CONTEXTUALISING TRENDS IN THE SOUTH AFRICAN DEFENCE BUDGET:
DOES MILITARY SPENDING IMPROVE SOCIAL WELFARE?
AN ECONOMIST'S PERSPECTIVE

Prof Ronney Ncwadi

Director: School of Economics, Development & Tourism

Nelson Mandela University,

Gqebera, South Africa

Email: Ronney.Ncwadi@mandela.ac.za

Defence Force – A Public Good

- Subject to Market Failure
- A Public good - commodity or service that is provided to all members of a society
- Free rider
- Makes use of tax-payers money
- Yields positive externalities
- Non-rivalry
- Non-exclusivity
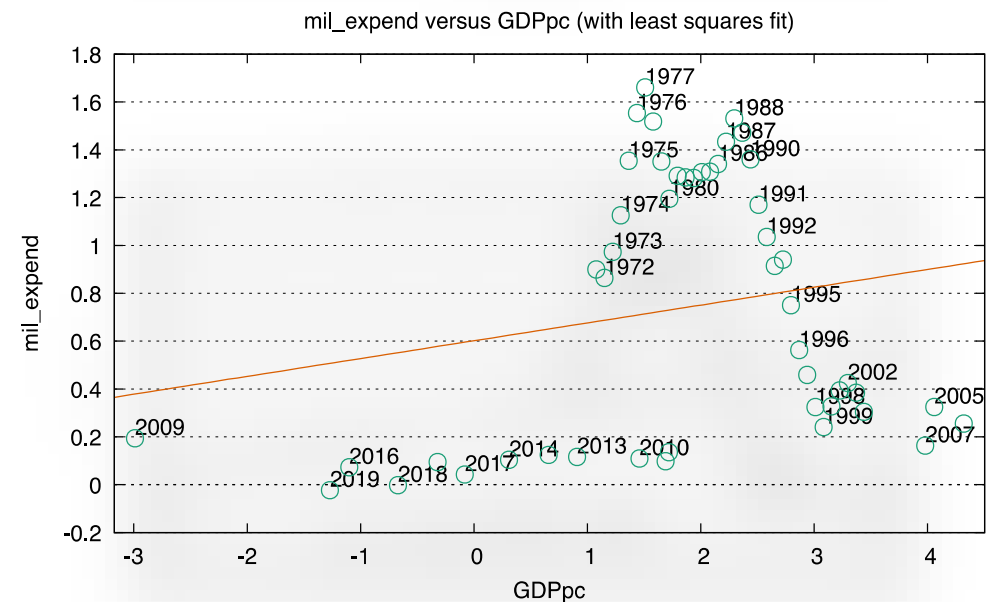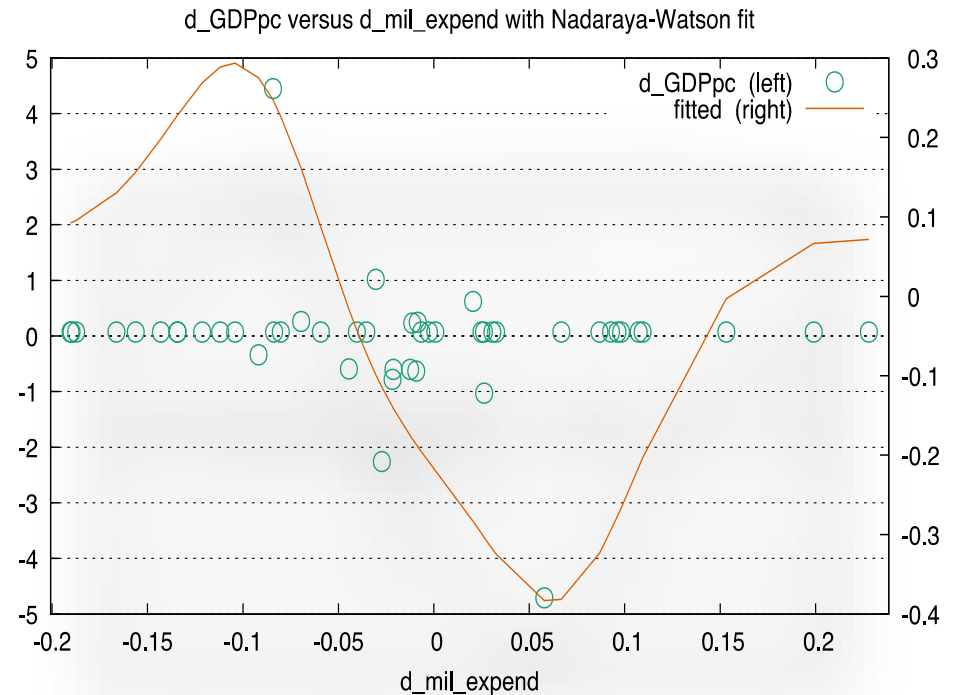
Military Expenditure & Externalities

- An *externality* is an uncompensated impact of one person's actions on the well-being of a bystander

- When the impact on the bystander is adverse, the externality is called a *negative externality*.

