

The Changing Economics of Security

J Paul Dunne

School of Economics,
University of the West of England, Bristol
John2.Dunne@uwe.ac.uk

Abstract

This paper provides an overview of the changing political economy of international security since the end of the Cold War. It reviews the theoretical perspectives that have been adopted and assess their value in understanding the developments that have taken place. Neoclassical analysis is seen to be providing a simple instrumental and phenomenological analysis that has some value, but fails to provide a fundamental understanding of the processes at work. At present economic questions are being dealt with by non economists who dismiss the neoclassical approaches. The important developments in the area need to be understood in their historical, material and social context, providing an important role for heterodox economics.

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1. Introduction

Peace, war and international security is an area in which economists are often conspicuous by their absence, to a degree that rivals the importance of economic issues to the problems at hand. It is getting to the point where the supposed imperialism of economics of the social science is reversed and the political scientists, international relations and other such groups exclude the economists and take on the economics themselves. It is not unusual to find studies of post conflict reconstruction undertaken by non economists in which economic issues are, to their surprise, found to be important (Cooper & Pugh, 2006). In the case of the World Bank it came as a great shock to the other social scientists when economists started to argue that economics might have a major role to play in understanding civil wars (Collier et al 2003). Economists do have the gift of overstatement and a tendency to state unpleasant truths in a clear and precise way that can disturb other social scientists. Their indignation and overreaction reflected this and more recently the debate has reached a more civilised recognition of the complexity of such issues (Arnson and Zartman, 2006). It has also meant that the accepted contribution from economists has been a neoclassical one. Yet, as will become clear, the study of peace, war and international security in a satisfactory manner requires a more interdisciplinary perspective, making it a potentially a fruitful arena for heterodox economists.

This paper reviews the economics of security and how it has changed since the end of the Cold War. In doing so it considers different levels of generality of analysis. Starting with the big questions of international security, usually the domain of international relations, and then to moving to the general economic theoretical perspectives, before focusing on some specific developments in economics and security. Thus the first section outlines some general perspectives on international security followed by a brief schematic outline of the main theoretical approaches in section 2. Section 3 then considers the economics of security distinguishing neoclassical theories, Keynesian and institutional, and Marxist. Section 4 considers the restructuring and change that have taken place with the end of the Cold War and the challenges they present. The economics of conflict is then considered in section 5, starting with the approach economists have taken –mainly neoclassical, before considering more general political economy perspectives within the context of the ‘new wars’ literature. Finally, a section 6 presents a brief discussion of the economics of peace and section 7 presents some conclusions.

2. General Perspectives

There are a number of general perspectives on international security that still influence views of the world and all of which have economic underpinnings or implications. Prior to capitalism, the dominant mercantilist perspective considered the nation state as needing to produce wealth in the form of gold and this required running trade surpluses – encouraging exports and discouraging imports in a world in which trade volumes were

considered fixed. This was one of the first instances of significant government intervention in the economy and encouraged wars in Europe and imperialism as the powers fought over available markets. Clearly creating wealth would require military strength, which in turn would require economic strength. In such a system economic openness only comes with a hegemon to provide the collective goods of security and stability, but that state will only do so if it is in its own best interest. This developed into a neo mercantilist perspective, linked with a realist perspective on international relations, which see countries and states motivated primarily by the desire for military and economic power or security rather than ideals or ethics. War is considered an irreducible human trait in earlier works but curable in more modern ones. In general, conflict will be inevitable unless there is some dominant hegemonic force –Pax Britannica, or more recently US hegemony.

In contrast the liberal perspective that developed from the work of Adam Smith see capitalism as the best way to create wealth and maintain individual freedoms. Laissez faire capitalism and the global division of labour allow all to benefit from trade, it not a zero sum game. States intervene because of market failure and the public good nature of defence means they have to provide it, but it is seen as costly to the economy. Globalisation promotes peace and free trade with competition, both internationally and domestically and war is dangerous and likely to be very costly. A liberal realist or rationalist perspective developed from this, which argued that there is a society of states at an international level, despite the condition of anarchy, in the sense of the lack of a ruler or world state. Governance is provided by the key institutions that regulate international relations, treaties, diplomacy and the mutual recognition of sovereignty.

During the Cold War the realist perspective was dominant and the confrontation between the superpowers led to an enduring perspective in international relations dominated by the competing hegemonies and their arms races and proxy wars. With the end of the Cold War there was something of a crisis for international relations theory as the world became a much more complex place. The realist perspective retained dominance but had to develop to recognise the more complex geopolitical environment and less regulated world polity.

One development took the idea of democratic peace (following from Kant's perpetual peace), which implies that democracies do not fight each other and added globalisation to it, suggesting at first a role for multi layered governance structures to deal with weak states with anti capitalist and anti liberal attitudes which were reinforcing their backwardness in a globalising world. More recently this has been replaced by the US hegemony pursuing democracy within states and protecting democracy from external aggression¹. This new orthodoxy, which sees war as a results of pre or anti capitalist sentiments and groups; sees the solution to conflict as a global neo-liberal system; accepts that military action might be needed in the shorter run to create the right conditions (dealing with rogue states and terrorists); that sees the need to maintain the basis to produce the means of destruction through high military spending; that accepts the

¹ This also reflects recent Democratic peace: that have to make everyone a democracy even by force then will get peace.

hegemonic role of the US; is certainly not what was expected at the end of the Cold War and represents a limited view of the world that is coming into question with the continuing problems in Iraq and Afghanistan. It was not demilitarisation that followed the cold war but remilitarisation with closer integration of the civil and the military, through homeland security and the privatisation of defence functions (Lovering, 2004). Another concern is the US Neo conservative interpretation and their influence on policy, though this would now seem to be in decline.

