The Role of the Most Favored Nation Principle of the GATT/WTO in the New Trade Model

Wisarut Suwanprasert

Vanderbilt University

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Motivation

The Most Favored Nation (MFN) treatment is one of the four pillars of the GATT/WTO:

> *"Any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties." (GATT, Article I)*

The MFN principle is also a fundamental principle in the GATS (Article II) and the TRIPS agreement (Article IV)

What do we know about the MFN principle?

> *"GATT's principles of* ***reciprocity*** *and* ***non-discrimination*** *can be viewed as simple rules that assist governments in their effort to implement efficient trade agreements." (Bagwell & Staiger, 1999)*

These two principles focus on eliminating different price distortions simultaneously.

1. The principle of reciprocity preserves world price ratios to prevent terms-of-trade inefficiency
2. The MFN principle prevents a local-price externality that would distort price ratios from a foreign exporter's point of view

Related Literature

The designs of bilateral trade agreements

- Terms-of-trade: Bagwell and Staiger (1999)
- Profit-shifting: Bagwell and Staiger (2009; 2012), Ossa (2012)
- Firm-delocation: Ossa (2011; 2014), DeRemer (2010), Bagwell & Staiger (2015)

What I do in this paper

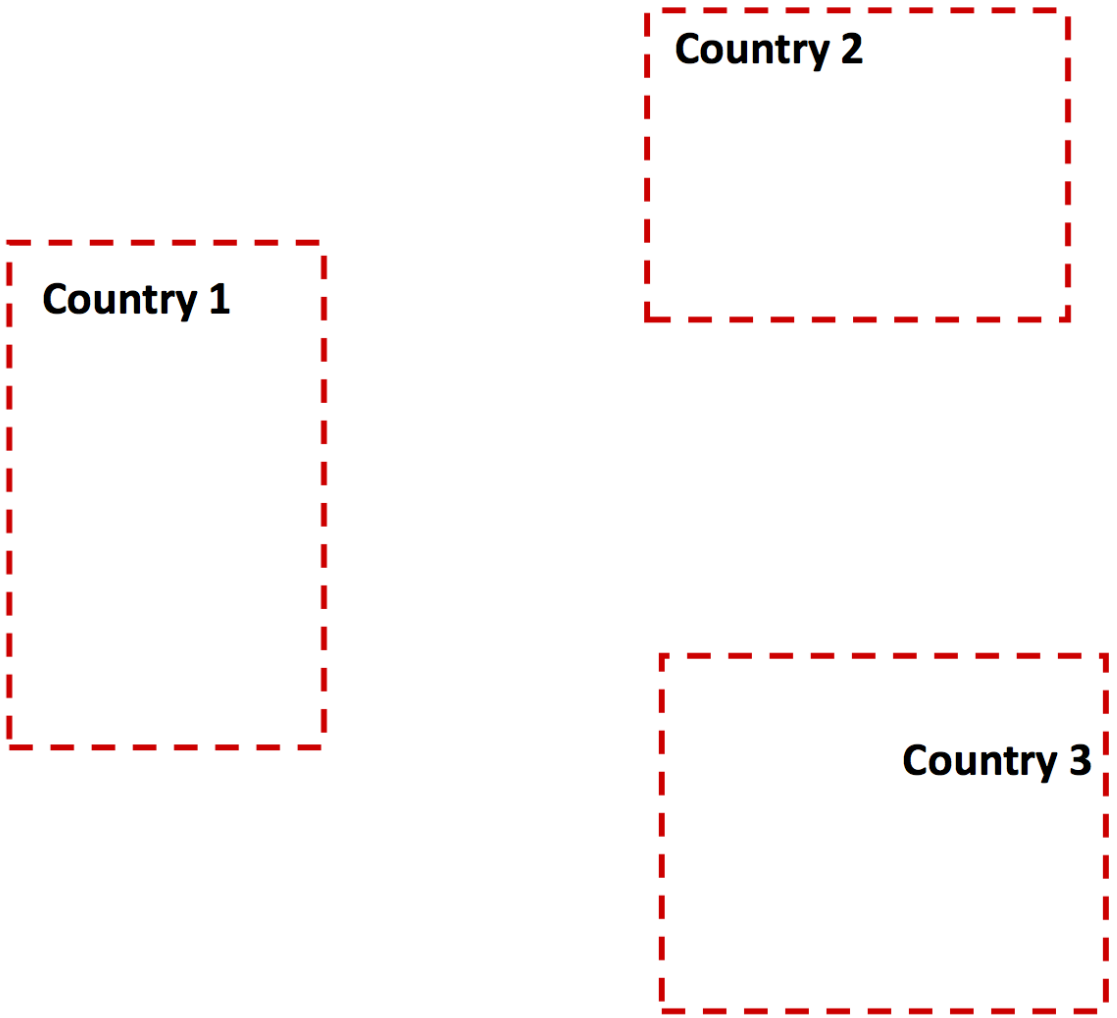
- Extend Ossa (2011) to investigate the role of MFN on bilateral tariff negotiations in the new trade model (Krugman 1980)
  - Key feature: **Firm-delocation effect**
- Characterize three types of Pareto-improving bilateral trade agreements
  1. Standard TAs (without third-country tariff adjustment)
  2. TAs with third-country tariff adjustment
  3. TAs under the MFN principle
- Apply the methodology in Dekle et al. (2007) and Ossa (2011; 2014) to quantify the firm-delocation effects and welfare changes in three counterfactual situations
  - Test the theoretical predictions

Preview of the Key Theoretical Results (Spoiler Alert!)

- Bilateral TAs **without** third-country tariff adjustments always hurt the outside country
- The MFN principle guarantees that a bilateral trade agreement always improves the welfare of the outside country
  - Potentially causes a free-rider problem
- The MFN rule prevents possible Pareto-improving trade agreements if
  1. initial tariffs are generally low, or
  2. the elasticity of substitution is low
- Theoretical results are supported by the calibrations

Model

Model



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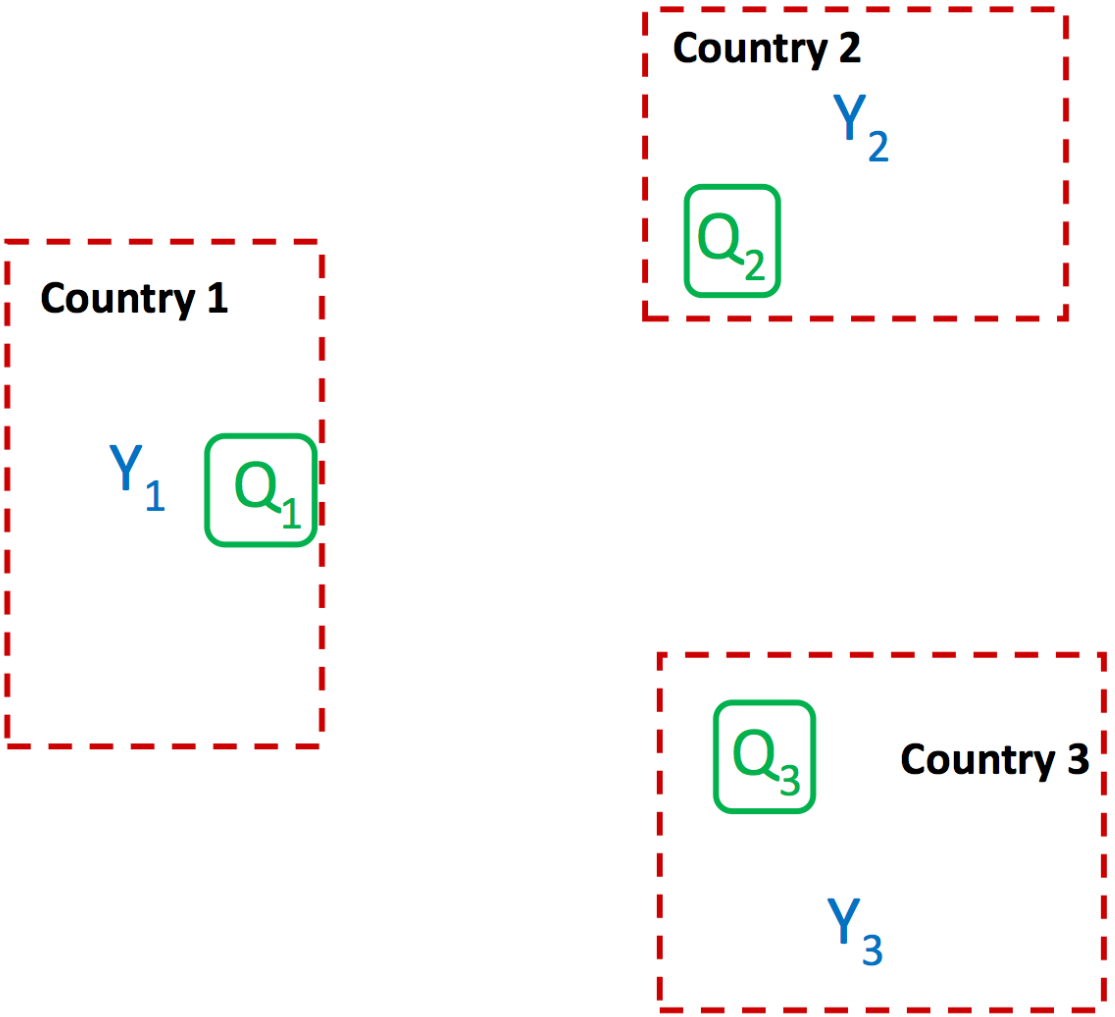

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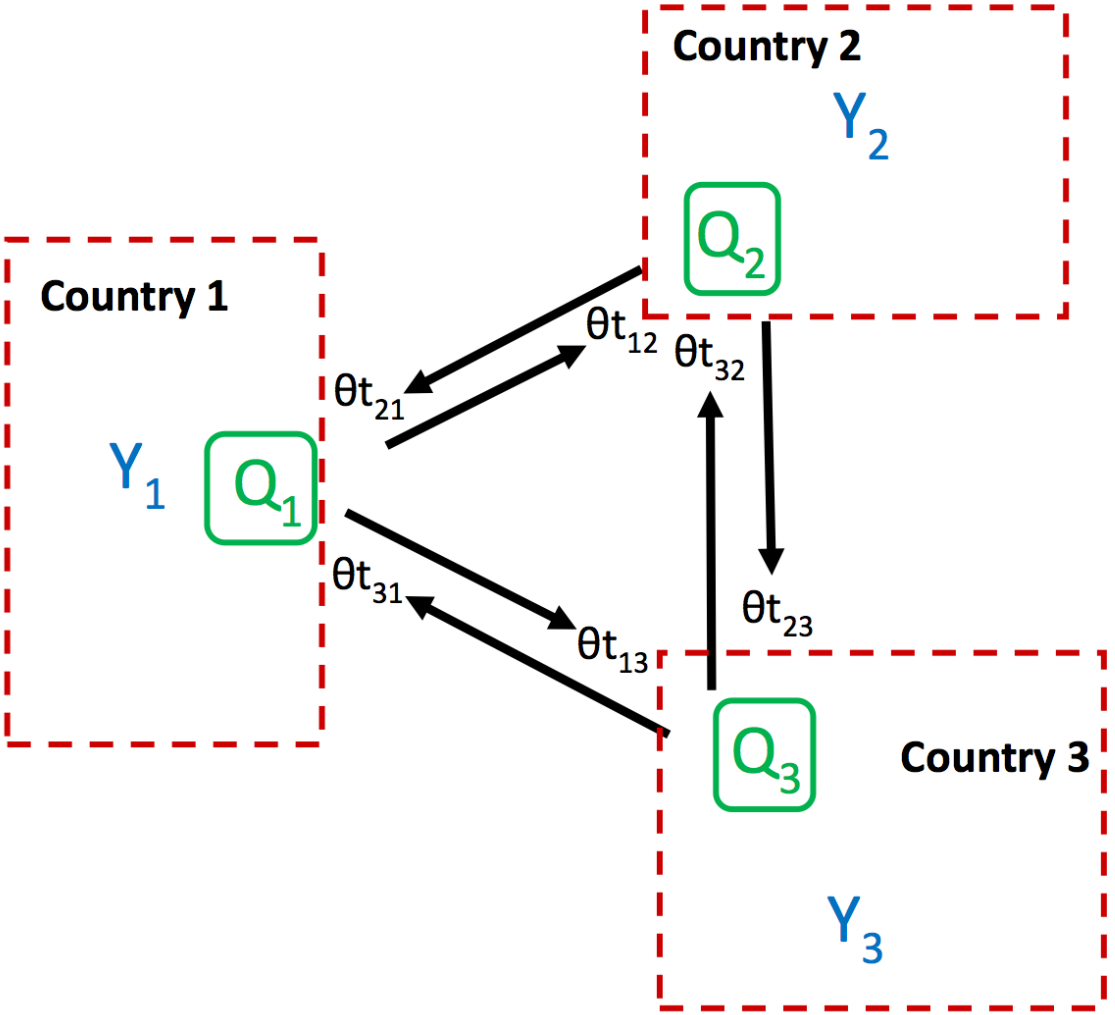
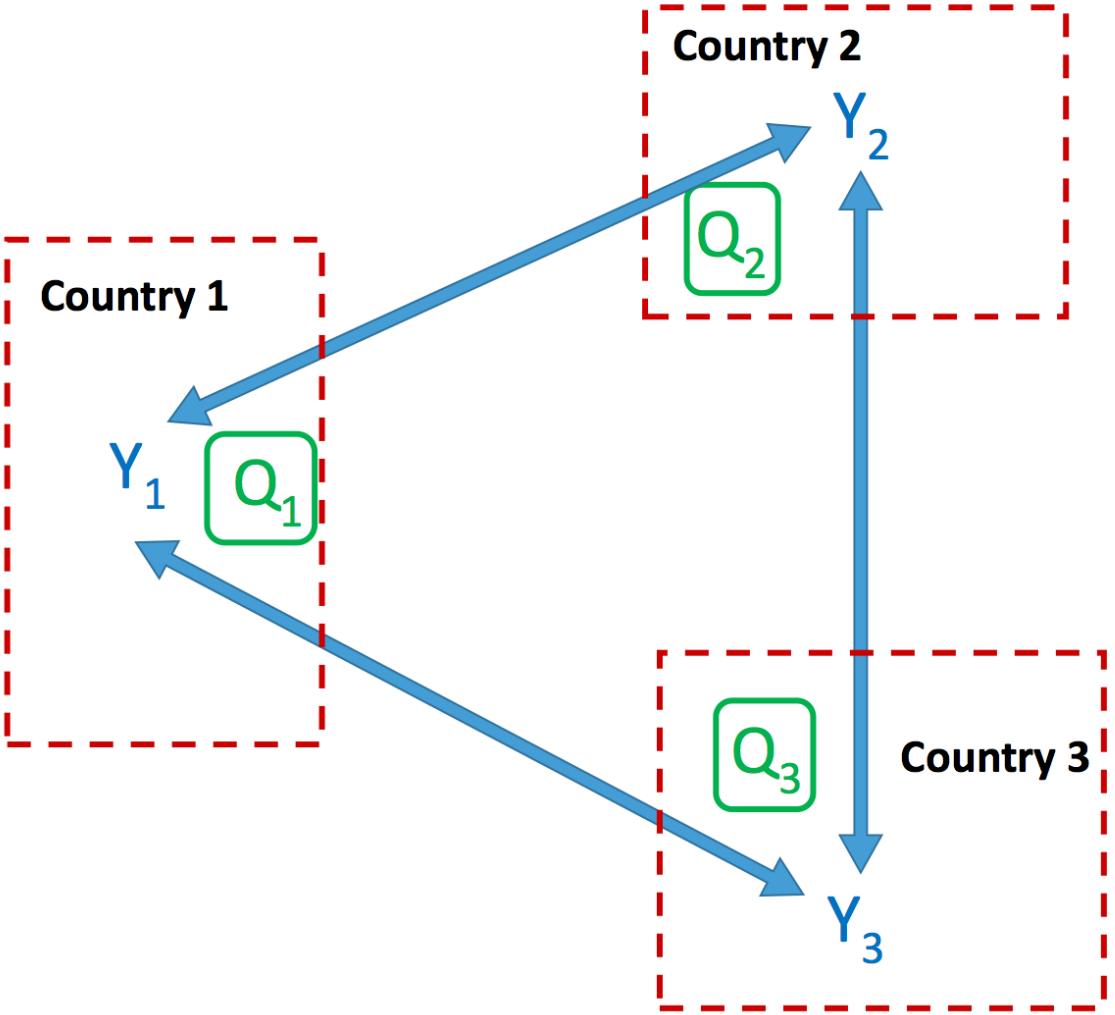

Country 2
Y_2
Q_2
Country 1
Y_1
Q_1
θt_{21}
θt_{12}
θt_{32}
θt_{31}
θt_{13}
θt_{23}
Q_3
Country 3
Y_3

Model



Model

- Three countries: Country 1, Country 2, and Country 3
- Labor is the only factor of production
- Two sectors $\Rightarrow$ two types of goods:

Manufacturing sector	Non-manufacturing sector
Differentiated goods $q_{ij}(\omega)$	Numeraire (identical) good Y_j
Monopolistic competition	Perfect competition
Increasing return to scale	Linear technology

- Preferences

$$U_j = \left[\int_{\omega \in \Omega_j} q_{ij}(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}\mu} Y_j^{1-\mu}$$

  - $\sigma > 1$ is the elasticity of substitution
  - $\mu \in (0,1)$ is the expenditure share of manufacturing goods

Model

- Exporting manufacturing goods is subject to **international trade barriers**.
  1. Iceberg transportation cost $\theta_{ij} > 1$
  2. Import tariffs t_{ij} (manufacturing goods from country i to country j)
     - Tariff revenues are not redistributed to consumers and become a deadweight loss in the theoretical model.
     - In quantitative exercises, tariff revenues are included.
- Exporting a non-manufacturing good is **frictionless** without any trade barriers.
- Define: $\tau_{ij} = (1 + t_{ij})$

Equilibrium

- Define: $\tau_{ij} = (1 + t_{ij})$
- The aggregate manufacturing price index

$$G_j = \left[\sum n_i \left(\theta_{ij}\tau_{ij}p\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}}$$

  - n_i = the number of manufacturing firms in country i
- Total income in country j is L_j
- The indirect welfare function of country j is

$$V_j = \mu^{\mu}\left(1-\mu\right)^{(1-\mu)} L_j G_j^{-\mu}$$

- The total number of firms in the world is fixed:

