

Alliance Participation and Military Spending

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How does alliance participation affect military spending?

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2. I find strong alliance commitments *increase* military spending in non-major powers and *do not impact* spending in major powers.
3. So I consider two alternative arguments.

Current policy debates emphasize low defense spending by alliance members.

These debates lack theoretical and empirical context: do most alliances lead to reduced defense spending?

Scholarly Importance: Part 1

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- **Foreign Entanglement**- Alliance participation increases military spending.

Mixed Empirical Results

	Decrease	Increase	Null
Most & Siverson 1987			X
Conybeare 1994	X		
Diehl 1994		X	
Goldsmith 2003			X
Morgan & Palmer 2006		X	
Quiroz-Flores 2011		X	
Digiuseppe & Poast 2016	X		
Horowitz et al 2017		X	

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3. Alternative Arguments

Initial Expectations

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- Small states depend on larger partners, and sacrifice autonomy for security.
- Large states provide security, and gain autonomy.

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Strong/reliable alliance commitments $\uparrow \text{Pr}(\text{Support})$

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- Small states rely more on their allies.
- Large states increase spending to cover junior partners.

HYPOTHESIS 1: *Unconditional alliance participation will be associated with increases in defense spending by major powers.*

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HYPOTHESIS 2: *Unconditional alliance participation will be associated with decreases in defense spending by non-major powers.*

Empirical Analysis

1. **Key Independent Variable:** Binary indicator of Unconditional Alliance.

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2. **Base Category:** States with alliances that do not offer military support, and states with no alliances.
3. **Dependent Variable:** $\ln(\text{Military Spending})$
4. **Estimator:** Robust Regression.

- **Sample:** All states: 1816-2007.

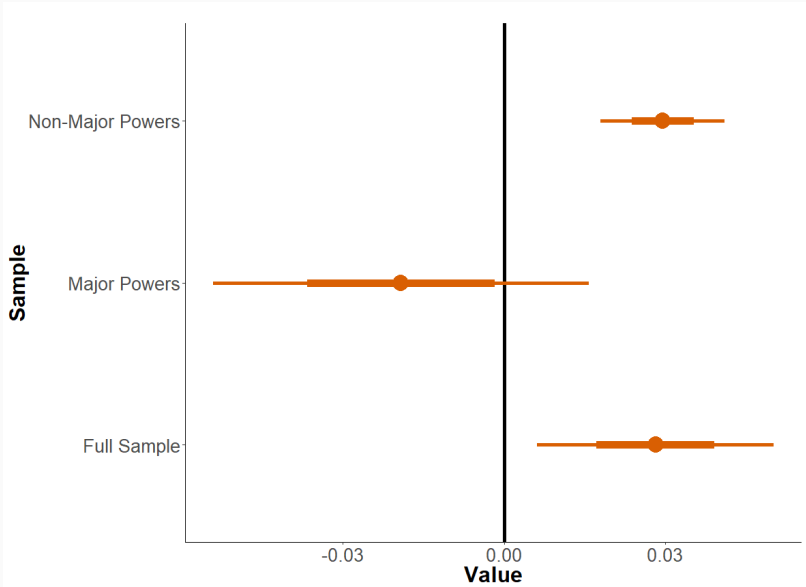
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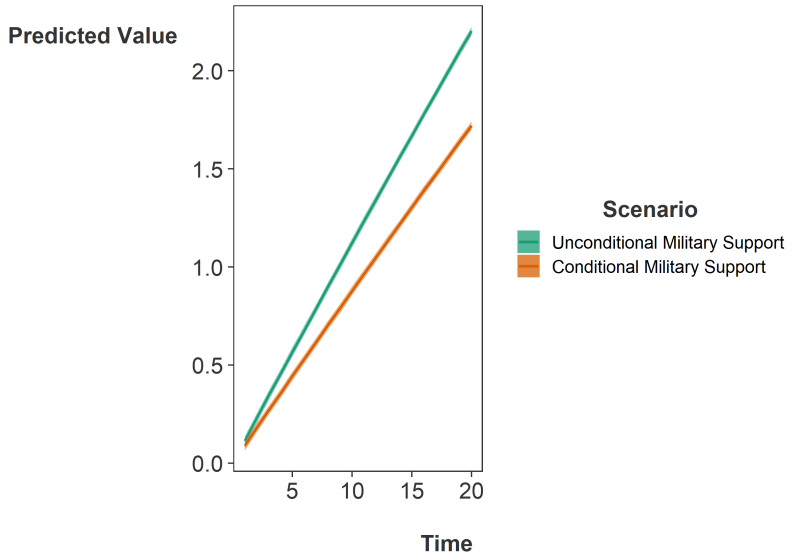
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- Lagged DV
- **Controls:** Conditional Military Support, Interstate war, Civil War, Annual MIDs, GDP, POLITY, Cold War, Major Power, Rival military expenditures, $\ln(\text{ally expend})$, Average Alliance Size, Avg Democracy Among Allies.

