War, Trade and Natural Resources: A Historical Perspective

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War and Trade are two human activities that are so intrinsic to the species that it is impossible to assign any moment in its evolution at which either of them first "appeared". Every stage of socio-political evolution, from hunting and gathering to agriculture and animal husbandry and on to the commercial and industrial nations of today, has seen people conducting trade and warfare, both within their own boundaries and across them. The object of both Trade and War, or "Warre" as Thomas Hobbes more emphatically labeled it, has for most of the time been access to and control over scarce "Natural Resources", differing only in the means by which this is to be achieved. Trade attempts to secure access to the fruits of the natural resources possessed by others by offering something of value in return, frequently the products obtained from the different bundle of natural resources in one's own possession, thereby making both parties "better off". War, on the other hand, attempts to do this by using force to deprive the other of the resources at his command, without offering anything of value in return. The use of force, however, itself requires the input of the user's own scarce resources. Thus both War and Trade, from this perspective, are but alternative options to convert one's own scarce resources into those of the other in a manner that enhances one's own welfare, the difference being that Trade also raises the welfare of the other while War reduces it. Which option will be taken, at any given moment, and to what extent, will of course depend upon the circumstances and the preferences of the agents with regard to the benefits, costs and risks involved.

War and Trade can also be mutually supportive of each other in a rational calculus of statecraft such as that of the seventeenth century Mercantilists with their twin objectives of Power and Plenty, as so lucidly explained by Jacob Viner (1948) in his classic article. Here the state deploys force, or the threat of it, to create markets for final products and to secure sources of raw materials, thereby raising national output and revenue which in turn enhances the level of force that can be sustained.

Lionel Robbins famously defined economics as the study of the relationship between ends and scarce means that have alternative uses. This places the rational use of force squarely within the discipline, so that in principle economics should have just as much to say about War as it does about Trade. As we all know, however, the contributions of economists on trade vastly exceed anything they have ever said about war, with Adam Smith's brilliant opening passages "Of the Expence of Defence" to Book V of the *Wealth of Nations* being a notable exception. Also worthy of note in this regard is the brief but suggestive formal discussion of international relations by Trygve Haavelmo (1954, p.91- 98) in which he makes the point that a country may choose to use some of its resources for "unproductive" or "predatory" purposes, to acquire goods by "grabbing" from others, requiring the others to in turn use their own resources "unproductively" in order to deter the aggressor, thus leading to an all-round reduction in global output.

While students of trade may have had little to say about war, students of war have generally recognized that competition over scarce resources, particularly natural resources, has been the underlying cause of war from the emergence of humanity itself to the present day. This point of view has recently been made most forcefully and impressively by Azar Gat (2006) in a remarkable work on *War in Human Civilization,* that begins with fighting and aggression in the animal kingdom as the evolutionary prelude to human conflict from the Paleolithic to the present. We find it interesting that Gat's history of war has had to deal with production and trade almost to the same extent as we have had to deal with war in our own contemporaneous book, Findlay and O'Rourke (2007) on *Power and Plenty: Trade, War and the World Economy in the Second Millennium.* War and trade are also intimately linked in the very well-known works of W.H. McNeill (1982) on *The Pursuit of Power: Technology, Armed Force, and Society since AD 1000* and Charles Tilly (1990) on *Coercion, Capital and European States AD 990-1990.* Clearly these two seemingly contradictory aspects of humanity, conflict in the one case and cooperation in the other, are inextricably intertwined throughout the entire course of history.

Given such a vast field to cover, what can we hope to usefully say in the space of a single chapter? Since any attempt to be comprehensive must obviously come at the

price of superficiality we choose to focus on putting forward sketches of two related analytical models that one of us has developed earlier in Findlay (1996) on "Territorial Expansion and the Limits of Empire", and Findlay and Amin (2008) on "National Security and International Trade: A Simple General Equilibrium Model", and applying them to some particular historical episodes. The "empire" model is first applied to three major empires across a wide span of time, the Romans, the Mongols and the European maritime empires that emerged after the fifteenth century European voyages of discovery. The "National Security and International Trade" model is then applied to the case of the "Global Cold War" between the United States and the Soviet Union, and then to the contemporary geopolitical scene in the final section. The objective is not to try to say anything substantively new about any of these momentous historical events, but to hopefully demonstrate that economic theory and history can usefully be applied to the unified treatment of war, trade and natural resources in relation to them.

The Expansion of Empires

The life cycle of empires can usefully be divided into three phases. These are (1) an initial expansionary phase in which the future imperial power exploits some "edge" that it has acquired in military technology or organization over surrounding peoples or states, bringing them under its dominion as either clients or subservient allies or directly incorporating and administering their territory; (2) a second phase of consolidation of the rule over the acquired lands and subject peoples in the "high" empire; and (3) a third phase of contraction, decline and fall under pressure either from resistance and rebellion of the subject peoples themselves or attacks from external forces and powers, combined with loss of internal cohesion and control. We will here be concerned almost entirely with the first of these phases, although some remarks will be made about the second and third. The "natural resource" that is involved in relation to empires will not so much be particular types of resources but rather the generic natural resource of "land", which can encompass all particular varieties from agriculture to forestry and mining.

From an economic point of view the concept of empire unifies the theme of the relationships between war, trade and natural resources in a historically very important way. Each successful empire seeks to maximize its defensible territorial extent by first

waging war, but then it has an enduring interest in maintaining peace across this domain to promote economic activity, trade and the exploitation of natural resources in order to provide the revenues necessary to maintain its armed forces and administrative services and promote the welfare of its elite members, as well as its ordinary citizens to whatever extent possible. Empires therefore always strive to maintain a peace or *Pax* within their own borders, while warily protecting them from rival empires, states or wandering marauders. Thus our history of the last thousand years of world trade in *Power and Plenty* is largely concerned with the struggles of empires to establish and maintain themselves while fostering trade within and also across their borders. On the other hand, the wars provoked by these very same attempts to create and preserve empires have often been the main causes of the disruptions of world trade throughout history, but particularly in the past century.

We begin with the presentation of a simple formal model of "territorial expansion and the limits of empire" based on Findlay (1996), but extended in an important direction. The next three sections are brief discussions of three major historical examples, the Roman Empire of antiquity, the Mongol Empire of the middle ages and the Western European empires of the early modern era, considered in their collective aspect in relation to the rest of the world, rather than singly in relation to each of the nation-states involved. Each of these examples will be examined in relation to the model to see how it "fits" each case, however loosely or broadly. The literature on each of these historical cases, as well as of the comparative study of empires, is of course incredibly vast and there will be no futile attempt at comprehensiveness, though all relevant sources on which we have drawn for particular insights or evidence will be mentioned. The subject of empire has been given a fresh lease of life as a consequence of the events of September 11th, 2001, so it will be difficult not to make some observations on the historical experience of empires in relation to contemporary issues, following the example of Chua (2007), which is only the most recent of several notable attempts in this regard.

A Model of Empire

Imagine a tribe of people, numbering N, concentrated at a point on a "featureless plain", so beloved by location theorists. They are surrounded by peoples of other tribes,

whom they regard as "barbarians", not yet having acquired the necessary degree of political correctness. In order to acquire and maintain surrounding territory for cultivation they need to devote some manpower to forming an army, with the radius of the circular domain that they can hold being an increasing function of the size of the army, but at a diminishing rate. More formally there is a function **r (A),** where r is the radius and A the size of the army, with the first derivative positive and the second negative to indicate diminishing returns to military expansion. For a given value of A the length of the radius of control r depends on the **relative** efficiency of the tribe's army compared to the forces of the barbarians by which they are surrounded. Any land acquired must be protected and held and thus A has to be thought of as a permanent stationary flow rather than a one-time commitment of armed force. For any A and hence r (A) the resulting area of the circular territory under the tribe's control would be given by the familiar formula of "pi r squared". The resulting area or territory T can yield output Q given by the production function Q = F (T, L) where L = [N- A], the number of citizens not enlisted in the army. We can think of land and labor as being substitutable for each other for the production of output, so that we can deploy the familiar textbook device of an "isoquant map" to illustrate the production function. The marginal products of land and labor are both positive but diminishing, while more of either factor increases the marginal productivity of the other.