It is also not without its conceptual problems. The liberal perspective can be argued to oversimplify the nature of capitalist development –focusing on particular problems it may be fine, but for the big picture it is lacking. There are also alternatives, both idealist (as opposed to rationalist) and Marxist, the latter drawing out the importance of economic processes and emphasising the inherent tendencies within capitalism to conflict and imperialism. These are discussed below. Generally, the contributions of economists have ignored the general context they operate in and how their theories fit into them. Yet clearly the discourse of international relations does often provide the context and points of reference within which debates on the economics of security take place.

3. Economics of Security:

Certainly economists have analysed the economics of security since Adam Smith, developing over the years a number of different schools of thought.

Neoclassical Theories

Theoretically the basic neoclassical perspective would see the state as reflecting national interests and providing security, recognising the trade off guns v butter. Defence is considered a pure public good (though in actual fact the state is usually providing security for itself rather than the population –e.g. nuclear shelters tended to be for the state officials and politicians). There are developments of this simple perspective to arms race models, the importance of property rights, the analysis of alliances- burden sharing free riding and rational agent theories of conflict.

As is characteristic of neoclassical economics which sees itself as the science of the social sciences providing tools with which to analyse any social setting its approach to analysing war is historical. As Hirshleifer's book starts that a basic economic problem is simply the possibility of predation and conflict, rather than production and exchange. Despite the existence of such analysis in Adam Smith traditional economics has tended to ignore the former and focus on the latter².

² In addition we could consider new classical theory tends to take a rather different perspective as it considers transitory and permanent shocks to the growth of the economy and recognises war as a permanent shock.

One interesting feature of the literature has been the popularity of particular types of models, in particular the Feder-Ram model. This supply side neoclassical growth model was developed to analyse the impact of the export sector on economic growth in developing economies. Using it for military spending, allowed the military sector to be treated as one sector in the economy and the size effect of the sector and its differential productivity effect to be distinguished, all in a single equation model. These advantages have led to it having a profile within the defence economics area well beyond what it has achieved in other areas and has contributed to a failure of the area to embrace important new developments in the general growth and development literature. Dunne et al (2007) provide a recent critique of the model suggesting an alternative Solow-type growth model would be better.

Arms Race Models

A related literature but one which has developed a clear perspective in which military effort can be explained in terms of one country reacting to increases of another. This started with Richardsons (1960) 'arms race' model supposes two countries whose military expenditure/level of arms/military capability, m_1 and m_2 , are related at time t by the equations:

$$\frac{dm_1(t)}{dt} = a_1 + b_1 m_2(t) - c_1 m_1(t)$$

$$\frac{dm_2(t)}{dt} = a_2 + b_2 m_1(t) - c_2 m_2(t)$$

Where a_i are exogenous 'grievance' terms, b_i are 'reaction' terms, whereby each country responds to the military capability of the other, and c_i are 'fatigue' terms, usually representing some internal limitations on a country's military spending/capability.

Interestingly this was not well received by the US government as it implied that arms races had no 'good' and 'bad' guy but were simply the result of one reacting to the other.

This basic model has been developed theoretically and empirically in a variety of ways, including the explicit modelling of rational economic decision-making by neoclassical economists, different dynamic specifications, game theory approaches, and empirically with the use of approaches such as co-integration. While much of the work has taken on a N-C perspective this is not necessary, as the dynamics of arms race process are simply action-reaction models, even discussed by Engels in *Anti-Duhring* for the case of the construction of Dreadnoughts and Robinson (1981) in a more political and institutional perspective.

The search for clear empirical evidence of 'arms races' has, however, met with rather limited success, with even apparently obvious examples as the Cold War superpower arms race proving ambiguous and very much dependent on specification³.

An early attempt to deal with strategic effects more generally by Rosh (1988) developed the concept of a security web where, instead of dyadic relationships neighbours and other countries (such as regional powers) that can affect a nation's security as being part of a country's Security Web. Rosh calculates the degree of militarisation of a nation's Security Web by averaging the military burdens of those countries in the web, finding it to have a significant positive effect on a country's military burden.

More recently, a number of authors, including Dunne and Perlo-Freeman (2003a and 2003b) and Collier and Hoeffler (2004), have sought to generalise the concept of an arms race by looking at the demand for military expenditure across a large group of countries, using either cross-section or panel data, incorporating a range of economic, political and security variables, and including variables for the aggregate military expenditure of neighbours and rivals. These models have typically shown that a country's military expenditure is significantly and positively influenced by that of those around them. Dunne and Perlo-Freeman (2003b) break this down, finding that the significant positive influence comes through the military spending of 'Potential Enemies'⁴. They suggest that this indicates, if not an arms race as such, then at least arms race-like effects, or spillover effects, where there is some tendency towards an action-reaction pattern of military spending between hostile nations⁵.