- When the impact on the bystander is beneficial, the externality is called a *positive externality* → The social value of the good exceeds the private value

NELSON MANDELA
UNIVERSITY
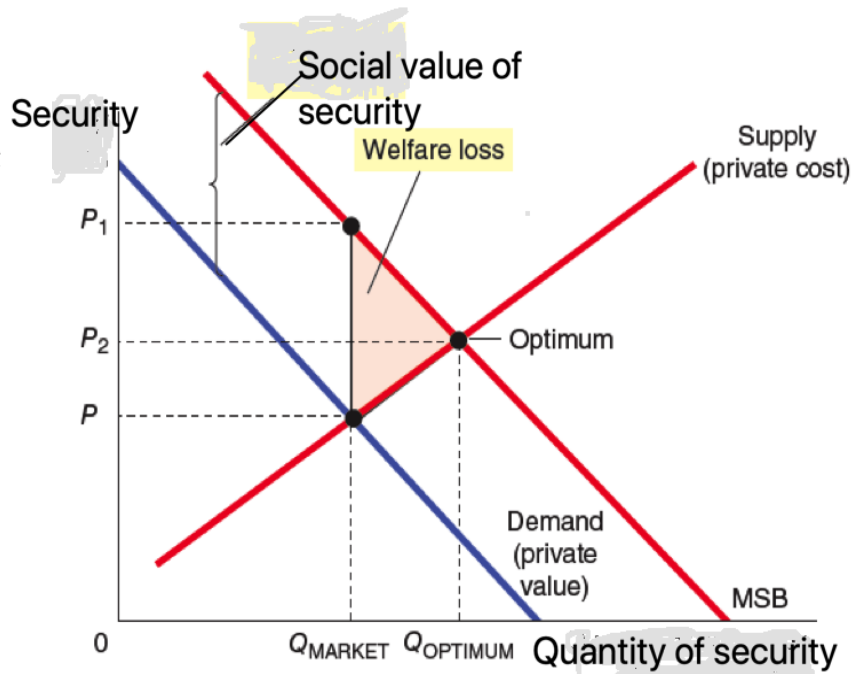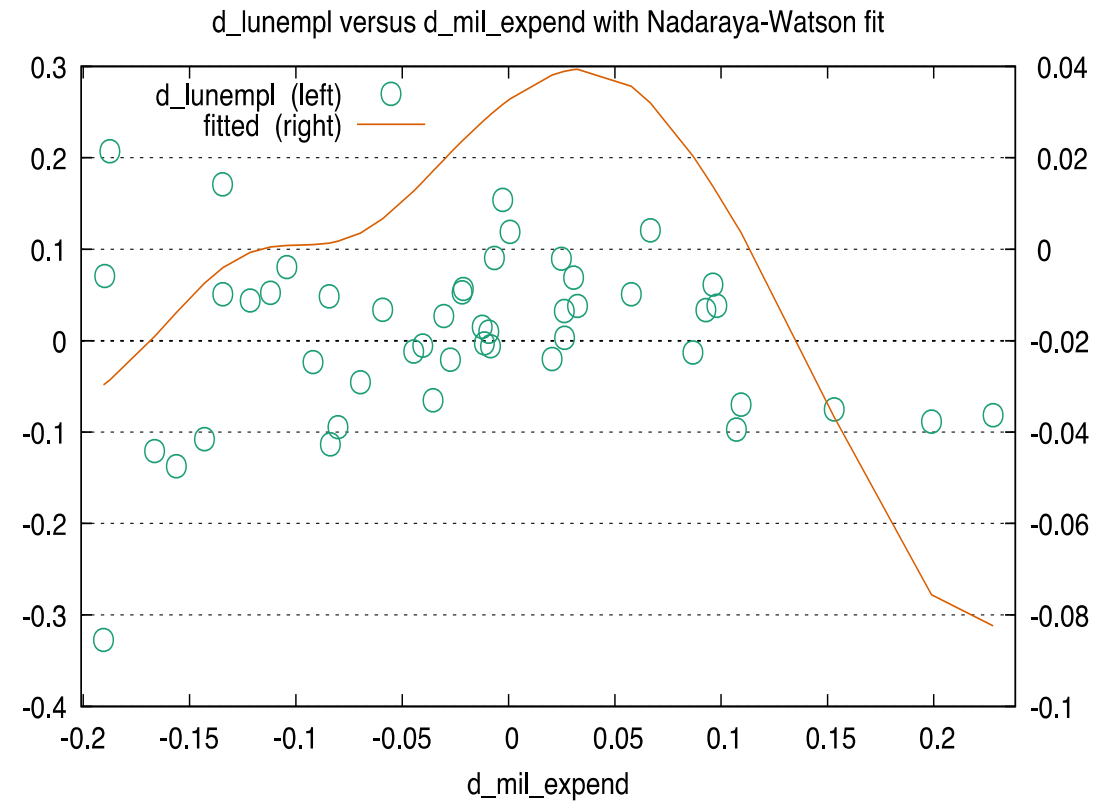
Military Expenditure and the Social Optimum

