.
- Multinational Revenue, Employment, and Investment Database (MREID)
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- International Trade and Production Database for Estimation (ITPD-E)
  - Contains international and domestic trade for 265 countries in 1986-2019. It includes data for 170 industries in agriculture, mining, energy, manufacturing, and services.
- Dynamic Gravity Dataset (DGD)
  - Describes country characteristics and relationships between trading partners. It covers the period between 1948 and 2019.
- Domestic and International Common Language Database (DICL)
  - Bilateral measures of both international and domestic language similarity for 242 countries.
- Gravity Modeling Environment (GME)
  - Python package to perform Poisson Pseudo-Maximum Likelihood (PPML) estimation.
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	(1)	(2)	(3)
fta	0.443***	0.441***	0.441***
	(0.05)	(0.05)	(0.05)
NYCboth	0.359***	0.780***	
	(0.04)	(0.09)	
NYCone		0.359***	
		(0.06)	
NYCXBRDR_j			0.826***
			(0.08)
num_n	668611	668611	668611
r2	0.986	0.986	0.986
Importer-yearFE	Yes	Yes	Yes
Exporter-yearFE	Yes	Yes	Yes
PairFE	Yes	Yes	Yes

Robust Standard errors in parentheses, clustered by country pair.

Col1: Both in NYC

Col2: Diversion effects

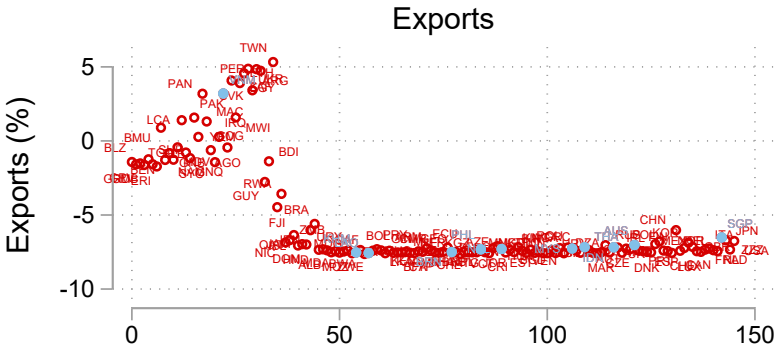
	(1)	(2)	(3)
fta	-0.044	-0.044	-0.044
	(0.03)	(0.03)	(0.03)
NYCboth	-0.009	0.139*	
	(0.04)	(0.09)	
NYCone		0.127**	
		(0.06)	
NYCXBRDR_j			0.057
			(0.08)
num_n	668611	668611	668611
r2	0.986	0.986	0.986
Importer-yearFE	Yes	Yes	Yes
Exporter-yearFE	Yes	Yes	Yes
PairFE	Yes	Yes	Yes
BRDR-year	Yes	Yes	Yes

Robust Standard errors in parentheses, clustered by country pair.

