

Lectures on The Economics of Military Spending

ROUGH DRAFT: 1997

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Lecture 1

This are interesting times for the defence economist. From the certainties of the Cold War the world has been plunged into an uncertain environment. There is no longer the likelihood of MAD but the world is still a dangerous place. Certainly the days of bloated defence budgets justified by an arms race of increasingly baroque weapons systems are over and any threats to national security are likely to be of much less destructive capability. The old days of arms races and spiralling budgets have gone and are unlikely to return. this means that most countries in the world can undertake some form of disarmament and reductions in their expenditure on defence, providing the possibility of reallocating expenditures to other needs to achieve a 'peace dividend'. There has been an interesting change in the arguments that military expenditure (miles) is good for the economy to those that justify cuts, but there have been economic problems and this has led some to argue that there is a peace penalty and that we need to maintain military spending for economic reasons, or at least cut it no further than it has already been cut.

There are costs of the reductions in the military. Some are in fact illusory, the costs of cleaning up the mess left by military bases at the end of the Cold War and the cost of destroying weapons -but these are not the cost of the peace, but the continuing cost of the cold war. There are real costs, those associated with the structural adjustments required of economies moving to lower level of military expenditure and military industry. These may be in terms of unemployment and regional imbalance. Yet the work on the peace dividend and conversion policy has always argued that reductions in military spending can be economically beneficial but that they need some form of policy response, to use the resources released elsewhere.

There is still considerable potential to reduce military spending and we shall consider these issues later, focusing upon the economic aspect but also considering some of the strategic and political issues.

What we are going to look at is;

- How we explain the role of military expenditure in the economy
- What causes military spending to grow
- What the economic effects of military expenditure are
- The Military Industrial Complex
- Military technology and its dynamics, form and effects
- Conversion, the 'peace dividend' and related policy issues
- The links between disarmament and Development
- The arms trade

Lecture 2

In considering the economic effects of military expenditure the first thing worth mentioning is the fact that military spending is only one aspect of 'militarism'. When we talk of highly militarised societies it doesn't necessarily mean that they have high military spending. The nature of militarism is controversial, but it is clear that militaristic phenomena will have economic consequences. However, any analysis of the effects of militarism will be sensitive to the theoretical understanding of the role of military spending in economic development. Smith (1983) defines militarism as a portmanteau concept with aspects:

- high military spending levels
- militarisation of domestic social relations
- tendencies towards war and the use of force in international relations
- nuclear arms race

There is no real structural relation between them other than they all involve the military.

Measuring military spending and its impact is problematic firstly it is an input not an output -it is difficult to measure its indirect effects, e.g. the employment it supports -the magnitude of military expenditure does not provide a measure of the overall importance to the global economy. It can have effects on economic development/imperialism, effects on the pace and character of development, it can use premium skill, technology and provide ideological support of regimes.

After Smith (1977) we can distinguish three theoretical approaches to understanding the relation between military spending and the economy. The neo-classical or new classical, the critical liberal and the Marxist.

In the case of the neo-classical approach the state is assumed to reflect the national interest, an aggregation of the individual preferences or some form of social democratic consensus. There is a well defined national interest plus a threat or potential enemy and the state behaves as a rational act to maintain the required level of security given the trade off between utility and security. There is also the interstate dynamic of arms race models developed from the action reaction models of Richardson, and introducing game theoretic models. High military expenditure can result from changes in technology and increased costs and then arms races maintain. There are also models of alliances such as NATO in which burden sharing and free riding can take place between member states. Defence is often seen as a public good-indeed as the example of a pure public good, non-excludable and clear free rider problems. However, this has been criticised by Hummel and Lavoie who argue that there is a fallacy of composition, that defence is defence of the state not the defence of the citizens. Hence there are vested interests.

This would suggest that disarmament needs massive ideological surge to surmount free rider obstacle.

The new classicals have used military spending as an exogenous shock to the system in their dynamic models. They distinguish temporary and permanent increases, with temporary having the largest impact as agents substitute intertemporally towards periods like war time when aggregate output is valued unusually highly.

There are a number of criticisms of the neo-classical approach
-ahistorical models

-always able to justify observed outcomes

extreme computational requirements for agents. In reality consensus required is unlikely, there are conflicting interest groups, high levels of secrecy, an uncertainty in international relations. The true test of a strategy is war in peacetime there are only psychological benefits to MILEX -a feeling of security. Fortunately it can't often be tested.

Lecture 3

The liberal approach is usually predicated on the concept of a MIC. This was a term coined by Eisenhower to represent the interest groups around the defence budget, that create internal pressure for increasing or maintaining military expenditures even in the absence of security threats. There is a national interest but this is distorted by vested interests.

Fine has criticised this as being a middle range concept

The MIC is seen by Melman and Dumas to lead to inefficiencies in the economy as a whole. It crowds out investment, diverts technical skills from civilian production and leads to complacency and inefficiency within firms. The arms sector thus has a negative impact on the rest of the economy because it takes away resources, fosters bad production methods, leads to increasing reliance on defence contracts as defence firms become increasingly unable to compete in civilian markets.