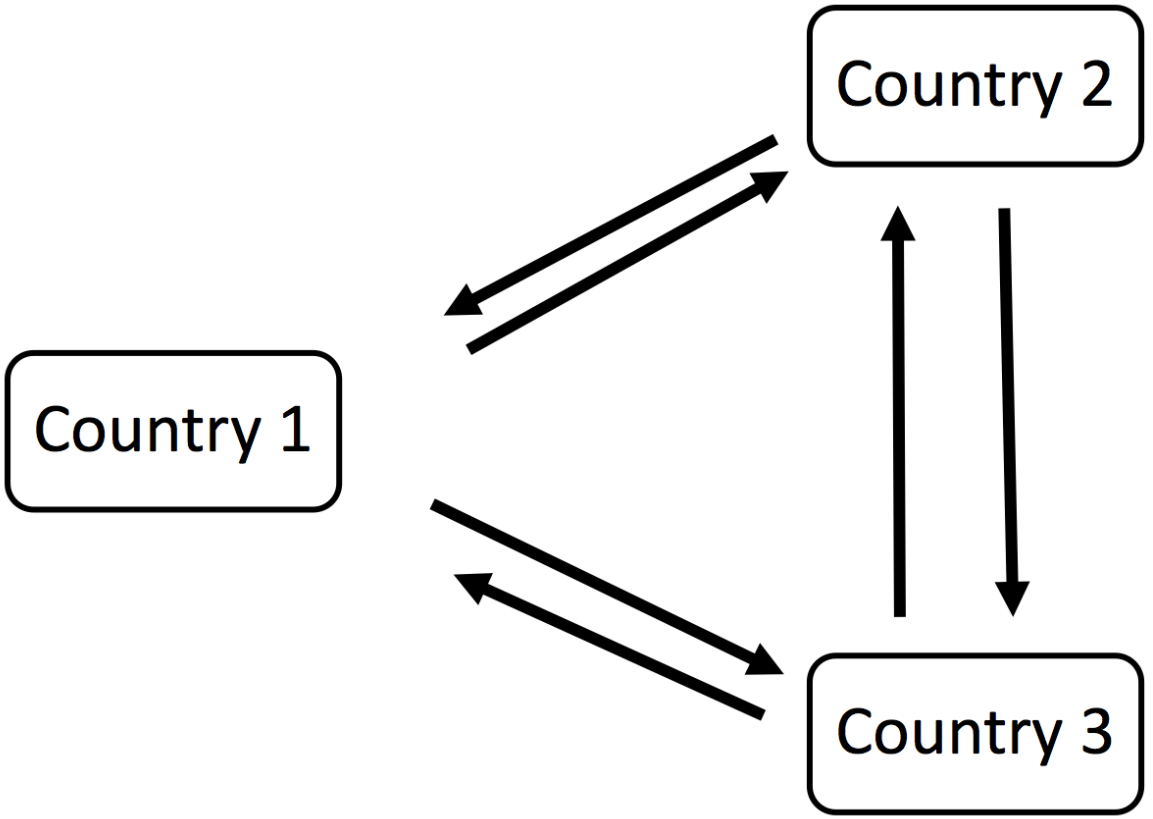
$$n_1 + n_2 + n_3 = \frac{\mu}{qp}\left(L_1 + L_2 + L_3\right)$$

Bilateral Trade Agreements

Consider three types of bilateral trade agreements in this paper:

1. *A bilateral tariff agreement without third-country tariff adjustment* is a tariff negotiation on $\{t_{21}, t_{12}\}$
   - Standard agreement which is similar to a preferential trade agreement
2. *A bilateral tariff agreement with third-country tariff adjustment* is a tariff negotiation on $\{t_{21}, t_{12}, t_{31}, t_{32}\}$
   - All instruments become available
3. *A bilateral tariff agreement under the MFN principle* is a tariff negotiation on $\{t_1, t_2\}$
   - The MFN principle requires that $t_{31} = t_{21} \equiv t_1$ and $t_{32} = t_{12} \equiv t_2$

Firm-Delocation Effect



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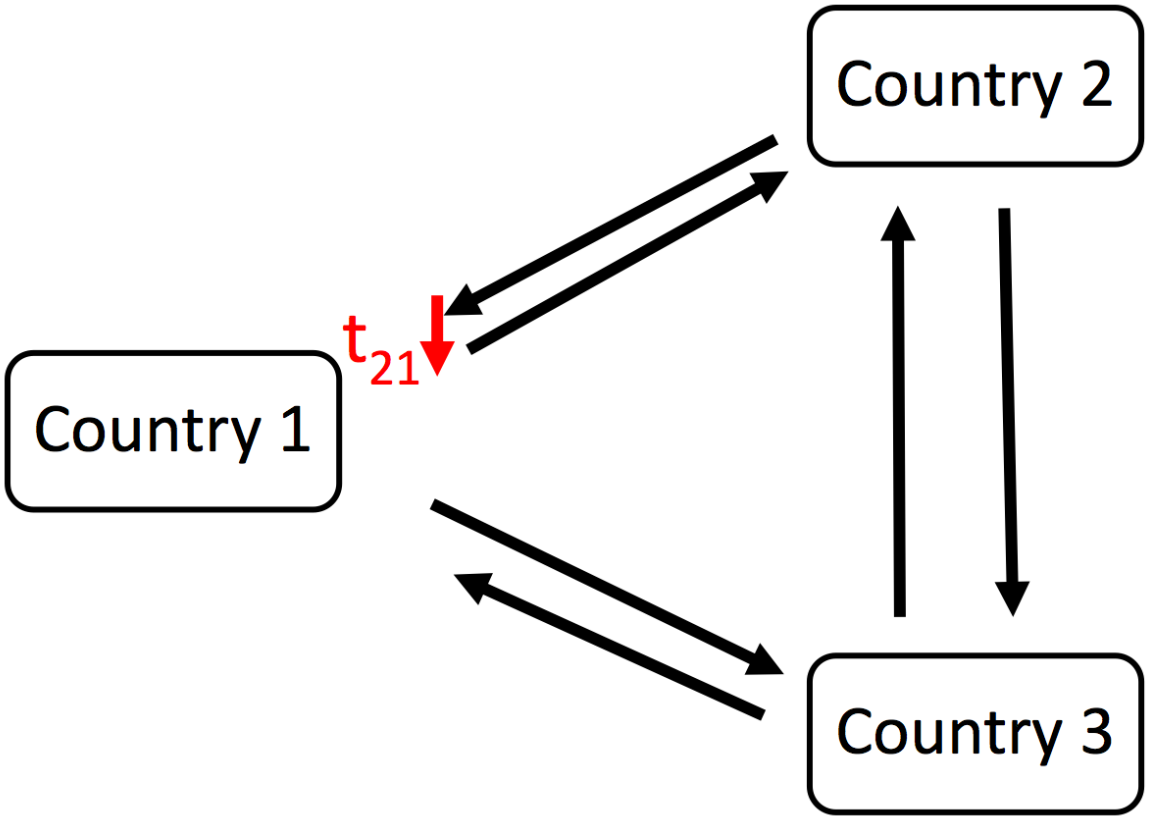

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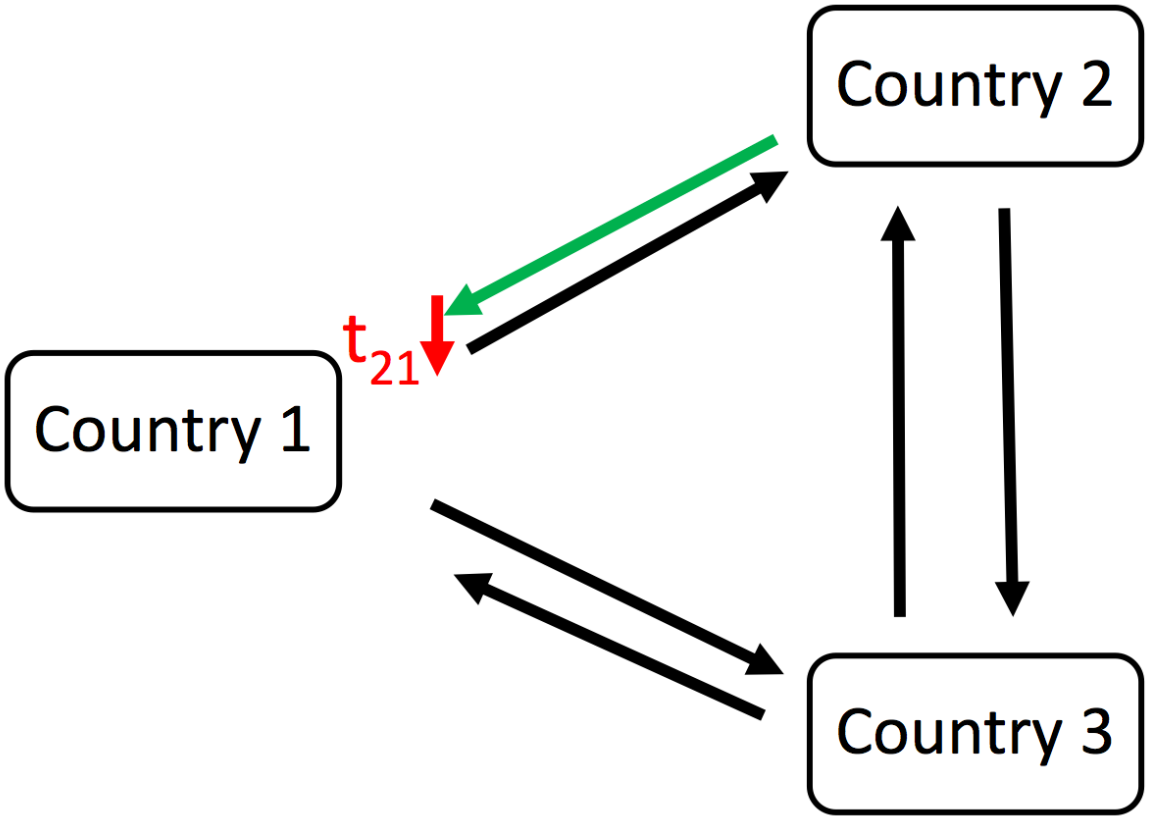

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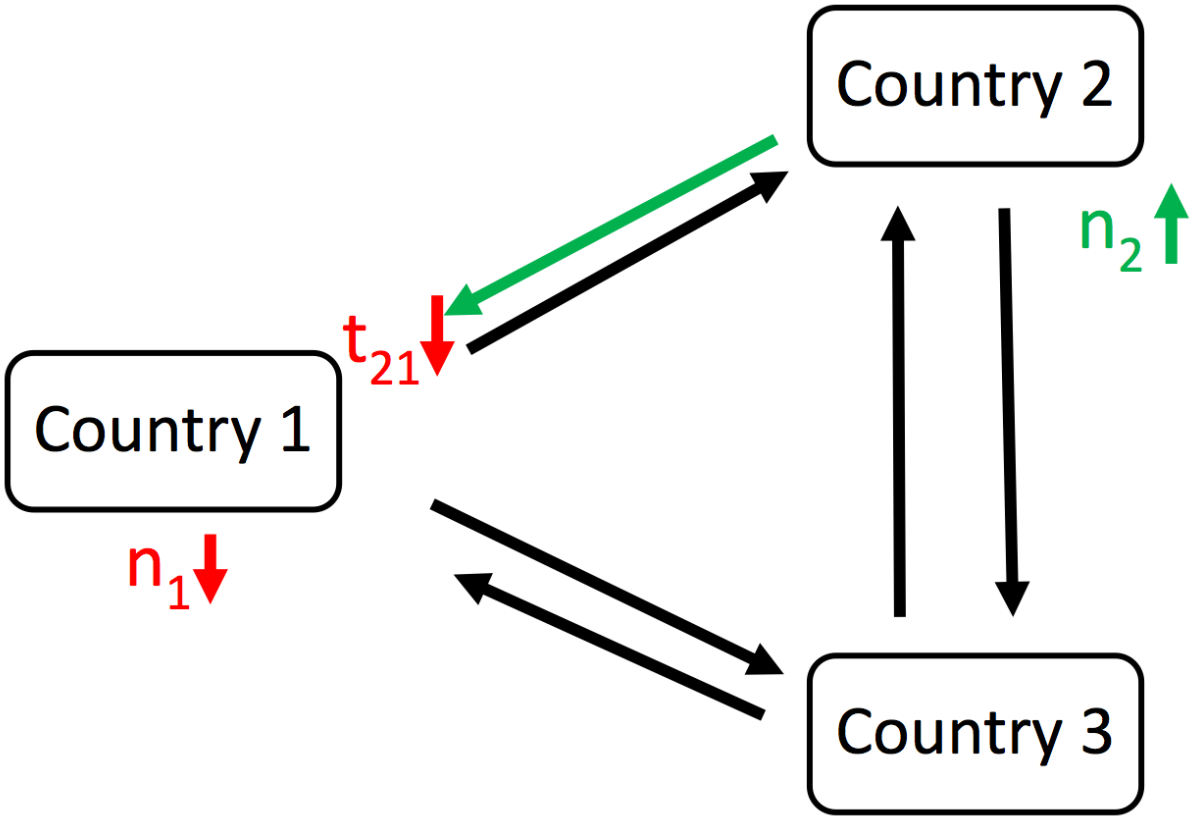

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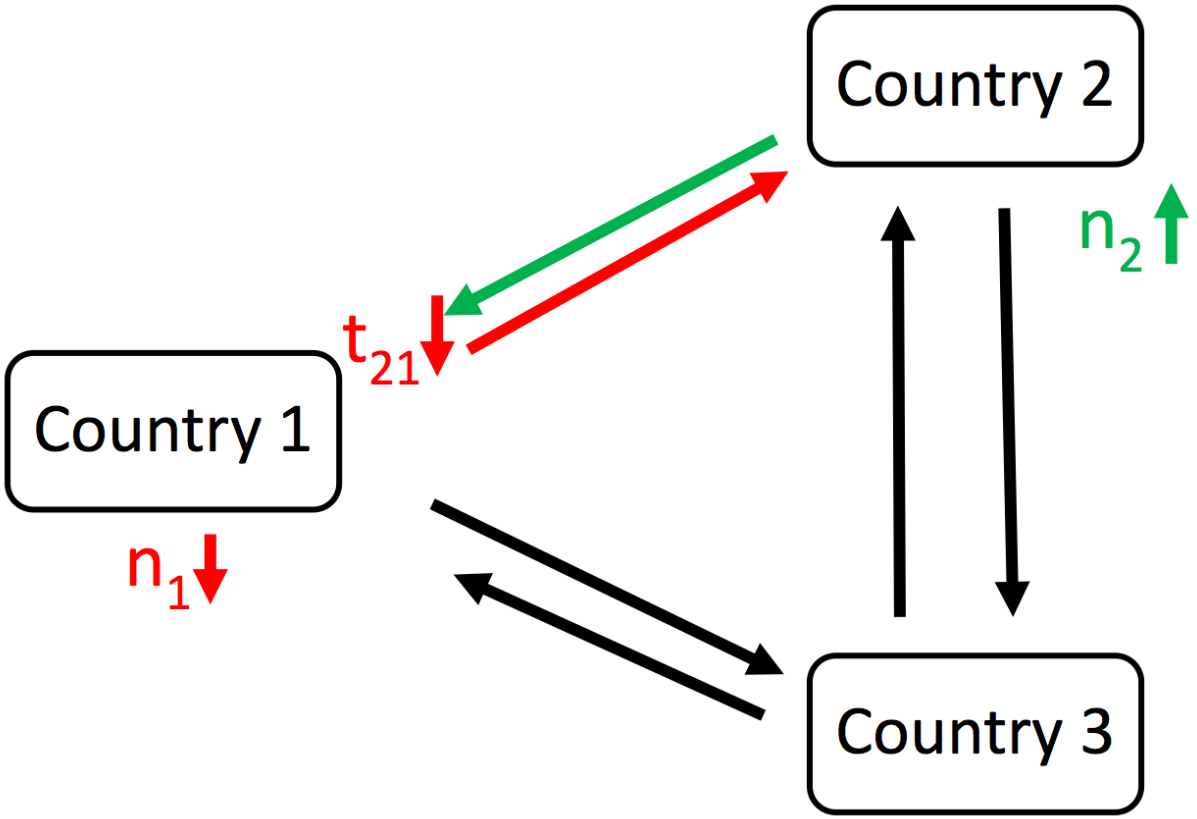

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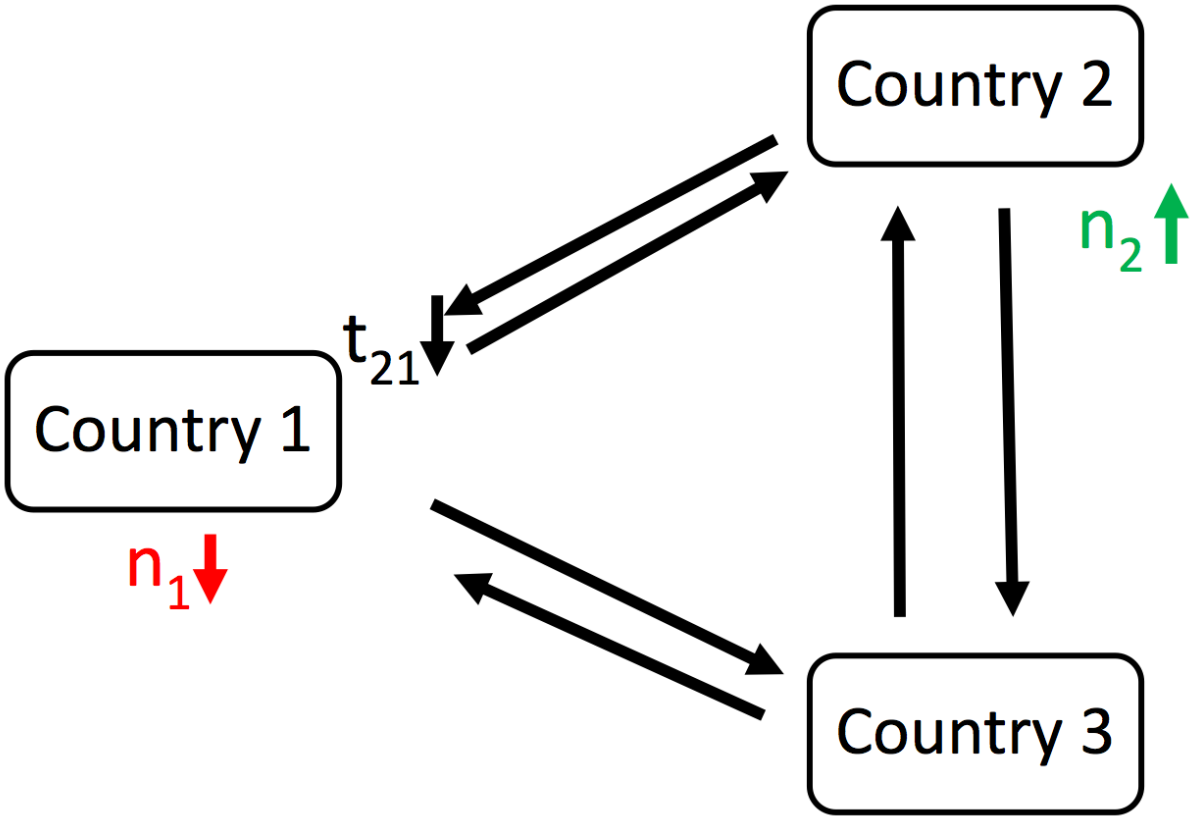