Adapted from Mankiw, Taylor & NCWADI, Microeconomics
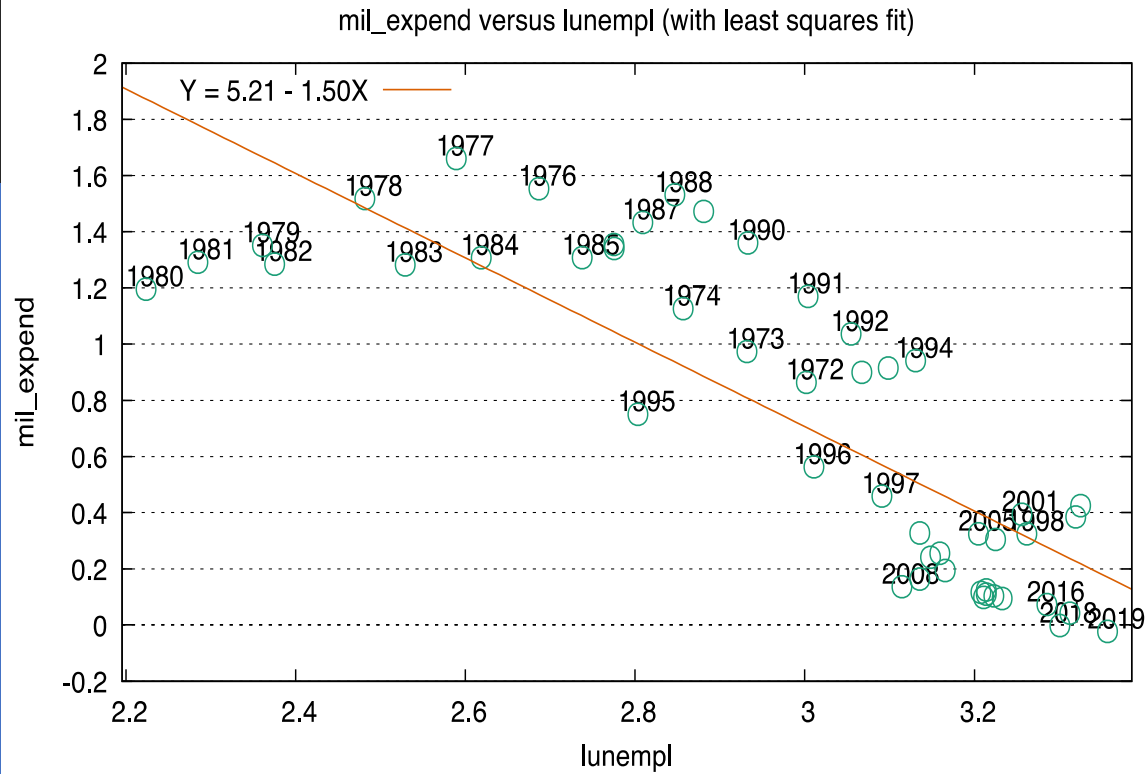*2nd SA edition 2018*

