

Spheres of Influence

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November 30th, 2023

China's rising power: a world-shaping force



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Why do spheres of
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Where and when
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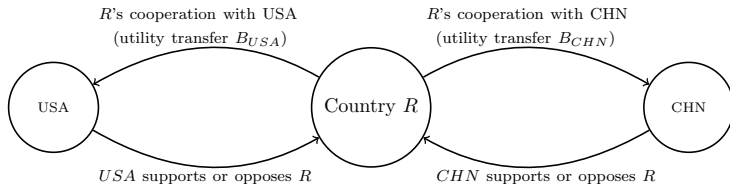
Are they emerging?

Why do spheres of influence emerge?

- **Theory:** countries optimize cooperation with the great powers $\Rightarrow$ spheres of influence

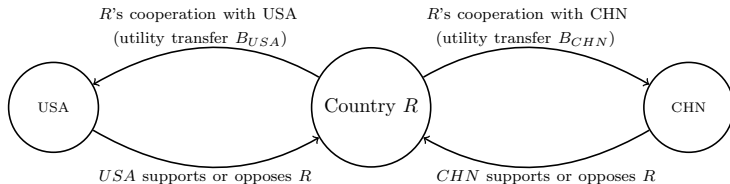
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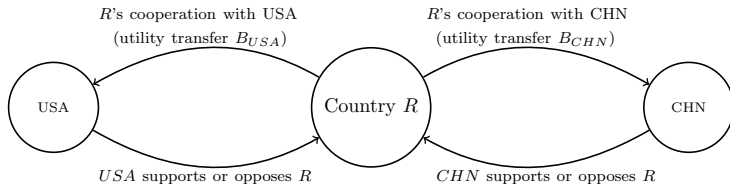
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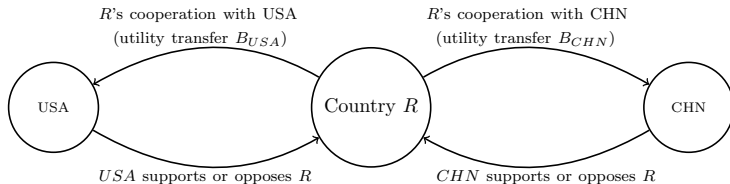


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Spheres of Influence emerge regardless of what US or China want

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When: Changes in US-China balance of power affects the extent of policy polarization:

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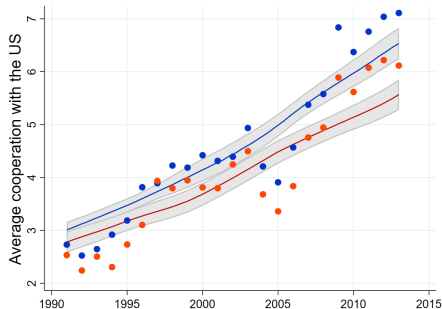
Spheres of influence more distinct/visible when more geopolitical competition

Evidence: collapse of the Soviet Union and rise of China

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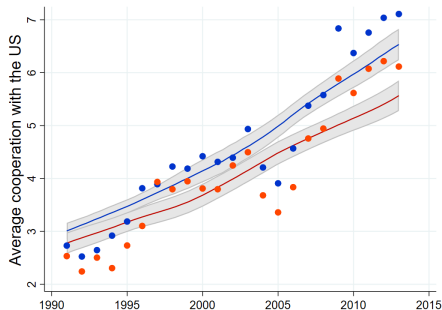
China's rise $\Rightarrow$ repolarization

US vs Chinese potential spheres of influence: in

blue (orange) countries more (less) economically
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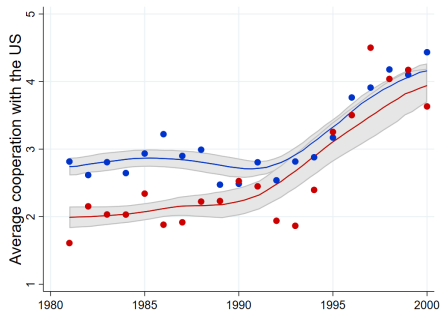
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Soviet collapse $\Rightarrow$ depolarization

US vs Soviet potential spheres of influence: in blue (red) countries more (less) economically dependent on the US than the USSR in 1980

Spheres of Influence: key takeaways

Why: Countries have incentives to pick sides, self-organizing into spheres of influence

Where: Spheres of influence emerge from *potential* spheres of influence:
countries cooperate disproportionately more with the great power they are most exposed to

When: Spheres of influence more distinct when great powers' influence more equal

⇒ Process of fragmentation is already well underway

Thank You!

Any feedback would be much appreciated!