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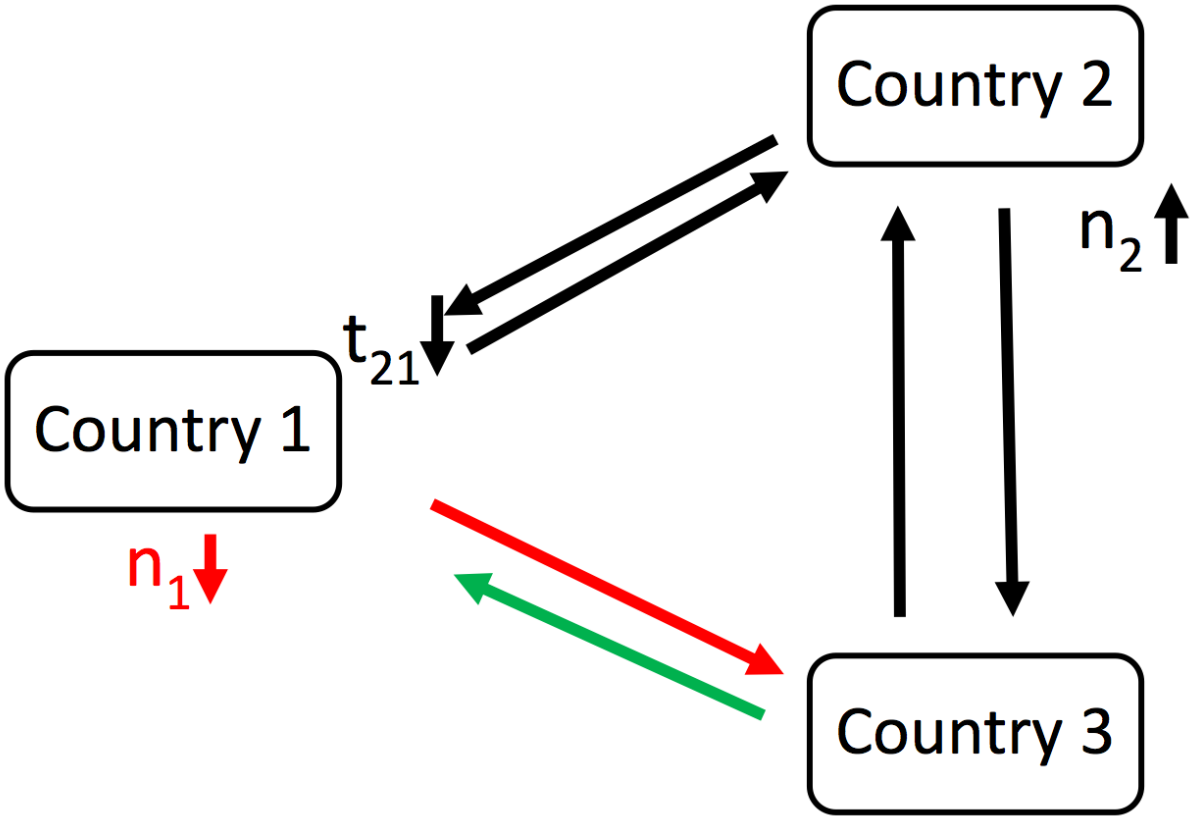

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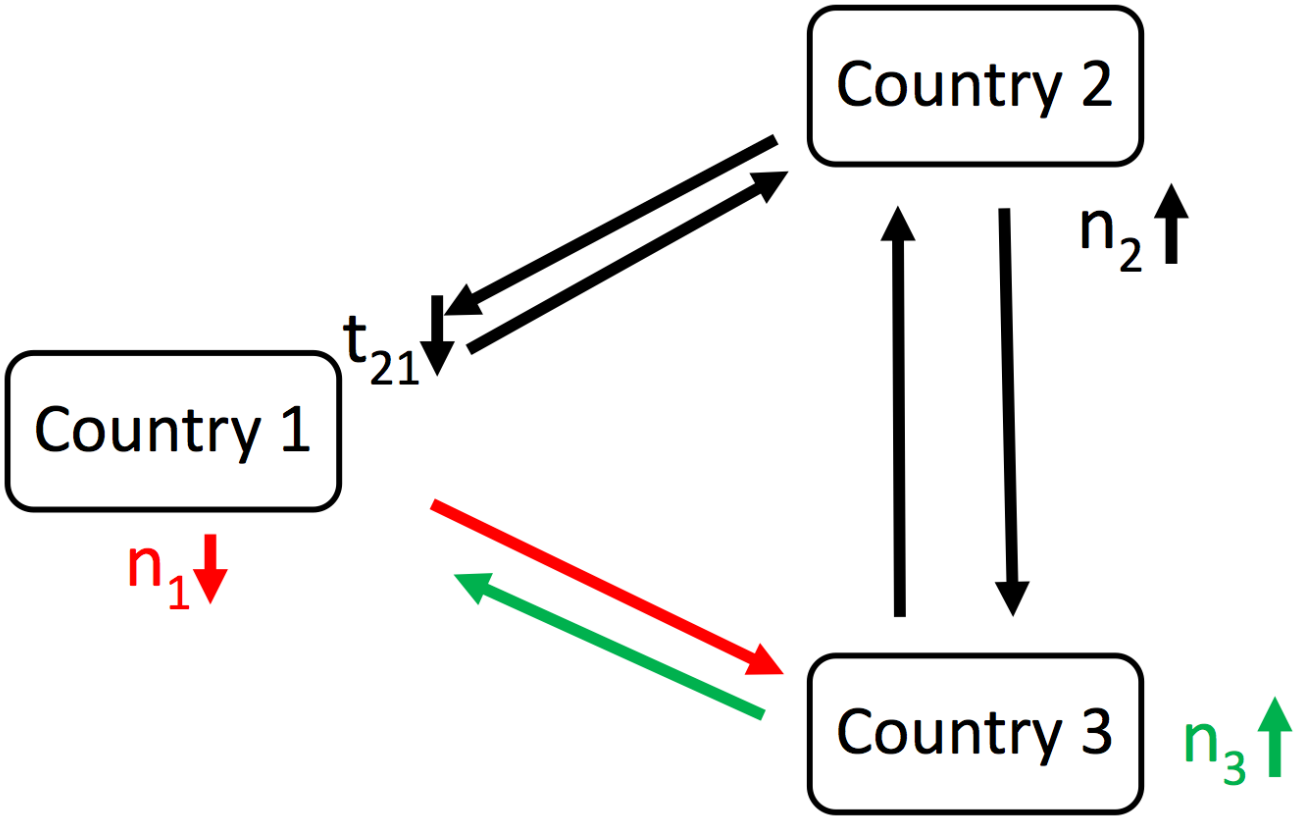

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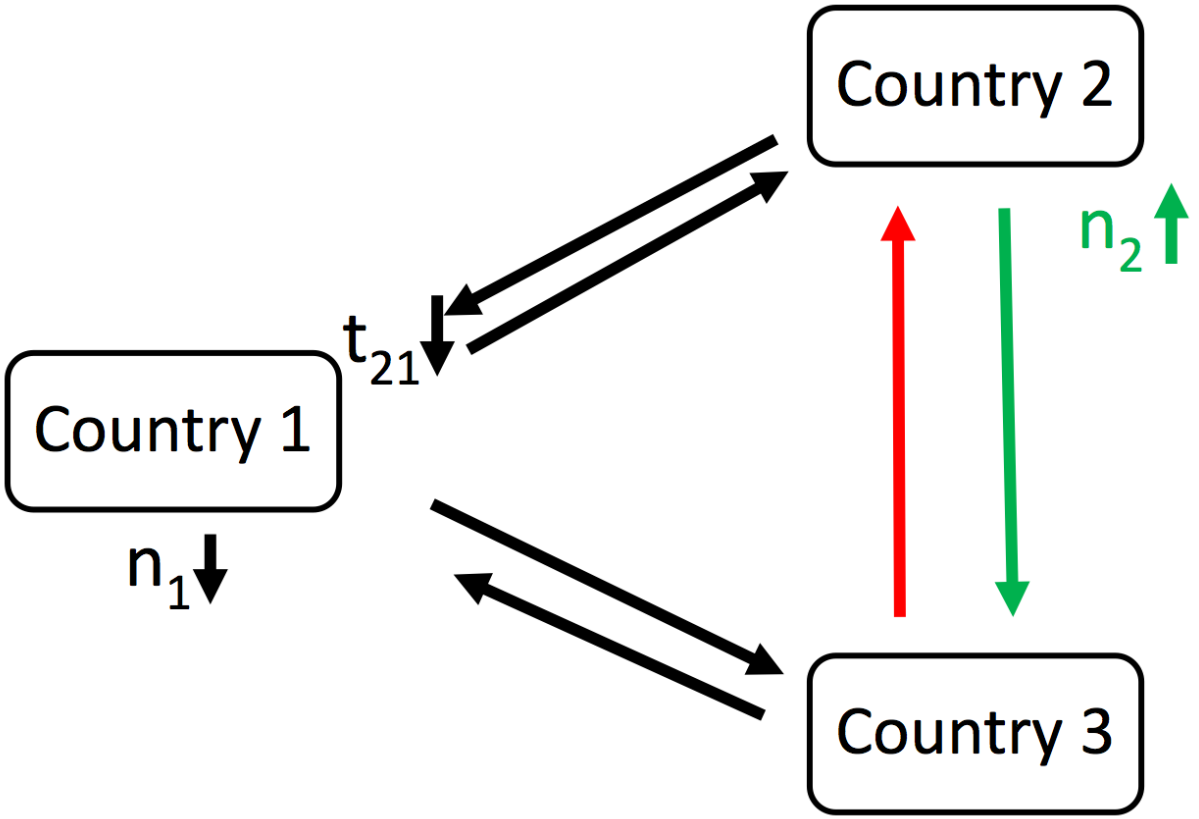

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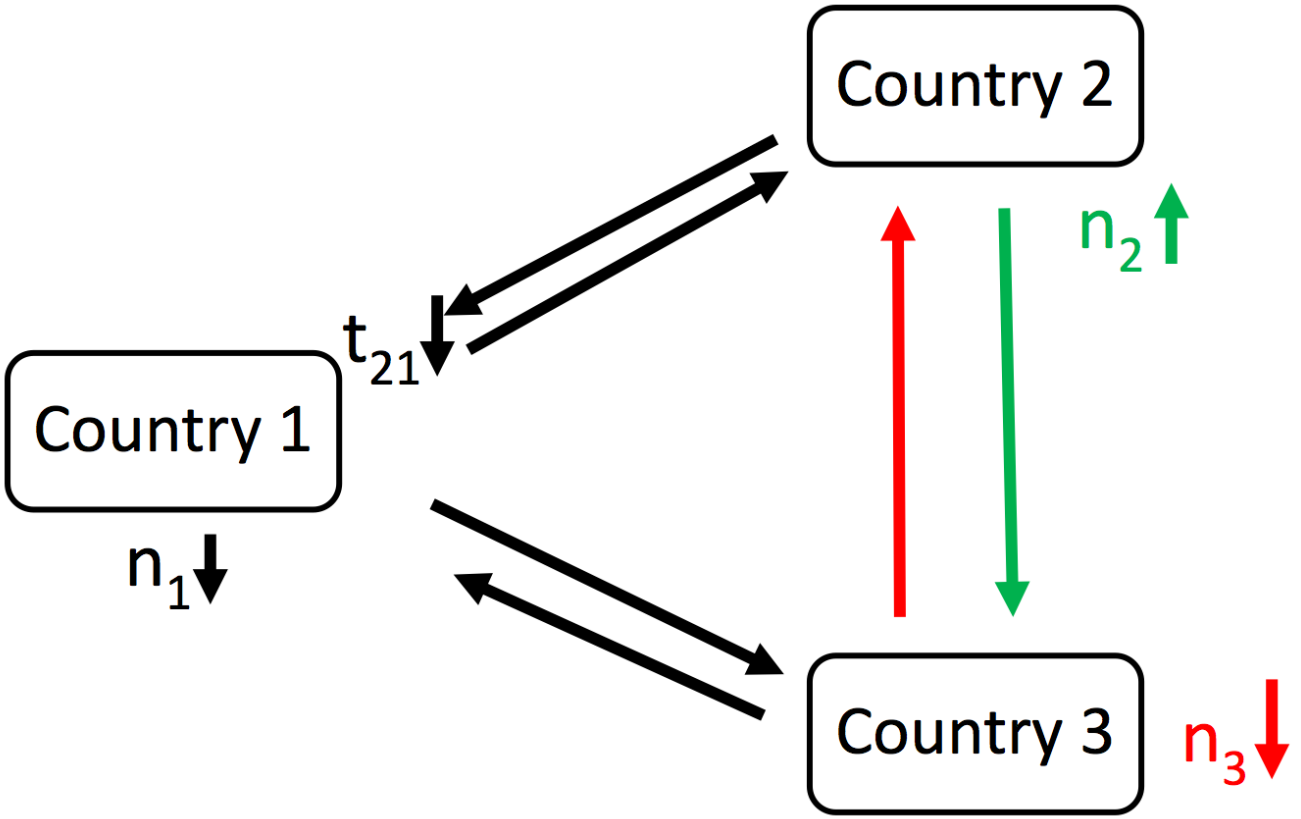

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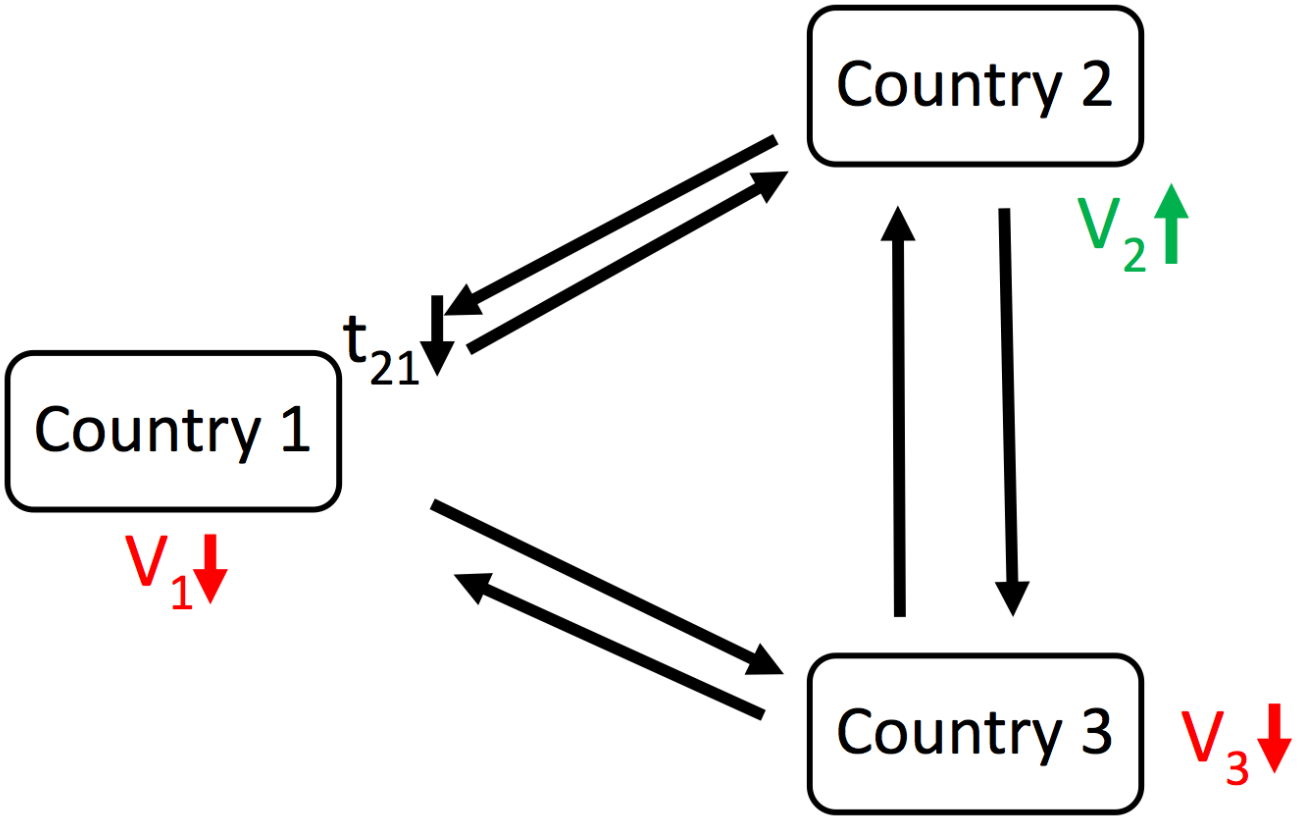
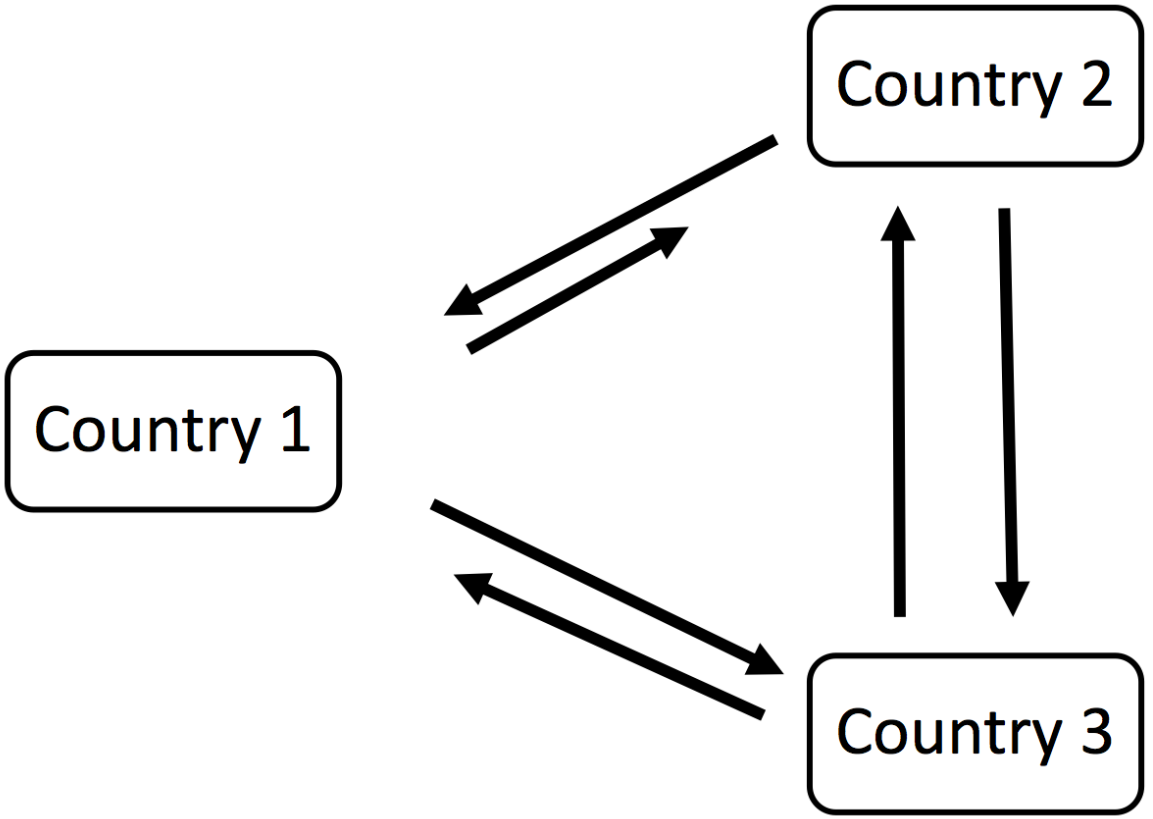