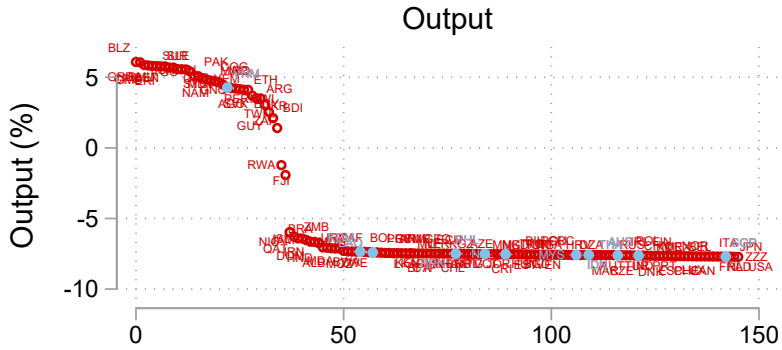
Col1: Both in NYC

No Arbitration

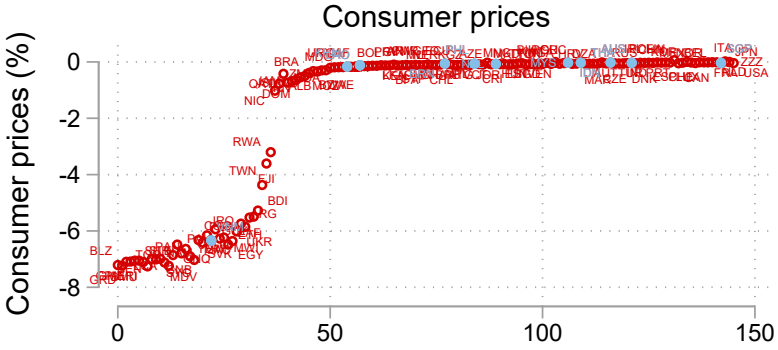
ARB NYC



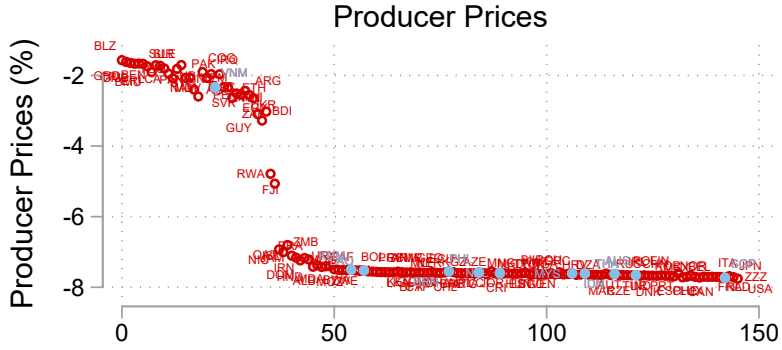
Export Change:
World Change -6.568%
NYC -6.865%
No NYC 0.388%



Output Change:
World -7.354%
NYC -7.604%
No NYC 4.175%



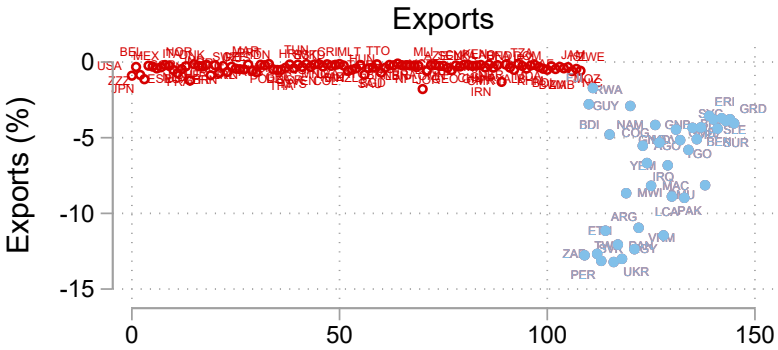
Consumer prices Change:
World -1.743%
NYC -0.154%
No NYC -6.277%



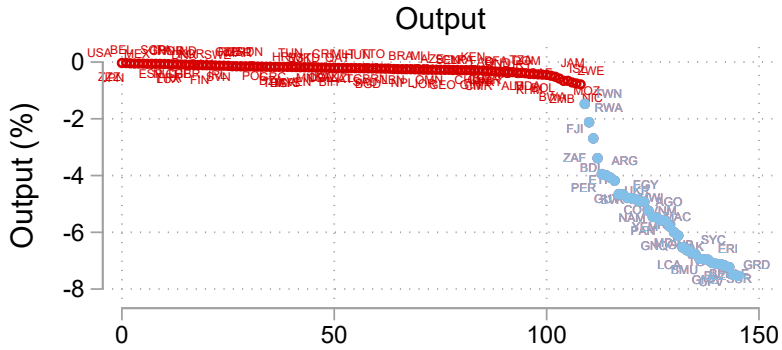
Producer prices Change:
World -6.262%
NYC -7.550%
No NYC -2.364%

No third country effects

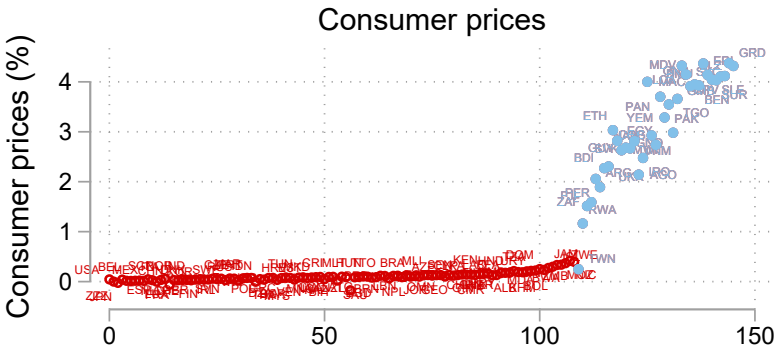
ARB NYC no one



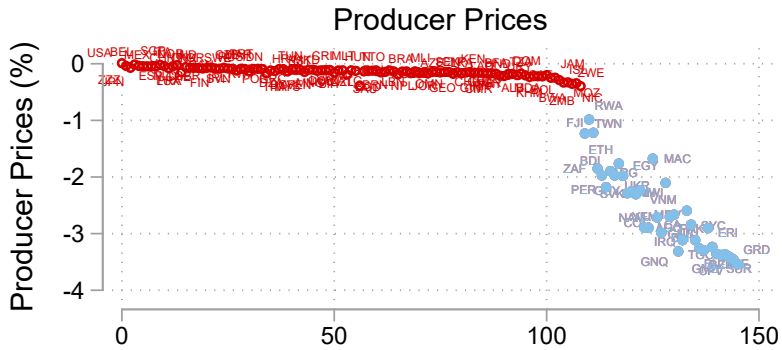
Export Change:
World Change -1.528%
NYC -0.718%
No NYC -7.171%



