Military Spending and Democratisation

Historical Analysis for Defence and Security Symposium

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Outline

- Motivation for studying military expenditure
- Problems with studying military expenditure
- Overview of the literature on determinants of military expenditure
- Discussion of relationship between military expenditure and regime type
- Testing for reverse causality
  - Motivation
  - Theory
  - Analysis
- Conclusion

Motivation: Why study military expenditures?

- Military expenditures:
  - impact on a countries economy;
  - tell us about governments priorities;
  - indicate how a country views the various security threats and challenges it may face;
  - give a rough indication of the relative level of military capability or power of different countries

Problems with Studying Military Expenditure

- Military expenditure data is notoriously inaccurate!
- Problems include:
  - Reliability;
  - Comparability;
  - Validity.

Overview of the Literature

- Determinants of military expenditures can be grouped into three categories:
  - Resources: GDP, natural resource rents
    - Brauner and Perlo-Freeman (work in progress)
  - External factors: conflict, potential threat, alliances
    - Rosh (1988)
    - Dunne, Perlo-Freeman and Smith (2009)
    - Nordhaus, Oneal, Russett (2009)
  - Internal factors: regime type
    - Fordham (2005)

Military Expenditures and Regime Type

- Key finding: democracies spend less than autocracies on the military (as a percentage of GDP).
- Possible reasons:
  - Democratic leaders are accountable to the broader public who prioritize social spending over spending on the military;
  - Democracies are less likely to go to war;
  - Autocracies require the military for internal repression.

Causality

- However, causality may run the other way!
- The military is a force that has the power to severely undermine democracy.
- Examples:
  - Egypt
  - Latin America
  - Interesting counter-example: Turkey
- According to Huntington (1995), there have been somewhere between 30 and 40 coup attempts against newly democratic governments.

Motivation

- Understanding democratic transition and consolidation is paramount!
- Arab Spring
- According to Reich (2002), the 20th century witnessed 58 transitions towards more authoritarian forms of government (40% of all transitions).

Motivation

Transitions Matrix

		After							
		Authoritarian		Semi-democratic		Democratic		Total	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
Before	Authoritarian	1972	96.15	44	2.15	35	1.71	2051	100
	Semi-democratic	29	7.55	346	90.1	9	2.34	384	100
	Democratic	24	1.79	5	0.37	1309	97.83	1338	100
	total	2025	53.67	395	10.47	1353	35.86	3773	100

Theory

- Hypothesis: Countries, in which the military was politically powerful before democratic transition occurred, are less likely to consolidate democracy.

Theory

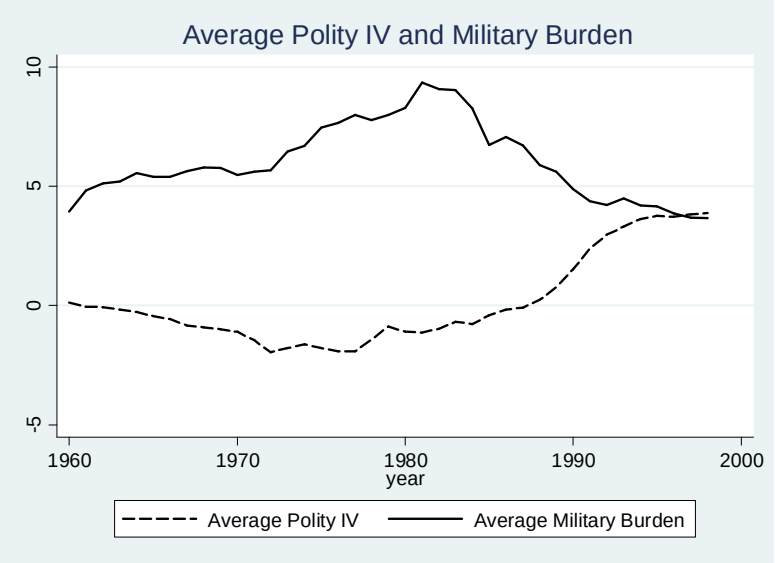
- Acemoglu, D, Ticchi, D and Vindigni, A (2010), "A Theory of Military Dictatorships," *American Economic Journal*: *Macroeconomics*, 2(1), 1−42:

  "If the elite create a powerful military to prevent democratization, then the military also plays an important role in democratic politics until it is reformed, and such reform is not instantaneous. In particular, we show that faced with a powerful military, a newly-emerging democratic regime will either need to make costly concessions or face a high probability of a coup. This coup threat disappears once the military is reformed. Interestingly however, it is the anticipation that the military will be reformed as soon as the opportunity arises that makes it difficult to control the military during the early phases of a democratic regime - because this creates a commitment problem, making it impossible for democratic governments to make credible promises to compensate soldiers for not taking actions against democracy".