Firm-Delocation Effect

The impacts of tariff cuts on the number of firms and the welfare of each country

Tariff changes	welfare		
	V_1	V_2	V_3
$t_{21} \Downarrow$	−	+	−
$t_{12} \Downarrow$	+	−	−

Bilateral Trade Agreement



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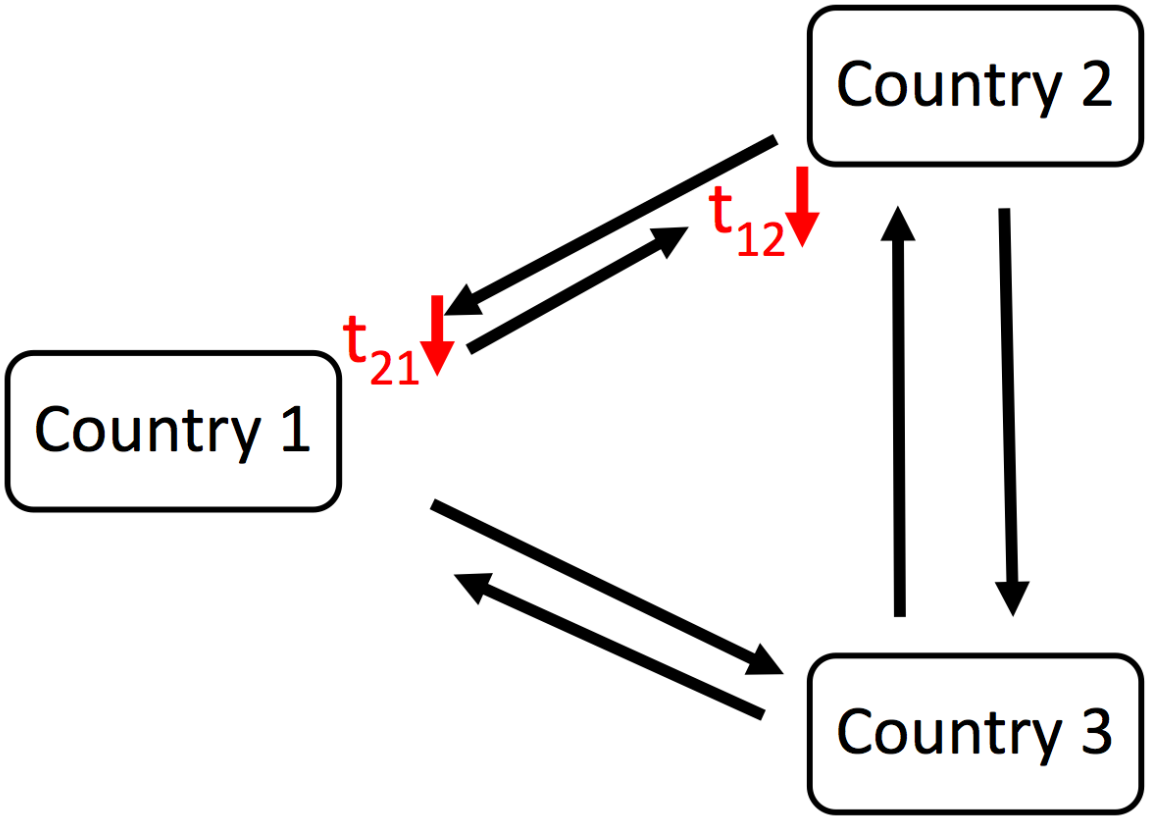

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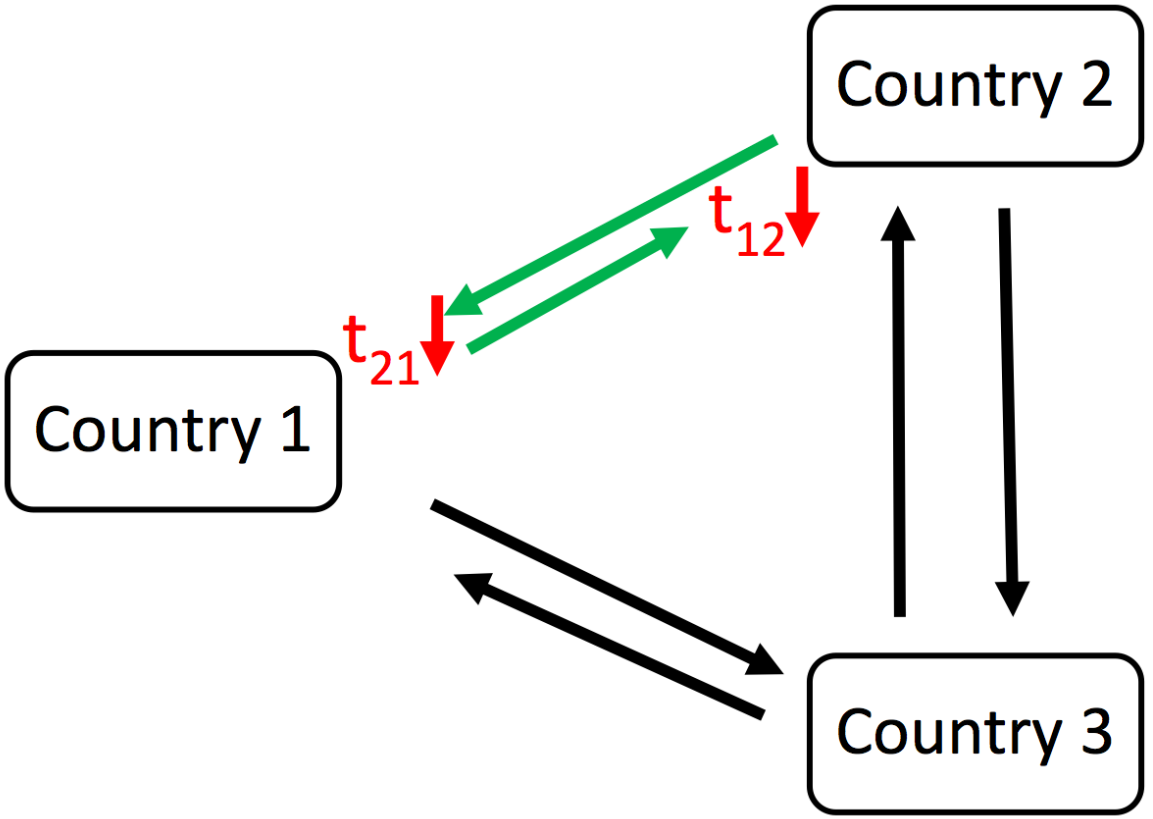

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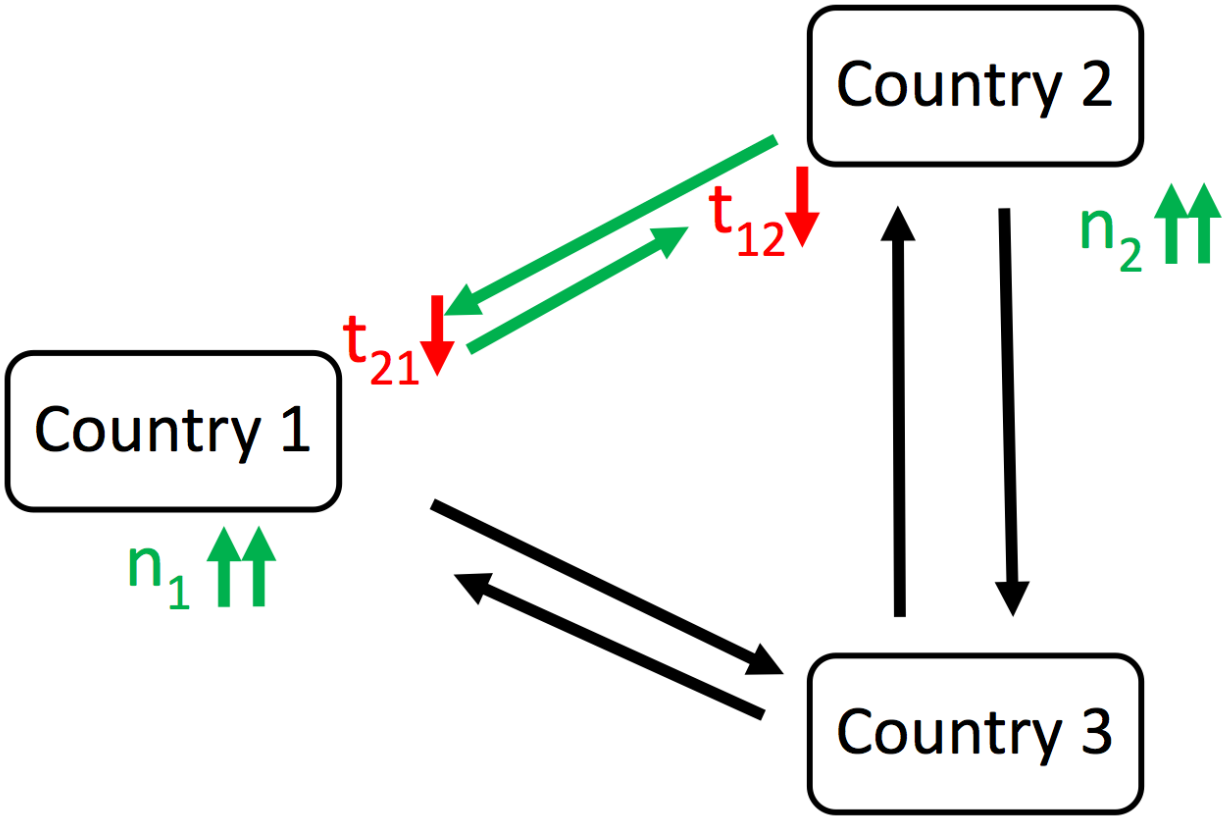

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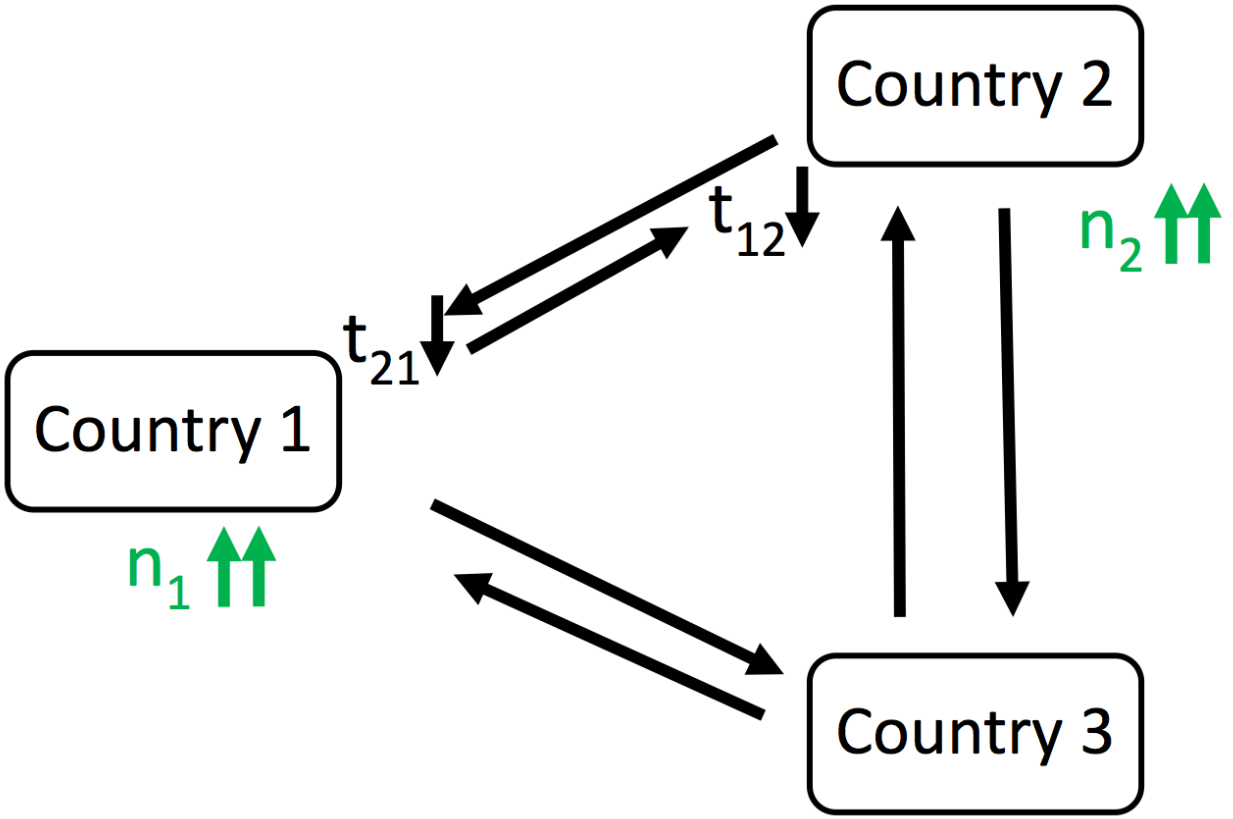

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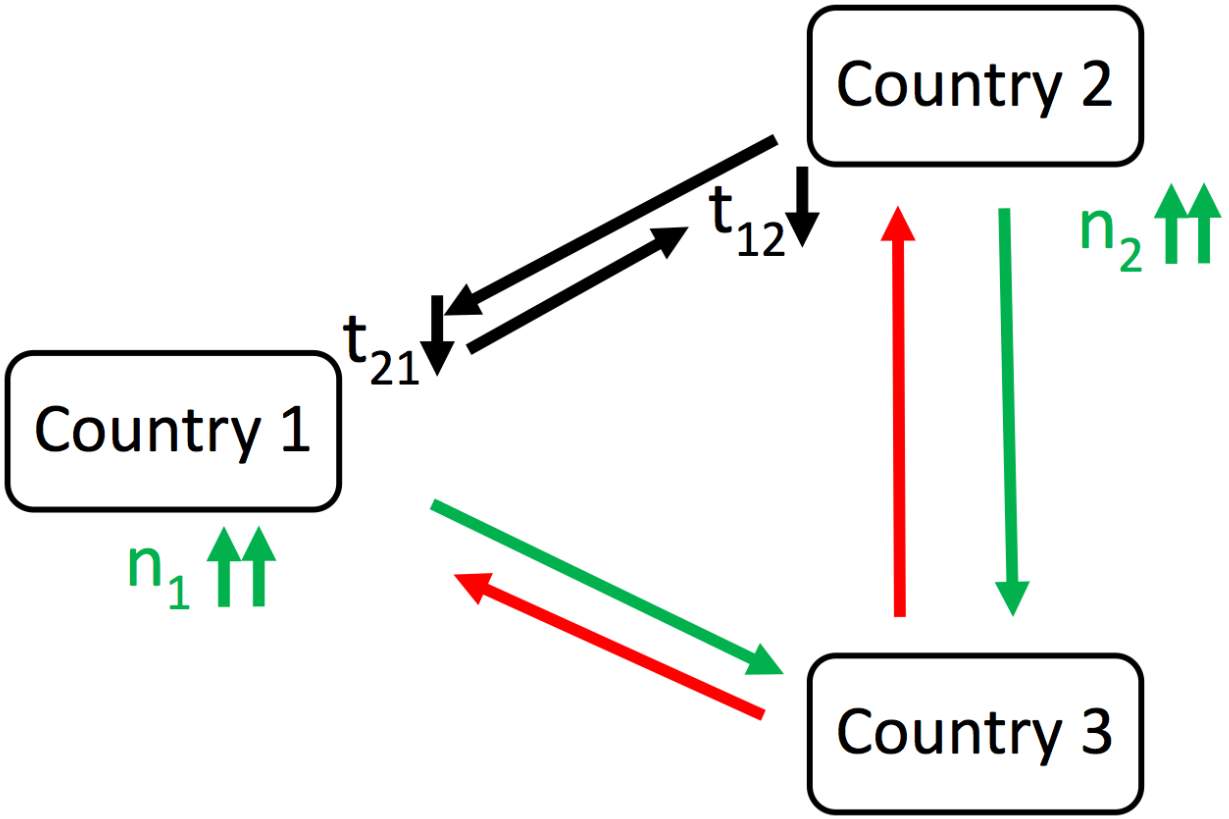

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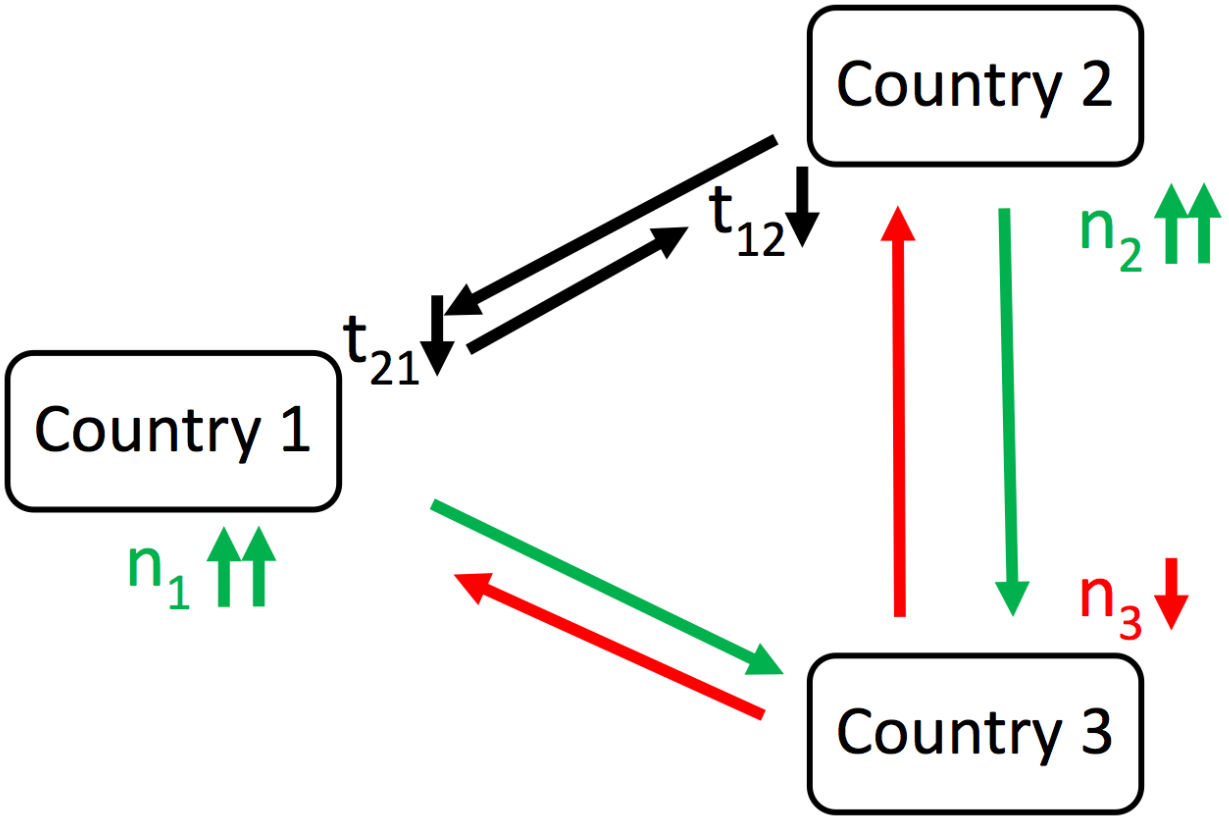