Keynesian and Institutional

A basic Keynesian perspective would see military spending as one component of government spending, with effective demand/multiplier effects. In this way military spending can be good for an economy, getting out of recession and helping plan expansions in effective demand. War would have a negative impact upon the economy? In general this has been combined with a form of institutional analysis which would take it beyond a liberal perspective.

In response institutionalists have provided a more complex understanding of the processes at work and the role of military power and conflict⁶. The institutionalist

³ India and Pakistan provides one of the few examples where researchers have been able to provide consistent evidence of a Richardsonian arms race. Even then, Oren (1994) has offered an alternative approach, based on hostility levels between the two countries, under which the apparent arms race disappears. Numerous attempts have been made to estimate arms races for Turkey and Greece, using a variety of theoretical and econometric models, without clear evidence of an arms race emerging. (E.g. Dunne, Nikolaidou and Smith (2003), and Smith, Sola and Spagnolo (2000).)

⁴ Which includes actual enemies

⁵ In addition, Murdoch and Sandler (2002, 2004) have focussed on the 'spillover effects' of military spending. Dunne and Smith(2007) provides more detail on the econometric issues.

⁶ This literature overlaps with the Marxist perspective outlined below.

perspective is predicated on existence of MIC (Eisenhower), where internal pressures for increases in military spending and forces are independent of threat. They create inefficiencies in the economy and so can have negative economic effects, particularly as the nature of defence production changed during the cold war and became very different from civil). This can also have other externality effects through influences on the civil sector and crowding out (Melman, 1970, 1985; Dunne, 1995). A more Marxist interpretation, would suggest that the capitalist mode of production still would not necessarily be an acceptable system even if military spending and the MIC were removed.

Marxist

The Marxist perspective is rather mixed. Indeed, Marx had little to say on militarism and it was Engels who provided most of the specialist writing even when jointly penned. His main statement is in *Anti-Duhring* and was influenced by Clausewitz, though there he argued there were no benefits to war only the prospect of financial ruin, Wars were won by technology, but this led to ruinous arms races, such as the Dreadnoughts. Looking at Marxist theory in the context of crisis theory it is a complex story, with different form of crisis (financial collapse, long waves, cyclical downturns and mechanisms (realisation, distributional, rising OCC, disproportionalities. These are usually not monocausal but the backdrop is the law of the tendency for the rate of profit to fall plus countervailing tendencies.

Following Marx, Kautsky considered the need for capitalism to expand its markets by colonial expansion but suggested that this plays a contradictory role, as it has costs. Boosting consumer demand benefits capitalists but they will resist if it is tax from profits. Luxemburg expanded reproduction model based analysis suggested that there could be positive effects depending how military spending was financed. Taxes on workers change composition, taxes on profits reduce overall profit, deficit finance will provide demand stimulus if below full employment. There would also be social and ideological benefits and military spending provides an external market. Bukharin suggested it cut into surplus value and so hindered reproduction, which is the opposite of Luxemburg as, rather than helping realise surplus value, it destroys the production of value. Lenin developed his analysis of imperialism from Kautsky, essentially providing a pseudo mercantilist view that war is the continuation of economic competition by other means. While by 1939 the Stalinist orthodoxy was underconsumptionist, as it suited Stalin to see the West as needing military spending to overcome crisis, to be economically dependent on its military spending (Howard and King, 1992).

Later Kidron, focusing on the threat of overproduction not underconsumption, saw military spending as diverting capital from accumulation so creating a 'permanent arms economy'. Long wave analyses were then developed from Kondratief's attempts to periodise cycles of capitalist development. Mandel seeing high organic composition of capital in military production accelerating the decline in rate of profit, and the wave of post war prosperity resulting from countervailing tendencies. In a more general analysis

the regulation school following Aglietta/Lipietz argued regimes of accumulation with – extensive to intensive methods, with regimes of accumulation coordinating production and consumption, dealing with the contradictions between the forces of production and social relations, the move from competition to monopoly regulation, with changes in the nature of the superstructure and governance.. In the US the Social Structures of Accumulation School of Weisskopf/Bowles/Gordon saw an accord between capital and labour that allowed prosperity in the US, though country and historically specific. Neither of these two approaches explicitly focused on military spending, rather it is just seen as one facet of US hegemony which was a factor in the post WW2 “Golden Age” and as such was tied in to the geopolitical environment of the Cold War and the hegemonic role of the US⁷. It has, however, proved to be a useful framework for understanding post Cold War developments, with Serfati (2006) developing the regulation approach to account for the military industrial complex within the globalised world economy.

Underconsumptionist

This is the only economic theory that has military spending as an integral and important part of capitalist system. Based on Baran and Sweezy’s ‘surplus’ approach to Marxist analysis, that emphasised the monopoly nature of the post war system⁸. Military spending was important in preventing realisation crises, through absorption of surplus without raising wages or capital. Other government expenditure doesn’t do this. Baran and Sweezy were more circumspect than later proponents of the effective demand/underconsumption Pivetti and Cypher, who suggest that military spending conscious instrument of economic policy and military spending has a stimulating effect on economy. The evidence does seem to go against this interpretation, but that hasn’t prevent protagonists like Pivetti making such assertions (see response to Smith and Dunne).