Consider the problem of how the tribe should divide its manpower N between A and L. Devoting all N to A would maximize the territory T that the tribe can clear and hold but would leave no labor L to produce Q. No army at all would maximize L but Q would again be zero in the absence of any T. We can describe the problem for the tribe to be to maximize Q, subject to the production function F(T, L), the "military range" function r(A) and the manpower constraint A+L = N. A simple graphical solution of this problem is to construct a "factor transformation curve" showing how increasing A from zero to N yields increasing areas of T from zero to the maximum attainable at r(A) = r(N) (*see Figure 1*). This curve would be concave to the origin, i.e. display diminishing returns because the second derivative of r (A) is assumed negative due to lengthening supply lines and other difficulties of being further away from the base at the center. Superimposing the isoquant map onto this factor transformation curve determines the

highest attainable output Q* by the point of tangency between the factor transformation curve and the isoquant corresponding to Q*. The coordinates of this tangency point also yield the optimal values for the size of the army A* and hence the civilian labor force [N-A*], and the territorial extent T*. In the usual economic jargon this tangency point equates the marginal rate of substitution between land and labor in the production of output to the marginal rate of transformation between land and labor determined by allocating labor to the acquisition of land by mobilization in the ranks of the army.

The underlying logic of this "first order condition" is however intuitively clear and can be very simply explained and understood. As with the ancient Romans a man can serve as either farmer or soldier or even both at different times of the year since the campaign seasons were determined largely by weather conditions. The opportunity cost of placing a man in the legions would be what he could produce as a farmer, his marginal product on the land. The gain of making him a legionary would be the additional land that could be acquired as a result, multiplied by the extra output that this additional land could produce in conjunction with the residual labor force engaged in farming. Thus the necessary condition for the optimal size of army A*, output Q* and territorial extent of the "empire" T* is that the marginal product of the additional land acquired by the Roman as legionary be equal to the marginal product of that same Roman as farmer.

This solution to the problem of the optimal extent of the empire assumes that the inhabitants of the conquered territories are killed or expelled, and that only the land is acquired to be worked by the empire's own original citizens. One obvious extension of the model would be for the empire to use the conquered people as slaves or Spartan-type helots, thus augmenting the non-military labor force at the disposal of the empire. Each possibility could be worked out but the most interesting is to have the empire attach the conquered peoples to itself not just as allies or client states, like the Athenians or Romans did earlier in their history, but to go all the way and extend full citizenship to all who would accept it, as the Romans did in the later phases of their empire. Thus the army not only extends the territory of the empire but augments its labor force as well, for both civilian and military employment. The simplest way to extend the model to take this important modification into account is to assume that additional labor is acquired in proportion to the additional land as the size of the army is increased. The fact that there is

diminishing returns to land acquisition, while labor acquisition is proportional to land, ensures that there is an upper bound to the optimal size of empire in this extended case. It is easy to prove that such an "inclusive" empire, other things being equal, would not just have more population and labor but greater territorial extent as well. To establish this point consider the solution already obtained in the absence of labor acquisition. With additional labor per unit of land denoted by "n" the total additional labor acquired from land T* would be nT*. If all this labor were to work the land the marginal product of each farm worker would fall and the marginal product of land would rise. Thus the opportunity cost of an extra legionary would fall while his marginal product in the army would rise since the extra land he acquires would be more productive as the result of the larger civilian labor force. The army should therefore be enlarged, until the first order condition is restored, resulting in a more expansive territory over which the empire extends its sway. In the opinion of many historians of antiquity their willingness to grant citizenship to subject peoples was why Rome was able to acquire and maintain such a large empire for so long, while the Greek city-states' jealously guarded exclusivity in this respect prevented them from ever gaining and holding any wide swath of territory under their dominion for any length of time.

Simple as it is, our model is able to give analytical precision to some important ideas in the literature on empire. One is the concept of the "military participation ratio" or MPR introduced by the sociologist Stanislav Andreski (1968) to denote the extent of the allocation of the labor force to military activities. In our model this is defined as A/N. This ratio is taken as a given for each society by Andreski but we are able to derive it endogenously as A*/N* in our model with both the size of the army A* and the population N* itself determined by the model as functions of the civilian and military technologies.

An even more important concept is the idea of "imperial overstretch" introduced by Paul Kennedy (1987). Thus, suppose that like Alexander or Napoleon the leader of our imperial polity is seduced by the desire to conquer land for the sake of "glory" rather than merely for the economic benefit that it provides. He would expand the army beyond A*, acquiring more land than T* and more people than N* to satisfy his thirst for glory, but would have to pay the price of a lower Q* for this indulgence in satisfying Power at the

expense of Plenty. The military budget as a proportion of total output wA/Q, where w is the real wage of a soldier equal to the marginal product of labor, would be higher, as well as A itself, while Q would be lower, all relative to the optimal solution, meaning that the ratio of tax or tribute to output would also have to be higher than under the optimal solution. This means that the empire would be less able to sustain the fiscal burden of defense against external attack or internal dissension, accelerating the prospect of the empire's decline and fall.

The idea of the function r (A) and its properties used here is inspired by the concept of a society's "military range", or the area over which its armed forces can exercise effective striking power, introduced into a brief review of a comparative study of feudalism by Owen Lattimore (1957). He compares the military range with the "administrative range", the area over which the society can exercise direct centralized control. He suggests that feudalism arises when the former range exceeds the latter, i.e. the center finds it more convenient to cede local administration to the vassal or client entity, while at the same time being able to enforce its claims for tribute and so on by exerting force to ensure compliance when necessary. In the context of empire this suggests two concentric circles, with the center imposing direct administration only over the inner circle, while permitting devolution of authority in the area between the circles. The distance between the circles represents the area over which the benefits of direct rule to the center are exceeded at the margin by the additional costs. This same image can be found, quite independently of Lattimore, in Figure 1.2 of the well-known book on the *Grand Strategy of the Roman Empire* by Edward Luttwak (1976). His "hegemonic empire" has three concentric circles, the first being the "zone of direct control", the second an "inner zone of diplomatic control" over client states, and the third an "outer zone of influence over client tribes". His "territorial empire", on the other hand, has only one circle, representing the "totality of empire under direct rule", with all client states annexed and client tribes absorbed into the imperial polity. This is therefore a convenient point at which to consider the application of our model to this most famous of all empires, the Roman.