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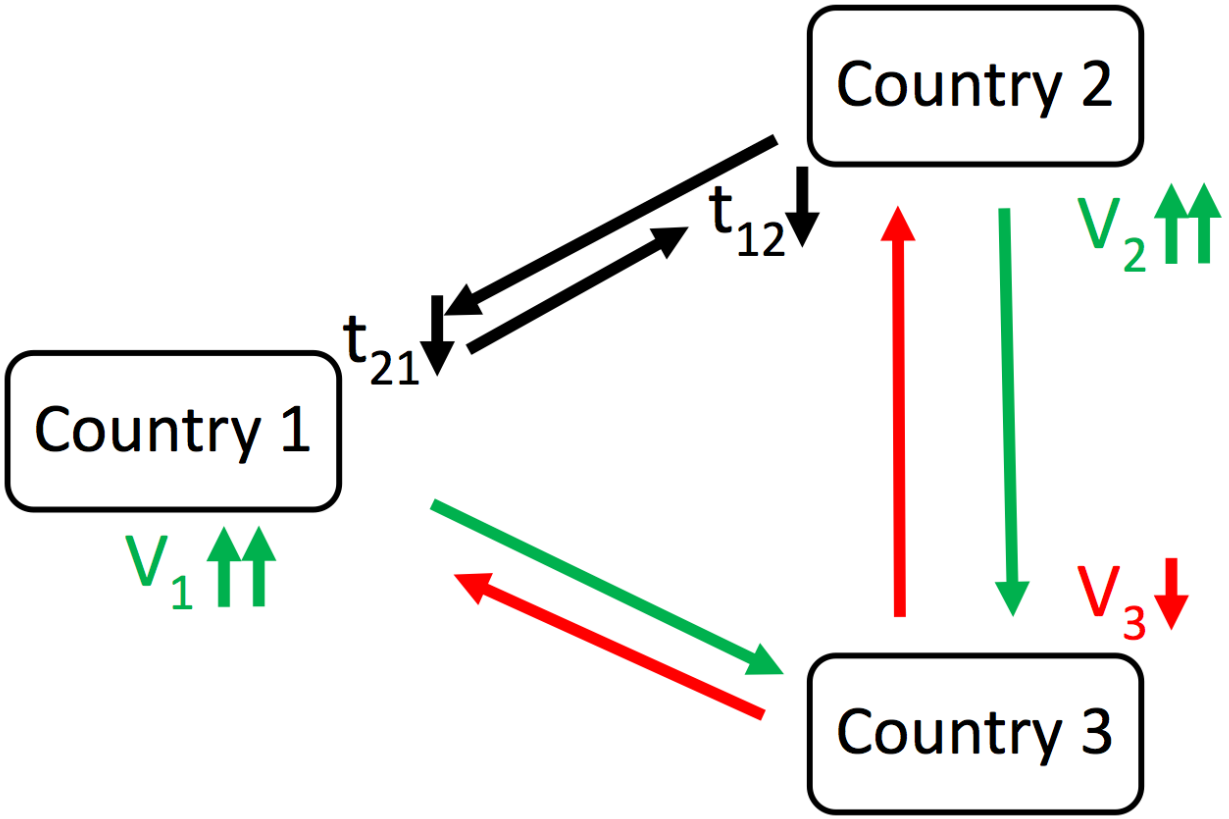


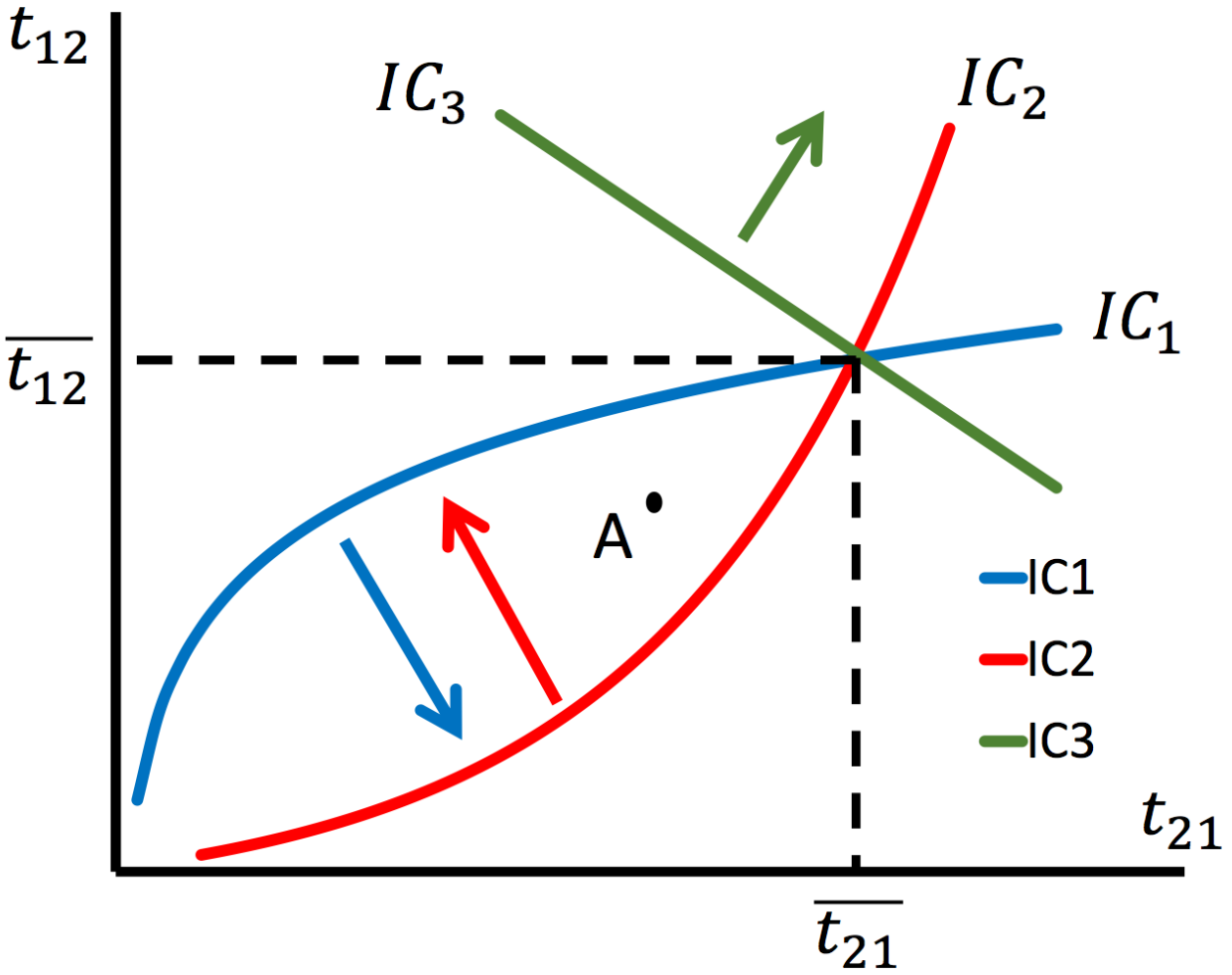
Bilateral Trade Agreement

Result:

- A bilateral trade agreement between country 1 and country 2 always hurts country 3
  - Country 1 and Country 2 expand their manufacturing sectors
  - Manufacturing firms in country 3 face tough competition against expanding manufacturing firms in country 1 and country 2
  - **Country 3 is worse off**

Third-Country Tariff Adjustment

A bilateral trade agreement without third-country tariff adjustment



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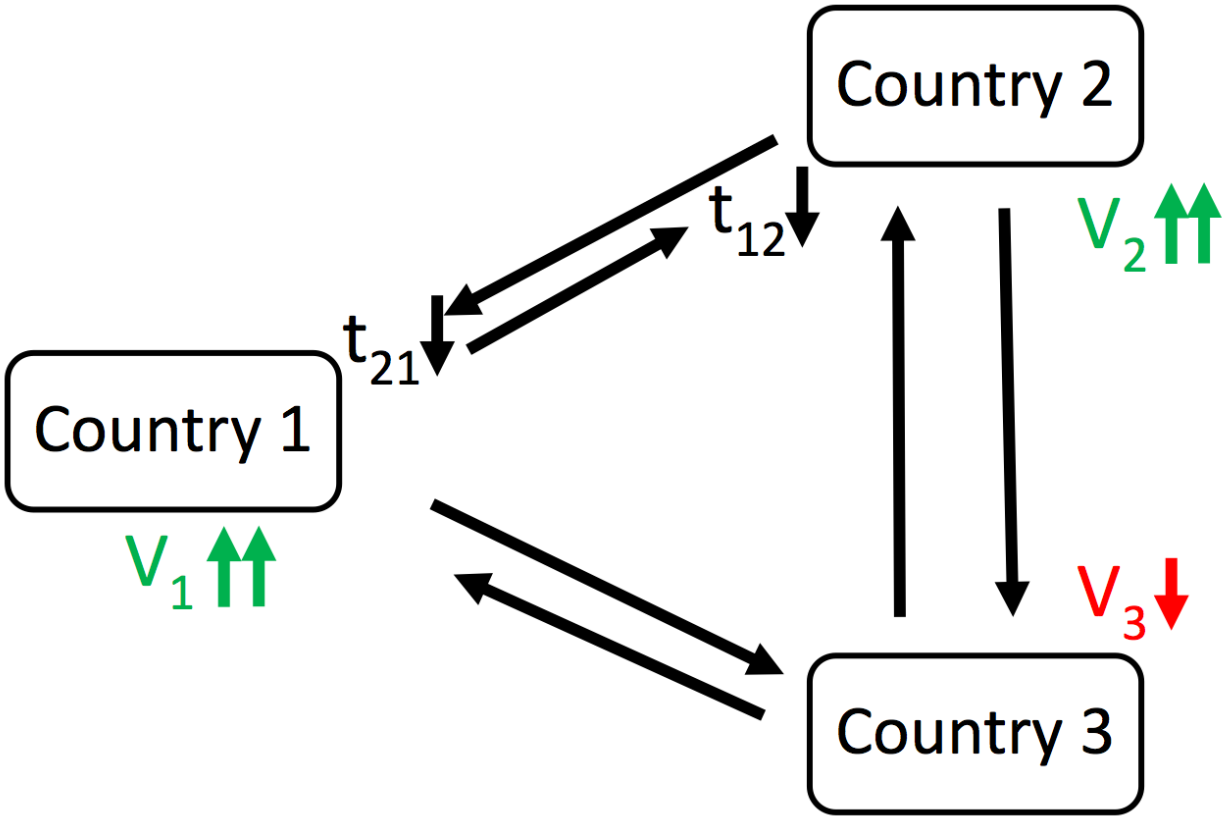

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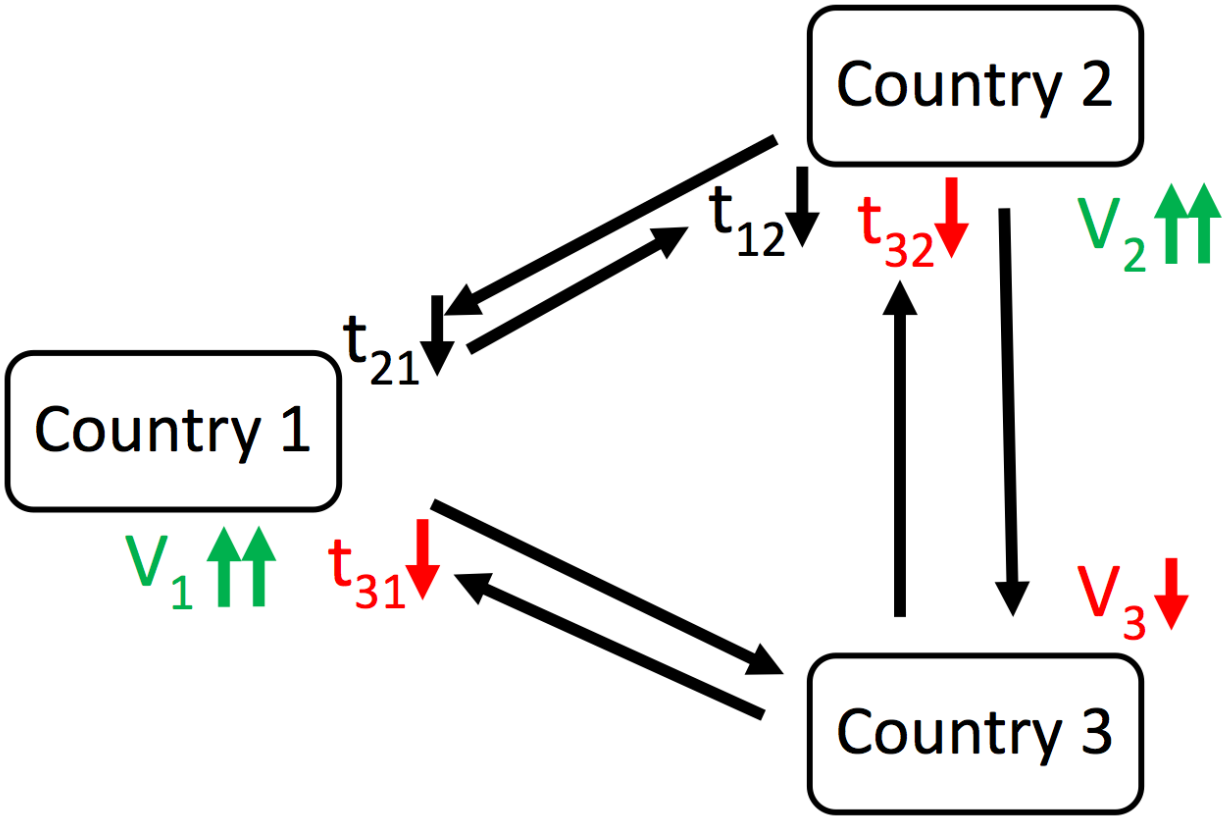

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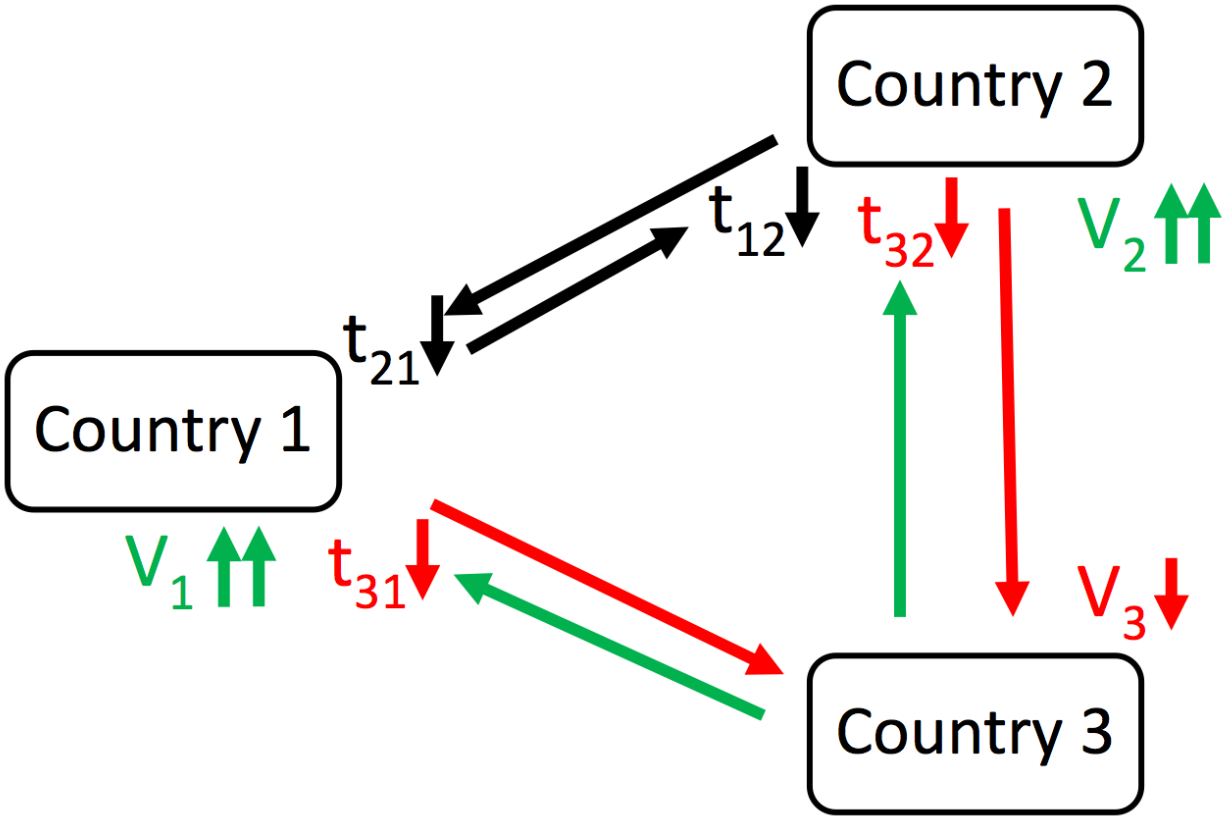