Post Cold War

Much of the work in these schools of thought was developed within the particular context of the cold war. In the case of the neoclassical and arms race perspectives the changes that have taken place since are of little relevance, given their ahistoric and asocial nature (though this is a weakness rather than a strength), but the institutional perspectives have clearly lost some of their relevance as the world has changed. They are, however, important in providing the background for understanding the developments in a sector which remains idiosyncratic and is being formed both by legacy and contemporary pressure⁹.

⁷ It was also argued that there were indirect effects for the US, benefit of international hegemony that outweighed the direct costs, but at expense of economy and it was these negative effects on the economy that showed up in the long run. For Europe these indirect effects were less clear.

⁸ Basically identifying value with observed quantities, so for example profit in price terms is seen as the money representation of surplus value.

⁹ Though see Fine (??) for a critique of the concept of and MIC used

One can have a similar criticism of the Marxist analyses, but again, they provide important background understanding. In addition, even if the specifics of the Marxist analyses are rejected it is still possible to see Marx's method as providing valuable contributions to understanding the economics of international security. To see the processes as historically specific, contingent rather than deterministic and as contradictory/dialectical processes which reflect the balance of power between groups within society. It is interesting that this is close to the approach Kennedy (1987) took implicitly, seeing empires as growing as a result of their military development, through building empires, but in the end empire overstretch forces them into decline. The next section consider the changes that have been taking place

4. Restructuring and Change

The end of the Cold War saw the Soviet threat disappeared and while new threats appeared, there were large cuts in military expenditure during the 1990s. There were also major innovations in military technology, which help explain the changes in the structure of the arms industry, the structure of the armed forces and the costs and benefits and thus the probabilities of different types of war. The Revolution in Military Affairs (RMA) discussed below.

Most weapons production have high development costs, they are also so costly to produce that they are limited to small batches with long gaps between generations. Rapid cost growth between generations of weapons means that almost nobody, not even the US, can afford it. Most military equipment is obsolete in commercial terms before it enters service, because it takes on average seven years to develop and deliver it¹⁰. The defence industry is fragmented and the market leaders are the same old firms who have been producing weapons for decades. Government's attempts to make defence more affordable include acquisition reform, use of commercial-off-the-shelf (COTS) technology, improved logistics and the like. The history of past procurement reform does not encourage optimism¹¹.

What is clear is that the arms industry remains idiosyncratic, though undergoing considerable change. It has moved beyond the analyses of the cold war, but does not share the features of the 'new economy'¹². The old heterodox contributions may have lost

¹⁰ Eurofighter, not yet in service, is based on early 1980s designs; and when it enters service, it will do so without its main missile, Meteor, which is mired in collaborative politics. A further consequence is that innovation is slow.

¹¹ A recurring theme in military procurement reform is the attempt to learn from the commercial world and the thrust of reform has been to commercialise the military, by importing private sector practices into military organisation. However, because military time-horizons are so long, much of the equipment is old and there are major problems of obsolescence, since commercial markets, particularly in electronics, do not support systems and devices designed to last for decades. The US Department of Defense has a special programme DMEA (Defense Microelectronics Activity) for the manufacture of replacement parts no longer supported by the commercial market.

¹² New-economy industries tend to have high fixed costs but low marginal production costs, eg software is expensive to develop but cheap to produce in quantity. They tend to have network effects, the more people who use the product the more effective it is. Innovation tends to be a series of winner-take-all races. At any

some of their relevance with the end of the Cold War, but their institutional and social perspectives locate the sector in its historical context with a clear path dependency and their method of analysis remain as relevant as ever. There is certainly great potential for heterodox economics to contribute to an understanding of the changing nature of the social relations of production within the industry.

5. Economics of Conflict¹³

There have been three strands to the linkage between economics and generalised conflict that can be identified, namely the consequences, causes and conduct of war (Dunne et al, 2006).

The first strand is the need to understand the causes of conflict, particularly when there may be economic elements in those causes. As we have seen, such economic elements include the liberal view that trade promotes peace; the mercantilist-Leninist view that war is the continuation of economic competition by other means; and the explanation of civil war in poor countries as often driven by attempts to control natural resources like oil or diamonds¹⁴. Also institutionalists would see conflict as likely because of the vested interest is in the MIC. Though interestingly in the Cold War the last thing anyone wanted was to use some of the advanced weapons systems in earnest –they often did not work, as in the case of early cruise missiles.