Military Expenditure & GDP Per Capita: MILITARY EXPENDITURE AND GDP PER CAPITA

Military Expenditure and Labour Markets

mil_expend versus lunempl (with least squares fit)

d_lunempl versus d_mil_expend with Nadaraya-Watson fit

Military Expenditure & Rule of Law

NELSON MANDELA UNIVERSITY
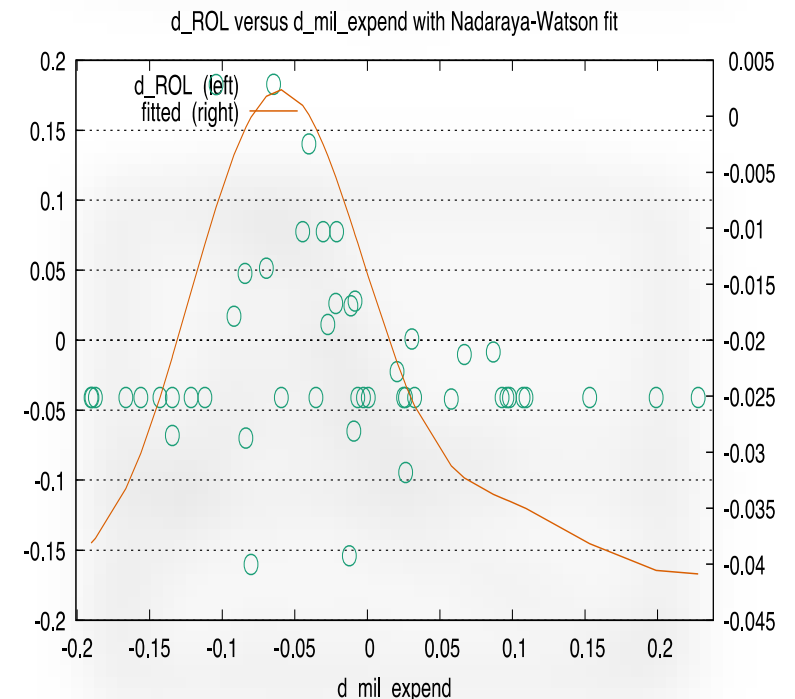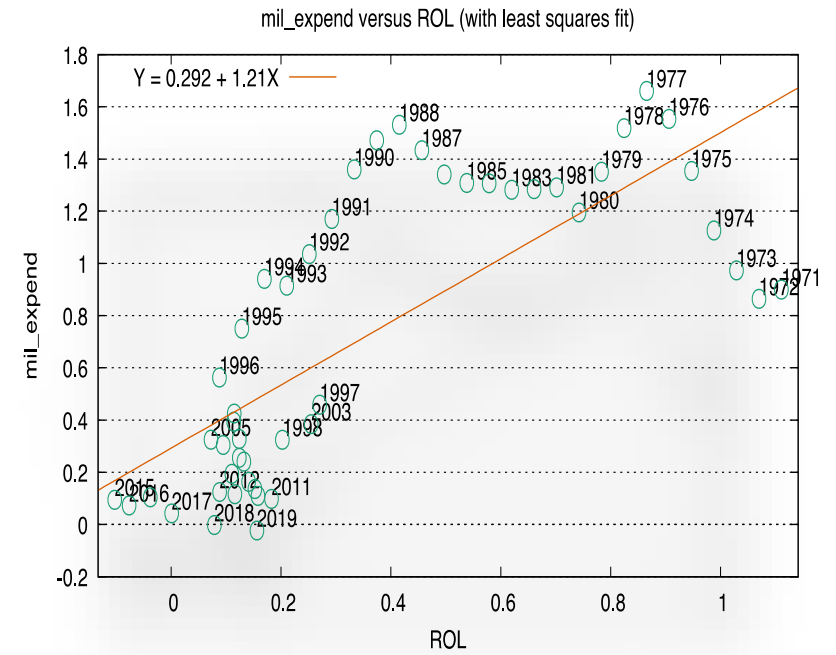
Military Expenditure & Industry Investments
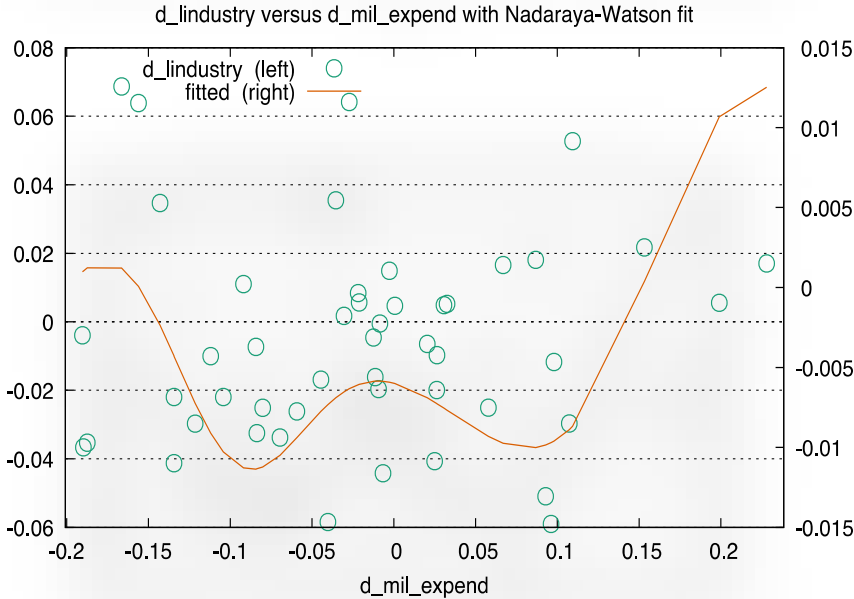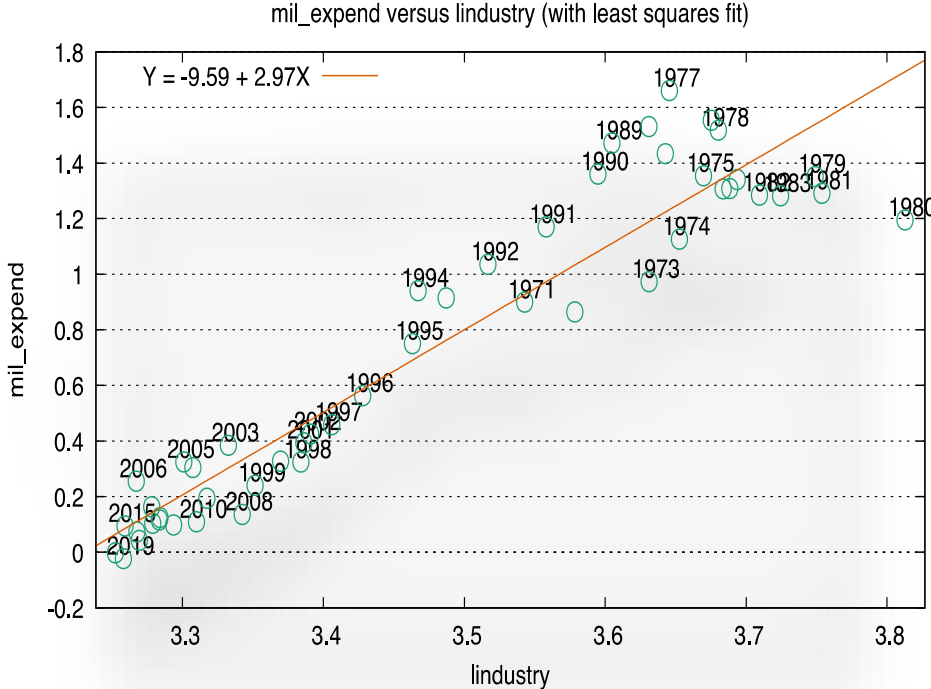
Social Benefits derived from the Defence Force