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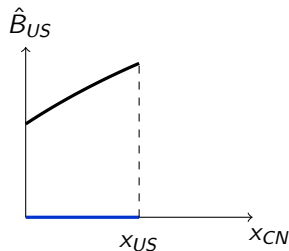
michael.porcellacchia@ifw-kiel.de

Appendix

Implications: where are all these spheres of influence?

Result: optimal cooperation with *US*, $\hat{B}_{US}$, depends on a government's exposure to both the US and CN (x_{CN}, x_{US})

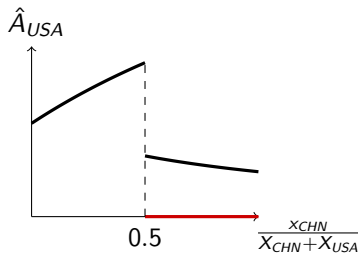
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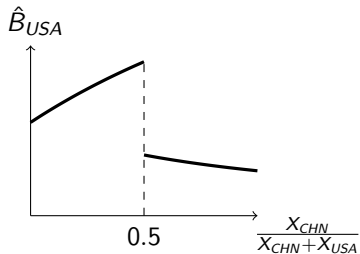


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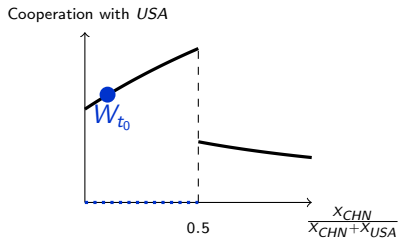
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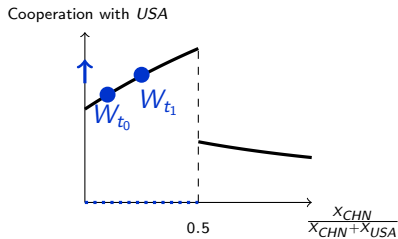
Rise of China $\Rightarrow$ Repolarization



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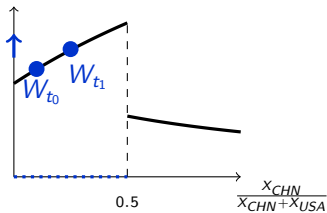
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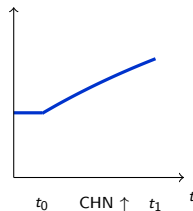
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Cooperation with USA



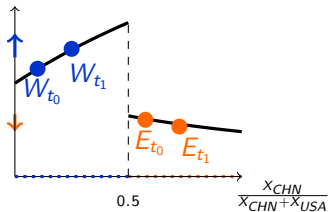
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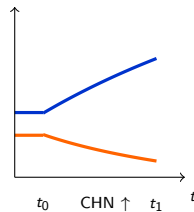
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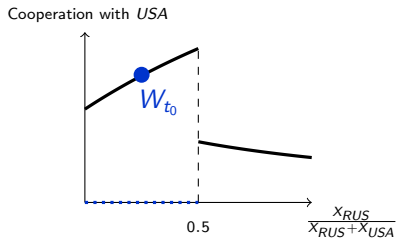
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China's Rise $\rightarrow$ Cooperation Decisions $\rightarrow$ Repolarization

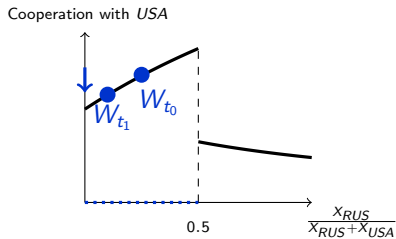
Soviet Fall $\Rightarrow$ Depolarization



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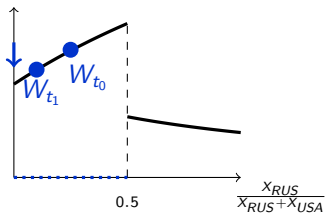
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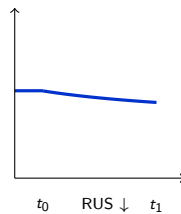
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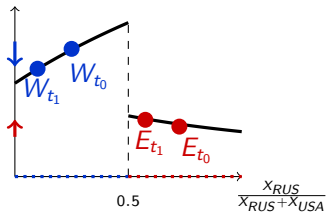
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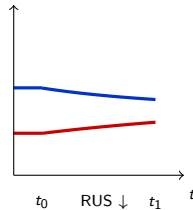
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Soviet fall $\rightarrow$ Alignment Decisions $\rightarrow$ Depolarization

Contribution to the Literature

① What determines a country's alignment with the great powers?

Kleinman,Liu&Redding2022; Waltz1979; Wohlforth&al.2007; Goh2007; Selden2013; Lim&Mukherjee2019; Strating2020; Haacke&Ciorciari2022

- New model rationalizing observed alignment heterogeneity (bandwagoning & balancing);
- New measure of alignment; new stylized facts; successful empirical test.

② How does “power” shape international exchanges?