Most economists have tended to ignore issues of conflict and security, often assuming exogenous provision of property rights. That there is a sovereign or state whose duties include protecting the society from the violence or invasion of other societies and establishing a legal system which administers justice and enables exchange and investment to proceed with security¹⁵. This may be a reasonable first approximation for some times and places, but is certainly not for others, including much of the world today. However, there is now a fairly large literature concerned with endogenous property rights. When conflict is an option, the resulting distribution of property reflects agents' ability to protect their resources from others or steal resources from others. The simplest models have individuals who can allocate their time between investment in growing food, stealing food from others and defending the food they have from theft by others. Typically the models will have a number of agents each subject to a budget constraint, with production possibilities for various goods, including military ones and exchange possibilities. This includes attempts to understand civil wars, Collier (2000), Gershenson et al. (2000), Sambanis (2002); to integrate the models of production and exchange with models of conflict and struggle, Rider (2002); to understand intervention in conflicts by third parties (Siqueira 2002); to consider issues of terrorism, organised crime, post-conflict demobilisation and reconstruction, etc. A common formulation is that the

moment in time a single firm, which produced the killer application, tends to dominate the market; but when innovation is rapid their dominance is precarious Netscape fell to Microsoft and Yahoo fell to Google. Bresnahan and Greenstein (1999) discuss some of these issues

¹³ This section is based on early versions of Dunne, Garcia Alonso, Levine, and Smith (2006).

¹⁴ See Kaldor (1999) and Collier (2000)

¹⁵ Coloumb (1998) discusses Smith's writing on defence economics..

objective function of a state, say welfare, depends on consumption and security, a function of own and opponent's armed forces. Welfare is maximised subject to a budget constraint, thus determining the optimal level of armed forces. Security can have many levels depending on what the threat is¹⁶.

More general perspective can see conflict as the results of the natures and dynamics of the Military Industrial Complex, for the Keynesian institutionalists, or a natural result of the development of the capitalist modes of production, for the Marxists.

The second strand is the use of economic analysis to improve the effectiveness of the prosecution of war. This runs from Adam Smith's discussion of the relative effectiveness of standing armies and militias to twentieth century applications of economics, and other types of applied mathematics, to develop effective military tactics and strategies. The application of game theory to nuclear targeting is a classic example; von Neumann was the model for Dr Strangelove. In the literature which deals with potential conflict with an identified enemy the analogy to the production function is the conflict success function, CSF: the inputs are the investments in fighting efforts of the two sides and the outputs are their relative degree of success in the conflict: either the probability of winning or the share of the pie that goes to each side¹⁷. While there is a vast military literature on success in battle, there is relatively little econometric work on conflict success functions¹⁸. One problem with this type of analysis is that it either treats aggregate military strength as a single aggregate, or distinguishes just between labour and capital, members of the armed forces and their equipment¹⁹.

¹⁶ From 1945 to 1989 the central concern was the potential conflict between NATO and the Warsaw Pact; a classic arms race between two militarised powers. In many parts of the world, such arms races continue to be important. Other countries face internal threats against which military preparations are effective. These are mainly poor countries, but also include Spain and the UK. Some countries, such as the US feel threatened by external non-state actors. Some states want to project power to intervene for human rights or other ways, while some, such as the small European powers, have no obvious threats but retain military forces as a general insurance policy. Given US military dominance there is a natural international concern about what its security objectives in fact are.

¹⁷ There are two main functional forms used in which success depends either on the ratio of the forces or the difference of the forces. Hirschleifer (2000) provides a discussion of CSF, with many military and non-military examples, which captures the spirit of the literature.

¹⁸ An exception is Rotte and Schmidt (2002), who use a data set of 625 battles 1600-1973 to estimate an equation to explain victory by the attacker in battle: a zero one dependent variable. The explanatory variables include the force-ratio of the two sides and expert assessments of relative advantages in leadership, surprise, morale, logistics and intelligence which were significant; and training, defensive posture, and technology, which were not significant. The estimates bring out the importance of the intangibles of battle: leadership, morale, etc; but even with all these included the fit is low, with a pseudo R squared of less than a third: outcomes of battles are relatively unpredictable even with the benefit of hindsight. As they point out there is a sample selection problem. We only observe a battle when both sides think they have a reasonable chance of winning, otherwise it does not take place.

¹⁹ In fact determining the optimal force structure involves four main choices for both labour and capital, variety (with some substitutability), quality of those forces, the quantity of each and whether they are obtained domestically or from abroad. This choice is primarily important for equipment, where security of supply for spares in case of conflict is often important, but does occur for labour for those countries that use foreign soldiers. Such as the UK with the Gurkhas and France with the Foreign Legion (Dunne et al, 2007)

The third strand is the need to understand the economic consequences of War and adjust policy accordingly. From Ricardo on the Bullion Controversy, provoked by the suspension of the Gold Standard during the Napoleonic Wars, through to Keynes, on how to pay for the Second World War, managing the war economy has been a central question²⁰. Such analyses do have some specific concerns, but do also overlap with the literature on the economic effects of military spending discussed above. Within much of the developing world, particularly Africa, civil wars are a major cause of economic dislocation and the international financial institutions are struggling to come to terms with this linkage. In particular, managing post-conflict reconstruction and providing incentives for combatants to return to civilian life has proved difficult²¹. We shall return to this below.