Analysis

Summary Statistics for Military Burden by Regime Type

PRC	Obs	Mean	Std Dev
autocracy	1,763	8.202043	14.06533
semi	389	4.631678	3.472358
democracy	1,357	3.595313	3.33132



Analysis: Pooled OLS, Fixed Effects

- Pooled OLS

$$PolityIV_{it} = \alpha + \beta_1 log\ Military\ Burden_{it-1} + \beta_2 log\ GDP\ per\ capita_{it-1} + u_{it}$$

- Fixed Effects

$$PolityIV_{it} = \alpha_i + \alpha_t + \beta_1 log\ Military\ Burden_{it-1} + \beta_2 log\ GDP\ per\ capita_{it-1} + u_{it}$$

- Specification is based on Acemoglu, Johnson, Robinson, and Yared (2008), "Income and Democracy", *American Economic Review*, 91, 808-42.

Analysis: Pooled OLS, Fixed Effects

Estimation Results: Pooled OLS, one-way, two-way fixed effects

		One-way	Two-way
Dep. vbl. is Polity IV	Pooled OLS	Fixed Effects	Fixed Effects
Log military	-.8700267**	-.774753**	-.3638741
$burden_{t-1}$	(.3792644)	(.3602042)	(.304044)
Log GDP pc_{t-1}	2.867411***	1.454207	-1.13584
	(.2419076)	(.977842)	(.9096871)
constant	-19.45061***	-9.145012	7.880659
	(1.918854)	(7.126586)	(6.504634)
fixed effects	no	yes	yes
year dummies	no	no	yes
Obs	3387	3387	3387
Groups	102	102	102
R^2 within		0.0218	0.2167
R^2 between		0.5166	0.3641
R^2 overall	0.3834	0.3760	0.0456

robust standard errors in (),*** p<0.01, ** p<0.05, * p<0.1

Analysis: ECM

- ECM

  $\Delta PolityIV_{it} = \alpha_i + \alpha_t + \beta_1 \Delta log\ military\ burden_{it-1} + \lambda(\theta military\ burden_{it-1} - PolityIV_{it-1}) + u_{it}$

  where λ is the adjustment parameter, which tells us the speed at which the dependent variable converges to its equilibrium value, θ.

- In practice, we estimate

  $\Delta PolityIV_{it} = \alpha_i + \alpha_t + \beta_1 \Delta log\ military\ burden_{it-1} + \beta_2 logGDP\ per\ capita_{it1} + \gamma_1 PolityIV_{it-1} - \gamma_2 log\ military\ burden_{it-1} + \gamma_3 logGDP\ per\ capita_{it1} + u_{it}$

  and recover $\lambda = -\gamma_1$; $\theta_1 = \gamma_2 / -\gamma_1$ and $\theta_2 = \gamma_3 / -\gamma_1$.

Analysis: ECM

Estimation Results: ECM

Dep. vbl. is Polity IV	Pooled OLS	One-way Fixed Effects	Two-way Fixed Effects
Δ log military burden	-0.3358024***	-0.3396909***	-0.2650571**
	(0.1099032)	(0.1229838)	(0.1115515)
Δ log GDP pc	-1.830771***	-1.913841**	-1.550788*
	(0.7358606)	(0.8521507)	(0.8407329)
Polity IV_{t-1}	-.0509492***	-0.1031674***	-0.1329156***
	(0.0065885)	(0.0124677)	(0.0137859)
Log military $burden_{t-1}$	-0.0396526	-0.1136064	-0.1195782
	(0.035852)	(0.086592)	(0.0775714)
Log GDP $per\ capita_{t-1}$	0.1436725***	0.3709243**	-0.2596793
	(0.0316583)	(0.1713859)	(0.1748132)
constant	-0.8423177***	-2.398595*	1.705422
	(0.2437426)	(1.263288)	(1.393555)
fixed effects	no	yes	yes
year dummies	no	no	yes
Obs	3369	3369	3369
Groups	n/a	101	101
R^2 within		0.0538	0.0952
R^2 between		0	0.0722
R^2 overal	0.0302	0.0273	0.0246

robust standard errors in (), *** p<0.01, ** p<0.05, * p<0.1

Analysis: Ordered Probit

- The specification for the ordered probit is based on Epstein, Bates, Goldstone, Kristensen, O'Halloran, (2006), "*Democratic Transitions*", *American Journal of Political Science*, 50(3), 551-569.
- They define PRC0* and PRC1* as in the table and interact them with the explanatory variables. This makes it possible to test whether the effect of the explanatory variables on democracy depends on whether the country was initially an autocracy, semi-democracy or democracy.

