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Trade policy in the shadow of war: A quantitative toolkit for geoeconomics

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Motivation

- The new face of globalization and international order:
  - ▷ Interstate geopolitical tensions are rising: Ukraine, Pacific region, ↑ military expenditures
  - ▷ In the shadow of high-intensity warfare, objectives & design of trade policy must be reconsidered: ↑ security-related trade concerns, vulnerability of global value chains, economic sanctions, US-CHN decoupling
  - ▷ Beyond the purely mercantile view: shift from a liberal paradigm to a realist one

- Lack of guidance regarding the management of conflict risk in international trade
  - ▷ Best strategy for import sourcing?
  - → Engage in trade relations that maximize peacetime economic surplus but could be disrupted by war?
  - → Or should diversification of sources and friend shoring be prioritized?
  - → Fundamental dilemma of geoeconomics
  - ▷ Reversely, how does trade dependence with geopolitical rivals/friends feedback on conflict risk?

This paper: quantitative geoeconomics

- Toolkit to inform the conduct of trade policy in a conflict-prone world

- Contribution to geoeconomics: interaction between trade, diplomacy and geopolitics
  - ▷ conflict lit. → endogenous war proba.
  - ▷ Why is trade policy of interest for scholars working on conflicts & development?
  - → Premise: Trade is one factor among many in the escalation/containment of armed conflicts ... ... however, it is one of the few levers on which diplomats and policy makers can directly act
  - ▷ WTO "Trade for Peace" Program
  - ▷ Challenge of bringing together tools from conflict and trade lit.
  - ▷ trade lit. → policy evaluation based on CF simulations of a GE model

This paper: quantitative geoeconomics

1. Build a **generic and portable** quantitative model of international trade and inter-state conflict

→ Derive a welfare formula of trade gains in the shadow of war

→ Involve 4 **endogenous** geoeconomic factors: OCW, proba. of escalation to conflict, PKC, WIM

→ Sufficient statistics: OCW

2. Simulate trade policies (US-CHN decoupling; Ukraine annexion to EU; sanctions)

→ Illustrate the method

→ Estimated welfare impact often differs from peacetime predictions

→ Align Geography of Import Sourcing with geopolitical risk

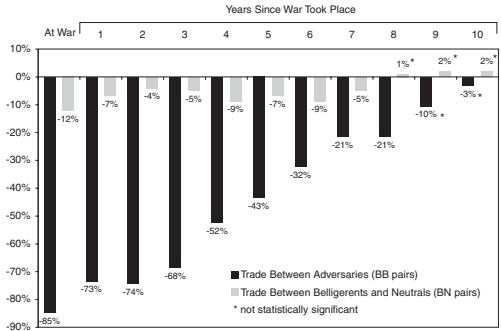
3. Survey theoretical/empirical literature (i.e. Handbook chapter).

Section 3

A Quantitative Model of Trade and War

Trade dependence and conflict: logic and pitfall

- Montesquieu (1748) and the logic of "Doux Commerce": Trade dependence raises OCW
  - ▷ Key element: conflicts disrupt trade → Empirically well-grounded (e.g. Glick & Taylor 2010)
  - ▷ Yet, unclear that trade losses substantially increase OCW: call for a quantitative evaluation



Setup I

- Plug a diplomatic game of escalation to conflict into a structural gravity model of trade
  - ▷ Generic bargaining setup from the mechanism design literature → rational leaders, despite huge OCW, may fail at deescalating geopolitical tensions (paradox of war)
  - ▷ Robust data-fed method to quantify OCW and welfare gains of trade
  - ▷ Reformulate and extend MMT 2008 (geoeconomic factors, welfare analysis)

Setup II

- Multi-country world with a matrix of bilateral trade frictions contingent to war/peace

- Sequence of events
  1. Exogenous geopolitical dispute arises between countries i and j (other countries n being neutral)
     $\rightarrow$ Endogenous escalation to conflict if subsequent diplomatic negotiations fail
  2. Optimal diplomatic protocol is adopted by i and j (mechanism design)
  3. Information on their costs of war is privately revealed
  4. Negotiation outcome:
     (i) Agreement on a Peace-compatible transfer T_{ij} between i and j
     (ii) Otherwise negotiation fails and War_{ij} occurs
  5. Trade equilibrium: Production, trade, and consumption for all countries.