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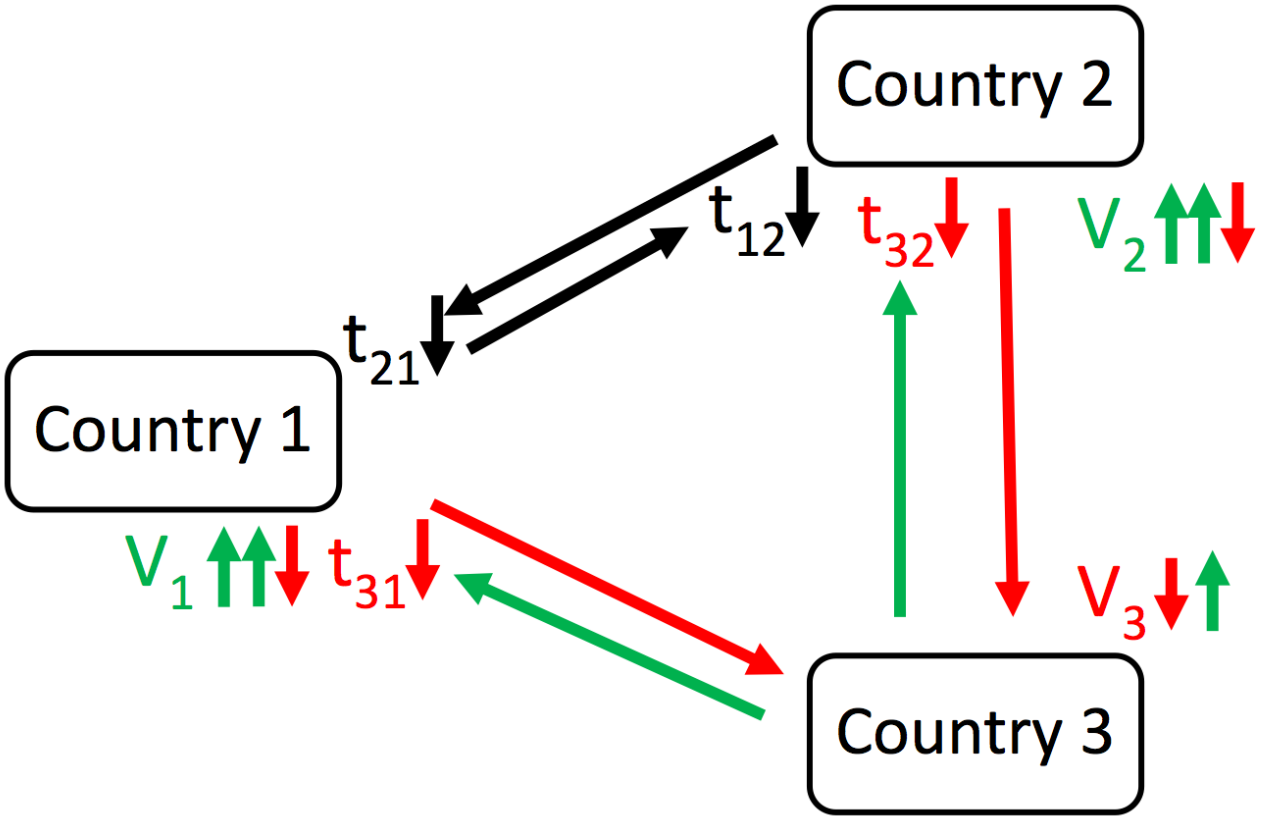

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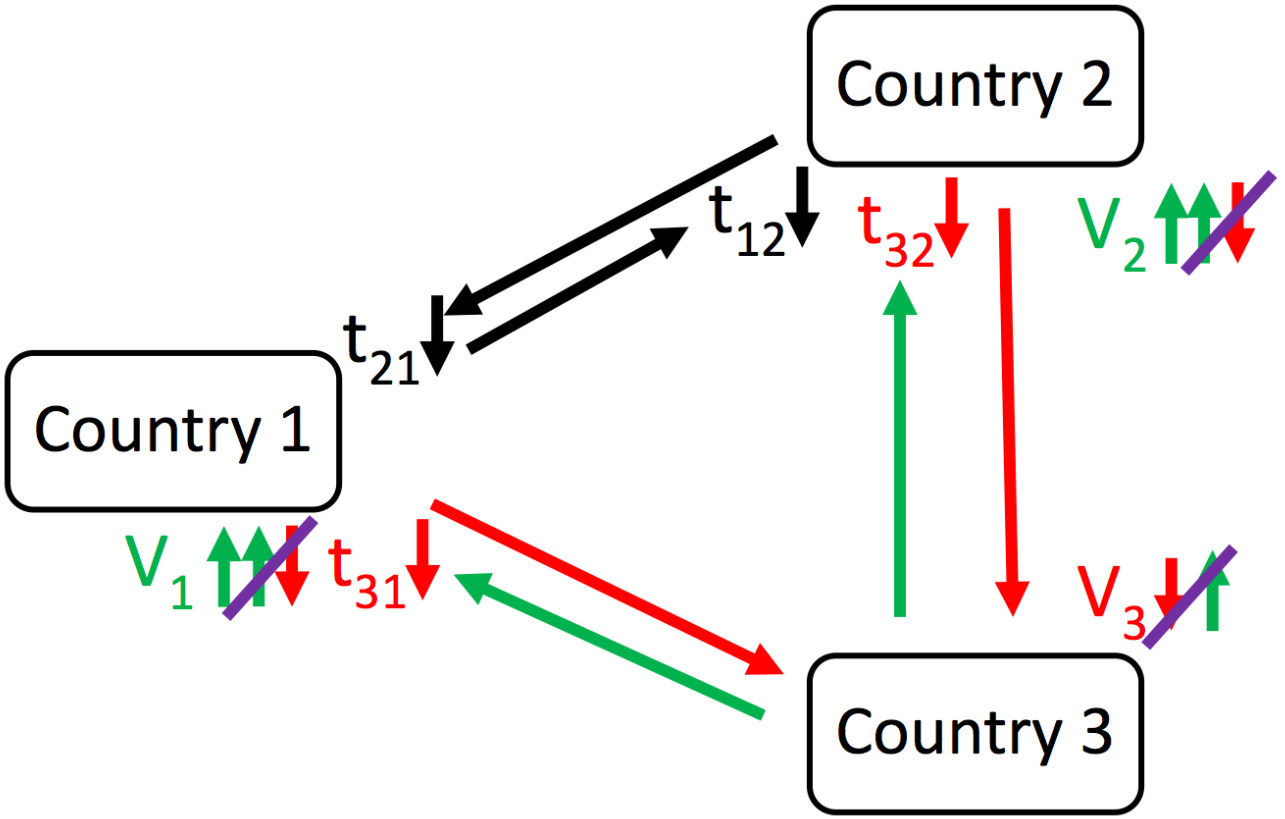

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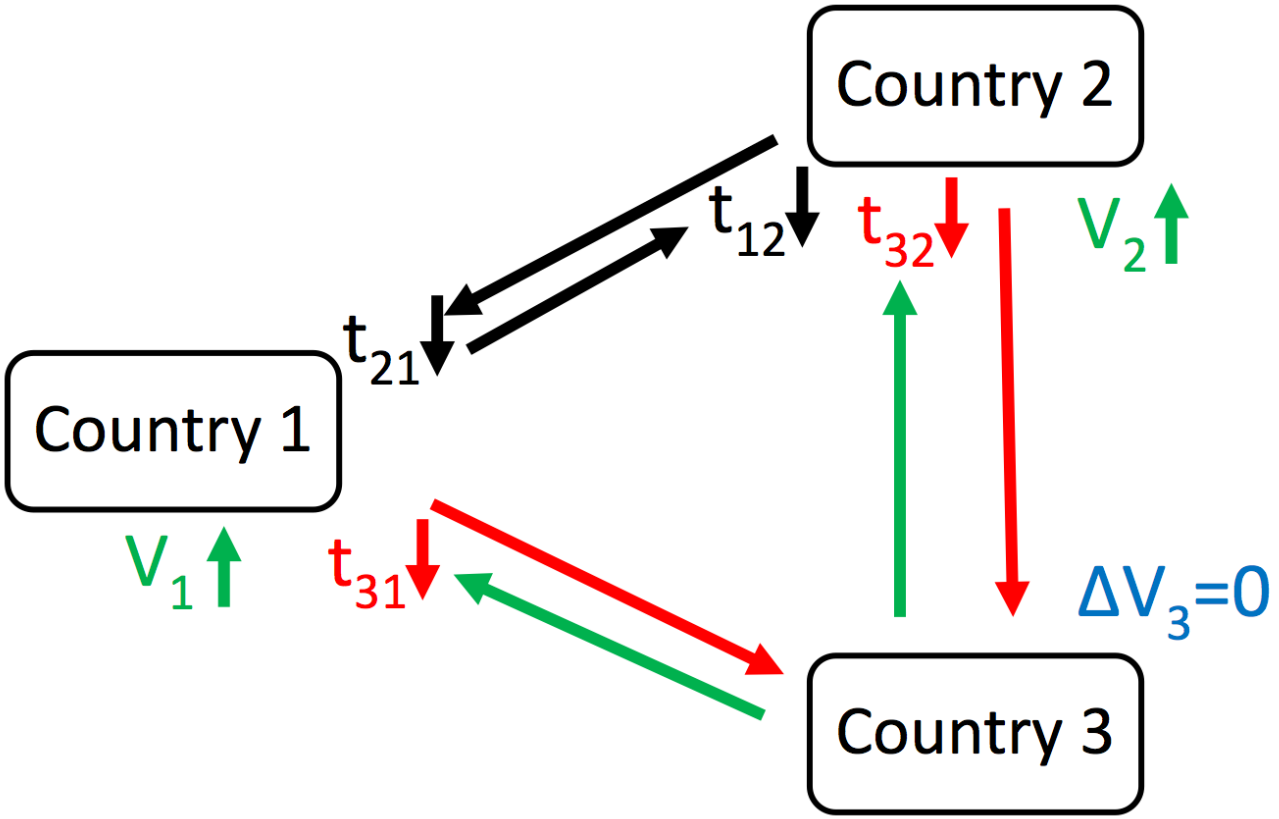
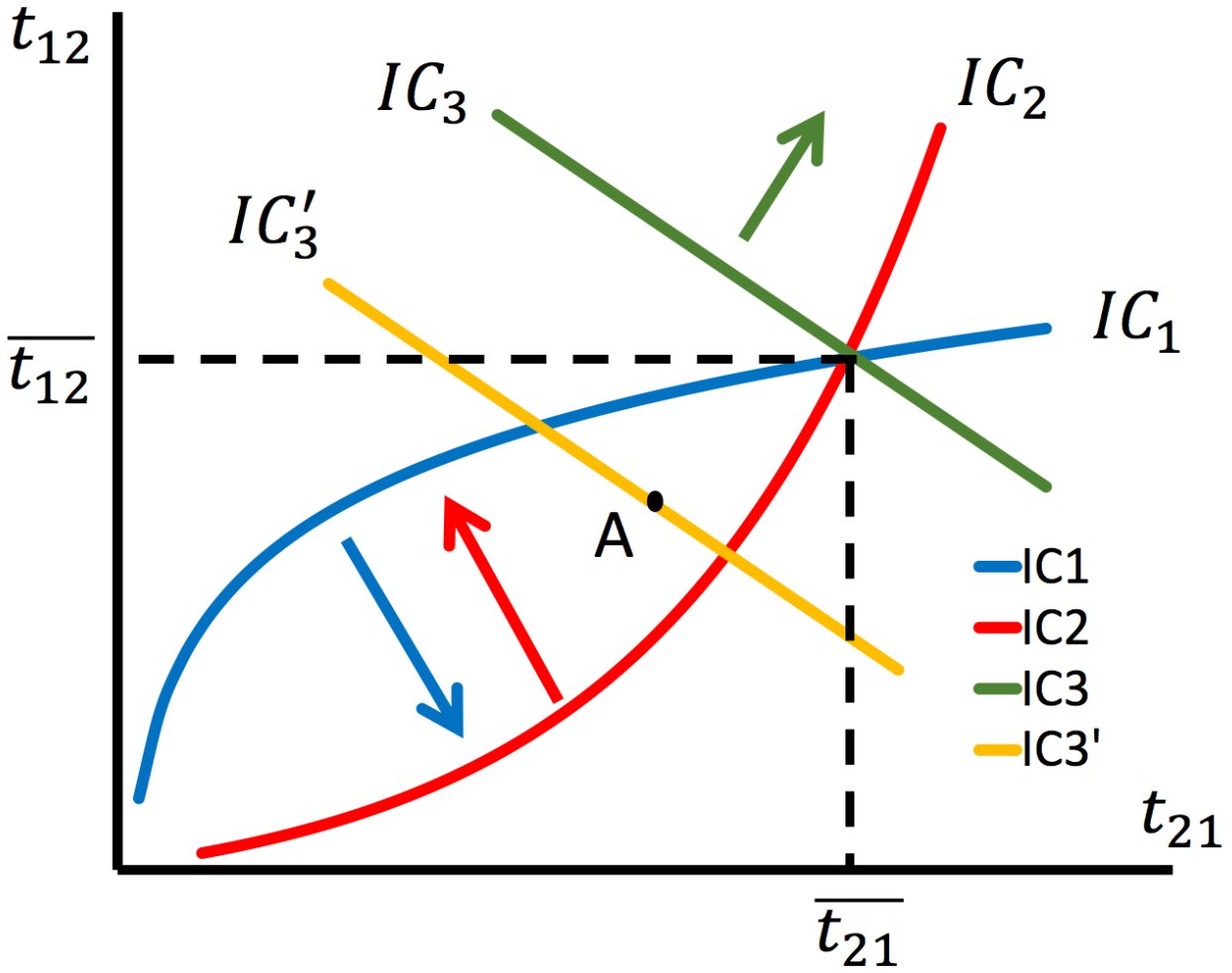
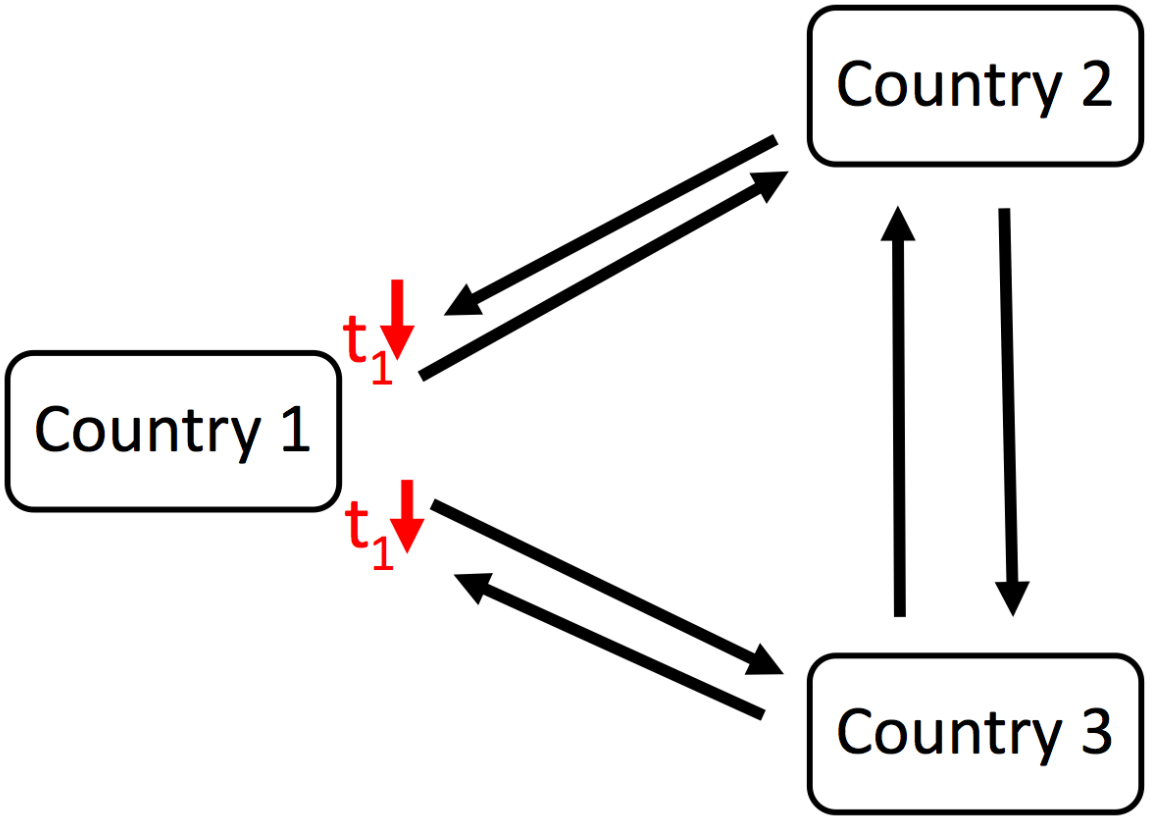


Third-Country Tariff Adjustment

A bilateral trade agreement with third-country tariff adjustment



Tariff Cut Under MFN



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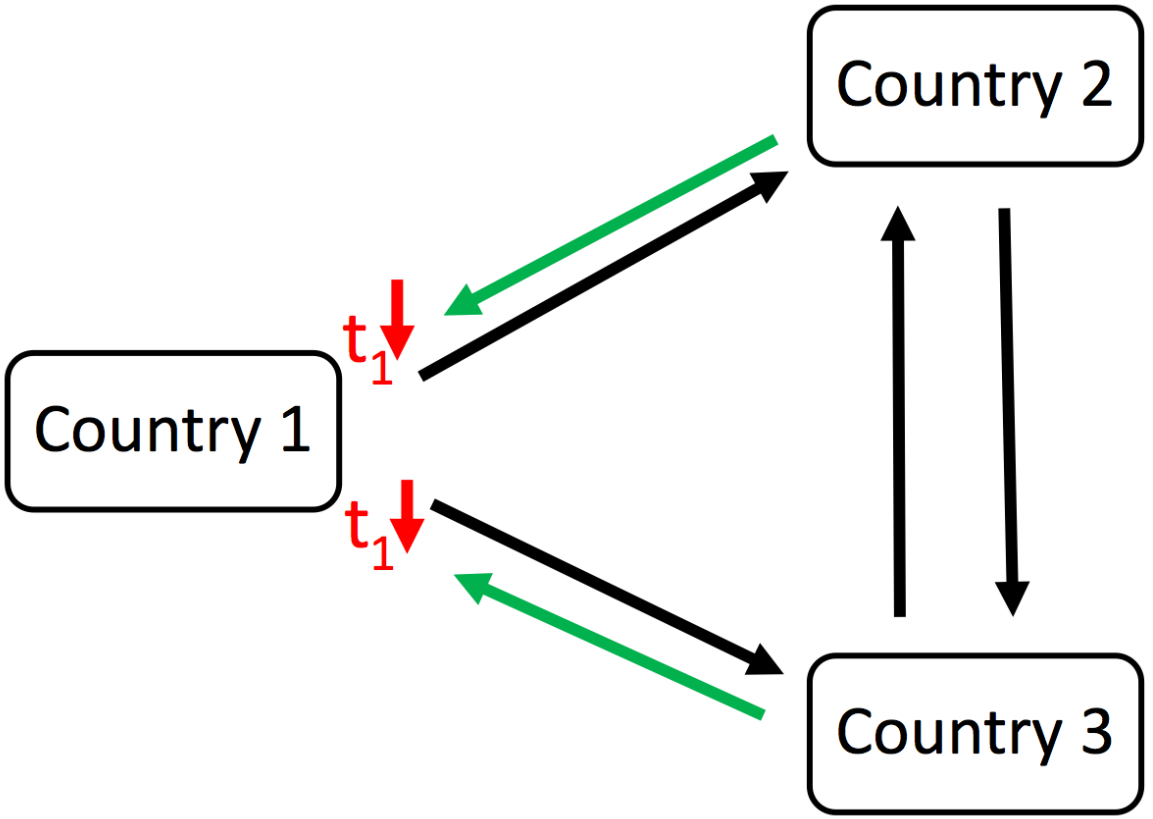