But the implications of this are that capitalism can still be efficient, we just need to get rid of military expending. This is questionable.

Also there is a worry that the US debate tends to become inward looking in terms of industrial and economic policy.

In the Marxist approach MILEX is seen to have a wider and more pervasive role than in the orthodox Liberal, with the MIC constrained by the laws of motion of the capitalist mode of production. Marx actually had very little to say on militarism, with his views reflected in Lenin's Anti-Duhring, which was heavily influenced by Clausewitz and the notion of war as an extension of politics. MILEX had no benefits to capitalist economies and only presented the prospect of financial ruin.

Kautsky pointed to the costs of colonial expansion leading to economic problems, though MILEX could boost consumer demand it was contradictory. Capitalists could benefit from arms expenditure, but would resist it if revenue came from profits and this provided limits on the increase in MILEX (see Howard and King).

Rosa Luxemburg dealt with the issue of military expenditure explicitly, within a rather

complicated expanded reproduction schemas. She provided a role for military expenditure that was positive, depending on how it is financed from taxes on workers or profits. Taxes on workers will change the composition of output, taxes on profits could reduce overall profit, but depends on what would have done otherwise; deficit financing will have a stimulating effect on the economy if below full employment. Also emphasised the social and ideological benefits to the capitalist mode of production and that military expenditure can aid realisation of profits through providing demand. (Rowthorn shows that there are some technical problems with her work but the general approach retains consistency)

In contrast Bukharin argued that armaments production cut into the production of surplus values and hindered expanded reproduction.

Howard and King suggest that the Stalinist orthodoxy by 1939 was underconsumptionist, that military spending helped to overcome realisation crises. There were some who argued that capitalism could not survive a 'peace economy'.

Kidron in his development of the idea of a 'permanent arms economy' argued that military expenditure diverts capital from accumulation and focused on the threat of overproduction i.e. not underconsumption. Purdy criticises the ahistorical nature of this theory.

Mandel argues that there is a high organic composition of capital in military production and that the arms economy has accelerated the decline in the rate of profit with post war prosperity the result of other countervailing tendencies. Howard and King criticise this approach

Lovering uses the general approach of the regulation school, which sees military spending as just one facet of US hegemony which was an important factor of the post-war 'Golden Age' to analyse the UK

Only underconsumption theories have military spending as important and integral to the capitalist system. It allows absorption of surplus without increasing wages and so maintains profits. Other forms of government spending do not do this. Baran and Sweezy are actually more circumspect but later writers such as Cypher and Pivetti make a clearer and more focused statement of the argument. But the argument in this form suggests that military expenditure has been a conscious instrument of economic policy and that military spending has a stimulating effect to the economy, it is not a burden. The empirical evidence does not support this (Smith (1977), Dunne and Smith(1990), Smith and Dunne (1995), Abell (1990)).

Rejection of the underconsumptionist thesis leads us to fall back on a more complex understanding of military spending and accumulation:

Historical process

Contingent rather than deterministic

Complex process of dialectical interaction

Contradictory -important to capitalism but also imposes economic costs.

Wouldn't expect to find a simple economic relation and don't.

Kennedy (1987) has a similar perspective -though none Marxist.

This means that empirical work on the economic effects of military spending will be contingent. It will be necessary to analyse at different levels of abstraction and at both aggregate and disaggregate levels.

Major wars mean that military expenditure is not seen as investment and consumption is sacrificed.

Considerable evidence that military spending crowds out invest and more so than other forms of government spending, though the effect is not quantitatively large. Evidence that it diverts R&D from civil

- effects the quality of civil investment-takes best resources and skills with little spin off
- effects the civil economy through influence on work practices etc. (as with Liberal)

So have given an overview of how researchers deal with general questions regarding the economics of military spending. Now we move on to consider the problems in more detail and look at evidence/institutional forms etc.

Shall look at:

- what determines the levels of military spending
- what studies show on the effects of military spending on the economy. Care will be needed as ideological in cold war led to funding of misinformation and biased studies.
- the MIC in the UK in particular but also consider the developments in the US and Europe.

Lecture 4

So far we have looked at the general theories of the role of military expenditure on economic development. Now we shall consider some of the more detailed issues. We wish to ask the questions:

What causes military spending and keeps it relatively high ?

What are the economic effects of military spending?

The answers to these questions are of course contingent on a theoretical understanding but as we have seen our theoretical discussion tend to suggest that they can only be answered empirically. Thus we need to pay attention to the different studies that have been undertaken.

Really military expenditure is just a part of total government expenditure -it has specific characteristics but in many cases is simply seen as part of the 'public sector' or government. So it would seem a good idea to look first at how government expenditure in general is analysed and how the state is dealt with. Before moving on to applied studies we need to consider the different views of the state.

Given the different theoretical approaches to analysing military spending and the economy, it is not surprising that this reflects as many different ideas about the determinants of government spending across the different schools of thought.