Results

Impact of Unconditional Military Support on Military Spending



Dynamic Simulation



1. OLS.
2. FGLS.
3. Fixed Effects with Changes in Military Spending.
4. Selection Models: Alliance Participants as Estimation Sample.
5. Multilevel Model with separate alliance-level regression.

Alternative Arguments

(1) Value to Non-Major Powers

Strong commitments produce greater foreign policy gains.

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As a consequence, states are more willing to take costly actions to maintain the agreement.



Signal ongoing commitment through sunk costs.

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Smaller alliance partners increase military spending to signal ongoing commitment.

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- Only form strong commitments with the expectation smaller partners will make significant contributions.
- Small states lose so much autonomy they must increase military spending.

Distinguishing Between Alternatives

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1. Coercion: Smaller partner sacrifice autonomy on a range of other issues.
2. Strong commitments reflect more hierarchical governance by larger partners.

Discussion and Conclusion

Limitations:

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2. Alliances as military coalitions.

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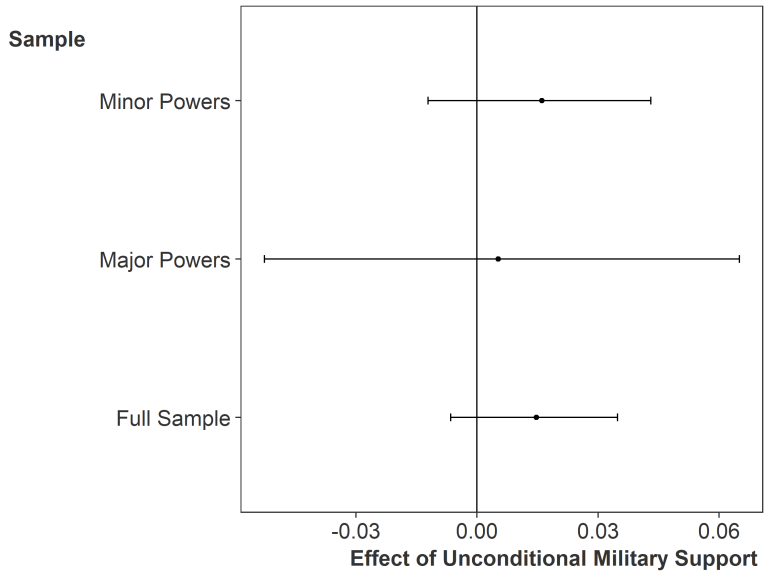
Next Steps:

- Developing alternative arguments and considering when alliances decrease spending.
- More general measure of alliance treaty strength.
- Alternatives to major/non-major split.

Regression Table

	Full Sample	Major Powers	Minor Powers
Unconditional Mil. Sup.	0.03*	−0.02	0.03*
	[0.01; 0.05]	[−0.06; 0.03]	[0.01; 0.06]
Conditional Mil. Sup.	0.01	−0.00	0.01
	[−0.01; 0.03]	[−0.04; 0.04]	[−0.02; 0.03]
Lag ln(Mil. Ex.)	1.00*	1.00*	1.00*
	[0.99; 1.00]	[0.99; 1.01]	[0.99; 1.00]
At War	0.10*	0.11*	0.09*
	[0.08; 0.12]	[0.09; 0.14]	[0.06; 0.11]
Civil War Part.	0.01	0.01	0.01
	[−0.00; 0.02]	[−0.02; 0.04]	[−0.00; 0.03]
Polity	0.00	−0.00*	0.00
	[−0.00; 0.00]	[−0.01; −0.00]	[−0.00; 0.00]
ln(GDP)	0.00	0.02*	0.00
	[−0.00; 0.00]	[0.00; 0.03]	[−0.00; 0.00]
Major Power	−0.03*		
	[−0.04; −0.01]		
External Threat	0.04*	0.07*	0.04*
	[0.02; 0.07]	[0.01; 0.12]	[0.02; 0.07]
Cold War	0.04*	0.00	0.05*
	[0.04; 0.05]	[−0.02; 0.03]	[0.04; 0.06]
Avg Alliance Size	0.00	0.00	0.00
	[−0.00; 0.00]	[−0.00; 0.00]	[−0.00; 0.00]
ln(Allied Spending)	−0.00	−0.00	−0.00
	[−0.00; 0.00]	[−0.01; 0.01]	[−0.01; 0.00]
Avg Alliance Dem.	0.00	0.00*	0.00
	[−0.00; 0.00]	[0.00; 0.01]	[−0.00; 0.00]
Constant	0.04*	−0.44*	0.05*
	[0.01; 0.07]	[−0.76; −0.13]	[0.01; 0.08]
Num. obs.	9461	916	8545