- Rescue operations.
- Medical assistance in impoverished areas.
- Food and humanitarian relief.
- Security at embassies and other locations.
- Policing in volatile areas.
- Natural disaster relief.
- Law enforcement.
- Piracy and drug interdiction.

NELSON MANDELA
UNIVERSITY

Further Social Benefits of the Defence Force

Involvement of military forces in development activities

Military participation in development work has a considerable justification on economic grounds.

Ensures regional stability

Enhances economic growth through stability in the region

NELSON MANDELA
UNIVERSITY

Regional Stability as a determinant of Economic Growth

The struggle for a better life in South Africa is intertwined with the pursuit of a better Africa in a better world.

Regional and continental integration is the foundation for Africa's socio-economic development and political unity, and essential for South Africa's prosperity and security.

Defence Expenditure Externalities see Ando (2017) Defence and Peace Economics, 2017

- The concept of externality helps understand the short-term effects of defence expenditure on growth.

- Huang and Mintz (1991), applied the neoclassical economics approach to the defence–growth relationship,

- Mueller and Atesoglu (1993), developed the nonlinear model with technical progress,

- Many other empirical analyses on externalities by country- specific (Ando 2000; Atesoglu and Mueller 1990; Augier et al. 2017; DeRouen 2000; Heo 1996; Heo 2010; Huang and Mintz 1991; Mueller and Atesoglu 1993; Ward, Davis, and Lofdahl 1995)

NELSON MANDELA

UNIVERSITY

Regional Stability as a determinant of Economic Growth

Africa is at the centre of South Africa's foreign and security policy.