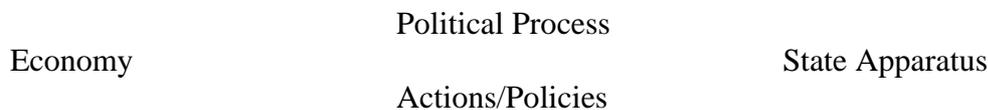
The conventional approach has in fact little to say about the state. The government is

considered to respond to market failure a neoclassical paternalistic state dealing with the excesses and imperfections of the market, a Keynesian state with government control and involvement in economic development through fiscal and monetary policy.

It is useful to distinguish between positive theories -why the state does what it does and normative -what the state should do. The state exists to provide public goods -those which cannot be provided by the market because of non-exclusivity of which security is an obvious example, and because of the importance of externalities, which again are not dealt with by the market. This suggests a minimal state is necessary for a market economy, which protects agents against violence and theft, enforces contracts and taxes only to fund this activity. Such a state does not have to be democratic or even reflect the preferences of the individuals in society. Social contract from Hobbes and Locke onwards have provided criteria to may normative judgements on the nature of society, but to relate this to the neoclassical model requires some form of social choice analysis, with the individuals in society having preference aggregated to the level of society (cardinal or ordinal) or some form of voting rules which allow majorities to determine outcomes. This view sees the government as simply reflecting the public choices, but recognises “slippage between the lips of voters and the flow of outputs from the government’s cup” (Mueller, 19?).

This approach can be used to analyse a number of phenomena in the modern state, bureaucratic behaviour, pressure groups, government monopolies etc. But this is done in an ad hoc manner and for our purposes is inadequate. There is no real concept of the state as a complex entity, it is a black box except for some ad hoc formulations.

To go further it is useful to distinguish between the state and the state apparatus



The state sets up a bureaucracy to collect information on the economy, but will be affected by the state apparatus/political process. This will affect how data are collected, interpreted, acted upon. The apparatus is amenable to change, through political pressure and action. Pressure groups can become incorporated into the apparatus -corporatism. (Aaronovitch and Smith, 198).

Different theories of the state can then be seen as different ways of describing the processes and interrelations. The conventional theory sees feedback through the political system -voting theory and ‘institutionalist’s approach would focus on the party political processes and the bureaucratic.

Note that the state has much wider interests than taxes and expenditure. It is involved in production, through coercion and legislation. It is involved in moral and ideological developments and in education and it is involved in the media. Though there are constraints on actions and conflict within the state between groups.

Marxist analyses take three forms

1. reductionist: expression of nature of capitalism in general, just reflects underlying class monopoly
 2. functionalist -automatic response to the needs of capitalism
 3. institutionalist-set of institutions reflecting nature of class struggle
- Conflict within the state and no determinate outcome.

Does provide useful insights -more complex.

Empirical Analyses

Most of the empirical work on government expenditure has been concerned with explaining the observation that government has growing al developed economies and the share of government expenditure. There are a number of approaches

1. Wagners law -increases in wealth/income lead to increases in demand for public provision
2. Baumol -relative productivity difference/ wage growth
3. Peacock and Wiseman -displacement hypothesis .there is an upper limit on taxes and expend at any point in time but disturbances e.g. war lead to increases which are not fully removed after the crisis -there is a 'ratchet effect'
4. Alt and Chrystal (1983) Stability of government expenditure as share of GDP -permanent income model -short run movements around trend transitory
4. Political explanations
 - party in power
 - median voter model/public choice
 - inter-party competition election lead to political business cycle
 - bureaucratic behaviour (Niskanen)
 - intra-state competition -bargaining
5. Demand system approach: Dunne and Smith, Pashardes, Dunne and Smith, Deacon

Stylised facts
to mid 1980s

1. From 1950 till recently there has been an upward trend in defence spending
check real figures
2. But as a share of GDP it has generally fallen -recent changes to below health and education share
3. Services employment has fallen over time -more marked as a share of total employment
4. Employment related to defence also falling

What is foreign/defence policy -no defence review

Displacement effect but recent changes

Lecture 5

In explaining military spending we can distinguish between external and internal factors. In principle the major determinant should be the provision of security from external threat. The growth in expenditures observed can then be explained as a growth in threat. The seminal

work of Richardson showed how external forces could operate to lead to arms races, simply through the existence of some protagonists responding to each others actions. His action-reaction model provides a formal rationale for arms races:

$$\Delta X = a_0 + a_1 X + a_2 Y$$

$$\Delta Y = b_0 + b_1 Y + b_2 X$$

This implies that the change in military expenditure for country X is a linear function of the levels of expenditure of X and Y. The parameters a_0 and b_0 are constants, grievance factors and a_1 and b_1 represent fatigue/costs, with a_2 and b_2 being defence reaction coefficients.

At first this was considered very radical as it explained the arms race between the superpowers simply in terms of them responding to the other after an initial increase. The general dynamic continues through the action of both once started, going against the 'them and us' rhetoric where the Americans would blame the Soviets.