Preferences I

- Before negotiation: utilities in peace (pre-transfer) and war (disagreement payoff)

$$U_i(\text{peace}) = \log C_i(\text{peace}) + v_i,$$

$$\tilde{U}_i(\text{war}) = \log C_i(\text{war}) + \tilde{u}_i,$$

  - ▷ C_i: Consumption level compatible with the trade equilibrium
  - ▷ $v_i \gtrless 0$: Geopolitical valence. Exogenous state-controlled transferable public good (territory, natural resource, water body, leader ego rents, ...). External numeraire good $\rightarrow$ utility transfers (Grossman-Helpman 1994)
  - ▷ $\tilde{u}_i \gtrless 0$: random war shock (fog of war); privately observed by i.

- Aggregate resource constraint: Peace Pareto dominates war (destruction)

$$\tilde{U}_i(\text{war}) + \tilde{U}_j(\text{war}) < U_i(\text{peace}) + U_j(\text{peace}).$$

Preferences II

Opportunity cost of war (ppt)

$$\texttt{OCW}_i \equiv \log C_i(\text{peace}) - \log C_i(\text{war}).$$

Utility Cost of War

$$\widetilde{\texttt{UCW}}_i \equiv U_i(\text{peace}) - \tilde{U}_i(\text{war}) = \texttt{OCW}_i + v_i - \tilde{u}_i.$$

Reformulation of the aggregate resource constraint

$$\widetilde{\texttt{UCW}}_i + \widetilde{\texttt{UCW}}_j > 0$$

Diplomacy and Resolution of Geopolitical Disputes I

- Rational leaders negotiate on $i \to j$ transfers, $T_{ij} \gtrless 0$, to avoid war

$$\widetilde{\texttt{UCW}}_i > T_{ij} \qquad \text{and} \qquad T_{ij} > -\widetilde{\texttt{UCW}}_j$$

  - ▷ Peace $\succ$ War: $\exists$ non-empty set of peace-compatible transfers. No war under perfect information !
  - ▷ Intuitively: it is better to have a low (or even negative) UCW!

- **Diplomacy: Bargaining under asymmetric information**
- Canonical setup in mechanism design= Myerson & Sattherwaite (1983)
  - ▷ Adjusted further to the peace/war question ...
  - ▷ Unconstrained diplomacy: **Free to choose any type of negotiation protocol**.
  - ▷ Negatively correlated disagreement payoffs: $\mathbb{E}\left[\tilde{u}_i \tilde{u}_j\right] < 0$, uniformly distributed on $[0, \eta] \times [0, \eta]$.
  - ▷ Each leader can unilaterally quit the negotiation table (no commitment mechanism)

Diplomacy and Resolution of Geopolitical Disputes II

Optimal diplomatic protocol: A (simple!) Nash bargaining procedure

1. Leaders announce their UCWs and check joint compatibility with aggregate resource constraint:

$$0 < \widetilde{\mathtt{UCW}}_i^a + \widetilde{\mathtt{UCW}}_j^a$$

2. If not compatible: negotiation fails, war breaks out, countries receive $\tilde{U}(\text{war})$
3. If compatible: Peace is maintained and a $i \to j$ transfer is agreed upon

$$\widetilde{T}_{ij} = \frac{\widetilde{\mathtt{UCW}}_i^a - \widetilde{\mathtt{UCW}}_j^a}{2} \gtrless 0$$

Optimal announcement

$$\widetilde{\mathtt{UCW}}_i^a = \frac{2}{3}\widetilde{\mathtt{UCW}}_i + \frac{1}{12}\max \widetilde{\mathtt{UCW}}_i - \frac{1}{4}\max \widetilde{\mathtt{UCW}}_j.$$