Resolving crises, strengthening regional integration, significantly increase **intra-African trade**, and **champion sustainable development and opportunities in Africa.**

NELSON MANDELA
UNIVERSITY

- The direct or indirect link approach was developed by Huang and Mintz (1990), Mintz and Huang (1991), Cohen et al. (1996), and Heo (1999, 2000)

- All these authors investigated the direct and short-term effects of defence expenditure on economic growth and the indirect and long-term effects on economic growth as a whole

- A number of studies have examined the effects of defence expenditure on economic growth (inter alia: Compton and Paterson 2016; Dunne and Tian 2015; Yilg.r, Karag.l, and Saygili 2014; Dunne 2012; Wijeweera and Webb 2011; Augier et al. 2017; Alexander 1990; Heo and DeRouen 1998; Mueller and Atesoglu 1993; Mintz and Huang 1991; Ward, Davis, and Lofdahl 1995).

NELSON MANDELA
UNIVERSITY

Military Expenditure & Economc Growth Literature Review

- Alptekin, A. and Levine, P., 2012. Military expenditure and economic growth: A meta-analysis. *European Journal of Political Economy*, *28*(4), pp.636-650.

- Hou, N. and Chen, B., 2013. Military expenditure and economic growth in developing countries: Evidence from system GMM estimates. *Defence and peace economics*, *24*(3), pp.183-193.

- Churchill, S.A. and Yew, S.L., 2018. The effect of military expenditure on growth: an empirical synthesis. *Empirical Economics*, *55*(3), pp.1357-1387.

- Raju, M.H. and Ahmed, Z., 2019. Effect of military expenditure on economic growth: evidences from India Pakistan and China using cointegration and causality analysis. *Asian Journal of German and European Studies*, *4*(1), pp.1-8.

- Dimitraki, O. and Win, S., 2020. Military expenditure economic growth nexus in Jordan: an application of ARDL bound test analysis in the presence of breaks. *Defence and Peace Economics*, pp.1-18.

NELSON MANDELA
UNIVERSITY

Inconclusive results

- Some of these studies found the following results:

- *Military spending had negative effects on **economic growth** in 44% of cross-country studies and 31% of case studies.*

- *Some studies found positive results, while others reported unclear results.*

- ***Others are of the view that Increased military spending** leads to slower economic growth.*

- ***Military spending** tends to have a negative impact on economic growth.*

Inconclusive Results

- The mainstream growth literature has not found military expenditure to be a significant factor in explaining growth.

- For instance, Sala-i-Martin *et al.* (2004) consider 67 variables, including the initial share of military spending, as possible determinants of growth for 1960–1996 in a cross-section of 88 countries.

- Using Bayesian averaging, they find 18 variables that appear significant, with a posterior inclusion probability of better than 10%.

- In contrast, many papers in the defence economics literature have found military expenditure to be a significant determinant of growth.

- The difference seems to come largely from the use of different models.

NELSON MANDELA
UNIVERSITY

Military Expenditure & Economic Welfare

Welfare gained from additional **military expenditure** is equalised at the margin with the opportunity cost of **military expenditure** - the **welfare** lost from foregone civilian output. See for example Smith, R.P., 1980. The demand for military expenditure. *The Economic Journal*, *90*(360), pp.811-820.

Any additional **military** burden crowds out civilian government **expenditure** and thus has an impact on social **welfare** depending on whether security or civilian governmental activity is valued more.

See for example : Berthelemy, J.C., Herrera, R. and Sen, S., 1995. Military expenditure and economic development: an endogenous growth perspective. *Economics of Planning*, *28*(2), pp.205-233.

Military Expenditure & Welfare

- Neoclassical: This approach sees the state as a rational actor which balances the opportunity costs and security benefits of **military** spending in order to maximise a well defined national interest reflected in a societal social **welfare** function.

- *See for example: Dunne, J.P., 2000. The economic effects of military expenditure in developing countries. Economics Group, Middlesex University Business School.*

Empirical Evidence

- This study modifies the models used in the previous studies on military expenditure and economic growth by adding GDP per capita amongst others as a measurement for welfare – see Deger, S. and Smith, R., 1983. Military expenditure and growth in less developed countries. *Journal of conflict resolution*, *27*(2), pp.335-353.

- Also see: Klein, T., 2004. Military expenditure and economic growth: Peru 1970–1996. *Defence and Peace Economics*, *15*(3), pp.275-288.

- Also see: Dunne, P. and Nikolaidou, E., 2001. Military expenditure and economic growth: A demand and supply model for Greece, 1960–96. *Defence and Peace Economics*, *12*(1), pp.47-67.