Although this was initially seen as having general applicability, later work suggested that the model needed asymmetries between the actors, especially in its applications to other wars and arms races than the Cold War. Increasingly the developments in this area became more technical and more obscure and failed to perform well empirically.

Other explanations for the Cold War considered the economics of alliances and considered the issues of burden sharing and free riding with Nato.

Need diagram

Response to threat can lead to step increase, but if want to explain increase over time need arguments which gives the continuous pressure. This is why the arms race models need some action/reaction framework (see Gleditsch,)

The radicals focused on the internal pressure to increase military spending, on political and military determinants within a country. The most satisfactory applied work has generally taken a comprehensive approach, but there is a vast array of studies.

Note that can always have arms races without increases in military spending, through increases in the number -with lower process, the quality and the power.

Political factors:

- Perception of threat -out of area operations, imperial legacy
- Nato commitment
- voting and party politics -complex (more cuts under conservatives)
- militaristic ideology important as seen by reaction to closing regiments
- bureaucratic growth and inertia and bargaining within the state over public spending
- concept of security, might consider economic or environmental security rather than just military.

Strategic factors and technology

- Nato defence posture -flexible response, forward defence, nuclear and conventional weapons

This determines the force structure and technological developments. The technological development and the arms race leads to increased costs as relative process also increase. There are interservice battles over equipment to increase their shares and this can lead to increase overall and to strange compromises. The change in the share of expenditure towards the airforce clear, while whole weapon systems, such as cavalry have been replaced. Military response to change not great -cavalry still in use in US post WW2.

As technology has advanced and conscription has been closed the number of soldiers has been reduced there has been an increase in their skill requirement and a reduction in the demand for labour.

Technological developments can increase uncertainties about the future and so increase spending above what it needs to be .

Technology can end up being the end product -not the weapon itself. This can lead to a 'baroque arsenal' (quote MK) with high tech, high spec expensive weaponry that doesn't work in practice and is not efficient. (PRODEM briefing)

Economic Factors

As we have seen some argue that MILEX is not a burden, but has economic benefits. In the US MILEX has clearly been used for industrial policy and in the past there have been some spin off, but as we have argued it is more likely to spin in and the opportunity cost of MILEX can be high.

The recognition of economic costs can lead to cuts in MILEX, but if there is no policy response to replace demand this can lead to increase in unemployment and resistance to change.

What is optimal military burden? -same as allies of enemies?

Military Industrial Complex -role in economy, vested interests maintain shares
Efficiency vs inefficiency of supply.

Empirical Work

Formal/consistent models generally estimated using econometric methods
theoretical model important to specify causality, provide functional form, suggest relevant variables, and to test restrictions suggested by the theory, allowing reductions in the number of parameters and increase in the degrees of freedom. Hypotheses can be well defined and tested the assumptions made explicit. Usually in N-C framework.

Hartley and Sandler () provide a wide variety of applied studies of the demand for MILEX. Their general specification for the demand equation is

$ME = F(\text{income, spillin, threat, economic variables, political variables, dummies})$
-income is usually GDP

- spillin is lagged MILEX of allies
- Threat is lagged MILEX of threat
- Economic variables -eggs are size of budget deficit
- Political variables are political party/affiliation
- Dummies are other environmental factors such as wars summarised as dummy variables.

Lecture 6

The approach used in economics is usually to treat the government as a rational actor facing some threat. Following Smith (1980), the model starts with a well defined social welfare function (SWF) where welfare is a function of the welfare gained from a sense of security (S), from non-security expenditures (C), and exogenous internal political influences (ZP).

$$W = W (S, C, ZP)$$

This is seen as a household production model (Lancaster,) where Security S is seen as being an output from the inputs of military spending and other security variables, such as the military spending of allies.

$$S = S (M, ZS)$$

There is then a budget constraint:

$$Y = P_M \cdot M + P_C \cdot C$$

From this model a demand function can be derived where military spending is a function of output (Y), or just civil output, the price of military P_M , the price of civil P_C , the political and security factors.

$$M = F (Y, P_M, P_C, ZP, ZS)$$

This is of course very general and gives rather different forms when operationalised to use real data for specific countries. Smith (1990) updates his 1980 study for the UK and estimates the following model which is an error correction model that resulted from a general to specific specification search.

$$\Delta SM_t = \beta_0 + \beta_1 \Delta SA_t + \beta_2 (SM_t - SM_{t-1}) + \beta_3 KD_t + \beta_4 RD_t + \beta_5 N_t$$

where SM is the share of UK military expenditure in output (GDP), SA is share of US military spending in output, SR is the share of Soviet military spending in output (GNP, from ACDA), KD is a dummy for the Korean War, RD is a Defence Review dummy variables and N is a dummy variable for the NATO 3% real growth in military spending commitment made in the mid 1970s.