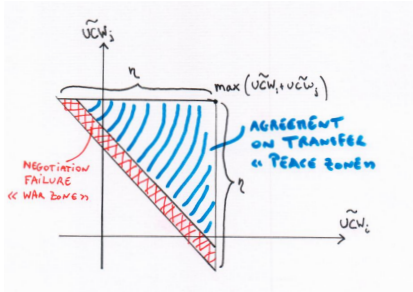
Both players strategically misreport a low UCW to extract more concession $\to$ risk of negotiation failure

Geoeconomic Factors I

When do negotiations fail?

→ (i) Informational noise η is large (more misreporting) and (ii) joint realization of UCWs is low (less to loose)

→ Diplomacy is relatively efficient at deescalating the most intense forms of war.



Endogenous probability of peaceful diplomatic resolution:

$$\Pr(\text{de-escalation}) = s_{ij} = \frac{1}{\eta^2} \times \max\left(\widetilde{\mathtt{UCW}_i} + \widetilde{\mathtt{UCW}_j}\right)^2 = \frac{1}{\eta^2} \times \left[\mathtt{OCW}_i + \mathtt{OCW}_j + v_i + v_j\right]^2$$
$$= 1 \qquad \text{for} \quad \mathtt{OCW}_i + \mathtt{OCW}_j \geq \omega^*$$

Geoeconomic Factors II

War Intensity Mitigation (War = equilibrium path)

$$\mathbb{E}\left[\widetilde{\mathtt{UCW}}_i|\text{war}\right] = \mathbb{E}\left[\widetilde{\mathtt{UCW}}_i\right] - \mathtt{WIM}_i \qquad \text{with} \quad \mathtt{WIM}_i = \frac{1}{4}\frac{\left[\mathtt{OCW}_i + \mathtt{OCW}_j + v_i + v_j\right]^2}{\eta + \mathtt{OCW}_i + \mathtt{OCW}_j + v_i + v_j}.$$

We show that $\mathbb{E}\left[\widetilde{\mathtt{UCW}}_i|\text{war}\right]$ is decreasing in $\mathtt{OCW}_i$.

Peace Keeping Costs (War = out of equilibrium path)

$$\mathbb{E}\left[\widetilde{T}_{ij}|\text{peace}\right] \equiv \mathtt{PKC}_i = \frac{\mathtt{OCW}_i + v_i - \mathtt{OCW}_j - v_j}{2}.$$

Geoeconomic Factors III

"Welfare in the shadow of war" is defined as

$$\mathbb{E}\tilde{U}_i \equiv s_{ij}\left(U_i(\text{peace}) - \mathbb{E}\left[\widetilde{T}_{ij}|\text{peace}\right]\right) + (1 - s_{ij}) \times \left(U_i(\text{peace}) - \mathbb{E}\left[\widetilde{\texttt{UCW}}_i|\text{war}\right]\right)$$

Replacing with geoeoconomic factors:

$$\mathbb{E}\tilde{U}_i = U_i(\text{peace}) - s_{ij} \times \texttt{PKC}_i - (1 - s_{ij}) \times \left(\texttt{OCW}_i + v_i - \frac{\eta}{4} - \texttt{WIM}_i\right). \tag{1}$$

Sufficient statistics: All geoeconomic factors $\{s_{ij}, \texttt{WIM}_i, \texttt{PKC}_i\}$ can be derived from $\texttt{OCW}_i$

Trade Equilibrium - I

GE closure: plug the diplomatic game into a workhorse model of structural gravity

- ▷ Modern approach (2010s) to welfare evaluation of changes in trade costs/policies
- ▷ Class of quantitative models with many $\neq$ micro-foundations
- ▷ All yield a gravity equation. I use it to quantify OCWs.
- ▷ Extremely economical in terms of data requirement: only trade shares observed in peace and a parsimonious set of calibrated structural parameters are needed for quantification.
- ▷ Multi-country world: suited for modeling import sourcing and trade dependence