NELSON MANDELA
UNIVERSITY

Estimation techniques

NELSON MANDELA
UNIVERSITY

- The **vector** autoregressive (VAR) **model** is a general framework used to describe the dynamic interrelationship among stationary variables.

- So, the first step in time-series analysis should be to determine whether the levels of the data are stationary.

- An **error correction model** (**ECM**) belongs to a category of multiple time series **models** most commonly used for data where the underlying variables have a long-run common stochastic trend, also known as **cointegration**.

- **Johansen's test** is a way to determine if three or more time series are **cointegrated**. More specifically, it assesses the validity of a **cointegrating** relationship, using a maximum likelihood estimates (MLE) approach.

Econometric Equatio

- The Econometric equation used in the study is as follows:

- $\delta = \alpha_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$

- *Where GDP per capita is a dependent variable followed by the following independent variables:*

- *Bank credits; exports; Gross domestic fixed capital; household incomes; imports; private industry investments; military expenditure; GDP and unemployment;*

- ε_t *is a stochastic error term*

- *The data series covers a period of 1971-2019*

NELSON MANDELA
UNIVERSITY

Results – Long Run Equation

GDPpc	1.0000	t-stat
	(0.0000)	
lcredit	-6.0955	
	(0.79318)	-7.68489***
lexp	-0.82287	
	(1.3798)	-0.59637
lgdcf	5.7160	
	(1.7888)	3.19562***
lhhcon	2.7535	
	(3.0492)	0.90299
limports	-2.1176	
	(1.9091)	-1.10921
lindustry	-37.435	
	(2.0129)	-18.59755***
mil_expend	1.8087	
	(0.40782)	4.43504***
GDP	-0.63663	
	(0.039219)	-16.23269***
lunempl	-8.6562	
	(0.56479)	-15.3264***
const	177.87	
	(12.435)	14.30398***

Short-Run Equation

coefficient	std.	error	t-ratio	p-value
d_GDPpc_1	−0.0907340	0.196445	−0.4619	0.6483
d_GDPpc_2	−0.0138609	0.188664	−0.07347	0.9420
d_lcredit_1	7.64567	3.10309	2.464	0.0213**
d_lcredit_2	4.03200	3.84535	1.049	0.3048
d_lexp_1	0.481235	4.03035	0.1194	0.9060
d_lexp_2	0.647433	2.88892	0.2241	0.8246
d_lgdcf_1	2.10768	3.14671	0.6698	0.5094
d_lgdcf_2	1.81715	3.18679	0.5702	0.5738
d_lhhcon_1	−1.47084	9.50550	−0.1547	0.8783
d_lhhcon_2	−4.13315	8.95965	−0.4613	0.6487
d_limports_1	−4.69017	3.07138	−1.527	0.1398
d_limports_2	−3.22665	3.27793	−0.9844	0.3348
d_lindustry_1	−23.1640	11.8074	−1.962	0.0615*
d_lindustry_2	−7.53330	9.43115	−0.7988	0.4323
d_mil_expend_1	−0.310118	2.27467	−0.1363	0.8927
d_mil_expend_2	−0.927593	2.58802	−0.3584	0.7232
d_GDP_1	−0.218077	0.167424	−1.303	0.2051
d_GDP_2	−0.0798404	0.136278	−0.5859	0.5634
d_lunempl_1	−3.71356	2.64600	−1.403	0.1733
d_lunempl_2	−2.04614	1.89636	−1.079	0.2913
ECM	−0.612413	0.245710	−2.492	0.0200**