The results from this model suggest that the UK adjusts its share of milex to remove

deviations from its share in previous years and a long run target share based on the Soviet milex share in GNP. There are of course measurement problems in measuring the Soviet burden, but the ACDA data should at least be consistent over time even if they are not an accurate measure, as for a model such as this we are more concerned with the changes than the actual level. The model also shows that the change in the UK share tracks the US and that it has a positive coefficient which is less than one. This suggests that the UK 'free rides' on the US, increasing in line with the US but not by the same amount. There is also a clear influence of the Korean War and the Defence Reviews.

Dunne, Pashardes and Smith (1984), provide a model which is more complex, allowing the interaction of milex with other forms of government expenditure and considering incrementalism, allowing for the persistence of milex due to bureaucratic inertia.

Overall, the results with Smiths specification and other studies, suggest that milex in the UK is little influenced by political factors. This is certainly not the case for the US, where the political business cycles influenced by changes in President and government are well recognised and such effects are very important in the determination of milex.

In the UK the problem has been that the Labour party in power has tended to be more hawkish than the Tories in some ways, despite commitments to cuts when in opposition. Thus the political patterns are rather blurred. Dunne and Smith () discuss this in more detail.

There are other studies which focus more on the external factors, retaining the formal approach, but focusing on modelling arms races e.g. Murdoch and Sandler. See chapter in Gleditsch et al on arms race models.

Hewitt provides a more general study, across 125 countries, which uses a greater variety of variables. It uses a public choice framework and finds that geographic, political and government effects are found to be significant. he also finds that milex is sensitive to financial and economic constraints.

See Dunne for a discussion of demand for milex in LDCs

In addition to these theoretical approaches there have also been a number of ad hoc approaches. Some of these are 'measurement without theory' ad hoc statistical exercises, but they do give information on correlation's. Others are ad hoc in the sense that they do not have a consistent theoretical basis, such as non-standard case studies of particular countries, more qualitative , institutional and historical studies qualitative studies. Such studies provide analyses which cant fit in with the formal framework, this may make them inconsistent but it also makes them less restrictive and they can still provide a valuable contribution and highlight important factors.

1. Statistical analyses of this form have in the past been predominantly correlation analyses searching for associations within the data on GDP, growth, investment and interest rates. More recently the growth in popularity of statistical causality tests, has led to tests of Granger causality between milex and other macro variables. This approach considers the temporal sequence of the variables, but importantly is not actual causality. It can be a valuable way of

identifying important variables and testing reduced forms of a more complex structural model.

An early study by Georgiou and Smith considered the issue of Granger causality of growth and miltex in the OECD, while in a more recent study Dunne and Smith (0 consider the relation between military spending and unemployment.

2. Case studies institutional and historical

As we discussed there are many political/bureaucratic etc. internal influences on miltex and external influences in international relation, which cannot be quantified or formalised and have to be treated in a qualitative manner. See Higgs for a discussion of US ME processes.

Lecture 7

Economic Effects of Military Spending

Moving to look at the economic effects of miltex it is clear from the previous lecture that whether it is a burden or not will depend upon the school of thought you choose. Might say that the answer to the question 'What are the economic effects of miltex?' is 'it depends' -on the theoretical analysis and on the empirical analysis.

The theoretical approaches we have considered are the neoclassical, the Keynesian, the Institutional and the Marxist. once we go beyond their broad stroke of understanding towards any form of specific study the analysis becomes less straightforward and more difficult. We have to make choice over theory and in operationalising any theory an these will influence the results;

We have to:

- decide on the level of abstraction
- operationalise the theory into concrete concepts which we try to measure
- decide on the type of empirical analysis -quantitative, qualitative, historical, institutional, or some mixture.
- decide on the time period d to be covered
- determine the sample -select relevant countries
- decide on the empirical/statistical analysis to be used.

Difference in the results of studies can often be because the researchers have made different choice. They may be answering different questions as a result, they may be biased -searching for a particular result as a result of the Cold War pressures on funding and directly n the conduct of the research. It I interesting in the UK that the ideologically more hawkish Tories have provided unprecedented amounts of information about the military. Given their pride and patriotism they don't feel they need to hide anything as the Labour Party did.

All of these factors mean that care must be taken when assessing the evidence of the different studies

From Smith (1977) onwards simple correlation analyses have tended to find a negative correlation between military spending and economic growth (See Gleditsch et al, De Grasse, Symanski) but as Chester pointed out I a comment these can be vary sensitive to the sample chosen. Usually studies look at cross country averages over a period of time . Although

Benoit suggested a positive relation between military expenditure and growth for developing countries and sparked off a whole literature, there has been little support for this. The general findings are that military expenditure is a burden (see Dunne (1996), Gleditsch et al (199) Ch 2), certainly for developed economies and there is no evidence of any positive impact in developing economies.

But there are problems with the studies and the empirical work has developed to take account of them.

1. Focus on aspects of the channels by which military expenditure can effect growth, employment, investment, productivity, the balance of payments and inflation.
2. Try to develop analysis using data in a more sophisticated way.