The Roman Empire

Rome expanded with remarkable rapidity from the mythical date of its founding by the "sons of the she-wolf" Romulus and Remus in 753BC. After being ruled by a rather murky line of kings an aristocratic revolution established the Republic in 509BC, which absorbed its smaller neighbors in Latium, granting them full or partial Roman citizenship after defeating them in war. In 396BC the rich and powerful Etruscan city-state of Veii close to Rome north of the Tiber was defeated and sacked. Disputes with the Latins over the spoils from Veii and relations with Campania led to revolts against Rome that were crushed by 338BC, but their links with Rome were preserved if on a less equal basis than before. At this date Rome had an area of 4500 square miles and a population of at least a million, according to Grant (1978, p.57), but Rosenstein (1999) says the free population was only about 350,000 with an area of 5,500 square kilometers. Next came the protracted conflict known as the Second or Great Samnite War from 327-302BC, which was provoked by the Romans by intrusions into the Samnite sphere of influence, followed by a Third from 298-290BC. Raaflaub (1996, p.277) dates the beginning of Roman "imperialism" proper from these wars against the Samnites, since the defeated powers were not absorbed into the victorious polity but dominated by it. Rosenstein (1999) gives a free population figure of 900,000 and an area of over 26,000 square kilometers in 264, just before the outbreak of the First Punic War. By the end of the third century BC, after the defeat of Hannibal in the Second Punic War 218-202BC, Rome had become mistress of the central Mediterranean, occupying Sicily, Sardinia and Corsica as well as bringing the entire peninsula either directly under her control or under that of relatively subservient allies. The second century saw two wars against Macedon in 200-196BC and 171-167BC that gained much of Greece in the east while the conquest of Gaul and Spain was begun in the west. By about 130BC Rome controlled the entire Mediterranean basin according to Rosenstein (1999, p.196). The Mediterranean for the Romans had truly become *mare nostrum*, "our sea", and all the trade relations conducted across it would be under their aegis for centuries to come.

How and why was the small city-state on the Tiber able to so successfully launch such a sustained expansion? Earlier historians of Rome paradoxically maintained that all Rome's wars were defensive in origin, a view that was vigorously disputed and effectively overthrown by William Harris (1979). In this and subsequent works by many

other scholars emphasis is laid on the manner in which the Roman social structure and political institutions channeled the ambitions of its elite citizens into intense competition for political office and military command to satisfy their thirst for *gloria* and *dignitas*, not to speak of the riches and booty that successful campaigns could bring. Conquered land could also be distributed to the class of smallholders that provided the bulk of the legions. As Rosenstein (1999, p.200) observes, "war at Rome became the nexus linking the interests of rich and poor, Roman and ally, patrician and wealthy plebian, junior senator and distinguished ex-consul", thus preserving the social equilibrium of the state. Service in the army and its continued success also played an important part in linking the separate classes together in a common Roman identity. It is this structural feature of the Roman socio-political system, rather than the notion that they were "born to be wolves" in keeping with their mythical origins, that scholars such as Raaflaub and Harris stress as the explanation of why they were so prone to war as an almost endogenous feature of their society. The highest offices were the two consuls elected every year for one-year non-renewable terms, which meant that war came to be sought almost annually for each incumbent to gain his opportunity for the glory of a triumph. The ability of this pattern to be maintained presumed that these wars would be both successful and lucrative, not only for the consuls but also for the lesser office-holders and ultimately the citizen-soldiers themselves. It is to answer the question of why this was so that we have to consider the unique military tactics and organization that were developed by the Romans.

The Roman legion, their basic military unit, was derived from the hoplite phalanx that the Greek city-states invented in their wars against each other. The hoplite (bearer of a *hoplon* or shield) was an armored infantryman carrying a thrusting spear in his right hand while covering his left side and his neighbor's right with a large oval shield, while standing in one of the ranks of a rectangular formation known as the phalanx. The phalanx moved and fought as a single unit, so that each man had to trust that his comrades would not break ranks. Group solidarity was thus essential and was provided by the fact that the soldiers were generally all farmers from the same locality, fighting in the off-season from agricultural labor. The discipline and fortitude of the hoplite phalanx was tested again and again in the conflicts between the Greek city-states and in their battles against foreign enemies. The Spartans in their heroic stand against the Persians

while vastly outnumbered at Thermopylae exemplified this type of warfare at its best. Philip of Macedon and his son Alexander in the second half of the fourth century created the Macedonian phalanx, with more offensive power using longer spears and cutting down on the cumbersome defensive armor and large shields of the classical phalanx. They also worked out effective coordination between the heavy infantry of the phalanx and supporting armored heavy cavalry, as well as making innovations in logistics and other aspects of military science.

The Romans benefited from all of these developments in the art of war but excelled them all with the creation of the legion as a more mobile and flexible adaptation of the phalanx. The strength as well as the weakness of the phalanx was its operation as a single unit. The Romans divided the phalanx into sub-units called "maniples" or handfuls, consisting of about 160 men, 30 of which formed a legion of approximately 5000 men. If necessary they could fight as a single unit, like the phalanx, but each maniple could also operate independently to carry out separate maneuvers as required by the ebb and flow of battle. The armament was also significantly different. The thrusting spear was replaced by a missile weapon, the *pilum* or javelin, especially effective when thrown simultaneously as a single volley, as well as a sharp, strong double-edged sword the *gladius,* that could be used to both slash and stab at close quarters. The large curved rectangular shield or *scutum* could also be used offensively to set up the sword-thrust. Later developments created the cohort consisting of three maniples as the basic sub-unit of the legion. The Roman legions proved almost invincible for hundreds of years, with memorable defeats only coming in especially unfavorable terrain as against the Germans in the Teutoborg forest in AD9, and the Parthians at Carrhae in 53BC, where Crassus was annihilated in an open plain by showers of arrows from mounted archers, or by the sheer genius of the Carthaginian general Hannibal at Cannae in 216BC. Supporting cavalry and other units for the legions were frequently drawn from barbarian tribes. The Romans also excelled as military engineers, constructing roads, bridges and harbors along with walls and other fortifications to facilitate their operations.

In the early days of the Republic the legionaries would return to farming after each campaign but as the theater of operations was widened first to all over the Italian peninsula and later to the entire Mediterranean world and beyond, the period of service

was necessarily lengthened and the armies became increasingly composed of salaried professionals serving for long terms. These developments had several major consequences, the most serious of which was that the loyalty of the troops increasingly went to their own generals, politico-military grandees like Pompey and Julius Caesar, rather than to the Republic itself. The very success of the legions in winning territory, slaves and booty in foreign wars undermined the yeoman farmer basis of the army and the Republic since land passed increasingly into the hands of large estate owners using slave labor to raise livestock and cultivate vines and olives, dispossessing the small owner-cultivators in the process. Competition for office intensified with the increasing spoils and costs of war, leading to a succession of civil wars and power struggles between ambitious generals. Pompey, Crassus and Caesar formed a temporary alliance known as the First Triumvirate, which broke up when Crassus was killed in Parthia in 53BC, after which Caesar and Pompey fought to the finish in a major conflict that ended with the defeat and death of the latter in 48BC, after Caesar had crossed the Rubicon in 49BC returning from his immensely destructive but highly lucrative conquest of Gaul. The way was clear for Caesar to become dictator, leading to his assassination in 44BC by Brutus, Cassius and others hoping to restore the Republic. Caesar's nephew and adopted son Octavian, together with Mark Antony and Lepidus, formed the second Triumvirate that defeated the forces of the assassins at Phillipi in 43BC, after which Octavian and Mark Antony fought it out between themselves until the naval Battle of Actium in 31BC. After their defeat, Antony and his paramour Cleopatra fled to Egypt where both committed suicide, leaving Octavian, the last warlord standing, in sole possession of the Roman state that he was soon to rule as Caesar Augustus, the first of the line of Julio-Claudian emperors that ended with Nero in 68AD. While one must allow for the exigencies of personality and circumstance, it is remarkable how the very same structure of its social system and political regime that created a war machine of unparalleled efficiency, that made the Roman Republic master of the world from the Atlantic to the Euphrates, and from the Rhine and the Danube to the fringes of the Sahara and the upper reaches of the Nile, inevitably also brought about its transformation into a hereditary monarchy that was essentially a military autocracy.