GDP PER CAPITA RESPONSE TO MILITARY EXPENDITURE

response of GDPpc to a shock in mil_expend, with bootstrap confidence interval
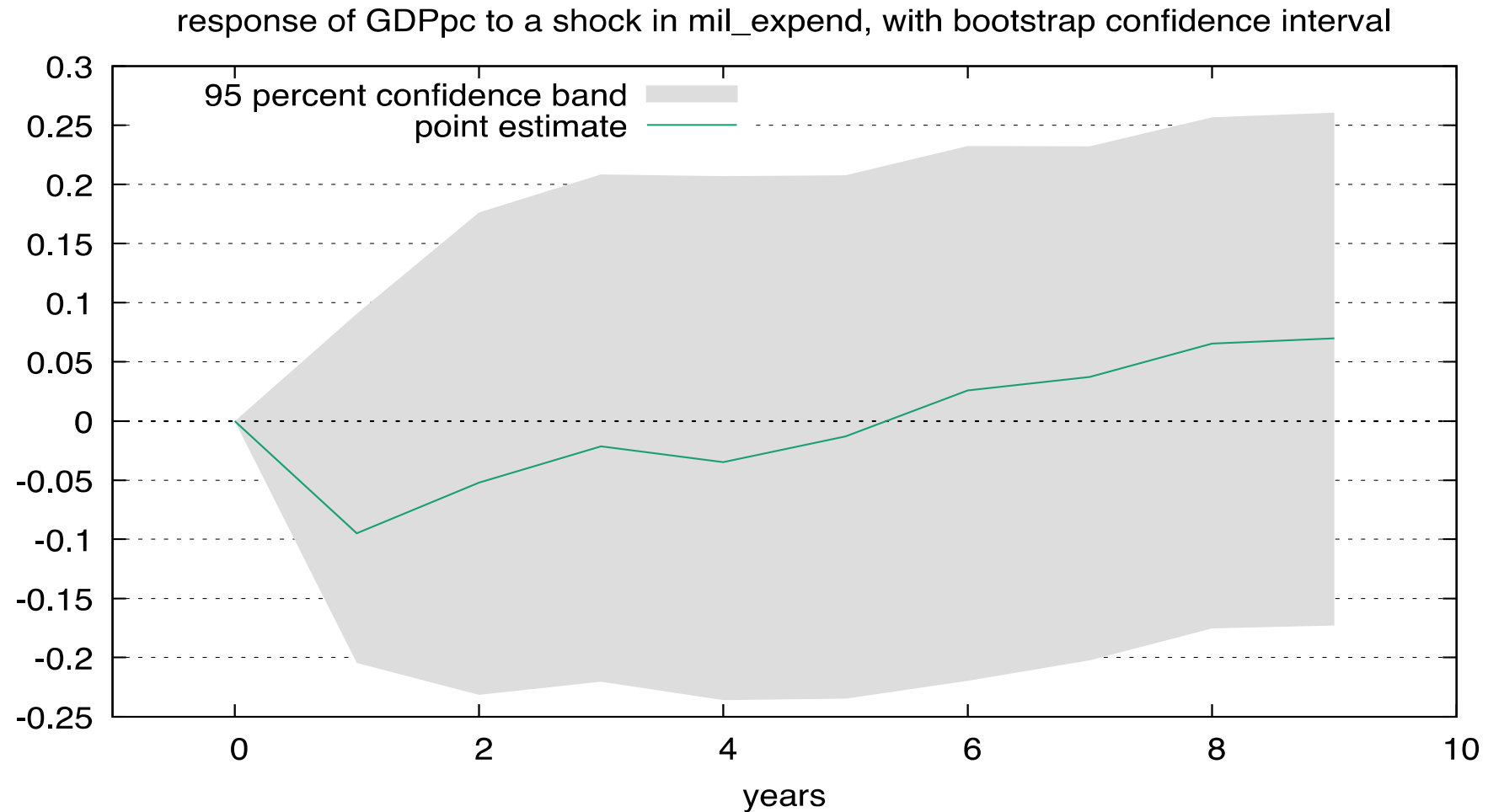
Summary of non-linear Nadaraya-Watson Regressions

- Military expenditure has a positive relationship with GDP per capita
- Military Expenditure has a negative relationship with unemployment
- Military expenditure has a positive relationship with the Rule of Law up to a certain point after which the relationship becomes negative
- Military expenditure has a positive relationship with private investment in industry

Conclusions

- Military spending is one area where there is no private solution.
- No single corporation or group of citizens is motivated and trustworthy enough to take financial responsibility for maintaining a nation's military.
- Every rand spent on defence is a rand not spent on other public services.
- On the other hand, rands spent on the military wind up in the private sector as payment for goods and services the military requires; thus improving the economic welfare of the civilians

Conclusions

- The results of this study show that military budget has an opportunity cost; however, the benefits of military spending accrue to both.

- That is the reason why military spending is increasing in many other countries; e.g. in 2019, U.S. military expenditure increased by almost 5.3% to $732 billion (see Beattie, A. 2020;

- China increased its military spending by 5.1%; India increased its spending by 6.8%, and Russia increased it by 4.5%, (Beattie, A. 2020)

Conclusions

- The government is acting on behalf of the public to ensure that the military is capable of defending the nation.
- In practice, defending the nation expands to defending a nation's strategic interests.
- The whole concept of "sufficient" is up for debate in any democracy.
- Adam Smith a father of free-market economics, identified the defence of society as one of the primary functions of government and a justification for reasonable taxation.