Possible Channels

Labour: From Adam Smith onwards the military was seen as unproductive, a burden. But can train soldiers and conscripts and they can become skilled civil workers. they can modernise societies, through their organisational skills and break social rigidities (Benoit). On the other hand they can attract skilled labour away from the civil sectors, the skills they impart may be non-transferable and the MIC can lead to bad habits. military expenditure may be at the expense of civil education and training expenditures.

Capital: Both savings and investment.

Can reduce investment in civil sector by crowding out, through the rate of interest. On the other hand can lead to useful infrastructural investment, though bottlenecks may prevent any positive effects.

Can boost demand output and profits and lead to increased investment, though other forms of government expenditure may have the same effect -and better. Military investment may be irrelevant to civil industry -e.g. roads in the middle of nowhere, if they weren't would be valuable.

Linkages are important positive or negative -depend on number factors...

Demand: In common with other forms of government expenditures military expenditure increases aggregate demand. the underconsumption/ effective demand arguments suggest these increases in demand will increase output through multiplier/investment effects. The problems with underconsumption argument have been considered. Could use any form of government expenditure? ME at expense of investment?

Socio political: Military expenditure can provide conditions for successful accumulation (growth). It can have a modernising influence -military regimes control over labour can increase output. May break down social fetters. On the other hand the regimes can be conservative, corrupt and inefficient and short run strategies to control organised labour may not work in the long run and may lead to insurgency.

External Relations: effect on balance of payments will depend on whether or not the country produces arms and for developing countries whether they get aid -military related. Exports

can pay for imports and improve the balance of payments directly. A strong country can have strong trade and safe trade. Imports of arms may also bring with it superpower protection - may be an insurance policy. If there is an arms industry it may be costly and/or heavily subsidised. Often subsidies are hidden and mean that the exports aren't as good a deal as they appear. They may also crowd out civilian tradeables, while imports can lead to large debts, and use up scarce foreign exchange. If there is a large military it may mean that involvement in disputes is more likely and this can be economically damaging.

So in general it is not clear from a purely theoretical analysis what the economic impact of military spending is. We can identify the possible channels, but they may have differing effects and the only way to consider the overall effect is by empirical analysis. But we need to be clear what the question is.

We have argued theoretically that the economic effect of military spending should be considered to be historically specific, to possibly be contradictory, and to be complex so we don't necessarily expect a simple answer. But we can examine the studies to see if there is a consensus.

First look at the approaches that have been developed

Specifying a formal model to deal with interaction between military spending and the economy usually Keynesian theoretical framework, which emphasises the role of military spending in output through -multiplier effects

-in the presence of inadequate demand

But there are also more neoclassical approaches which use an aggregate production function.

There are 4 different types of studies:

1. Single equation analyses with economic growth as the dependent variable and military spending in the form of burden, per capita or absolute as the independent variable -some studies use more than one.
-only pick up the direct effect
-have found positive or insignificant effects
2. Simultaneous equation systems which emphasise the importance of interdependence between military spending and other variables
3. Macroeconometric and World Model studies -e.g. Leontief and Duchin -See Gleditsch et al
4. Look at the trade-off between military spending and other forms of welfare expenditure. This approach is problematic as it assumes that the money spent on military spending would actually be spent in other ways if military spending were reduced -this may not occur. Also it doesn't allow for the fact that it is possible to have more of all with economic growth. (In many cases the focus is on shares?)

Now move to look at the studies that have attempted to evaluate the economic effects of military expenditure, distinguishing them by their focus on particular channels. Consider the main economic channels missing out the socio political as it is less quantifiable and so less work of this type -look at trade later.

Labour: whenever military expenditure is cut the immediate response is to see problems in job cuts. But why should military expenditure be different to other cuts

-militaristic culture

-regional problems; base/factories often support local community and may be off beaten track.

but that is the relation between military expenditure and labour/unemployment

Overall, military expenditure is less employment intensive than other forms of government expenditure - though part of it, troops or conscripts, can be high. The problem is that the people gaining jobs as result of a reallocation of military expenditure to other forms of government expenditure, such as health and education, are unlikely to be the same people that have been made redundant. So there is a clear distributional issue.

Cutting procurement will reduce demand for defence manufacturer and one would expect problems with factory closures, but these problems of industrial restructuring are only the same as experienced with the rest of manufacturing.

But we have to consider the long run as well as the short run adjustments.

National studies suggest that reductions in military spending will increase employment, as long as the expenditure is reallocated to other forms of govt expenditure e.g. Barker Dunne and Smith.

ME not necessary for FE

Problems in comparing national studies -see Dunne

Underconsumption debate -considered earlier. Smith (1977) rejected the idea that military expenditure was used to maintain high demand and reduce unemployment. Cross section analysis provided evidence of a positive correlation between military expenditure and unemployment, but there were problems of the results being sensitive to the sample used (Chester,). Time series evidence supported this result, suggesting it is not military expenditure which has led to full employment but war.