Hirschman1945 Antràs&PadróiMiquel2011; Dube,Kaplan&Naidu2011; Fuchs&Klann2013; Berger&al.2013; Ambrocio&Hasan2021

- Find complex effects of power distribution; but provide simple way to summarize it

③ How third parties' features affect bilateral exchanges (e.g., gravity models)?

Tinbergen1962; Anderson&vanWincoop2004; Arkolakis,Costinot&Rodriguez-Clare2012; Bergstrand,Egger&Larch2013; Anderson&Yotov2020

- Multilateral resistance not enough. But provide simple way to include these effects.

Relation to Alignment Literature

- Observed alignments often move in **opposite directions**
 - **Example:** typical alignment responses to Soviet rise:
 - **Bandwagoning:** some countries ↓ their US-alignment, “switching” to USSR (e.g., EGY)
 - **(Positive) Balancing:** others ↑ their US-alignment, “balancing” Soviet rise (e.g., PHL)
- We show the optimality of a non-monotonic type of balancing + optimal strategy determines who “bandwagons” vs “balances”

Theory

Managing foreign pressures

Players

- Two types of actors: a “representative” government and multiple foreign powers
 - G , gov't (e.g., EGY, PHL, etc.)
 - $f \in F$, multiple FPs (e.g., USA, RUS, CHN, etc.)
- Heterogeneity: X_f , G 's “exposure” to f (also f “power” over G).
 - Focus on “relative” exposure/power $\rightarrow$ normalization: $x_G + \sum_{f \in F} x_f = 1$

Timing

- ① G offers **alignment** $\mathbf{A} = (A_f)_{f \in F}$, i.e., a costly transfer to each FP
- ② Each FP simultaneously chooses to **support** ($f \in Sup$) or **oppose** ($f \in Opp$) G
- ③ G either **survives** or **fails**, and payoffs are realized
 - If f opposes G , f gets $\bar{U} > 0$ **regardless** of G 's survival
 - If f supports G , f gets A_f **if G survives**, 0 **if G fails**.
- **Assumption:** $Pr(G \text{ FAILS}) = F(\sum_{f \in Opp} x_f)$, where $F(\cdot)$ is increasing

Robust Alignment Strategy

- **Incentive constraint:** f supports G if and only if $A_f[1 - F(\sum_{f \in Opp} x_f)] \geq \bar{U}$
 - f 's decision depends on f 's belief about other FPs' decisions $\Rightarrow$ **multiple equilibria**

Definition: a **robust** alignment strategy A is such that every FP supports the government in every equilibrium consistent with such strategy.

- **Example:** G deals with two FPs (USA and CHN) as follows:
 - G aligns with USA just enough to be supported when G is not opposed by CHN
 - G aligns with CHN just enough to be supported when G is not opposed by USA
 - strategy vulnerable to “**bad equilibria**” $\Rightarrow$ not robust!

Main Result

Characteristics of the Optimal Robust Alignment

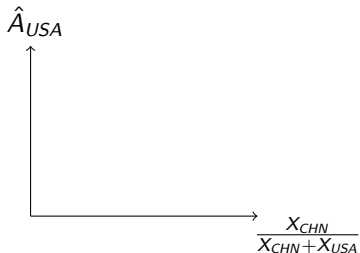
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Theorem: in every optimal robust alignment (ORA), when G obtains the support of FP f then f supports G **even if** G were to be opposed by all FPs **weaker than** f .

Recall: f supports G iff $A_f[1 - F(\sum_{f \in Opp} x_f)] \geq \bar{U}$, **thus:** $A_f \uparrow$ if $\sum_{f \in Opp} x_f \uparrow$

Corollary 1: G 's ORA with f , $\hat{A}_f$, is **non-monotone** in G 's exposure to other FPs.

Example: effect of x_{CHN} on $\hat{A}_{USA}$?



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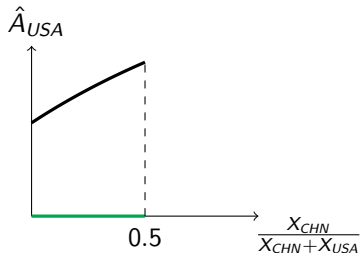
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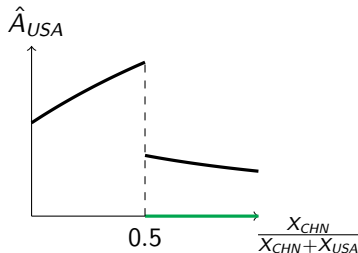
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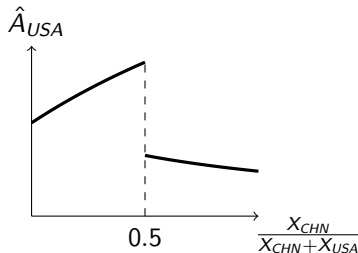
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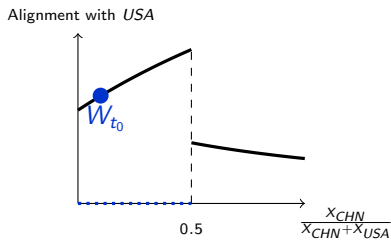
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- determined by **starting conditions!**