Trade Equilibrium - II

Here, for simplicity, I use the framework of Anderson (1979)

- Each region i populated by L_i workers is the unique source of each variety
  - ▷ Consumers in n have a CES utility ($\sigma > 1$) over all varieties (Armington diff.)

$$U_n = \left(\sum_i (q_{in})^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}, \tag{2}$$

  - ▷ Perfect competition + iceberg trade costs τ_{in}: $p_{in} = w_i \tau_{in} / A_i$.
  - ▷ w_i = wage, and A_i = productivity

- Gravity equation = share of expenditure that consumers of region n spend on the variety from i

$$\pi_{in} \equiv \frac{Y_{in}}{E_n} = \frac{(\tau_{in} w_i / A_i)^{1-\sigma}}{\sum_k (\tau_{kn} w_k / A_k)^{1-\sigma}} \tag{3}$$

Trade Equilibrium - III

- Goods market clearing: $w_i \times L_i = \sum_n \pi_{in} E_n$
- Budget constraint: $E_n = w_n \times L_n$
- Combining gravity eq. with previous two equations yields a (fixed point) "master equation" system

$$w_i L_i = \sum_{n=1}^{N} \frac{(\tau_{in} w_i / A_i)^{1-\sigma}}{\sum_k (\tau_{kn} w_k / A_k)^{1-\sigma}} w_n L_n. \tag{4}$$

- System of N equations, N unknowns $\{w_i\}$

$\rightarrow$ Once wage levels are known: (i) use gravity to get bilateral trade shares, $\{\pi_{in}\}$; (ii) then use budget constraint to get expenditures E_n

$\rightarrow$ This fully describes the model !

Section 4

Geoeconomic Factors: Determinants and Quantification

Computing OCWs - I

OCWs: Compare equilibrium consumption in peace (factual) and war (counterfactual)

- Method: Exact Hat Algebra

Express proportional changes $\hat{x} = x'/x$ in terms of *import shares observed in peacetime* and a concise set of structural parameters

- Modeling the effect of $\texttt{war}_{ij}$: Parameter assumptions
  - ▷ Human losses: $\hat{L}_i < 1$ & $\hat{L}_j < 1$
  - ▷ Economic damages: $\hat{A}_i \equiv 1 - \alpha_i < 1$ and $\hat{A}_j \equiv 1 - \alpha_j < 1$.
  - ▷ Trade disruption:
    $\hat{\tau}_{ij} = \hat{\tau}_{ji} = 1 + \tau_{\text{bil}} > 1$
    $\hat{\tau}_{ni} = \hat{\tau}_{nj} = 1 + \tau_{\text{mul}} > 1$
    No effect between third countries: $\hat{\tau}_{nm} = 1$ for $n, m \neq i, j$.
  - ▷ Balance between simplicity and realism: More complex parameterization can be handled

Computing OCWs - II

- Do we have some kind of Arkolakis et al. (2012) welfare formula for OCW ?

→ OCW: economic damages + foregone trade gains (captured by increasing self-trade $\hat{\pi}_{ii}$)

$$\texttt{OCW}_i \equiv -\log \hat{C}_i = -\log(1-\alpha_i) + \frac{1}{\sigma-1}\log \hat{\pi}_{ii}$$

- Change in internal trade relates directly to the weighted average of relative changes in market prices of firms operating on domestic market i

$$\hat{\pi}_{ii} = \left[\pi_{ii} \times 1 + \pi_{ji} \times \left(\frac{(1+\tau_{\text{bil}})(1-\alpha_i)\hat{w}_j}{(1-\alpha_j)\hat{w}_i}\right)^{1-\sigma} + \sum_{n\neq i,j} \pi_{ni} \times \left(\frac{(1+\tau_{\text{mul}})(1-\alpha_i)\hat{w}_n}{\hat{w}_i}\right)^{1-\sigma}\right]^{-1},$$

1. Change in market prices among domestic firms; margin unaffected by war.
2. Change in relative price of imports from j compared to domestic firms
3. Change in relative price of imports from third countries