The RMA and Asymmetric Warfare

During the 1990s two concepts became central to in the development of military discourse to these changes: The Revolution in Military Affairs, RMA, the term used for the way that changes in technology were transforming fighting, and Asymmetric Warfare, the term used for the way that opponents would respond to a dominant military power by fighting in ways that the dominant power did not expect or prepare against (Dunne et al, 2006). Weapons are very R&D intensive: small performance advantages over the enemy can translate into victory, but getting that advantage is very expensive, leading to both a race to improve technology and high growth in the real cost of weapons between generations (estimates suggest 6-10%). Because the weapons are so expensive the gaps between generations get longer and as a result much military equipment is very old, e.g. the B52, still being extensively used, is a 1950s bomber with newer avionics and weapons.

The RMA is potentially the latest of a sequence of technological changes that have transformed the military, Kirkpatrick (2000)²². Such revolutions usually also change the balance of power, as one group or country adopts the new technology faster than their antagonists and use it to change the way war is fought. The technological changes can involve new products, like the tank, or new processes, forms of organisation, like Blitzkrieg, that make better use of existing products. In the military, process innovation tends to be much slower than product innovation, particularly in peace-time. In general, new technologies have been most effective when used in ways that are unexpected by the enemy and have often been associated with the rise of new revisionist powers²³. The increase in sophistication and cost of the most advanced military equipment, means it is

²⁰ Indeed Stone (1988) refers to work by Gregory King in 1695 on the question of how long England could sustain the war against the league of Augsburg.

²¹ See Harris (1999)

²² Definitions of the RMA tended to emphasise the way that improvements in information technology, precision targeting and smart munitions created the possibility of a new form of network-centric warfare.

²³ For example, the Japanese defeat of the Russians in 1905, through the use of the latest technology and a more effective strategy. Also while some military revolutions concentrate power, because the equipment is so expensive and specialised that only an elite can afford it; the rise of the armoured knight in their siege-proof castles, for instance. Other revolutions disperse power as they put cheap capability into mass hands; the guns that displaced the knights and castles (Freedman, 1994; Parker, 1988).

impossible even for relatively rich countries to maintain a comprehensive defence industry the nature of confrontations and conflict has changed²⁴. It is unlikely that two sets of allies will face each other with similar weapons and tactics, as in the two world wars. It is more likely that there will be an asymmetry between antagonists and this will likely change the nature of the conflict²⁵. The idea of asymmetric warfare is not new but the changing nature of conflict in the modern world, for example in Iraq, suggests that asymmetric responses are likely to become increasingly important.²⁶ Definitions have emphasised asymmetries in technology, what each side fights with; asymmetries in tactics, how each side fights; or asymmetries in the stakes, the costs of defeat to each side²⁷. Much of the military discussion prior to the coalition attack on Iraq in Spring 2003 centred on the extent to which Iraq could neutralise technological superiority by using guerrilla tactics and urban warfare.

Neoclassical theory is well placed to adjust to these new developments and has begun to develop models to deal with these asymmetries and provide insights into the behaviour of adversaries²⁸. As mentioned above theory has been developed for the specifics of civil

²⁴ During the 1991 Gulf War 9% of the ordinance dropped consisted of 'smart' (precision-guided) munitions. In the 2003 Iraq war it was over 90%. Both the strap-on kits, JDAM (the GPS guided Joint Direct Attack Munition) and WCMD (Wind Corrected Munitions Dispensers) were cheap in military terms because they used more commercial development programmes and commercial components. It had been estimated that under traditional acquisition programmes JDAM would cost \$68,000 each. A new system, mandating a maximum price, was used and the final cost was about \$18,000 each, Lorel et al. (2000). Subsequently with competition and dual sourcing the price fell to about \$12,000. Of course JDAM is only useful if you already have the legacy systems: B52s and dumb bombs.

²⁵ The military distinguish three levels of analysis: the strategic, the conduct of the war as a whole; the operational, the conduct of a campaign; and the tactical, the conduct of a particular engagement with the enemy, e.g. a battle. Since the meaning of strategy is different between the military and game theorists, who use it to refer to state contingent moves, we will always refer explicitly to military strategy, rather than strategy, when we refer to the planning of a war as a whole.

²⁶ Indeed, one feature of the Lanchester square law formulation is that numbers matter more than technology. Suppose that side A replaces, say 1000 riflemen by 200 machine gunners, who are each 25 times as effective. But five enemy riflemen would each be targeting each machine gunner, who would on average last one fifth as long as the rifleman he replaced, so is only five times as effective rather than 25 times. Bellamy (2002) discusses this example in the context of asymmetric warfare, which he interprets as a significant qualitative asymmetry in the technical level of sophistication of the armaments employed by each side. He uses the Boer War as an example, where although the British eventually won, they had great difficulty in turning their technical superiority in weapons, including machine guns, into military advantage. Boer leaders, unlike World War I commanders, did not think it sensible to order their troops forward to be mown down by the opponent's machine guns, so the battles were no longer described by this particular law.

²⁷ Despite having massive technological and military superiority; the US withdrew from Lebanon in 1983 after a suicide bombing killed 241 troops and from Somalia in 1993 after a battle in Mogadishu, in which television covered the brutal treatment of two American corpses and one injured prisoner. In neither country did the US have large stakes.