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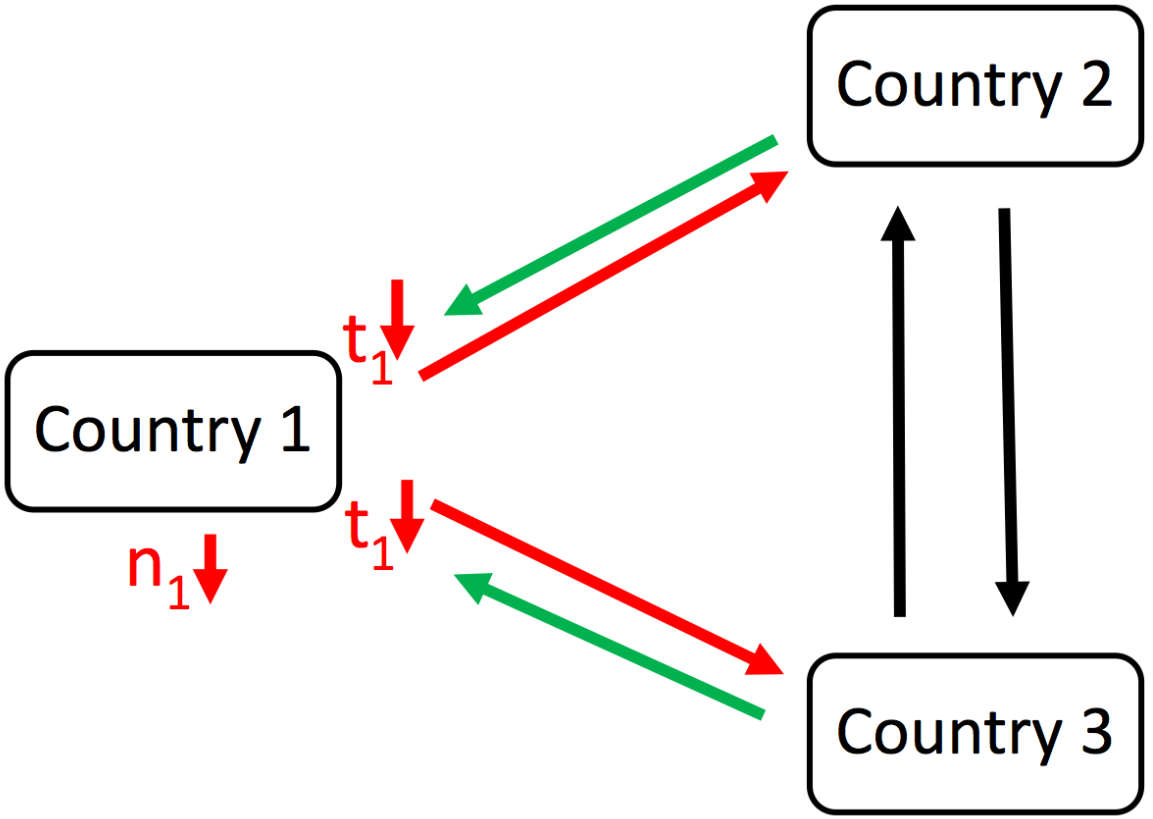

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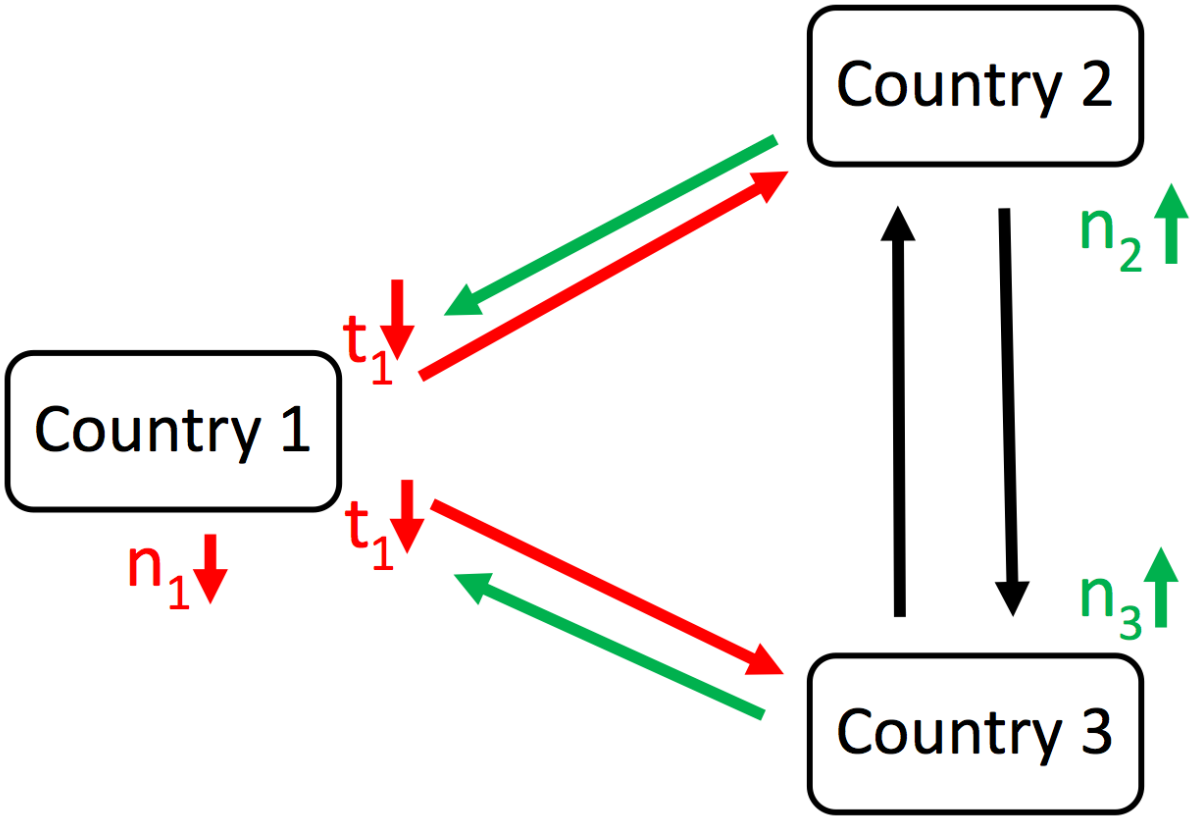

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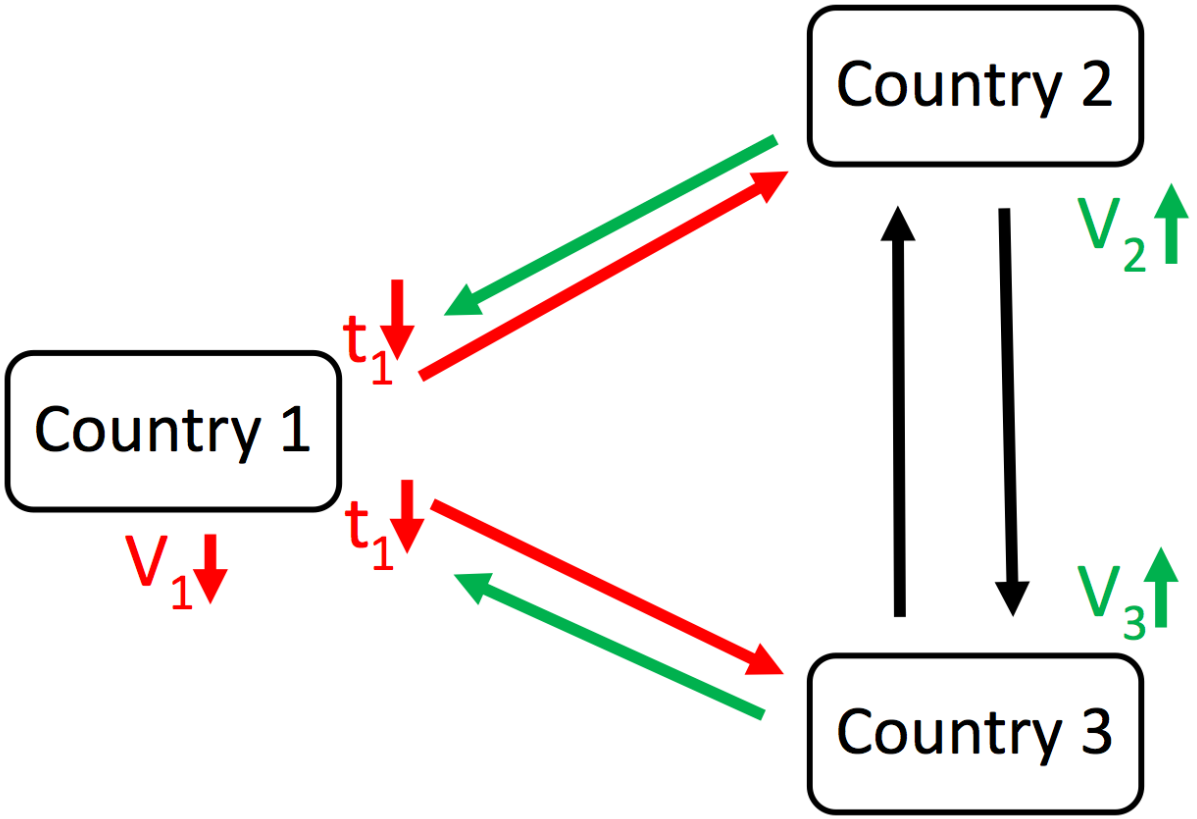
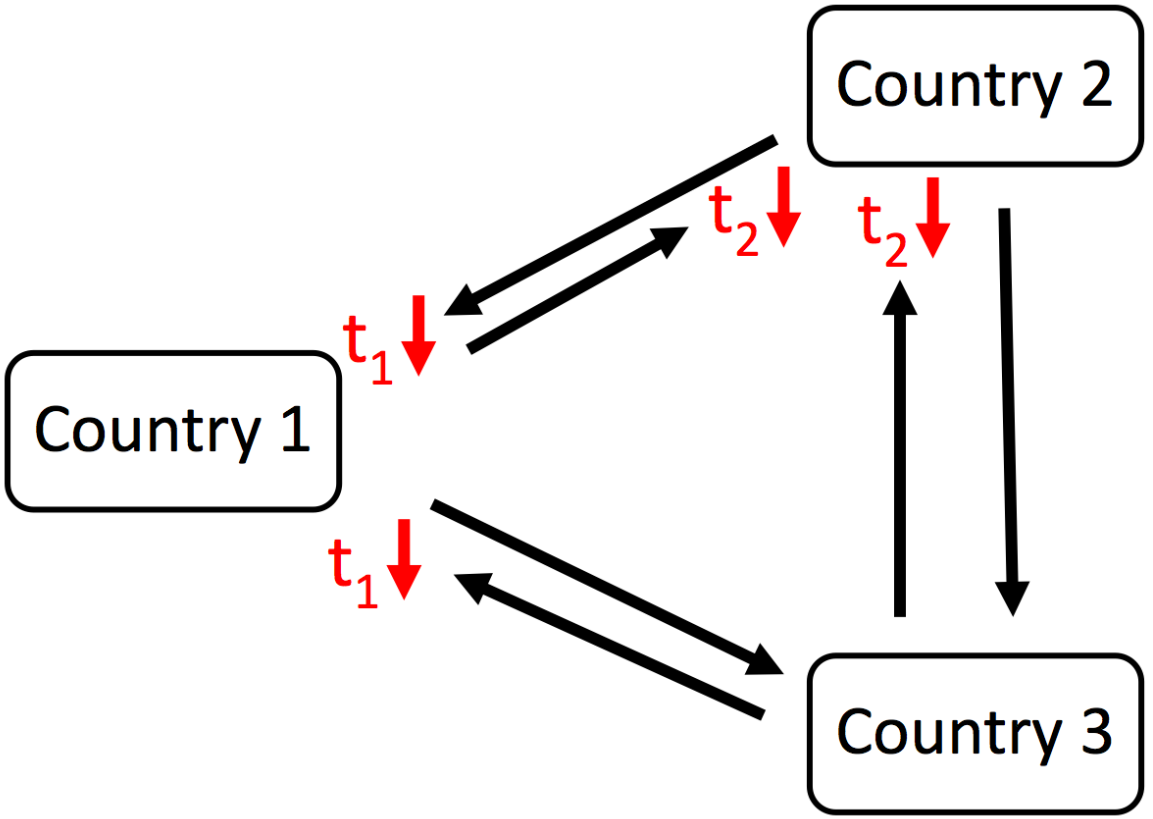


Tariff Cut Under MFN

Tariff changes	Without MFN			With MFN		
	V_1	V_2	V_3	V_1	V_2	V_3
$t_{21} \Downarrow$	−	+	−	−	+	+
$t_{12} \Downarrow$	+	−	−	+	−	+

Trade Agreement Under MFN



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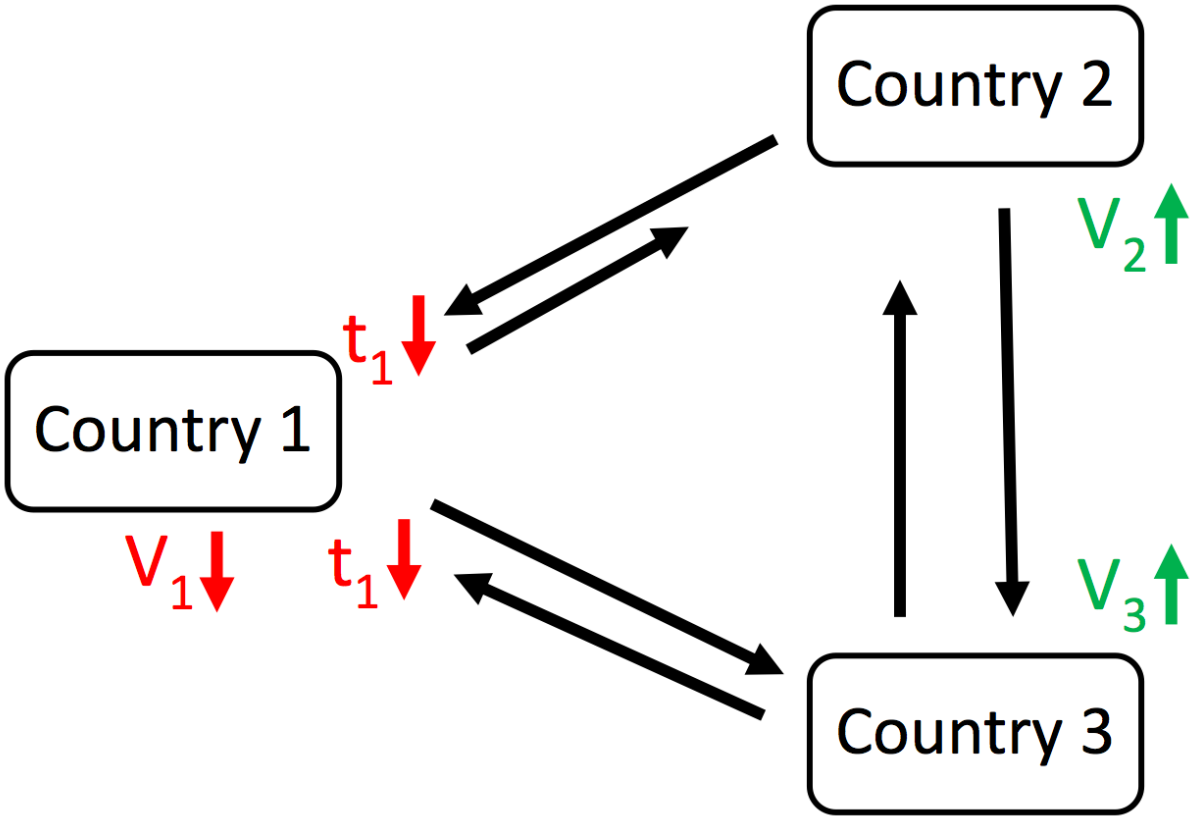

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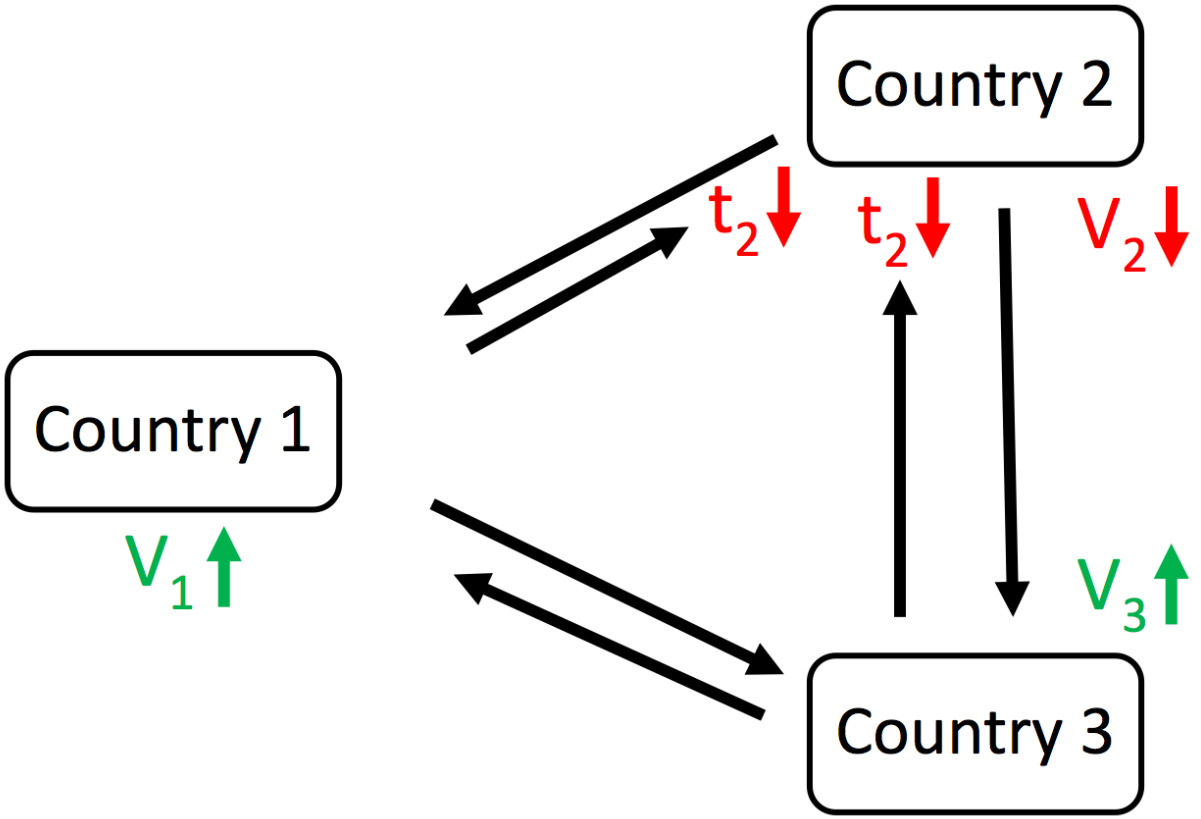