Computing OCWs - III

• Wage changes $\hat{w}$ are still unknown at this stage of the procedure
$\rightarrow$ obtained as a fixed-point solution to GE system expressed in hat-algebra

$$\hat{w}_i = \frac{1}{w_i L_i \hat{L}_i} \sum_{n=1}^{N} \frac{\pi_{in} \left(\frac{\hat{\tau}_{in} \hat{w}_i}{\hat{A}_i} \right)^{1-\sigma}}{\sum_k \pi_{kn} \left(\frac{\hat{\tau}_{kn} \hat{w}_k}{\hat{A}_k} \right)^{1-\sigma}} \hat{w}_n \hat{L}_n w_n L_n. \tag{5}$$

$\rightarrow$ Damage parameters $\left(\hat{\tau}, \hat{L}, \hat{A} \right)$ and trade elasticity $1 - \sigma$ are calibrated
$\rightarrow$ Peacetime import shares (the πs) and aggregate income (wL) are observed

• Quantification procedure:
Solve for $\hat{w}$, plug into $\hat{\pi}_{ii}$, get $\texttt{OCW}_i$ and finally compute $\{s_{ij}, \texttt{WIM}_i, \texttt{PKC}_i\}$.

Geography of Import Sourcing (GIS) - I

Impact of external trade dependence on OCW and other geoeconomic factors? Extending MMT 2008

- Focus here on the case of symmetrical high-intensity warfare: $\hat{A}_i = \hat{A}_j = 1 - \alpha$ and $\alpha > \tau_{\text{mul}}$
- First-order approx.: consistent quantitative pattern $\hat{P}_i \gg \hat{w}$ (MTI in Head & Mayer 2014)

$$\texttt{OCW}_i \approx \alpha + \pi_{ji} \times \tau_{\text{bil}} + \sum_{n \neq i,j} \pi_{ni} \times (\tau_{\text{mul}} - \alpha),$$

  - ▷ Trade logistics disruption: affect both bilateral and multilateral imports
  - ▷ Consumption Insurance: multilateral imports not impacted by drop in productivity

- Impact of ↑ bilateral sourcing π_{ji} and/or ↓ multilateral sourcing $\sum_{n \neq i,j} \pi_{ni}$:
  - ▷ $\texttt{OCW}_i \uparrow$
  - ▷ $s_{ij} \uparrow$,$\texttt{PKC}_i \uparrow$, $\texttt{WIM}_i \uparrow$, $\mathbb{E}\left[\widetilde{\texttt{UCW}_i} | \text{war}\right] = \texttt{OCW}_i + v_i - \texttt{WIM}_i \uparrow$
  - ▷ Overall welfare effect on $\mathbb{E}\tilde{U}_i$ is ambiguous: quantification needed!

Geography of Import Sourcing (GIS) - II

Empirical Evidence

- Empirical tests of how GIS impacts peace/war
  - ▷ MMT (2008); Hegre et al. (2010); Vicard (2012); Seitz et al. (2015); Hadjiyiannis et al. (2016); Morelli and Sonno (2017); Kleinman et al. (2020); Garfinkel et al. (2020)

- These papers estimate this type of econometric equation

$$\mathbb{P}(MID_{ijt}) = \alpha \ln(\frac{m_{ijt}}{E_{it}} + \frac{m_{jit}}{E_{jt}}) + \beta \ln\left(\sum_{n \neq i,j} \frac{m_{nit}}{E_{it}} + \frac{m_{njt}}{E_{jt}}\right) + \text{controls}_{ijt} + FE_{ij}.$$

- Consistent empirical patterns across papers: $\hat{\alpha} \leq 0$ and $\hat{\beta} \geq 0$

- Variants: LHS var.= defense expenditures and/or RHS predictors=trade agreements.