²⁸ Hirschliefer argues that the role of the economist is not to replace the technical experts in the micro-technology of conflict, but to address the macro-technology of conflict, making use of such familiar concepts as increasing and decreasing returns, economies of scale and scope, and factor substitution. In doing this the CSF function is treated as basic, rather than being derived from specific scenarios as Lanchester and Intrilligator do. In addition, as Hirschliefer (2000, p774-5) recognises the CSF describes the mechanics of attrition, grinding your opponent down; but a lot of warfare is about manoeuvre, using your forces to catch your opponent at a disadvantage a fact emphasised by Luttwak (1987) who he cites. But

wars, eg Collier(2000) and in a recent contribution, Dunne et al (2006) develop a game theoretical model that attempts to capture the main features of asymmetric warfare. They interpret this as involving either different technologies, types of weapon, or different tactics, ways of fighting, though in practice it may often involve both. The asymmetry arises because one side can gain an advantage by choosing to fight in a way that the opponent is not prepared for, i.e. choosing tactics very different from the enemy²⁹. The most likely scenario is an incumbent power with dominance in available resources, but committed to a certain type of technology, and a smaller challenger, with limited resources but more flexibility in choice of technology. Most incumbent powers one could think of tend to have military capabilities whose characteristics are very similar and when similar sized powers engage in conflicts or arms escalation they do so with those very similar technologies³⁰. Having invested considerable resources in a particular conflict technology and having developed the industry to produce it (and export it), incumbent countries would find it difficult to change.

As usual neoclassical economics strength is being applicable to a range of issues, because of its ahistorical and a social nature. This means it could be used to analyse the new situation. This is also its weakness as it makes it partial and subject to instrumentalist justification, limiting its contribution to the understanding of the processes at work. This has also tended to be the case in the wider economics of security literature.

Old Wars and New Wars

Within the wider literature the political economy of conflict underwent considerable changes as it confronted the post Cold War environment. The end of proxy wars and superpower involvement had not reduced conflict, though it had reduced their intensity, it had changed them. Civil or intra state wars were the most common and the nature of war had clearly changed. Kaldor (1999) considered the new wars to be very different and only understandable within the context of political economic and military globalisation. There was a blurred distinction between war and organised crime and while local the wars tended to have a transnational connection. There were no real military battles as in the past but skirmishes and in general civilians were targeted by militia. New war economies were seemingly based upon plunder and black marketeering and sometimes supported by aid and were sustained through continued violence. This was not helped by the tendency

Luttwak explicitly rejects the production function approach “when it comes to military power, the relationship between material inputs and desired outputs is not proportional; it is in fact very loose, because the making of military strength is dominated by nonmaterial, quite intangible human factors, from the quality of military strategy to the fighting morale of individual servicemen.” It is these intangibles that the CSF lacks

²⁹ For instance, before World War II, French tactics were largely defensive based on the Maginot line, which the Germans outflanked with a Blitzkrieg attack in 1940 defeating superior British and French forces. In the late 19th century, the machine gun was a major technological advance, which gave the British a great advantage in Colonial Wars; but the Boers were largely able to neutralise this advantage through their tactics and although the British did eventually win it was a longer and more expensive war than they expected .

³⁰ The Cold War, for instance, was mainly a vertical arms race, with similar types of technology on both sides and effort/quality the main strategic variable (Walker, 1994).

of the 'international community' to work with the protagonists to broker peace deals rather than the civil society that existed outside of the conflict (Kaldor,2006).

A harder look at the endemic and continuing conflicts in Africa was particularly challenging and it started to become clear that the continuing struggles needed some source of income, that this was often resources and that it was possible that the resources control had become the object of the struggle overtaking any previous goals. That it was not a breakdown of the system but a way of creating a new system of income and profit and power. When the World Bank group led by Collier started to investigate the economics of civil war starting what became known as the greed versus grievance debate there was a profound impact on the subject area. Collier and Hoeffler produced a series of careful and detail empirical studies which looked at the cause of conflict and explanations for their continuation/duration. The results suggested that it was greed (often represented by the proportion of primary commodities in GDP and other such indicators) rather than grievance that explain civil wars. There was little impact of the factors that had tended to be assumed of primary importance in the past. There was a furious response and a lively debate. The results was to accept that grievance may be involved in starting conflicts, but that that they are likely to be captured by more economic concerns over time. Collier focuses on feasibility durability and opportunity of civil war explained by greed rather than actual start of conflict. When this work was being produced there was no real reason why this should have been done in the context of a neoclassical model of rational agent, other than publishing in the economics journals, but it was. A lot of the responses were not. Since the initial colourful exchanges the debate has settled down to an interesting multidimensional analysis of the determinants of civil wars (Arnson and Zartman, 2006)

Important findings came out of these debates that have important implications for policy. It is important to recognise that economic issues are important in wars and that war economies develop that have a logic and incentive structure; that shell or shadow states exist as do commerce and trade links and financial links within such structures; and that the distinction between criminal and non criminal transactions is rather blurred in such environments. It is important that international agencies recognise this and that the design of peace accords reflects this complexity. Otherwise policies will have unforeseen and potentially catastrophic effects, for example criminals may be maintaining vital trade links within a conflict zone, to simply normalise trade relations without proving an alternative could lead to serious problems, such as famine in particular local areas (Duffield, 2001).