Augustus had an enormous force of sixty legions at his disposal after Actium, clearly too large and expensive a force to maintain now that the long internal power struggles were over. His reorganized and more professional standing army was cut down to about thirty legions, or about 150-200,000 men, supplemented by an approximately equal number of auxiliary troops, making for a total force of about 400,000, a level that was essentially maintained for the next few centuries of the empire. Augustus sensibly decided to resist any temptation to expand his already enormous empire any further beyond the Rhine or Danube, after the disaster in the Teutoborg forest with the loss of three legions and their eagle standards under Quinctilius Varus in AD9. Claudius added Britain to the empire as the province of Brittannia with its capital at Colchester in 43AD. The area of the present state of Rumania, north of the Danube, was invaded by Trajan and annexed in 106AD as the province of Dacia, the campaign also bringing in immense amounts of treasure, more than paying for the five years of warfare necessary to acquire it. In the east Septimius Severus invaded Mesopotamia and seized it from the declining Parthian empire in 195-197AD. Campbell (1999, p.218) has an interesting map showing the disposition of the Roman legions in 200AD. There are three in Britain, one in Spain, four on the west bank of the Rhine, no less than ten along the long eastward stretch of the Danube, two in Dacia north of it, eleven in the east from Turkey to Egypt and one in Numidia, in the region of the present Libya. Significantly there was only one in Italy. The population of the vast area guarded by these legions was approximately 60 million. Mesopotamia was difficult to hold after the Parthians were overthrown by the vigorous new Iranian dynasty of the Sassanids in 225AD. In 260AD the emperor Valerian was captured by the Sassanid ruler Shapur I while campaigning against him, dying in captivity to the utter humiliation of the Romans. Then, as now, the lands between the Tigris and the Euphrates have not been congenial to invaders from the west.

The cost of this military establishment of the empire is estimated at between 40-50% of total revenue. Public administration was sufficiently light for Garnsey and Saller (1987, ch.2) to describe it as "government without bureaucracy", the secret of which was a system of self-governing cities and relatively autonomous provinces. In effect the power of Roman arms and the seductiveness of the Graeco-Roman culture effectively co-opted local elites, from Gaul, Spain and Britain to Syria, Palestine and Egypt, to the

service of the empire without the necessity to expend resources to control them. The army itself with its extensive network of military colonies and settlements was a major agent of Romanization. The liberal grant of citizenship made for "careers open to talents" and eventually the Senate and the emperors themselves were drawn increasingly from both the western and eastern provinces. The Romans clearly regarded themselves as a superior people but they seem to have been free of racial or religious prejudice. Persecution of the Jews and Christians was due to their difficulties with the acceptance of the symbols of Roman authority, rather than to any objection to their religious practices. This did not prevent the Romans from suppressing the Jewish revolts with savage brutality and liberally accommodating the early Christian desire for martyrdom.

While the problem of "decline and fall" is beyond the scope of this paper a few words might nevertheless be in order. One trend was the fact that recruits increasingly tended to come from the provinces rather than Italy itself, leading perhaps to some loss of loyalty to the empire on the average. Another military trend was the wholesale adoption of barbarian tribes into the army as independent units under their own leaders, an obviously dangerous procedure. Romanization of the Germanic tribes also made them more formidable adversaries. In terms of our model r (A) shrank for any given value of A, leading to a loss of relative if not absolute military efficiency, requiring either a loss of security or an increase in cost and hence taxation. Thus our model, limited though it is, can perhaps contribute something to the "triumph of barbarism" explanation for the decline and fall, if not to that of Christianity.

The Mongol Empire

Remarkable as was the speed and extent of the expansion of the Roman Empire it was substantially exceeded by that of the Mongol Empire under Genghis Khan and his successors in the thirteenth century. Application of our model to this most fascinating of all cases of imperial expansion however requires an important extension to be made first. The model as presented has a unique solution for the optimal size of the army because the marginal contribution of an additional soldier to output is always decreasing while the marginal cost in terms of output foregone is always increasing, giving us only one intersection for the two curves. It is entirely possible however for the marginal benefit

curve to reflect an initial phase of increasing returns in army size by first rising, then reaching a maximum and declining thereafter. In this case there could be three possible equilibrium army sizes A1, A2 and A3, as shown in Findlay (1996, Figure 3-1, p.46) and Findlay and Lundahl (2006, Figure 2, p.39), and reproduced as Figure 2 of the present paper. It can readily be seen that A1 and A3 are stable points, while A2 is unstable. If decision makers are "myopic" and equilibrium is established at A1 there will be no incentive to try to extend further to the right (increase army size) because the marginal cost of doing so would exceed marginal benefit, even though a move to A3 would secure a higher global optimum. The situation exactly corresponds to the idea of a "low level equilibrium trap" in development economics. If somehow the army size could be increased even a little beyond A2 however, there will be an incentive to proceed all the way towards A3 since marginal benefit exceeds marginal cost to the right of A2.

What does all this have to do with Genghis Khan and the Mongols? Instead of armies, think of tribes of nomads in the vast steppes of Central Asia. Individual families or clans would have an incentive to coalesce in larger units or tribes for mutual protection, greater efficiency in hunting or predation on settled populations and so on, i.e. for economic benefit. Given the environment and technology the equilibrium size of such a group would be A1, since anything larger would not yield net gain and there is no means of getting beyond A2, even if someone could conceive that such a potentially attractive option as A3 might exist. Suppose however that there is a charismatic leader of some small tribe who, however dimly, sees the possibilities of great gains from consolidation into a supra-tribal unit such as A3, which may be vastly larger than A1. If he could somehow cajole, threaten or induce enough other clans or tribes to join him and enlarge the group to a size beyond A2, a natural process of further incremental steps would take the group eventually to a size of A3.

What we have been discussing is a stylized representation of exactly what Genghis Khan seems to have done. He united the numerous disparate warring nomadic clans and tribes of Turco-Mongol peoples in Central Asia into a powerful alliance owing allegiance only to himself, by the lure of lands and booty if they followed him coupled with dire threats of the consequences to them of incurring his wrath by not doing so. Born probably in 1162 into a relatively small tribe, Temujin, as he was first called, built up a

sufficient following for him to be declared Genghis ("Universal") Khan of all the Mongol tribes at a *kurultai* or great tribal gathering in 1206. The details of how he achieved this feat are too intricate for us to recount here. Allsen (1994), Barfield (1989), Biran (2007) and Ratchnevsky (1991) are all accessible accounts by distinguished specialists, to which the interested reader is referred. As Biran (2007, p.27) says "it took Chinggis (Genghis) more time to unite the tribes of the eastern steppe than to conquer half the world". Once the initial task of unifying the tribes was accomplished (getting past A2 in our stylized representation) he could use their unrivalled mobility and prowess as mounted archers to strike and conquer the sedentary civilizations both to the east and to the west.