Alignment Dynamics

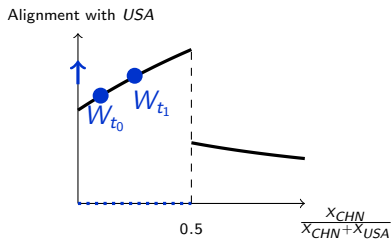
Why alignment decisions can explain geopolitical cycles

Rise of China $\Rightarrow$ Repolarization



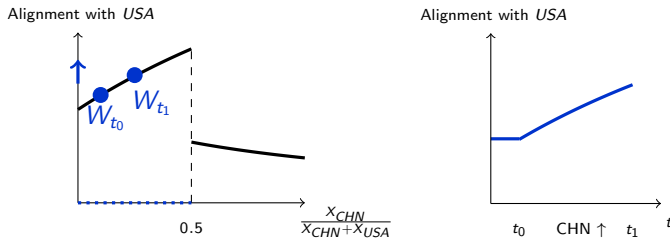
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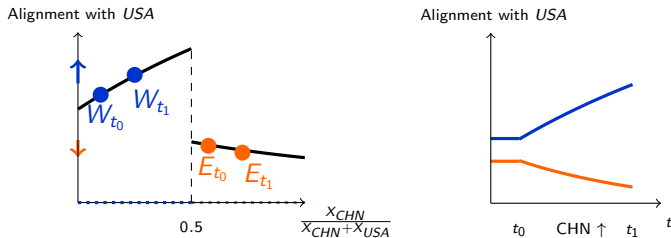
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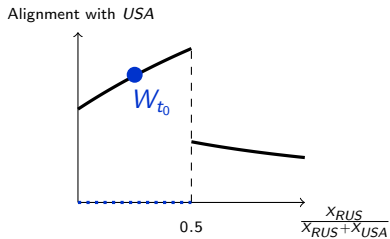
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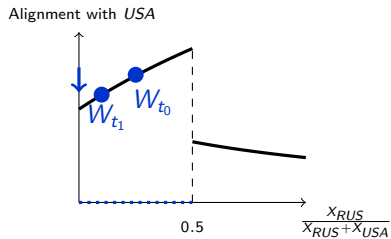
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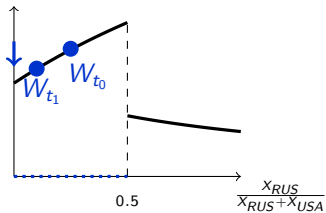
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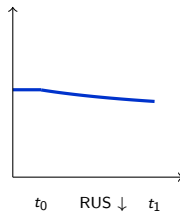
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Alignment with USA



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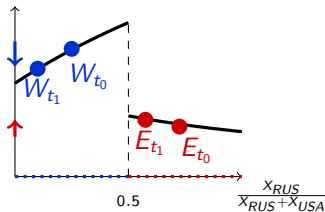


Effect of *Soviet fall* ($x_{RUS} \downarrow$ between t_0 and t_1) on alignment with USA.

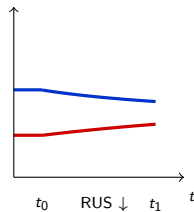
In blue countries where $x_{USA} > x_{RUS}$ in t_0 .

Soviet Fall $\Rightarrow$ Depolarization

Alignment with USA



Alignment with USA



Effect of Soviet fall ($x_{RUS} \downarrow$ between t_0 and t_1) on alignment with USA.
 In blue (red) countries where $X_{USA} > X_{RUS}$ in t_0 ($X_{USA} < X_{RUS}$ in t_0).

Soviet fall $\rightarrow$ Alignment Decisions $\rightarrow$ Depolarization

Empirics

Data and Empirical Analysis

- Cooperation choices are public and typically **make the news**



Turkey moves closer to Moscow

Tuesday 23 August 2022 /// No Comments

Moscow and Ankara strengthen their collaboration in the energy sector. Thus, Turkey seems to be taking advantage of the current energy crisis. The country's refineries

[Lire la suite »](#)