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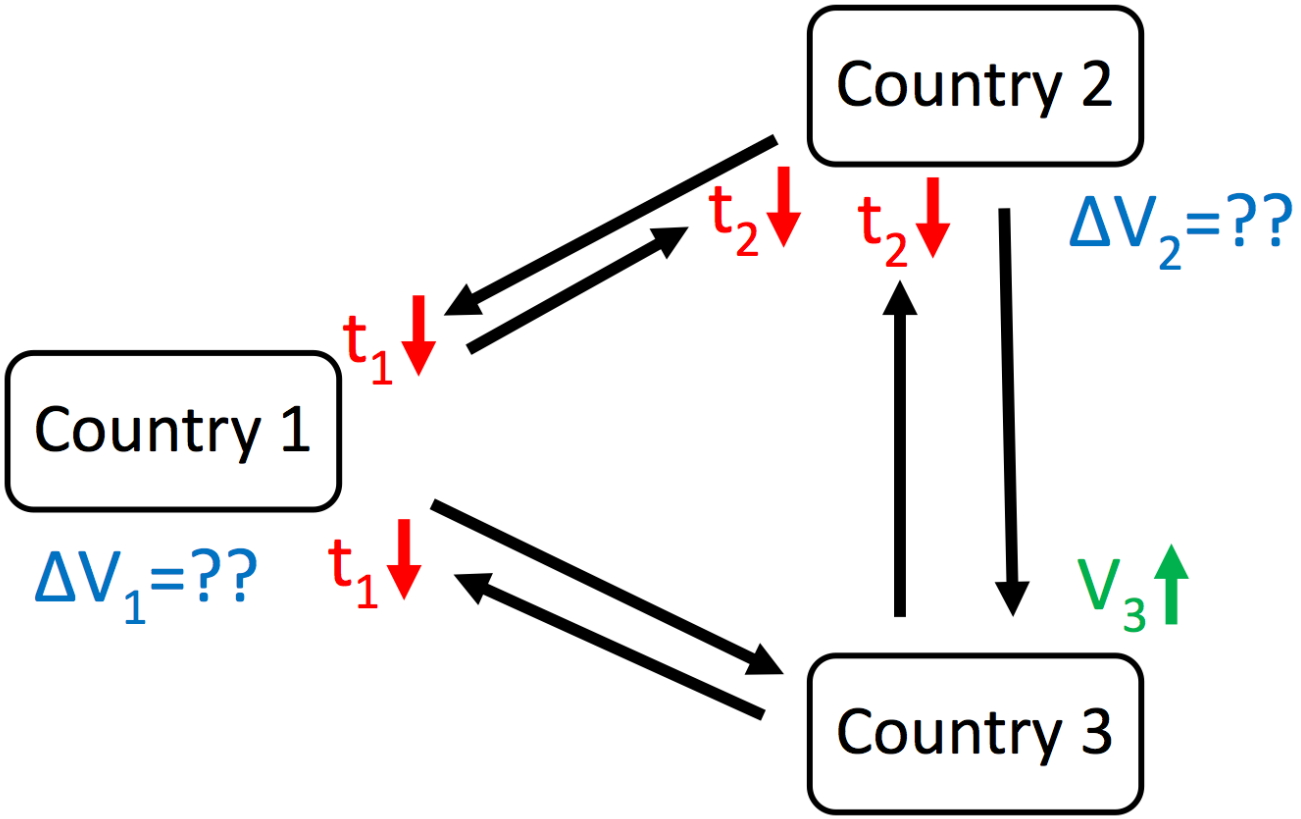
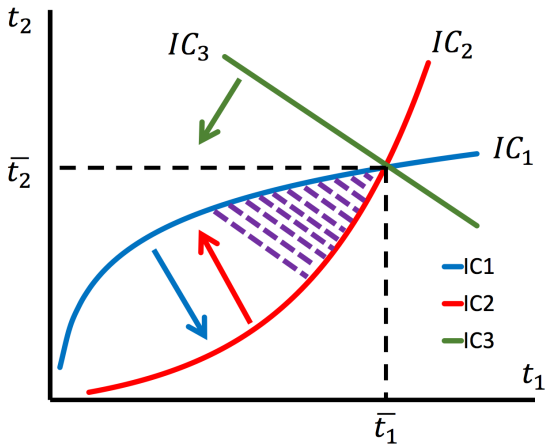


The Role of the MFN Principle

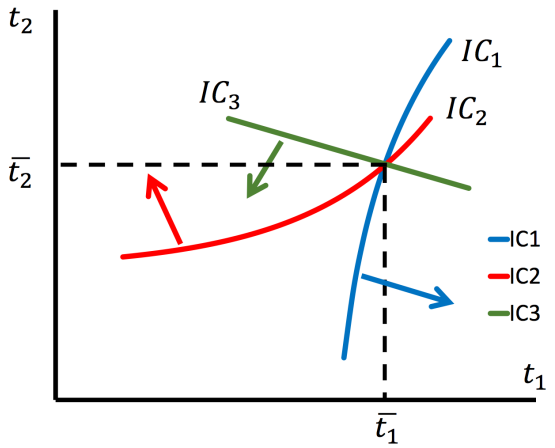
Result:

- The MFN principle guarantees that any bilateral trade agreement always makes the outside country better off
  - Over-compensates Country 3
  - Creates a free-rider problem
- Can Country 1 and Country 2 negotiate on a trade agreement?

The Role of the MFN Principle



$$(\theta_{13}\tau_3)^{1-\sigma} + (\theta_{23}\tau_3)^{1-\sigma} < 1$$



$$(\theta_{13}\tau_3)^{1-\sigma} + (\theta_{23}\tau_3)^{1-\sigma} > 1$$

The Role of the MFN Principle

Interpretation: $(\theta_{13}\tau_3)^{1-\sigma} + (\theta_{23}\tau_3)^{1-\sigma} < 1$

- A bilateral trade agreement under the MFN principle **exists** only if
  1. if initial tariffs are sufficiently high
     - The MFN principle was effective in the past when tariffs were high
  2. if the elasticity of substitution is sufficiently high
     - The definition of "like product" must be sufficiently narrow

Examples: Assume $\theta_{13} = \theta_{23} = \theta_3$

- For $\sigma = 4.6$, $\theta_3\tau_3 > 1.21$
- For $\sigma = 9.28$, $\theta_3\tau_3 > 1.08$

The Role of the MFN Principle

Policy Implications:

- The MFN principle worked well in the past when tariffs were high
  - But in the future when tariffs are low, the MFN principle could prevent potential tariff negotiations
- To minimize welfare losses to external countries, a country negotiates with its large trading partners
  - Large trade flow means low trade costs
  - Consistent with the "principal supplier" rule in GATT Article XXVIII
- Multilateral trade agreements and Preferential trade agreements would be more preferable in the future
  - Reduce welfare losses from MFN tariff cuts on outside countries
  - Avoid the free-rider problem

Quantitative Results

- The calibration methodology follows Dekle et al. (2007) and Ossa (2011; 2014)
- Generalizations:
  1. Seven (groups of) countries that trade with every other country
     - The European Union (EU), Brazil, China (and Hong Kong), India, Japan, the United States, and the rest of the world (ROW).
  2. Potentially heterogenous production technology and transportation costs
     - Either different marginal costs or different fixed costs
  3. Trade imbalances and tariff revenues.
     - Capture the income effect due to the existence of tariff revenues, which are absent in the theoretical model.

Quantitative Results

- Given parameter values, import tax rates τ_{ij}, and trade imbalances, the system of equations is given by

$$
\begin{aligned}
G_j &= \left[\sum_{i=1}^{7} n_i \left(p_i \theta_{ij} \tau_{ij}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \\
q_i &= \sum_{i=1}^{7} p_i^{-\sigma} \theta_{ij}^{1-\sigma} \tau_{ij}^{-\sigma} G_j^{\sigma-1} \mu X_j \\
X_j &= w_j L_j - TB_j + \sum_{i=1}^{7} t_{ij} n_i \left(p_i \theta_{ij}\right)^{1-\sigma} \tau_{ij}^{-\sigma} G_j^{\sigma-1} \mu X_j
\end{aligned}
$$

Quantitative Results

- Define $\hat{z} \equiv z'/z$.
- Using the new notation, the system of equations is re-written as

$$\begin{aligned}
\widehat{G}_j &= \left[\sum_{i=1}^{7} a_{ij}\widehat{n}_i \left(\widehat{\tau}_{ij}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \\
1 &= \sum_{j=1}^{7} b_{ij}\widehat{\tau}_{ij}^{-\sigma}\widehat{G}_j^{\sigma-1}\widehat{X}_j \\
\widehat{X}_j &= \gamma_j + \sum_{i=1}^{7} d_{ij}t'_{ij}\widehat{n}_i\widehat{\tau}_{ij}^{-\sigma}\widehat{G}_j^{\sigma-1}\widehat{X}_j
\end{aligned}$$

Quantitative Results

Calibration:

- Data on actual tariffs and aggregate trade flows in 2004 is from Dekle et al. (2007)
- Two values of σ
  - $\sigma = 4.60$ from Bernard et al. (2003)
  - $\sigma = 9.28$ from Eaton and Kortum (2002)
- Construct
  - a_{ij} = the fraction of the total expenditures on manufacturing goods by country j that is spent on manufacturing goods from country i
  - b_{ij} = the fraction of the total value of manufacturing goods from country i that is consumed by country j
  - γ_j = the fraction of the total income of country i that is not from tariff revenue
  - d_{ij} = the fraction of pre-tax expenditure on imports from country i in the total expenditure of country j

Quantitative Results

Table: Aggregated trade matrix.

	ROW	EU	Brazil	China	India	Japan	USA
ROW	3907.4	551.6	15.1	434.4	20.4	91.2	550.8
EU	656.9	6372.9	14.3	83.6	16.9	48.3	235.9
Brazil	24.1	9.3	314.6	2.1	0.3	1.0	16.4
China	349.7	161.6	3.9	801.7	7.0	82.4	212.2
India	18.6	17.3	0.4	6.2	387.0	1.4	14.6
Japan	191.8	96.1	2.9	123.1	2.9	3074.1	128.4
USA	390.4	177.4	10.7	45.6	5.5	44.0	5201.3

Quantitative Results

Table: Aggregated tariff matrix.

	ROW	EU	Brazil	China	India	Japan	USA
ROW	0	2.5	12.7	4.2	14.8	1.3	2.2
EU	7.0	0	12.7	4.2	14.8	1.3	2.2
Brazil	7.0	2.5	0	4.2	14.8	1.3	2.2
China	7.0	2.5	12.7	0	14.8	1.3	2.2
India	7.0	2.5	12.7	4.2	0	1.3	2.2
Japan	7.0	2.5	12.7	4.2	14.8	0	2.2
USA	7.0	2.5	12.7	4.2	14.8	1.3	0

Quantitative Results

Focus on bilateral trade agreements between EU and USA

- Low tariffs, Developed countries, large international trade flows

Test three theoretical predictions

1. A bilateral trade agreement without a third country tariff adjustment hurts outside countries.
2. A bilateral trade agreement under the MFN principle weakly improves the welfare of outside countries, but the negotiating countries may be worse off.
3. A bilateral trade agreement under the MFN principle can improve the welfare of all countries when tariffs are sufficiently high, but the MFN principle hurts the negotiating countries when tariffs are small.

Quantitative Results

Does a bilaterally reciprocal trade agreement hurt outside countries?

- The impacts of a bilaterally reciprocal trade agreement between EU and USA
  - $\triangle \log(\tau_{EU,USA}) = \triangle \log(\tau_{USA,EU}) = -0.01$.

	$\sigma = 4.60$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	-0.00443	0.10025	-0.04713	0.00443
USA	-0.00685	0.02246	-0.04223	0.00109
Brazil	0.00005	-0.01253	0.00274	-0.00047
China	0.00010	-0.08334	0.01628	-0.00296
India	0.00002	-0.01193	0.00301	-0.00054
Japan	0.00000	-0.00539	0.00200	-0.00038
ROW	0.00025	-0.06974	0.01108	-0.00183

Quantitative Results

Does a bilateral trade agreement under MFN benefit the outside countries and hurt the negotiating countries?

- The impacts of a bilateral trade agreement **under MFN** between EU and USA
  - $\triangle \log(\tau_{i,USA}) = \triangle \log(\tau_{i,EU}) = -0.01$ for all exporters in country i.

	$\sigma = 4.60$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	-0.02412	-0.78100	-0.00210	-0.02373
USA	-0.03252	-1.06484	-0.00716	-0.03117
Brazil	-0.00007	-0.28846	-0.07890	0.01477
China	-0.00271	2.40550	-0.46477	0.08481
India	0.00099	0.25906	-0.08488	0.01695
Japan	0.00015	0.13542	-0.05682	0.01084
ROW	-0.00440	1.65928	-0.31368	0.05468

Quantitative Results

When tariffs are sufficiently high, can a bilateral trade agreement under MFN improve the welfare of all countries?

- Use the predicted Nash tariffs (when countries have tariff wars) from Ossa (2011)

	ROW	EU	Brazil	China	India	Japan	USA
ROW	0	28.7	27.8	26.2	27.7	28.3	27.8
EU	26.3	0	27.7	27.6	27.78	27.8	27.7
Brazil	26.7	28.2	0	27.6	27.8	27.9	27.8
China	28.4	26.9	27.7	0	27.7	28.9	25.6
India	27.5	28.0	27.8	27.5	0	27.8	27.6
Japan	26.3	27.5	27.8	26.9	27.8	0	27.5
USA	27.0	27.8	27.8	27.8	27.8	27.9	0

Table: Predicted Nash tariffs with $\sigma = 4.6$ from Ossa (2011)

Quantitative Results

When tariffs are sufficiently high, can a bilateral trade agreement under MFN improve the welfare of all countries?

- The impacts of a bilateral trade agreement **under MFN** between EU and USA , when the starting tariffs are Nash tariffs
  - $\triangle \log(\tau_{i,USA}) = \triangle \log(\tau_{i,EU}) = -0.01$ for all exporters in country i.

	$\sigma = 4.60$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	0.00765	-0.94655	-0.01106	0.00973
USA	0.00813	-1.29589	-0.01855	0.01162
Brazil	-0.00051	0.29885	-0.07872	0.01430
China	-0.01674	2.57389	-0.46998	0.07185
India	0.00172	0.25685	-0.08500	0.01771
Japan	0.00345	0.11767	-0.05772	0.01431
ROW	-0.01659	1.76591	-0.30778	0.04136

Conclusion

- This paper studies the effects of the MFN principle on the set of Pareto-improving bilateral trade agreements.
- Key results:
  - Firm-delocation effects change the impacts of tariff cuts on the welfare of the outside countries.
  - Without third-country tariff adjustment, TAs that strictly benefit negotiating countries always hurt the outside country.
  - MFN ensures that the outside country is not hurt from TAs.
    - The outside country may free ride.
    - When tariffs are low, TAs are less likely to happen.
  - MTAs and PTAs would be more desirable in the future.
- I quantify welfare changes from different tariff negotiations:
  - The results support the model predictions.

Equilibrium

- Demand

$$q_{ij}(\omega) = \left(\frac{\theta_{ij} \tau_{ij} p_{ij}(\omega)}{G_i} \right)^{-\sigma} \frac{\mu L_i}{G_i}$$

- Price

$$p_{ij}(\omega) = \frac{\sigma}{\sigma - 1} c \equiv p$$

  - $q_{ij}(\omega) = q_{ij}$

- The aggregate manufacturing price index

$$G_j = \left[\sum n_i B_{ij} p^{1-\sigma} \right]^{\frac{1}{1-\sigma}}$$

  - n_i = the number of manufacturing firms in country i

- The indirect welfare function of country j is

$$V_j = \mu^{\mu} (1 - \mu)^{(1-\mu)} L_j G_j^{-\mu}$$

- Note: $n_1 + n_2 + n_3 = \frac{\mu}{qp} (L_1 + L_2 + L_3)$

Quantitative Results

The impacts of a bilateral trade agreement between EU and USA **without third-country tariff adjustments**,
$\triangle \log(\tau_{EU,USA}) = \triangle \log(\tau_{USA,EU}) = -0.01$.

	$\sigma = 9.28$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	-0.00425	0.18287	-0.04290	0.00382
USA	-0.00658	0.00595	-0.03881	0.00072
Brazil	0.00006	-0.02359	0.00246	-0.00041
China	0.00020	-0.17165	0.01459	-0.00254
India	0.00002	-0.02330	0.00270	-0.00049
Japan	-0.00001	-0.01041	0.00179	-0.00035
ROW	0.00045	-0.16534	0.00994	-0.00142

Quantitative Results

The impacts of a bilateral trade agreement between EU and USA **under the MFN principle,** $\triangle \log(\tau_{i,USA}) = \triangle \log(\tau_{i,EU}) = -0.01$ for all exporters in country i.

	$\sigma = 9.28$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	-0.02170	1.77736	-0.00527	-0.02070
USA	-0.02997	-2.42875	-0.01093	-0.02792
Brazil	-0.00035	0.60862	-0.07092	0.01299
China	-0.00585	5.07217	-0.42116	0.07352
India	0.00193	0.54186	-0.07632	0.01628
Japan	0.00032	0.28116	-0.05107	0.00992
ROW	-0.00945	3.51163	-0.28336	0.04390

Quantitative Results

Table: Predicted Nash tariffs with $\sigma = 9.28$ from Ossa (2011)

	ROW	EU	Brazil	China	India	Japan	USA
ROW	0	13.0	12.1	11.6	12.0	12.4	12.4
EU	11.0	0	12.1	11.9	12.0	12.1	12.0
Brazil	11.6	12.5	0	12.0	12.1	12.2	12.3
China	10.3	11.5	12.0	0	12.0	12.5	10.9
India	12.2	12.5	12.1	12.0	0	12.1	12.1
Japan	11.3	12.0	12.1	11.6	12.1	0	11.9
USA	11.4	12.1	12.1	12.0	12.1	12.1	0

Quantitative Results

The impacts of a bilateral trade agreement between EU and USA **under the MFN principle**, when the starting tariffs are Nash tariffs

	$\sigma = 4.60$			
	$\%\triangle log\,(\text{Income})$	$\%\triangle log\,(n)$	$\%\triangle log\,(\text{G})$	$\%\triangle log\,(V)$
EU	0.00696	-1.91644	-0.00893	0.00864
USA	0.00664	-2.62823	-0.01549	0.00955
Brazil	-0.00052	0.61780	-0.07084	0.01280
China	-0.01650	5.27282	-0.42576	0.06373
India	0.00149	0.54569	-0.07605	0.01580
Japan	0.00307	0.26680	-0.05141	0.01274
ROW	-0.01545	3.54384	-0.27988	0.03725