The keys to the Mongol conquests were not sheer natural ferocity as often depicted by their victims. Even their massacres were not the product of bloodlust but of cold calculation about the effects of terror on a mass scale in reducing resistance. Meticulous planning and forethought before each campaign regarding the organization of supplies and movement of troops, and probing the weaknesses of the enemy, seem to have been the norm. Lattimore (1963) even argues that Genghis had a continent-wide grand strategy in mind when he first destroyed all viable opposition in the west before turning east to conquer the most lucrative prize of China, ensuring that he could not be taken in the rear by powerful rival nomadic armies if he occupied China first. Another vital point was his replacing of "particularist" tribal loyalties and values in his armies by blending men from different tribes in each *tumen* or "thousand", the basic unit of his army corresponding to the Roman cohort. Commanders were selected solely on talent and merit rather than tribal or kinship affiliation, with the result that supremely gifted generals like Jebe and Subotai were in charge of his major campaigns, almost never losing even a single battle. The battle tactics of the Mongols were subtle and flexible, using feints, simulated retreats and concentration of force at decisive points, frequently using heavy cavalry to finish off opposition after it had been confused and put off balance by the maneuvers of the light cavalry. Chinese and Muslim specialists in military engineering, siege warfare and other skills that the Mongols lacked were all employed and richly rewarded. The Khitan diplomat and statesman Yeliu Chutsai was the major adviser to Genghis and Ogodei on all aspects of policy. Useful practices and institutions were adopted wherever they were found, with a Uighur script to write the Mongolian

language or the Khitan system of a sort of "pony express" to deliver messages speedily over long distances. At its peak in the second half of the thirteenth century the Mongol Empire ran from Korea and China across Central Asia to Russia and the Ukraine, as well as Iraq, Iran and Afghanistan. Only the seaborne invasion of Japan and the thrust into Vietnam failed. South and Southeast Asia were probably saved more by their climate than by any military defense they were able to muster, and Western Europe by the distance away from the grass necessary to feed the Mongol horses, a very high proportion of the world's stock and as tough and durable as their riders. Egypt, Syria and Palestine were saved by the Mamluks who stopped the advance of Hulagu's Christian general Kitbhoga at the Battle of Ain Jalut in Palestine in1260 after he had destroyed Baghdad and killed the Abbasid Caliph in 1258, a blow from which the Islamic world seems almost never to have recovered.

The creation of the *Pax Mongolica* stimulated trade and the diffusion of technology along the Silk Roads, integrating the Eurasian landmass to an extent that it had never been before, possibly with major beneficial effects on Western as well as Eastern Europe. The story has been vividly and on the whole accurately told in the very well received account by Janet Abu-Lughod (1989). This very same integration, however, unfortunately also led to the catastrophe of the Black Death, which, as argued by us in Findlay and O'Rourke (2007), chapter 3 on "The Economic Consequences of Genghis Khan", and also in Findlay and Lundahl (2003), did not have only negative consequences, at least for Europe. The initial drop in population raised per capita incomes and real wages and stimulated trade in luxury goods from the east and possibly also technical progress and fertility reduction, as argued by Herlihy (1997). The consequences for the Islamic World however were unequivocally harmful, perhaps owing to the successful efforts of the Mamluk rulers of Egypt and Syria to maintain their revenues by increasing taxation on agriculture, industry and trade to exorbitant levels, strangling the natural forces of demographic and economic recovery.

Unlike the Romans or the Arabs the Mongols were never numerous or developed enough to permanently "Mongolize" their subject populations by giving them a language or a religion. Instead they tended to be absorbed by them, whether in the China of Kublai Khan or the Persia of the Ilkhans. The Golden Horde's suzerainty over Russia lasted

much longer since the Mongols preserved their cultural identity by remaining in the steppe at their camp in Sarai. The successors of the Mongols, the Timurids in Central Asia and the Mughals in India, have however both left lasting legacies of their own on world history.

The European Maritime Empires

Up till now we have been considering the Lattimore "military range" function **r (A)** operating only on land, carrying the Roman legions around the shores of the Mediterranean and the mainland of Western Europe, and the Mongol horsemen riding across the plains of Central Asia in both eastern and western directions. Starting with the Portuguese capture of Ceuta in North Africa in 1415, in an operation that a young Prince Henry the Navigator participated in, a succession of emerging European nation-states extended their reach across the oceans of the world, planting trading posts and settlers and seizing immense amounts of booty at the expense of both the aboriginal populations of the New World and Oceania and of the ancient civilizations of Asia. The ancient world did not present many examples of maritime empire apart from the problematic case of a possible Minoan "thalassocracy" in the second millennium BC and the colonies of the Phoenicians. In the medieval period Venice and Genoa did exert naval power to support commerce in the Mediterranean, as did the Hanseatic League in the Baltic and North Sea, but the extent of **r(A)** in all these cases was very limited. Facing the Atlantic the small but compact and unified kingdom of Portugal, with its capital at Lisbon captured with the help of Crusaders from the Moors in 1147, ventured into that ocean in a series of small incremental steps down the west coast of Africa, finally rounding the Cape of Good Hope with Bartolemeu Dias in 1487. This set the stage for Vasco da Gama's epoch-making voyage to Calicut in 1498. The Genoese Christopher Columbus had meanwhile already crossed the Atlantic under Spanish auspices in 1492, to be shortly followed by the landing of the Portuguese Cabral on the coast of Brazil when he swung too widely west into the Atlantic on his way to India. In 1519 a fleet led by the Portuguese Ferdinand Magellan, in the service of the Spanish crown, circumnavigated the world. The voyages of Columbus, Da Gama and Magellan can be seen as discontinuous jumps in the European **r (A)** function over the oceans of the world. From this time on, there would be

no spot anywhere in the world, unless deep in the heart of one of the great continental landmasses, that would be beyond their reach. The development of the caravel, with its combination of square and lateen sails, and the necessary navigational techniques for oceanic ventures, that made these voyages feasible, emerged from the earlier multicultural nautical traditions of the Mediterranean. The fact that these maritime thrusts, in pursuit of both Power and Plenty, were conducted not by a single but by an overlapping succession of rival nation-states, meant a more active and intensive process of expansion and exploitation, even though resources were undoubtedly wasted in the almost incessant warfare between them as a result.

The Ming Chinese voyages into the Indian Ocean in the first half of the fifteenth century under the Muslim admiral Zheng He provide an instructive contrast to these European efforts. The fleets, as well as the ships and crews themselves, were much larger, better armed and equipped and more seaworthy than the European caravels. They were also launched by a single massive unified state under an absolute ruler. When the imperial court bureaucracy decided in the 1430s that the voyages were of little benefit and a waste of resources better spent on frontier defense against nomad incursions they were permanently discontinued and the technology atrophied. The Ming and the successor Manchu Qing Dynasty never ventured beyond the South China Sea again. It is unlikely that this would have happened had China been divided into three or four competing regional powers. A trading state with a strong far-reaching maritime orientation did emerge in southern China and Taiwan under the famous half-Japanese merchant and pirate Zheng Chengong, known in the west as Coxinga, and his descendants in the second half of the seventeenth century but it was defeated and absorbed by the invading Manchus in the 1680s. What these ultimately abortive Chinese maritime efforts prove, however, is that China certainly had the technological capability, but not sufficient material incentive relative to the West Europeans, to launch long-distance overseas trade and navigation.

The Portuguese *Estado da India*, under the leadership of Afonso de Albuquerque and subsequently, devised a system of strategically located trading posts and fortifications from Macau and Melaka to Goa and Hormuz to control the spice trade in the Indian Ocean by a system of licenses. This proved only partially effective, despite the

famous statement of Tome Pires that "the lord of Melaka has his hand on the throat of Venice". As Frederick Lane and other scholars have shown, substantial quantities of spices were able to elude Portuguese interception and be shipped by Gujerati and other indigenous merchants through the Red Sea into eventual Venetian hands for a considerable time following 1498. Thus despite a considerable comparative advantage the Portuguese did not by any means have a monopoly of "guns and sails" [Cipolla (1965)] in the Indian Ocean. The Portuguese could make no inroads into China beyond Macau but their entry into Japan did have some momentous consequences during what has been called her "Christian century" from the 1530s to the 1630s, when the Tokugawa expelled them to enforce their seclusion policy. Aside from the conversion of some Japanese, including notable *samurai* families, and trade, the greatest impact was by the introduction of firearms, enthusiastically adopted by the contending Japanese warlords during their "warring states" period in the second half of the sixteenth century. Portuguese mercenaries also played an active role in the wars between the Burmese and Siamese during this same period.