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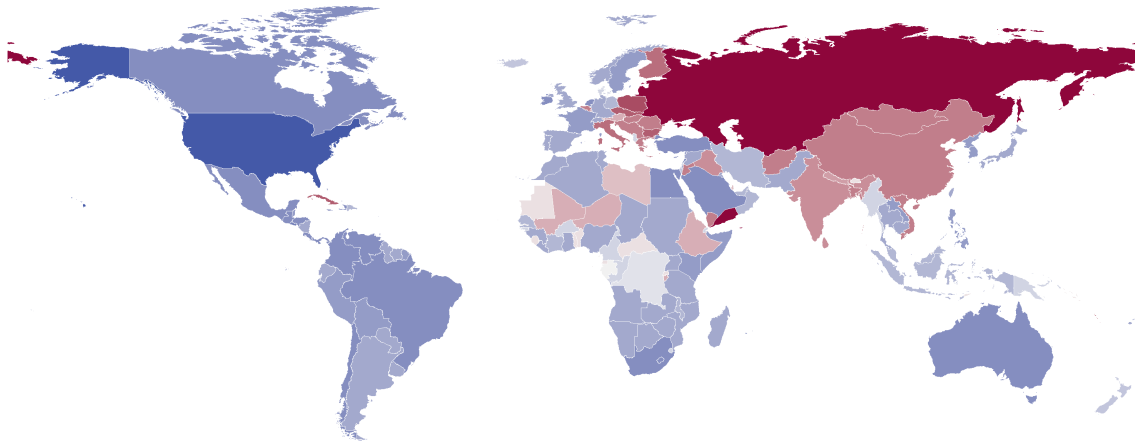
[Lire la suite »](#)

- **Source:** *GDELT* processes articles from several news agencies generating a **global bilateral dataset (1979-2013)** recording multiple types of interactions and events

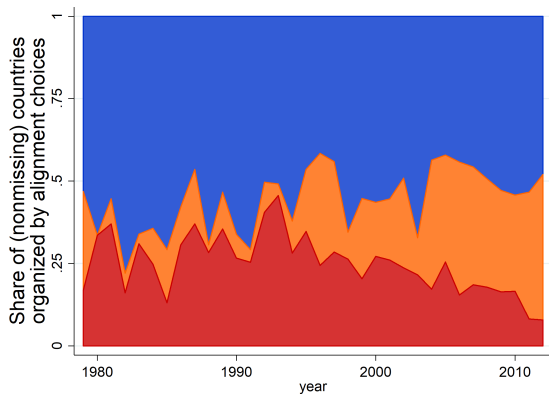
Definition: we measure **cooperation** of country G towards country f as the number of times over year t in which G **pledged to or expanded its cooperation** with f

Data Validation

Mapping the Cold War and China's Rise



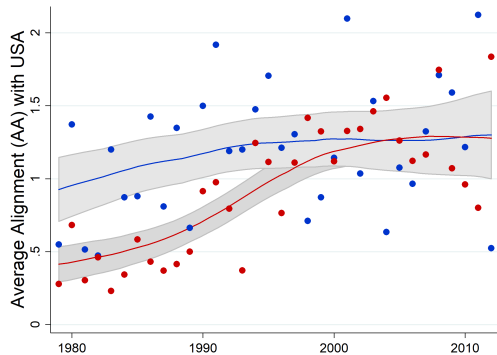
Mapping the Cold War: map of the difference between each country's alignment with USA and with RUS between 1978 and 1989. Countries in blue (red) are more (less) aligned with USA than with RUS. Darker shades represent larger absolute values. USA (RUS) colored dark blue (red).



China's rise: each area represents the share of countries aligning more with **USA**, **RUS**, or **CHN**.

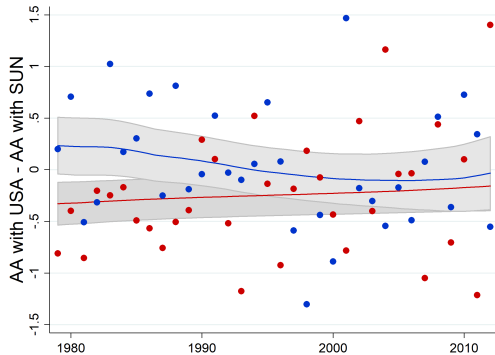
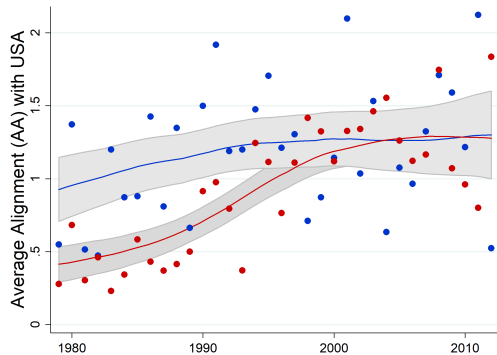
Suggestive Evidence