Have seen Pivetti still tries to argue the effective demand case, but his argument is not well supported by the evidence (see Smith and Dunne,)

Other studies have found contradictory results. Symanski found military expenditure better than non-military spending at reducing unemployment, but Chans review of the studies fails to find any evidence that increases in military expenditure lead to increases in employment

Dunne and Smith (1990) provide an analysis using cross sectional and time series data for 11 OECD countries and find a positive correlation in the cross section. But when this is broken down into time series there is no obvious relation and when and this holds when the data are

pooled. So *miles* seems to have no significant impact on unemployment, which suggests that when *miles* is reduced we don't need to worry about unemployment. But this is a long run effect and in the short run there will be problems of structural adjustment and this can best be dealt with by having some form of conversion policy. If we do it may lead to an improved economic situation over what would have had leaving to the market.

Investment and Growth

As mentioned there seems to be a negative relation between economic growth and military spending in cross section analyses Smith, Symanski, Cappelen et al etc., but others question this e.g. Chester.

Seems to be sample specific -are clear counterexamples South Korea, Taiwan, Singapore

When we look at time series the evidence for the negative relation is a bit less clear cut, but most studies do suggest that *miles* is a burden on the economy and very few try to argue the obverse.

Will find positive correlations post war if don't allow for dynamics -both moving the same way -spurious?.

Have been a number of studies -see Gelditsch et al Ch2 and Chan

In general *miles* has a negative effect on economic growth in developed economies.

Less clear for developing economies, seems country and sample specific. Might be positive in specific circumstances but in general is negative or insignificant.

This is especially true for models which allow for the second round (indirect effects) through feedback -simultaneous equation models. See Dunne ()

Underconsumption arguments would suggest that *miles* has a positive effect, through maintaining demand and increasing investment, while neoclassical and other analyses suggest that *miles* crowds out investment and so reduces growth. The question is an empirical one and when the evidence is collected systematically, not like Pivetti, suggests that *miles* is at the expense of investment in advanced capitalist economies.

Smith (1977) argues that the military goods tend to be produced by capital goods industries and that this can lead to bottlenecks for other sectors. The share of consumption -public and private- tends to be relatively stable, suggesting it is independently determined so that increases in *miles* are going to reduce investment -public and private-. There is also some evidence that increase in *miles* can increase the rate of interest and so effect investment.

Though there are critics of this view, such as Pivetti suggesting *miles* has a positive effect on investment and Adams & Gold suggesting that it has no impact.

Smith (1977) found evidence in cross section averages and time series, but looking at simple correlations in effect. In his 1980 paper he provides a better developed Keynesian model and uses the concept of potential output and pools time series and cross section data.

$$i_{jt} = f (m_{jt} , g_{jt} , u_{jt})$$

where i_{jt} is the share of gross investment for country j at time t , m is the share of military expenditure in output, g is the growth of GDP and u is the unemployment rate. Estimating this function he finds a negative relation between military and investment 1954-73. Smith and Georgiou (1983) confirm this result 1960-70 and 1973-8 using Granger causality tests.

Dumas and Melman argue at a more general level that military spending is a burden on investment, both quantitatively and qualitatively, through its influence on practices in general manufacturing and its crowding out civil investment.

But Edelstein finds military tends to be at the expense of consumption rather than investment in the US. He still argues there is a negative effect overall but that the focus ought to be on human capital aspects.

Overall, evidence suggests military is at expense of investment.

Moving beyond the single equation models some researchers have used more complex simultaneous models

- aggregate production function with more than one sector; Atesogl and Miller
- Keynesian multi equation model: Smith and Smith (1980), Cappelen et al ()
- Macroeconometric model simulations: Leontief and Duchin, Dunne and Smith

Often find that military has positive direct impact, though small, but when take into account the indirect effects, through saving, human capital, balance of payments, etc. the overall impact is negative

Technology:

As we have seen a major justification for military is its effects on technology. Military R&D is seen as producing invention and innovations which spin-off to civil applications and so benefit civil industry, introducing development which would otherwise not have been made. So if it wasn't for the military it wouldn't get done.

But empirically there are real problems with this. In the case of the UK, Chalmers and Kaldor et al discuss the issue. Seagram criticises them but with a poor/shabby piece of work.

The issues are

- selective examples used
- evidence not important
- military technology becoming different 'baroque'
- military production different
- military to civilian spin off can cause problems, bringing the same approach -social relations
- technological solutions which may not be needed
- cost overruns because of methods and organisation of production,

Buck, Hartley and Hooper (1993) found no direct crowding-out in UK of government

funding of R&D. But problem is that its not just direct crowding out its also externality effects. Also spin-off is becoming increasingly spin-in.

For the US Dumas, Melman, Markusen & Yudken give institutional information which shows the crowding out and externality effect. See also Gold/Adams and Gold for alternative perspective.

In looking at the evidence need to bear in mind the changes that have taken place over the post war period in the nature of military technology, relative to civil. It may have been true that there were spin-offs, but increasingly it is spin ins which are more likely. What we mean by weapons specific technology and its importance may be changing. It may become more knowledge based and less machine/technology based.