From the Marxist perspective there is criticism of the ahistoric nature of the available theories, such as their failure to recognise some conflicts are primitive accumulation rather than some simple greed or grievance trade off (Cramer, 2002)

6. The Economics of Peace

One could use the same schematic as for conflict and consider three strands the causes of peace, the effectiveness in the prosecution of peace and the economic consequences of peace

In terms of the causes of peace, we saw earlier that concepts of eternal peace and the democratic peace, suggest that peace is a normal state for republics and democracies. In general one would have to see peace as the absence of war and the schools of thought would differ. The mercantilists would certainly see conflict as inevitable and peace as the gap between wars. A Clausewitzian perspective on war as the extension of politics. Marxists would also suggest a conflict ridden development process of capitalism with some arguing for tendencies to armed conflict through attempts to overcome inherent contradictions and crisis, including new forms of imperialism, though not all. Institutionalists would see the MIC vested interests creating arms spending in economies, though it would not necessarily be in anyone's interest to go to war –though it could be. Liberal and neoclassical perspectives would see peace as best situation for accumulation and so identify economic incentives for it. Pigou, Veblen and Boulding have contributed to an analysis of peace, but most contributions are really the absence of war and the impact of the cuts in military spending.

In terms of the effectiveness in the prosecution of peace this will clearly require the development of peacekeeping and peace making forces and related equipment, which could be very different to what is available now and have implications for the nature and extent of the DIB and its related vested interests. In addition, The development of international governance structures that operate considerably better than those at present will be required as well as the recognition of wider concepts of security. To develop successful policies and support for post conflict reconstruction (following from previous discussion) it is clear that we have to understand economics of war better to make a better job of designing and maintaining peace accords and designing reconstruction packages that makes the incentives of peace greater than those of a return to war (Harris, 2003; Dunne, 2006a)

In the past, during the Cold War there was considerable debate about the economic impacts of reducing military spending and how to deal convert resources to civil uses. This now seems like a strange debate as the argument that cutting military spending would lead to significant economic problems is difficult to argue given the degree of cuts after the cold war and the relative success of the effected economies. There are of course transition costs but these are no longer seen as significant. Swords to ploughshares is no longer considered sensible, but the macro, and meso conversion policies of industrial restructuring relevant. It is an interesting debate to look back on and there are some useful analyses (Gleditsch et al, 1996)

Moving to the economic consequences of peace. Peace does not necessarily mean demilitarisation and reduced military spending, but if it does then the evidence suggests improved economic performance is possible. It is in fact likely to lead to moving resources away from existing DIBs to other civil sectors and this should have positive effects. It should also allow the focus to move from military to alternative concepts of security, such as human and environmental. This could improve the situation for developing countries as well as the poor in developed countries. It could also provide increased demand for industry, through investment in alternative technologies. This could

also allow policies to reduce inequalities, support sustainable development etc and so improve the economic situation for all countries. Improved trade and wealth should reduce the likelihood of conflict, but the experience of this century does make one wary of making such statements with confidence. Nevertheless, it is difficult to see anything but economic benefits resulting from peace.

7. Conclusions

This paper has considered the changing economics of security. In doing so it started by discussing the theoretical perspectives that dominate international relations and provide the context for any economic debate and suggesting they are not without problems. The dominance of the neo conservative perspective seems to be on the wane, but the context for the debate on the economics of conflict still remains a liberal realist one, with an expectation of democratic peace.

There are economics theories of military spending available, following the neoclassical, arms race, Keynesian and Institutional and Marxist, that offer explanation of the Cold War environment, but which have not all successfully been developed to account for the post Cold War environment. Neoclassical economics has made the transition more readily, but provides only partial understanding given its ahistorical and asocial nature, while arms race models still provide another useful but limited understanding. Keynesian and institutional theories have not been developed to account for the new environment, though there is a degree of continuity that makes this relatively straightforward. In contrast Marxist theories provide a range of self consistent options given and some have been developed to provide a valuable understanding of the processes at work.

Economics theories of conflict are seen to provide very different perspectives to the international relations ones, and tools with which to analyse the new developments in the international security environment, namely the Revolution in Military Affairs and Asymmetric Warfare. As expected neoclassical economics has made the major contribution to this analysis, while the wider perspective on the post Cold War developments in conflict have been made in the political economy, which has found economic issues to be important. The debate instigated by the World Bank analysis of 'greed and grievance', arguing that civil wars were greed rather than grievance, brought economic aspects to the fore. A colourful debate has settled down to an interesting multidimensional analysis of the determinants of civil war.

Peace has also seen a limited analysis by economists, in the causes, effectiveness and prosecution of peace. A failing that is particularly apparent in the post conflict development literature. There is considerable scope for contributions by all schools of thought.

It is clear that economics has the potential to play an important role in this area, despite the dominance of other subject areas in the general debate. What is needed is more recognition of the importance of the economics of security and the value economists can

bring to the existing literature, moving beyond the contributions of neoclassical economics. The Economics Peace and Security Journal (epsjournal.org.uk) was set up to contribute to developing a pluralistic economic perspective on issues of peace and security. It publishes accessible works that indicate the important contributions economists have made and the range of subject areas that still require their attention, eg a forthcoming issue on water conflict.

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