Fall of USSR and China's Rise



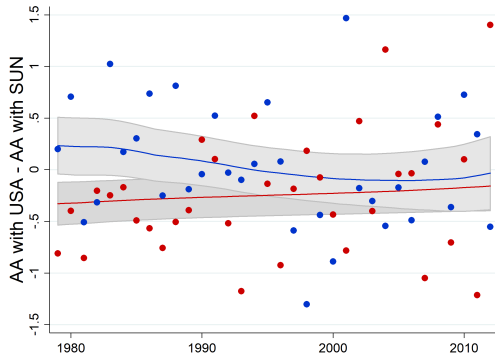
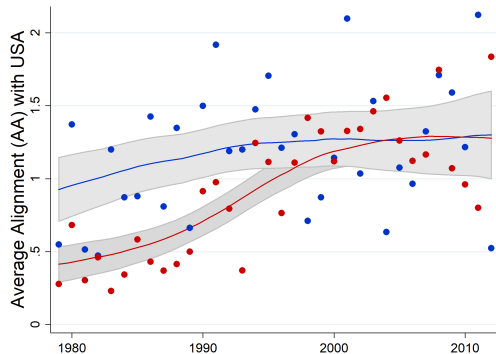
Blue for **USA "friends"** (Western Europe). Red for **RUS "friends"** (Eastern Europe).

Each line is the local polynomial fit of the relevant variable; 95% CI in gray.



Blue for USA "friends" (Western Europe). Red for RUS "friends" (Eastern Europe).

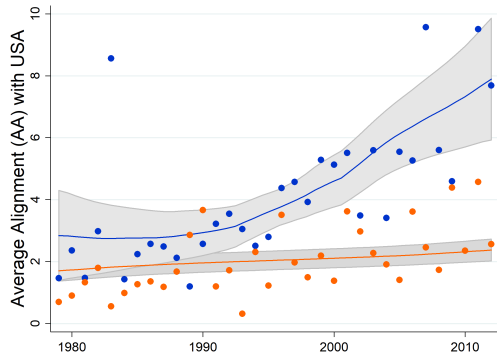
Each line is the local polynomial fit of the relevant variable; 95% CI in gray.



Blue for **USA "friends"** (Western Europe). Red for **RUS "friends"** (Eastern Europe).

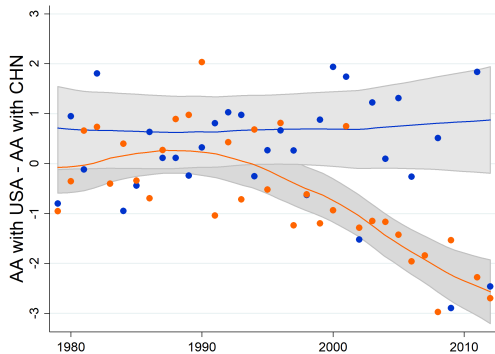
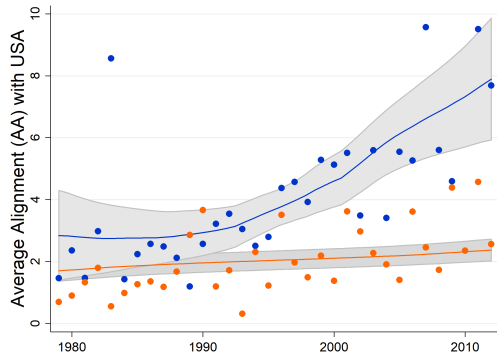
Each line is the local polynomial fit of the relevant variable; 95% CI in gray.

Soviet falls $\Rightarrow$ Depolarization: alignment with the USA from **USA friends** and from **RUS friends** converged (left figure) and distinctions between the two "blocs" decreased (right figure).



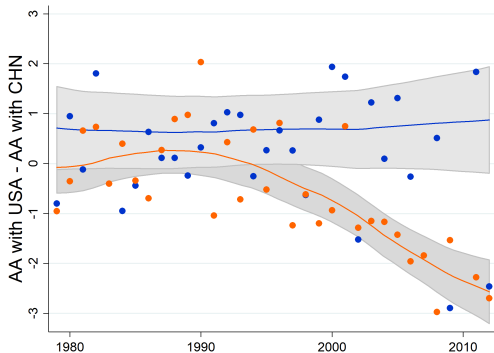
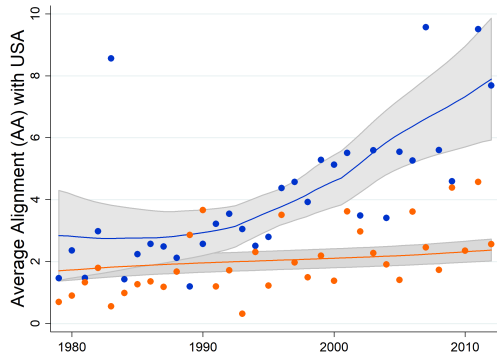
Blue for **USA "friends"** (e.g., AUS, PHL, KOR, JPN). Red for **CHN "friends"** (e.g., RUS, MNG, PRK, KAZ).