ML Model Results



Priors

$$p(\alpha) \sim N(0, 3)$$

$$p(\sigma) \sim \text{half-}N(0, 1)$$

$$p(\alpha^{yr}) \sim N(0, \sigma^{yr})$$

$$p(\sigma^{yr}) \sim N(0, 1)$$

$$p(\alpha^{st}) \sim N(0, \sigma^{st})$$

$$p(\sigma^{st}) \sim \text{half-}N(0, 1)$$

$$p(\sigma^{all}) \sim \text{half-}N(0, 1)$$

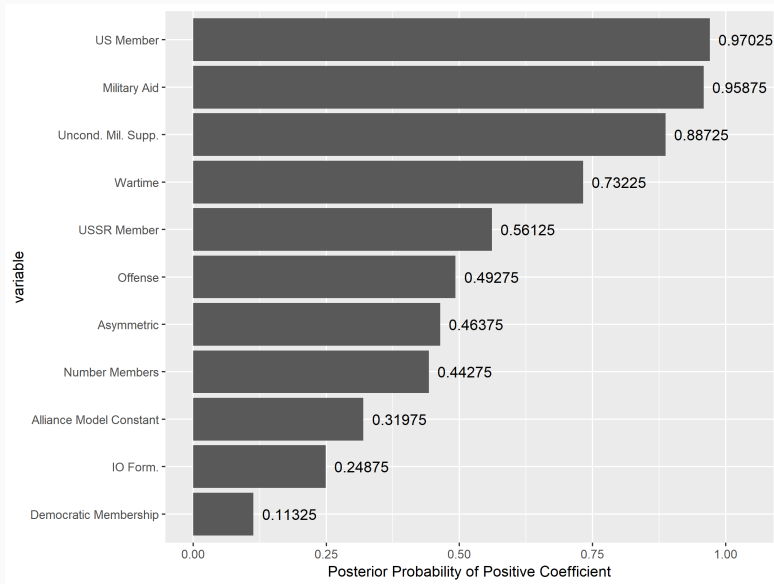
$$p(\eta) \sim \text{half-}N(0, 1)$$

$$p(\beta) \sim N(0, 1)$$

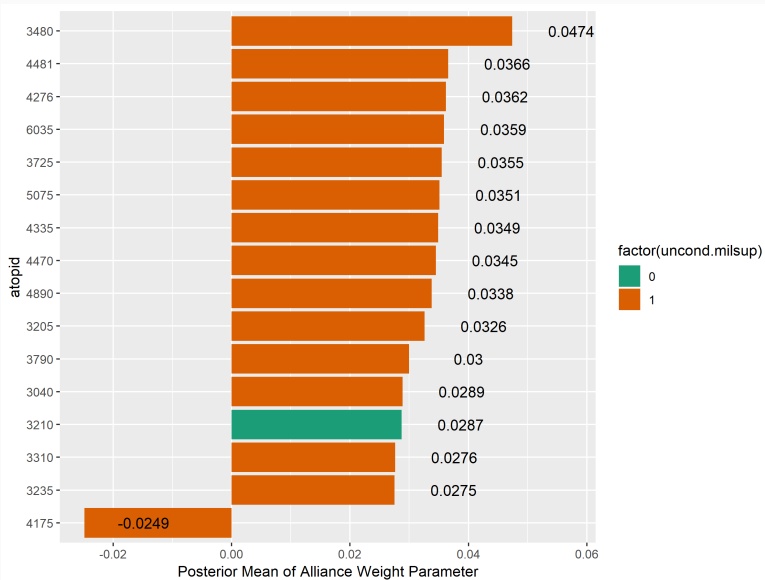
$$p(\gamma) \sim N(0, 1)$$

$$p(\nu) \sim \text{gamma}(2, 0.1)$$

Positive Posterior Probability of all Coefficients



Non-zero alliances



Violin Plot of Mean λ for all alliances