In addition to their leading role in the spice trade the Portuguese exploited the Ming ban on direct trade with Japan by exporting Chinese silk to Japan in exchange for the silver that Japanese mines were producing in large volumes at this time. Silver also came to China from the Spanish galleons that plied from Acapulco to Manila, where it again was exchanged for Chinese silk. Another notable impact of Columbus on China was the introduction of American food plants, such as the sweet potato and peanuts, the boost to agricultural productivity stimulating substantial population growth under the Qing Empire during the eighteenth century. The division of global spheres of influence between Spain and Portugal by the Treaty of Tordesillas left the Americas largely to Spanish influence and the Indian Ocean world to the Portuguese, with the production and export of silver from Potosi and other vast deposits on the one hand and the export of spices on the other as the main economic activities of the two Iberian powers, that were unified between 1580 and 1640 by the union of the two crowns.

The world was not to be left to Spain and Portugal alone however since the Protestant powers of the Dutch Republic and Great Britain actively entered the fray around 1600, with their great trading corporations of their respective East India

Companies. The Dutch soon won out over the British in the Indonesian world but the latter were relatively more successful in India, with the export of valuable Indian cottons playing a major role in both European and eastern markets, where they were exchanged for spices. The Dutch wrested control of Melaka from the Portuguese in 1641 and also drove them out of Ceylon and the lucrative cinnamon trade. In the islands the VOC established their headquarters in Jakarta, renamed Batavia in the 1620s and overthrew the troublesome native state of Makassar in Celebes in the 1660s. The aim of all these military efforts was to attempt monopolization of the spice trade, which succeeded with the rarer supplies of cloves, nutmeg and mace but not with the vastly more abundant pepper. The Dutch also formed a West India Company for their trade with Africa and the Americas. By the 1650s, after winning its independence from Habsburg Spain, the Dutch Republic was the leading commercial maritime power in the world by a wide margin. This position was successfully challenged by her Protestant ally, Great Britain, in the three commercially motivated mercantilist Anglo-Dutch Wars of the second half of the seventeenth century. The commercial and naval rivalry of the two Protestant powers was effectively ended with the accession of William of Orange and Mary Stuart to the English crown in the "Glorious Revolution" of 1688. In his important new book on this celebrated event, *1688: The First Modern Revolution*, Steve Pincus (2009) argues that it was not "bloodless, consensual, aristocratic and above all sensible" as long maintained in the traditional "Whig Interpretation" descending from Macaulay, but a genuine revolution, in fact "the first modern revolution", creating the institutions of a commercial, manufacturing state on the Dutch model instead of a centralized bureaucratic absolutist state on the lines of Louis XIV's France, as desired by the deposed James II.

The next stage in the prolonged conflicts of the Age of Mercantilism was between Britain and France, each deploying its own model of "modernity", in what has rightfully been called the "Second Hundred Years War". This began with the War of the Spanish Succession in the early eighteenth century and ended with the decisive British victories of Trafalgar in 1805 and Waterloo in 1815 against Napoleon. The Seven Years War of 1756-63 was a crucial step in the establishment of British global hegemony, with enormous territorial gains from Canada and the Caribbean to India. In India it was the Frenchman Dupleix who first realized the possibilities of using native Indian troops

drilled by European officers to defeat the traditional armies of Indian potentates, but it was Robert Clive and the British East India Company that gained hegemony in India with the Battle of Plassey in 1757, that won them the rich province of Bengal which served as a "bridgehead" for their later takeover of the entire subcontinent. It was from Bengal that the EIC obtained the opium that was exchanged for tea from China in the next major stage of the Company's trade with Asia, which was eventually to lead to the humiliation of the Manchu Dynasty in the Opium Wars and the acquisition of Hong Kong.

By 1815 the Industrial Revolution was already well under way in Britain. As we have argued in *Power and Plenty* the overseas markets and sources for raw materials won by the wars of the Age of Mercantilism were of crucial significance in the breakthrough of the new technology applied to the export of cotton textiles manufactured in Lancashire all around the world in the nineteenth century. We also argue that this could never have happened without the decisive role played by the "triangular trade" in slaves from Africa that rose to a peak at the end of the eighteenth century as a result of the demand for cotton from the New World. We discuss the highly controversial Williams Thesis about the Industrial Revolution and West Indian slavery in this light. Others are equally convinced that the sheer power of technological progress and entrepreneurial dynamism in would have been sufficient, on their own, to have produced the same outcome, if necessary in some other sector than cotton textiles, and that the resources diverted even to successful warfare were a net negative for the British economy in the decades straddling the turn of the nineteenth century.

The Industrial Revolution enabled the European powers to extend their sway from the coastal regions of Asia and Africa deep into the interiors, using armed steamboats to sail up the rivers and breech-loading rifles and later machine guns to sweep aside native resistance. The discovery of quinine to prevent malaria was another link in enhancing the reach of the **r (A)** function by the European empires of the nineteenth century. As the Industrial Revolution proceeded in Europe and later in the United States and Japan the rising demand for primary products saw the emergence of export economies in Southeast Asia, Africa and Latin America during the era from 1870 to1914. Dennis Robertson called this the Great Specialization, in which trade was an "engine of growth" for the world economy, accompanied by massive flows of capital and labor from Europe to the

"Regions of Recent Settlement". The century from Waterloo to the outbreak of the First World War, and especially the period from 1870-1914, have often been called the "Golden Age of Globalization", under the aegis of the *Pax Britannica,* and is fully documented in chapter 7 of *Power and Plenty.*

This all too brief and stylized an account of the "Expansion of Empires" given here has focused on Owen Lattimore's idea of the "military range" of a society, represented by Roman legionaries marching along roads with their swords and javelins, supplemented by the more humble but no less effective weapon of their spades and other "tools of empire", the Mongol cavalry with their sturdy ponies and the devastating weapon of the composite reflex bow, and finally the "guns and sails" of the European maritime powers, from the caravels of Columbus and Da Gama to the armed merchantmen of the VOC and the EIC , followed by the armed steamboats sailing up the Irrawaddy, the Yangtze and the Niger to extend their sway. As the examples of the *Pax Romana,* the *Pax Mongolica and* the *Pax Britannica* show so vividly, empires matter not only for War but also for Trade.

Two World Wars and the Great Depression

The century of peace and prosperity that the world economy on the whole enjoyed from 1815-1914 was followed by a disastrous three decades from 1914-1945, bracketed by two World Wars with the Great Depression in between. The decade of the twenties saw prosperity in the US but political and economic instability in Europe that led to the rise of Hitler. As we show in Findlay and O'Rourke (2007, figure 9.3, p.506) it was not until as late as 1972 that world trade recovered sufficiently to be on the trend growth line of 3.49% per annum for pre-1913 world trade, so that "it took six decades for the consequences of World War I to be undone". By this time all of the European empires had withdrawn from their overseas possessions, mostly as a direct or indirect consequence of World War II. The First World War was at least partly due to imperial rivalry between Britain and France on the one hand and Germany on the other. In the Second World War both Germany and Japan were to a large extent motivated by pressure to relieve perceived shortages and lack of access to industrial raw materials and fuel supplies. According to Adam Tooze (2006), in his outstanding book on *The Wages of*

Destruction: The Making and Breaking of the Nazi Economy, the German invasion of Norway was to secure Narvik as the outlet for essential imports of Swedish iron ore, while even the ultimately disastrous decision to launch Operation Barbarossa against the Soviet Union in 1941 was intended to gain secure control of the natural resources of the East rather than to continue to rely on the pact with Stalin to provide the necessary supplies for waging war in the west. The entire policy of *Lebensraum* was predicated on the need for Germany to find a way to match the continental extent of the United States in its command over agricultural and mineral resources necessary for both civilian and military purposes, by territorial expansion and "ethnic cleansing" for colonization in the east, and thereby to gain parity with the British Empire and its extensive overseas possessions. The attack on the Soviet Union was also calculated to give Japan a free hand in the East against the British, French and Dutch colonies in Southeast Asia with their rich oil and other natural resources. Japan, always acutely conscious of her deficiency in natural resources, had already occupied Manchuria in 1932 to exploit its iron ore and to develop heavy industry, and provoked war with China in 1937. To quote Tooze (2006, p.424) "Russia, according to Hitler, was the 'Far Eastern sword of Britain and the United States', a spearhead pointed at Japan".