Each line is the local polynomial fit of the relevant variable; 95% CI in gray.



Blue for USA "friends" (e.g., AUS, IND, PHL, KOR, JPN). Red for CHN "friends" (e.g., RUS, PAK, MNG, PRK, KAZ).

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Each line is the local polynomial fit of the relevant variable; 95% CI in gray.

China rises $\Rightarrow$ Repolarization: alignment with the USA from USA friends and CHN friends diverged (left figure) and distinctions between the two "blocs" increased (right figure).

Empirical Strategy: Soviet Fall

Testing for Alignment Depolarization

Empirical Strategy: Soviet Fall 1/2

Gravity Benchmark: $\ln(A_{G,US,t}) = \Gamma' \mathbf{O}_{G,US,t} + \varepsilon_{G,US,t}$

$\mathbf{O}_{G,f,t}$: bilateral Trade, bilateral FE, year FE, GDP, GDP p.c., and Pop of both G and US

Gravity Benchmark (Alignment with US)	$t \leq 1988$	$t' \in [1989, 1993]$
$X_{G,US} > X_{G,RU}$	$\Gamma' \mathbf{O}_{G,US,t}$	$\Gamma' \mathbf{O}_{G,US,t'}$
$X_{G',US} < X_{G',RU}$	$\Gamma' \mathbf{O}_{G',US,t}$	$\Gamma' \mathbf{O}_{G',US,t'}$

- From our model: even controlling for $\Gamma' \mathbf{O}_{G,US,t}$, **Soviet fall** has different effect on countries more exposed to US than RU compared to other countries

Empirical Strategy: Soviet Fall 2/2

- Depolarization Hypothesis: with Soviet fall, countries more exposed to US than RU **reduce** their alignment with US compared to **other countries**

Augmented model (Alignment with US)	$t \leq 1988$	$t' \in [1989, 1993]$
$X_{G,US} > X_{G,RU}$	$\Gamma' \mathbf{O}_{G,US,t} + \alpha_{MTR}$	$\Gamma' \mathbf{O}_{G,US,t'} + \alpha_{MTR} + \alpha_{t'} + \alpha_{MTR} \times \alpha_{t'}$
$X_{G',US} < X_{G',RU}$	$\Gamma' \mathbf{O}_{G',US,t}$	$\Gamma' \mathbf{O}_{G',US,t'} + \alpha_{t'}$

$$\ln(A_{G,US,t}) = \beta_{RU} \times \mathbb{1}\{X_{G,US} > X_{G,RU}\} \times \mathbb{1}\{89 \leq t \leq 93\} + \Gamma' \mathbf{O}_{G,US,t} + \varepsilon_{G,US,t}$$

Empirical Strategy: Soviet Fall 2/2

- Depolarization Hypothesis: with Soviet fall, countries more exposed to US than RU **reduce** their alignment with US compared to other countries

Augmented model (Alignment with US)	$t \leq 1988$	$t' \in [1989, 1993]$
$X_{G,US} > X_{G,RU}$	$\Gamma' \mathbf{O}_{G,US,t} + \alpha_{MTR}$	$\Gamma' \mathbf{O}_{G,US,t'} + \alpha_{MTR} + \alpha_{t'} + \alpha_{MTR} \times \alpha_{t'}$
$X_{G',US} < X_{G',RU}$	$\Gamma' \mathbf{O}_{G',US,t}$	$\Gamma' \mathbf{O}_{G',US,t'} + \alpha_{t'}$

$$\ln(A_{G,US,t}) = \beta_{RU} \times \mathbb{1}\{X_{G,US} > X_{G,RU}\} \times \mathbb{1}\{89 \leq t \leq 93\} + \Gamma' \mathbf{O}_{G,US,t} + \varepsilon_{G,US,t}$$

Test: Soviet fall leads to **depolarization** $\Rightarrow \alpha_{MTR} \times \alpha_{t'} < 0 \Rightarrow \beta_{RU} < 0$

Empirical Strategy: China's Rise

Testing for Alignment Repolarization

China's Rise: Empirical Strategy

- Repolarization Hypothesis: with China's rise, countries more exposed to US than CN increase their alignment with US compared to other countries

Augmented model (Alignment with US)	$t \leq 2001$	$t' > 2001$
$X_{G,US} > X_{G,CN}$	$\Gamma' \mathbf{O}_{G,US,t} + \alpha_{MTC}$	$\Gamma' \mathbf{O}_{G,US,t'} + \alpha_{MTC} + \alpha_{t'} + \alpha_{MTC} \times \alpha_{t'}$
$X_{G',US} < X_{G',CN}$	$\Gamma' \mathbf{O}_{G',US,t}$	$\Gamma' \mathbf{O}_{G',US,t'} + \alpha_{t'}$

$$\ln(A_{G,US,t}) = \beta_{CN} \times \mathbb{1}\{X_{G,US} > X_{G,CN}\} \times \mathbb{1}\{t > 2001\} + \Gamma' \mathbf{O}_{G,US,t} + \varepsilon_{G,US,t}$$