	Autocracy	Semi-democracy	Democracy
PRC0*	1	0	0
PRC1*	1	1	0

Analysis: Ordered Probit

- $PRC_{it} = \beta_1 PRC0_{it-1} + \beta_2 PRC1_{it-1} + \beta_3\ log\ burden_{it-1} + \beta_4 log\ burden_{it-1} * PRC0_{it-1} + \beta_5 log\ burden_{it-1} * PRC1_{it-1} + \beta_6 log\ GDPpc_{it-1} + \beta_7 log\ GDPpc_{it-1} * PRC0_{it-1} + \beta_8 log\ GDPpc_{it-1} * PRC1_{it-1} + u_{it}$

- For example, if the interaction between PRC0* and military burden is significant, this means that military burden has a different effect on the level of democracy if the regime is autocratic in the previous period, as opposed to partially or fully democratic.

Analysis: Ordered Probit

Estimation Results: Ordered Probit

Dep. vbl. is PRC	1	2
PRC_0*_{t-1}	-2.271157***	-2.2356***
	(0.4596298)	(0.0812)
PRC_1*_{t-1}	1.178199**	1.1495**
	(0.5685541)	(0.5099)
	0.0875135	0.0875
Log military burden$_{t-1}$	(0.0816755)	(0.0817)
Log military burden$_{t-1}$	-0.0687499	
$*PRC_0*_{t-1}$	(0.0634705)	
Log military burden$_{t-1}$	-0.1092603	-0.152*
$*PRC_1*_{t-1}$	(0.0957813)	(0.0874)
Log GDP pc$_{t-1}$	0.5317526***	0.5318***
	(0.0653119)	(0.0653)
	0.0175953	
Log GDP pc$_{t-1}$*PRC$_0$*$_{t-1}$	(0.0655847)	
Log GDP pc$_{t-1}$*PRC$_1$*$_{t-1}$	-0.4945226***	-0.4831***
	(0.0814674)	(0.0729)
cut1	0.7629806	0.7625
	(0.4530765)	(0.4531)
cut2	2.20789	2.2083
	(0.4524896)	(0.4525)
Obs	3376	3376

cluster-robust standard errors in (),*** p<0.01, ** p<0.05, * p<0.1

Preliminary Conclusions

- Some evidence for a small negative effect of military expenditure on democracy.

Granger Causality

- To test for Granger causality, estimate
  - $y_{it} = \alpha_i + \alpha_t + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \gamma_1 x_{t-1} + \gamma_2 x_{t-2} + \delta_1 z_{t-1} + \delta_2 z_{t-2} + u_{it}$
- X is said to Granger cause y, if, using an F-test, one can reject the hypothesis that the s are jointly equal to zero.

Granger Causality

	one-way fixed effects		
Dependent variable	**Independent variable**		
	ΔPolity IV$_{t-1}$	Δlog military burden$_{t-1}$	Δlog GDP pc$_{t-1}$
Δ Polity IV	0.0521437**	-0.0902786	-2.0076***
	(0.0275619)	(0.0749433)	(0.6369277)
Δ log military burden	-0.0054456**	-0.0198812	0.1829407
	(0.0024562)	(0.0253163)	(0.1472277)
Δ log GDP per capita	-0.0003324	0.0054229	0.2135931***
	(0.0005566)	(0.00339270)	(0.0555823)
	two-way fixed effects		
Dependent variable	**Independent variable**		
	ΔPolity IV$_{t-1}$	Δlog military burden$_{t-1}$	Δlog GDP pc$_{t-1}$
Δ Polity IV	0.0402572	-0.0357829	-1.449538**
	(0.0283176)	(0.075798)	(0.6865386)
Δ log military burden	-0.0045916*	-0.0374977	0.0386608
	(0.0025634)	(0.0276676)	(0.1419109)
Δ log GDP per capita	0.0000518	0.002897	0.1850338***
	(0.0005476)	(0.0034375)	(0.0561312)

Conclusion

- Some evidence that military spending affects democracy; however, these results are likely biased by the fact that democracy is endogenous.
- Contribution to the determinants of milex literature: Democracy Granger causes military expenditure.