Quantification of geoeconomic factors I

- Illustrate the method : not definitive calculations
  - ▷ Approximated OCWs; no sensitivity analysis (alt. calib.); minimalist trade framework with no intermediate goods sector

- Trade shares data incl. internal trade: Head and Mayer (2021), 153 countries, 1970-2018

Table: Calibration

parameter	value	source
$1-\sigma$	-5	Head & Mayer 2014
τ_{bil}	0.461	Glick & Taylor 2010
τ_{mul}	0.026	Glick & Taylor 2010
α	0.08	Chupilkin and Koczan (2022)
λ_{pop}	0.08	Overmans (2004)
η	0.16	internal ($6 \times SD_{OCW}$)
v	0	benchmark

Quantification of geoeconomic factors II

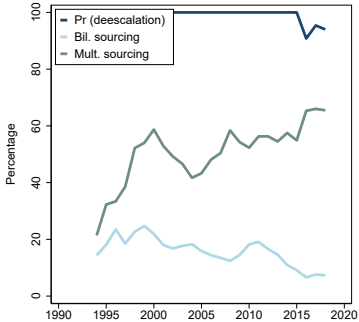
Table: Estimates of geoeconomic factors in 2018

		Import Shares		OCW		PKC	WIM	s_{ij}	PVP
		Bilateral	Multilateral	Ctry 1	Ctry 2				
IND	PAK	.8	45.2	6.8	7.1	.1	1.6	73.1	2.4
ZAF	AGO	2.4	80.9	6.2	6.5	.2	1.4	60.8	3.6
GRC	TUR	2.3	93.3	6	6.1	0	1.3	54.4	4.3
CHN	USA	8.6	37.8	7.9	10	1.1		100	-1.6
RUS	UKR	7.3	65.5	6.9	8.9	1	1.9	94	.5
FRA	DEU	27.3	105.4	13.9	9	-2.4		100	-6.6
Prox.	Pairs	3.6	105	6.1	5.9	-.1	1.2	53.4	4.3

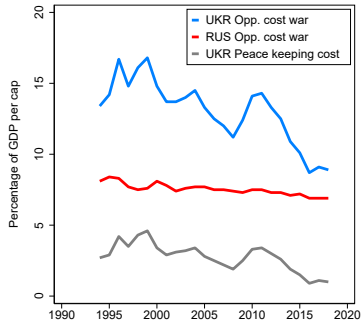
Note: Each row reports the geoeconomic factors attached to a dispute (susceptible to escalate into an armed conflict) between the two countries of the pair under consideration. Numbers represent percentage points. Bilateral and multilateral import sourcing are obtained by summing within the country-pair bilateral import shares in expenditures and total import shares net of bilateral imports. Col. 5 and 6 display the Opportunity Costs of War for countries 1 and 2. Col. 7 reports the Peace Keeping Costs for country 2. Col. 8, 9 and 10 respectively display the War Intensity Mitigation effect of diplomacy, the conditional probability of deescalation and the Pivotal Valence of Peace for the country-pair. The bottom row reports averaged values across the 443 pairs of countries in the sample distant less than 1000km from each other.

Quantification of geoeconomic factors III

Figure: Evolution of geoeconomic factors for the pair Russia-Ukraine



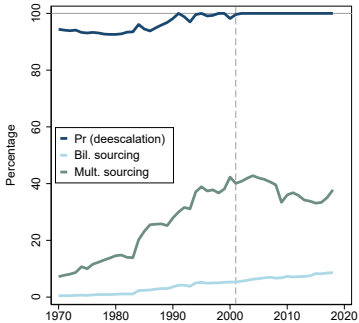
(a) Geography of Import Sourcing



(b) OCW and PKC

Quantification of geoeconomic factors IV

Figure: Evolution of geoeconomic factors for the pair China-USA



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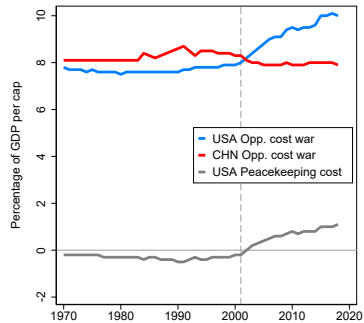


