Measuring Arms: Introducing the Global Military Spending Dataset

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Summary

The world has become much more peaceful, and yet, even after adjusting for inflation, global military spending is now three times greater than at the height of the Cold War. These developments have motivated a renewed interest from both policy makers and scholars about the drivers of military spending and the implications that follow. Existing findings on the relationship between threat and arming and arms races and war hinge on the completeness and accuracy of existing military spending data. Moreover, data on military spending is used to measure important concepts from international relations such as the distribution of the distribution of the completeness and accuracy of existing military spending the such as the distribution of power, balancing, the severity of states' military burdens, and arms races. Everything we know about which states are most powerful, whether nations are balancing, and whether military burdens and arms races are growing more or less severe rests on the accuracy of existing military spending estimates.

Existing Military Expenditure Datasets

Source/Author	Name of Dataset (short name)	Number of Countrie s	Number of Arming Variables	Years covered
International Institute for Strategic Studies	The Military Balance (IISS)	176	46	1961-present
Stockholm International Peace Research Institute	SIPRI Database (SIPRI)	169	2	1949-2020
U.S. Arms Control and Disarmament Agency and Dept. of State	World Military Expenditures and Arms Transfers (WMEAT)	159	17	N/A
William Zimmerman	Words and Deeds in Soviet Military Expenditures (Zimmerman/USSR)	1	4	1955-1983
B. Guy Peters	Political System's Performance Data: Sweden (Peters/Sweden)	1	1	1865-1967
Charles Lewis Taylor and Joachim Amm	National Capability Data: Annual Series (NCD)	133	4	1950-1988
John Gillespie and Dina Zinnes	Military Defense Expenditure Data (MDED)	63	1	1948-1970
Jan Faber	Annual Data on Nine Economic and Military Characteristics of 78 Nations (SIRE NATDAT)	78	1	1948-1983
National Military Capabilities from the Correlates of War	NMC v5/v6 data (NMC (COW))	217	1	1816-2012/ 1816-2016

Military Expenditures Latent Variable Model

 $^{(v_j)} * N(\alpha_i + \beta_t * \theta_{it'} \tau_{cur})$ $(1-v_j)$ $L(\alpha, \beta, \tau, \theta | y_{iti}) = \prod \prod \prod N(\alpha_i + \theta_{it}, \tau_{con})$ =1t=1j=1

constant U.S	. dollars	current U.S.	dollars
Parameter		Prior	
Country i latent variable estimate in first year	t	$\theta^{it=1} \sim$	N (0, 1)
Country i latent variable estimate in all other	years	$\theta^{it} \sim$	$N(\theta^{t-1}, \sigma)$
Latent variable standard deviation		σ~.	HN (0, 1)
Item j intercept (centered on the empirical me	ean)	a' ~ 1	N (y ⁱ , 4)
Yearly slope parameter for inflation		$\beta^t \sim 1$	HN (0, 1)
Model level uncertainty for constant items		τ _{con} ~	HN (0, 1)
Model level uncertainty for current items		$\tau_{cur} \sim$	HN (0, 1)

New estimates: China



New Estimates of Military Burdens



Evolution of military burden over time

Military burden - - Military expenditure/SDP (\$3) ---- Military expenditure/SDP (\$2) ---- Military expenditure/GDP



New Datasets:

Surplus Domestic Product (SDP): Anders, Therese, Christopher J. Fariss, and Jonathan. N.

Surplus Domestic Product (SUP): Anders, Interese, Unitsopher J. Fainss, and Jonatiani. N. Markowitz. 2020. "Bread before guns or butter: Introducing surplus domestic product (SDP)." International Studies Quarterly 64(2):392-405. Latent GDP, GDP per capita, and Population: Fariss, Christopher J., Therese Anders, Jonathan Markowitz and Miriam Barmum. 2022. "New Estimates of Over 500 Years of Historic GDP and Population Data." Journal of Conflict Resolution 66(3):553-591

Military Expenditures: Barnum, Miriam, Christopher J., Fariss, Jonathan, N. Markowitz, and Gaea Morales. "Measuring Arms: Introducing the Global Military Spending Dataset." https://osf.io/rsxze/