Also, the MIC is pushing for the development of dual use technologies to maintain itself. This is a defensive response rather than an attempt to convert and is still likely to have similar problems when consider competing I civil markets. It may make firms do civil technology badly and keep all of the bad practices, when more sensible to move straight to civil R&D. In addition, it can be destabilising as over time maintaining military technology could lead to a technological arms race. No longer a race to produce the weapons but to develop the capabilities. See Prodem briefing for discussion.

Productivity:

In the same way milex is considered to have an impact on productivity, not directly but through

- spin off : process or product ? Milex mainly product so effect on productivity? forward linkages?
- security
- social control
- infrastructure
- training

but again it could be spin in that is occurring rather than spin off and the military R&D resources, or at least the money spent on them may be more effective if allocated to civil.

Production -monopsonist/monopoly relationship has led to efficiencies in production and externality effects on the civil sector. Skilled labour used in military can lead to bottlenecks in civil areas. Infrastructure development for the military can crowd out privates sector investment.

Again evidence is not definitive. see Adams and Gold vs Dumas and Chalmers and Kaldor vs Seagrim.

Overall, these debates show it is difficult to make clear statements on the economic effects of milex using a survey of the studies undertaken by researchers. They are open to interpretation and there is no clear consensus between the protagonists. One has to recognise the impact of the Cold War on some of the work -funding going with the conclusions rather than the quality of research.

One has to make up one's own mind and to us there is no question that the evidence suggests that military spending is a burden on advanced capitalist economies. But it is important to remember that our theoretical understanding suggests that it is historically specific, may be country specific, and can be contradictory. Would suggest that it is easy to put at least part of the blame for the UK's demise at the feet of the military industrial.

Now move on to look at the MIC in more detail

Lecture 10

The Defence Industrial Base is the industrial sector that provides the state with its weaponry. We will see that there are problems of definition to be considered and that it is important to see the DIB within the context of the Military Industrial Complex (MIC)

Regarding the definition of the DIB this is not surprising. In fact there are considerable problems in defining industries per se -deciding which companies are in which industry so it is not surprising that it is difficult to draw a line around the DIB. Superficially it is the companies that provide defence and defence related equipment to the defence ministry.

The question then arises at what level of dependency does a company become a member of the DIB, or how important to the capability does it have to be. This is not so straightforward as at the extremes some companies may have very little dependence on defence sales but be vital to the MoDs maintenance of weapons production, while others may be completely dependent on defence production, but may not be important suppliers.

There is the problem of delineating the defence industry. Above we said it was to provide weaponry, but it is not clear how we define this. They range from large expensive weapon systems to inexpensive small arms, but may also include other commodities, such as razor wire, riot control equipment, which in general would not necessarily be classified in this way. A company supplying ball-bearings to build tanks is still an important part of the DIB, though as we shall argue the less generic the product the less important the individual supplier.

One way of classifying is to rank weapons by their distance from combat

- lethal large or small weapons
- non-lethal but strategic
- other products

But this may not reflect the importance to the military. It is all well and good to have expensive weapon systems, but they need infrastructure and back up to be used. Strategic goods such as fuel and food are crucial for conflicts.

Walker et al / Schofield focus on the technological aspects arguing that it is important to see the price contractors as systems manufacturers -integrating a variety of subsystems into a complete final product. In this way they define a hierarchy of products

Military strategies and concepts

-Integrated weapons and information systems

- Major weapon platforms and communication systems
- Complete weapons and communication parts eg Stingray torpedoes
- Sub-systems eg gyroscopes
- Sub-assemblies eg sight and fuses
- Components eg integrated circuits
- Materials eg semi-conductors

This goes from high unit value complex systemic integration with long product life to low unit cost components with short product life and mass produced.

This is useful in providing a taxonomy but still doesn't tell us where to draw the line.

If we were to try to measure the importance of the DIB, there is still the problem of subcontractors -any direct measure will underestimate their importance and there is still the uneven regional distribution, which has left some local areas heavily dependent.

In the end the definition is likely to be determined by practical consideration -what question you are asking and the available data. Using a wide definition of the DIB will lead to huge problems of data collection. Using a restricted one will mean missing a lot.

Another concern is whether we should focus on the DIB in a national form or not. In the UK the production of advanced weaponry necessary for superpower status, leads to major defence contractors. But production of weapons can be seen as more strategic and we may want a wider definition of the DIB to encompass the firms of allies. The question is whether we can see foreign suppliers as part of the DIB or not. There is considerable debate over this. (Though the increasing interdependency of production may be changing the way we think - don't forget the national DIB is a product of post ww2)

The extreme views of the DIB are at one end the free market approach which would see procurement decisions based upon competition and countries developing industries based upon their comparative advantage,. At the other end the 'fortress Britain' with a comprehensive DIB with the capability to produce everything. In between there is the minimum core of national companies providing some level of self sufficiency.

There is considerable debate -see Gansler, Hartley et al (1987)