(b) OCW and PKC

Section 5

Trade Policy in the Shadow of War

Geoeconomic welfare gains: theory

- Ctry i evaluates welfare gains $\mathcal{W}_i$ of implementing a "trade policy in the shadow of war"
- First-differentiating $\mathbb{E}\tilde{U}_i$ yields Standard Trade Gains in Peacetime + Geoeconomic Welfare Gains

$$\mathcal{W}_i = \log\left(\frac{C_i'(\text{peace})}{C_i(\text{peace})}\right) + \mathcal{G}_i$$

$$\mathcal{G}_i \equiv -(1-s_{ij}) \times (\Delta \texttt{OCW}_i - \Delta \texttt{WIM}_i) - s_{ij} \times \Delta \texttt{PKC}_i + \left(\texttt{OCW}_i + v_i - \texttt{PKC}_i - \frac{\eta}{4} - \texttt{WIM}_i\right) \times \Delta s_{ij}, \qquad (6)$$

- This captures a **fundamental security dilemma** of geoeconomics related to bilateral import dependence vis-a-vis geopolitical rivals
  - ▷ Imagine a policy-induced increase $\Delta \texttt{OCW}_i > 0$
  - → Welfare improving: $\Delta s_{ij} > 0$
  - → Welfare detrimental: $(\Delta \texttt{OCW}_i - \Delta \texttt{WIM}_i > 0)$ and $\Delta \texttt{PKC}_i > 0$
  - → Net effect? Calls for a quantification!

Geoeconomic welfare gains: numerical procedure

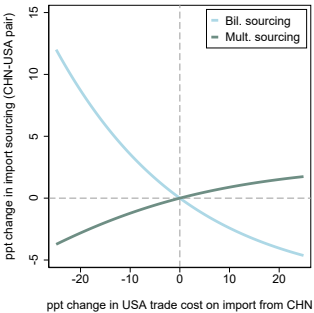
Double nested CF procedure:

1. Recover trade share matrix *observed* in peace time (π_{in}) and compute the vector of geoeconomic factors $\{\texttt{OCW}_i, s_{ij}, \texttt{WIM}_i, \texttt{PKC}_i\}$ in the no-policy equilibrium (**factual**)
2. Use a off-the-shelf procedure to estimate the trade share matrix in peace time (π'_{in}) in the policy-in-force equilibrium (**counterfactual**).
3. Repeat step 1 with counterfactual trade shares π'_{in} (in place of the observed ones) to compute the vector of counterfactual geoeconomic factors $\{\texttt{OCW}'_i, s'_{ij}, \texttt{WIM}'_i, \texttt{PKC}'_i\}$.
4. Take all geoeconomic factors in first-differences (i.e. $\Delta x \equiv x' - x$) and plug them into equation (6) to estimate $\mathcal{G}_i$.

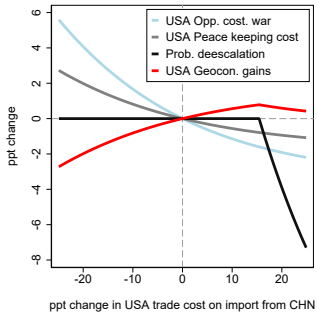
Optimal import dependence with geopolitical rivals

China-USA decoupling after 2018: Geoeconomic impact of $\Delta\tau_{CHN,USA}$

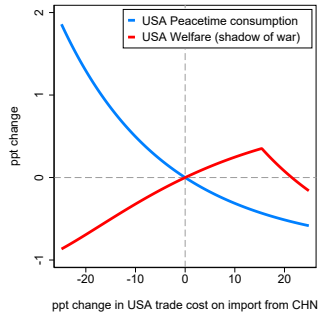
(a) Import sourcing



(b) Geoeconomic factors



(c) Consumption & Welfare



EU enlargement to Ukraine

Gravity estimates of "EU single market" recovered from Mayer and Thoenig (2016)

Table: EU-28 enlargement to Ukraine in 2018.