Prediction: China's rise leads to **repolarization** $\Rightarrow \alpha_{MTC} \times \alpha_{t'} > 0 \Rightarrow \beta_{CN} > 0$

Empirical Analysis

Regression Tables

	$\ln(\tilde{Y}_{USA,d,t})$		$\ln(\tilde{Y}_{USA,d,t}) - \ln(\tilde{Y}_{-f,d,t})$	
	(1)	(2)	(3)	(4)
Panel A: fall of USSR				
SOI_{USA}^{1989} vs SOI_{RUS}^{1989}	-0.90*** [0.047]	-0.87*** [0.046]	-1.20*** [0.077]	-1.23*** [0.077]
Benchmark (pre-1989 gap)	0.96	0.96	2.55	2.55
Observations	3,655	3,655	2,667	2,667
Panel B: rise of China				
SOI_{USA}^{2001} vs SOI_{CHN}^{2001}	0.93*** [0.042]	0.88*** [0.038]	0.99*** [0.039]	1.01*** [0.045]
Benchmark (post-2001 gap)	0.77	0.77	1.21	1.21
Observations	4,879	4,879	4,148	4,148

	$\ln(Y_{f,d,t})$		$\ln(Y_{f,d,t}) - \ln(Y_{-f,d,t})$	
	(1)	(2)	(3)	(4)
Panel A: fall of USSR				
SOI_f^{1989} vs SOI_{RUS}^{1989}	-0.41*** [0.026]	-0.40*** [0.024]	-0.97*** [0.035]	-0.98*** [0.035]
Benchmark (pre-1989 gap)	0.61	0.61	1.62	1.62
Observations	169,283	169,283	148,016	148,016
Panel B: rise of China				
SOI_f^{2001} vs SOI_{CHN}^{2001}	0.72*** [0.038]	0.66*** [0.037]	1.30*** [0.039]	1.32*** [0.039]
Benchmark (post-2001 gap)	1.46	1.46	3.24	3.24
Observations	235,709	235,709	221,134	221,134

More Restrictive Tests

Leveraging Bilateral Data

Leveraging Bilateral Data

- Restrictive benchmark: add Country $\times$ Year and FP $\times$ Year fixed effects:

$$\ln(A_{G,f,t}) = \alpha_{Gt} + \alpha_{ft} + \Gamma' \mathbf{O}_{G,f,t} + \varepsilon_{G,f,t}$$

Augmented model (Alignment with f) (Note: $\Gamma' \mathbf{O}_{G,f,t}$ suppressed)	$t \leq 1988$	$t' \in [1989, 1993]$
$X_{G,f} > X_{G,RU}$	$\alpha_{ft} + \alpha_{Gt} + \alpha_{MTR}$	$\alpha_{ft'} + \alpha_{Gt'} + \alpha_{MTR} + \alpha_{MTR} \times \alpha_{t'}$
$X_{G',RU} < X_{G',f}$	$\alpha_{ft} + \alpha_{G',t}$	$\alpha_{f,t'} + \alpha_{G',t'}$
$X_{G,f'} > X_{G,RU}$	$\alpha_{f't} + \alpha_{Gt} + \alpha_{MTR}$	$\alpha_{f't'} + \alpha_{Gt'} + \alpha_{MTR} + \alpha_{MTR} \times \alpha_{t'}$

A More Restrictive Test

- **Idea:** α_{Gt} and α_{ft} account for **time-varying unobserved country-characteristics** that might drive depolarization/repolarization results
 - **Examples:** unrest, political uncertainty, media attention, prevailing ideology, etc.

$$\ln(A_{G,f,t}) = \beta_{RU} \times \mathbb{1}\{X_{G,f} > X_{G,RU}\} \times \mathbb{1}\{t \in [1989, 1993]\} + \\ + \alpha_{Gt} + \alpha_{ft} + \Gamma' O_{G,f,t} + \varepsilon_{G,f,t}$$

Test: Soviet fall leads to **depolarization** $\Rightarrow \beta_{RU} < 0$

- **Robustness:** make tests more restrictive *saturating* the benchmark
 - Add: aid sent by FP f , FP $\times$ Year $\times$ Region FE, lagged outcome, $\ln(A_{f,G,t})$

Future Directions

- When do countries remain **non-aligned**?
- What if governments can actively **change their exposure** to the various FPs?
- What if alignment is **zero-sum** (e.g., ideology, military bases, etc.)?
- What if (in the empirical part) we allow countries to **switch blocs**?