The stage was thus set for a global conflict between the "Heartland" and the "Rimland", the land powers of Eurasia versus the sea powers of the Atlantic and Pacific, which had long been anticipated by the geopolitical theorists Halford Mackinder (1904) and Alfred Thayer Mahan (1890). War, trade and natural resources were once again fatefully intertwined, on a global scale.

The failure of Operation Barbarossa, and ultimately the preponderance of the "sinews of war" available to the Allied side as a result of the US economy pulling out of the Depression, enabled them to "turn(ed) their economic strength into effective fighting power" [Overy (1995, p.325)] and ensured the defeat of the Axis powers in 1945. The Allied victory left the fate of the postwar world largely in the hands of the US and the Soviet Union. Britain and Holland, and eventually France, acceded to the inevitable and withdrew from their former imperial domains in the Third World. This set the stage for what Odd Arne Westad (2007) has called the Global Cold War in which the two superpowers competitively constructed their nuclear arsenals and intervened

diplomatically and militarily in the Third World. What, if anything, can economic theory and history contribute to the understanding of this phase of world history that ended with the collapse of the Soviet Union after the fall of the Berlin Wall in 1989?

"Arms races" have been modeled in the well-known contributions of Richardson (1960), Brito and Intrilligator (1975) and others. What appears to be still missing, however, is a model that simultaneously considers defense expenditures motivated by rivalrous interaction over "national security" in a Hobbesian world, and production and trade for civilian purposes. The next section will present an outline of such a model, based upon Findlay and Amin (2008), after which we will attempt to apply it to some of the issues raised by the "Global Cold War".

A Model of Trade and National Security

Consider two economies, each endowed with a fixed amount of two factors of production, capital and labor. The ratio of capital to labor is higher in one of them, denoted "A", than in the other, denoted "R". Both countries produce tradable civilian consumer goods X and Y, and a nontradable public good, denoted D for "defense", using capital and labor as depicted in well-behaved neoclassical production functions with constant returns to scale, with the capital-labor ratios lowest in X and highest in D. These production functions are identical for D but could be Hicks-neutrally superior to the same extent for X and Y in "A". Consumers in both countries have identical and homothetic utility functions for the consumer goods X and Y. Welfare, however, also depends upon an intangible public good called "national security", which in each country is an increasing function of its own level of defense expenditure on D and a decreasing function of the defense expenditure of the other country on D. Each country has an overall welfare function that depends separably on ordinary consumer utility from X and Y, on the one hand, and national security as specified above on the other. These welfare functions could be identical or have "R" place a greater relative weight upon the national security component than "A". Each country's defense expenditures therefore impose negative externalities upon the other.

The model is solved as a Nash equilibrium in the defense expenditures and a competitive equilibrium in civilian production and international trade, with factor prices

in the defense sectors equal to their opportunity costs in the private goods sectors so that the conditions for full Pareto-optimality are met. The Lindahl-Samuelson conditions for the optimal valuation of the defense goods can be derived either by the usual vertical summation of individual marginal utilities or simply imposed as those of a central planner. Thus we may think of "R" as an efficient planned economy along Lange-Lerner lines or some other such rational scheme of socialist economic calculation, while "A" is a perfectly competitive capitalist economy with a government that reflects the preferences of the representative individual in its provision of public goods, in this case defense. Consumers in both countries will be as well off as they can be, given the defense expenditures in each country, with free trade resulting in the more capital-abundant "A" exporting the capital-intensive good Y and "R" the labor-intensive good X.

As it stands this model could be used for a variety of comparative static exercises, such as the impact on defense expenditures of a transition from autarky to free trade or *vice versa,* evaluating the nature of the "peace dividend" in the event of partial or complete disarmament, or of economic growth in the form of factor augmentation or technical progress in any of the three goods on consumer welfare and defense levels. Perhaps the most interesting single result is that since "national security" is not an inferior good in a Hobbesian world, any move towards trade liberalization will stimulate greater defense expenditures by each side in response to the greater consumer utility generated by the gains from trade. This is because in the optimal equilibrium situation that each country is in, the marginal utility of civilian consumption has to be equal to the marginal utility arising from the national security component of the overall welfare function, so that the fall in **marginal** utility of civilian consumption arising as a result of the gains from free or freer trade requires an increase in defense expenditure to reduce the marginal utility from national security for the optimal solution to be maintained.

The Global Cold War

The Global Cold War dominated all aspects of international relations in the second half of the twentieth century and we are still living with its consequences and will no doubt continue to do so for a very long time. As Westad emphasizes in the very title of his book, it was not simply a bilateral contest between two continental powers armed

with unprecedented weapons of mass destruction, but also a series of "proxy" conflicts throughout the Third World in which the superpowers contended for power and influence, the most notable arenas being perhaps Vietnam and Afghanistan. The ongoing conflict between the US and Islamic 'extremism' is itself a direct even if "unintended" consequence of US interventions against the Mossadeq regime in Iran in 1954 and the stationing of troops in Saudi Arabia, the location of the holy cities of Mecca and Medina. The connection with our theme of "war, trade and natural resources" is of course obvious since all of these actions were prompted by the desire to ensure the safety of the vital oil supplies of the Middle East. Another early example of the link was the 1954 US intervention against the Arbenz regime in Guatemala, the economy of which was dominated by the United Fruit Company and its export of bananas and other tropical fruits. The confrontation between the US and Fidel Castro, leading to the Cuban Missile Crisis of 1962, was also the outcome of a long standing US involvement in the Caribbean related to the politics and economics of sugar.

Westad, not without irony, refers to the contending powers as the "Empire of Liberty" and the "Empire of Justice" respectively. He rightly, in our opinion, differentiates both from the classical concept of territorial empire that we examined earlier in this paper with respect to the examples of the Romans, Mongols and the European maritime empires. Instead he sees each as sincerely driven by a universalist ideology of individual liberty, democracy and the free market in the case of the US, and of the social and political liberation of oppressed classes and subject peoples in the case of the Soviet Union, with its Communist Party acting as their "vanguard" and protector against the capitalism and imperialism of the West. Despite, or perhaps even because of these "good intentions", Westad contends that both sides were not averse to using more violent and unrestrained means in pursuit of their objectives than the European empire builders of the nineteenth century. Westad also points out, interestingly, that the US doctrine for waging the Global Cold War was developed largely on the basis of the self-consciously *contra-* Marxist theories associated with the Cambridge professors Daniel Lerner, Max Millikan and particularly Walt Rostow, whose highly influential *Stages of Economic Growth* was explicitly sub-titled "An Anti-Communist Manifesto".