		Δ Import Shares		Country 1						Country 2		
		bil.	mul.	ΔOCW	Δ logC(peace)	$\mathcal{G}$	Δs_{ij}	ΔWIM	ΔPKC	ΔOCW	Δ logC(peace)	$\mathcal{G}$
RUS	UKR	-.83	11.12	-.02	-.02	-1.12	-11.33	-.18	-.47	-.96	4.41	-.19
AUT	UKR	.61	9.81	.12	.05	-.27	-1.87	-.04	-.25	-.37	4.41	.22
DEU	UKR	4.22	6.21	.08	.04	1.36	16.56	.28	.73	1.53	4.41	-.1
HUN	UKR	1.81	8.84	.53	.21	-.29	2.96	.06	-.35	-.17	4.41	.41
POL	UKR	2.69	7.97	.25	.14	.41	7.71	.14	.16	.56	4.41	.1
EU28	UKR	.94	9.51	.15	.06	-.16	-.25	-.01	-.19	-.23	4.41	.22

Trade Sanctions against Russia in case of WAR_{i-RUS}

International $\tau_{\text{sanction}} = \tau_{\text{bil}} = 0.461$ for i-RUS and all pairs n-RUS

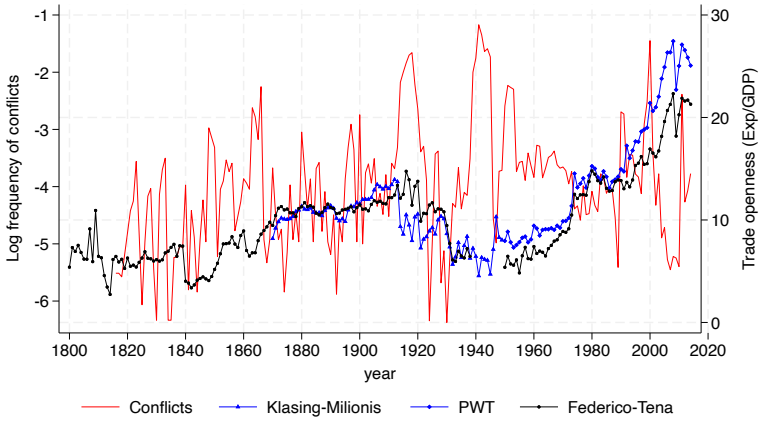
Table: Commitment to sanction Russia if war happens in 2018.

		Country 1						Country 2	
		ΔOCW	$\mathcal{G}$	s_{ij}	Δs_{ij}	ΔWIM	ΔPKC	ΔOCW	$\mathcal{G}$
UKR	**RUS**	**0**	**5.49**	**94.05**	**5.95**	**-1.95**	**5.58**	**11.16**	**-5.67**
CHN	RUS	0	4.44	100	0	0	4.44	8.88	-4.44
DEU	RUS	0	4.63	70.89	29.11	-1.57	5	10.01	-5.38
POL	RUS	0	5.1	73.4	26.6	-1.61	5.59	11.17	-6.07
USA	RUS	0	4.9	69.99	30.01	-1.55	5.4	10.81	-5.91

Conclusion

- Generic and portable quantitative framework → to be adjusted further for more realistic estimates
- Embed *endogenous* latent conflict risk in the standard toolkit of trade policy evaluation
- Welfare: standard gains in peacetime + geoeconomic welfare gains
- Geoeconomic factors:
(i) OCW; (ii) diplomatic concessions made to avert war; (iii) probability of war; (iv) cost of war itself
- Estimated welfare impact often differs from peacetime predictions
- Geography of import sourcing matters + Fundamental security dilemma
→ **generates a positive feedback loop between conflict risk and friendshoring**
→ inter-war period?
→ New role for multilateralism: WTO trade for peace
→ To be further explored!

Security Concerns and Trade



Klasing-Milionis (1870-1959) ; Penn World Table (1960-2020) ; Federico-Tena (1800-2020)