Output Change:
World -0.732%
NYC -0.109%
No NYC -5.498%



Consumer prices Change:
World 0.853%
NYC 0.102%
No NYC 3.100%

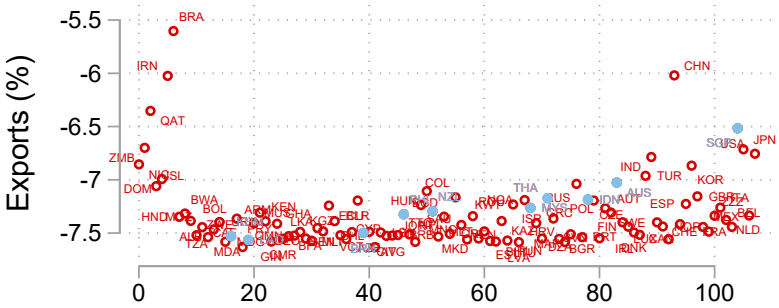


Producer prices Change:
World -0.761%
NYC -0.140%
No NYC -2.569%

Regions: Asia Pacific

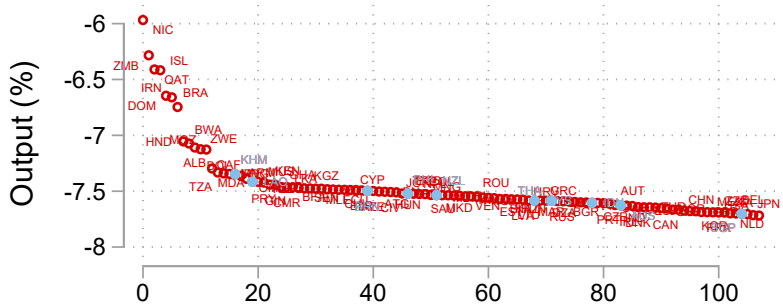
ARB NYC All_Sectors

Exports



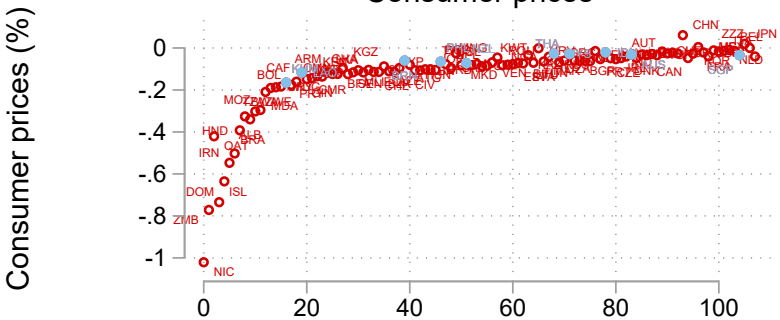
Export Change:
World Change -6.208%
NYC -6.866%
Asia Pacific -6.334%

Output



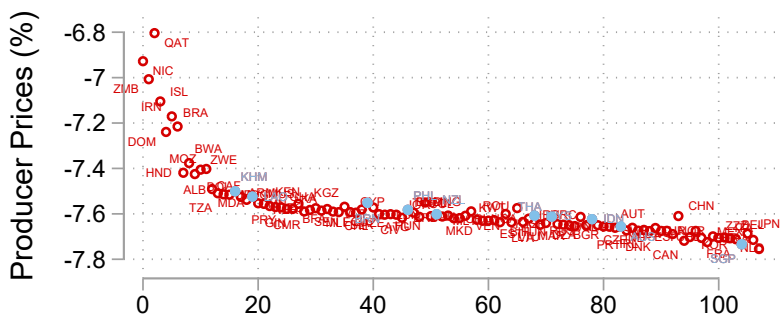
Output Change:
World -6.835%
NYC -7.612%
Asia Pacific -6.526%

Consumer prices



Consumer prices Change:
World -1.780%
NYC -0.122%
Asia Pacific -0.649%

Producer Prices



Producer prices Change:
World -6.264%
NYC -7.575%
Asia Pacific -7.133%

Take-aways

- We quantify the trade-indunced welfare GE effects of international commercial arbitration
  1. Sizeable thrid-country effects (non-members)
  2. The New York Convetion had an important effect on GDP and consumer & producer prices
  3. Heterogenous impact

Back

Figure 4.2 Deriving consumer and producer surplus