To apply the model of the previous section to the Global Cold War we identify the capital-abundant country as the US and the labor-abundant one as the Soviet Union. We also can let the production functions for the civilian goods X and Y be Hicks-neutrally superior in America, while keeping the defense technologies initially identical. Furthermore we can let the Soviet Union place relatively greater weight on national security as compared with civilian consumer utility in the overall welfare function. Another modification is to introduce a third 'country', or rather "Third World", into the model as the zone over which the two superpowers compete by offering "foreign aid" as a unilateral transfer payment, denoted F, to be spent on civilian goods by the recipients. Thus the powers compete by offering a composite public good, denoted G, which is equal to the sum of a defense component D and foreign aid F, both evaluated in terms of whichever civilian good is chosen as the *numeraire.* The Third World has an exogenous offer curve or excess supply function for the tradable civilian goods, on which it also spends the foreign aid received from both of the contending superpowers. The solution of the model is a Nash equilibrium in the composite G chosen by each side, optimally allocated between D and F, and a competitive equilibrium of production and trade between all three "countries", with the Third World having its consumption expenditure enhanced by the foreign aid it receives from the two superpowers enabling it to run a trade deficit equal to the sum of the two, while each superpower has a surplus on civilian trade equal to its chosen level of F, the "real transfer". Defense expenditures, factor endowments, technology and tastes of the Third World are all subsumed in the exogenous offer curve or excess supply function that is posited for it, and is used in the determination of the world market-clearing relative price of X and Y along with the corresponding endogenously derived excess supply functions for the two rival powers, that establishes the final solution for all the variables of the model.

Why did the Soviet Union collapse? One popular explanation was that the "Star Wars" anti-missile defense program initiated by Ronald Reagan placed such a burden on the Soviet Union to respond appropriately that it could no longer continue with the extended global war of attrition and conceded victory to the United States. In terms of our model this can be represented as a major technical innovation in the defense sector production function of the US. In the new equilibrium, even after the Soviet Union adopts

the optimal response in terms of its existing capabilities, the result in such a low level of welfare in terms of both consumer satisfaction and national security that the leadership of the Party becomes demoralized, and relinquishes its hold over the increasingly restive East European satellite states and Russia itself.

A different but not mutually exclusive hypothesis would stress the increasing technical superiority and economic efficiency of the US not in the defense sector itself but in the civilian sector, which made it possible to both increase defense expenditures to levels that were very difficult for the Soviet Union to adequately respond to, and also at the same time to deliver more foreign aid and military assistance to zones of contention in the Third World, notably Afghanistan, all the while raising per capita real incomes and private consumption at home and for its allies and clients as well through trade and foreign aid. All of this was achieved despite the oil shocks and inflation of the seventies and the recession of the early eighties. The long-sustained attempt by the Soviet Union to "overtake and surpass" its capitalist rival, the notion behind Nikita Khruschev's confident boast to John F. Kennedy that "we will bury you" in the aftermath of *Sputnik*, simply proved to have been an illusion, leading to Mikhail Gorbachev's withdrawal from Afghanistan and eventual capitulation. The policy of *Perestroika* attempted to solve the problem by pursuing economic reform but the loosening of political control whetted the dissatisfaction of the long-suffering public with the poor economic performance and the failure of living standards to rise and also undermined the functioning of the traditional economic system before it could be transformed. Thus the "Empire of Liberty" was finally able to vanquish the "Empire of Justice" by its technological superiority in both the defense and civilian spheres. As Westad (2007, p.403), no uncritical admirer of the United States, put it "America just had more of everything: power, growth, ideas, modernity". Even one of the Soviet Union's major economic assets, its abundant oil supplies, might actually have turned out to be a net disadvantage as a result of the "Dutch Disease" arising from the oil price rises of the seventies.

Geopolitics of the Early Twenty- First Century

The end of the Cold War was not entirely an unmixed blessing. During that long episode each side felt responsible for the actions of its own client states, if only for fear of

the reactions of its superpower rival, and so was prepared to restrain them in order to maintain the acceptable *status quo.* In the immediate aftermath of the Cold War, however, this restraint was removed. The temptation to take opportunistic unilateral actions by leaders of smaller states prepared to gamble for high stakes proved irresistible for one of them, Saddam Hussein, the Baathist military dictator of Iraq, who seized his oil-rich neighbor Kuwait assuming that the United States would not have sufficient incentive to punish him for it. In this he proved to be mistaken, bringing down on his unfortunate nation the fury of Operation Desert Storm and the First Gulf War but surviving himself politically after his forces were expelled from Kuwait, when the US decided that it was not worth continuing its offensive on to Baghdad itself. The United States had clearly demonstrated that it was the sole global superpower and that it was prepared to act as "policeman of the world". The reaction to the forceful US intervention to safeguard the regular flow of oil from the Middle East to the rest of the world came not from Iraq or any other state but from Al Qaeda, a shadowy organization created by Sunni Arab Islamists, many of whom had fought against the Russians in Afghanistan with CIA backing. Their attack on the twin towers of the World Trade Center in Manhattan on September 11th 2001 led the US to respond with the "War on Terror" and the invasion of Afghanistan and the overthrow of the Taliban regime that had sheltered and supported the Al Qaeda operatives who launched the attack on the twin towers. All the US actions thus far were broadly supported by the international community but the 2003 Second Iraq War and the occupation of the country have been less defensible and vastly more controversial. At the present moment the US under President Obama is trying to withdraw from Iraq without leaving a vacuum behind, while also attempting to launch a final "surge" in Afghanistan to prop up the Karzai regime before withdrawing from that country as well.

With 2% of world oil reserves and 25% of world oil consumption the US is the world's largest net importer but the rapidly growing economies of China and India are clearly also adding substantially to the upward pressure on the price of oil and other energy sources. China, in particular, has a voracious appetite not only for oil but also for iron ore, coal and other natural resource inputs of all kinds, and is scouring the world in the attempt to ensure future supplies by long-term contracts. It is clear that the scarcity of

oil and other essential fuel and energy sources are going to be the key to not only the economics of the twenty-first century but the geopolitics as well. Since oil supply is concentrated in the Middle East, Russia and Central Asia (and with new sources being discovered off the coast of Brazil), while demand is spread all around the world but particularly in the US, the EU and now increasingly China and India, the transportation of oil becomes a key issue in terms of not only the trade but also the national security of all the states involved on both sides of the supply-demand balance.

"He who controls the Heartland controls the Rimland" was the main message of the famous paper by Halford Mackinder on "The Geographical Pivot of History". He argued in 1904 that for the past four centuries the powers of Western Europe had enjoyed global supremacy on the basis of their command of the oceans but he saw this as a historic aberration. Power from the time of the Scythian horsemen had flowed outwards from the center of the Eurasian landmass, and the Mongols and the Turks had followed in the tracks of the Scythians. Columbus, Da Gama and Magellan had altered this pattern but in the age of coal and iron the Heartland would once again assert itself with the railway replacing the sailing ship as the symbol and instrument of geopolitical mastery. He spoke as a loyal servant of the British Empire but the future according to him belonged to either the German or the Russian Empire who would between them contend for the Heartland of Eurasia. We don't know if Hitler ever read Mackinder but *Geopolitik* was largely a German subject and Mackinder's ideas may well have come to him from one of the many German geopolitical theorists who would have been familiar with them. Operation Barbarossa was pure Mackinder in its conception, calculated to allow the land power of the Third Reich to dominate the Anglo-Saxon sea powers, with some help from its Japanese ally. But the United States, with its own continental heartland rich in coal and iron, was able to supply its British and Russian allies and ultimately to prevail.

Neither Mackinder nor Mahan (1900), in his pamphlet on the "Problem of Asia", could have imagined that China would be the leading contender for mastery of the Eurasian landmass a mere century after they wrote, when the decrepit Manchu dynasty was on its last legs in the aftermath of the Boxer uprising, and the infamous Siege of Peking had placed the country at the mercy of the European powers and Japan. China is

now the leading exporter in the world, ahead of Germany and the United States with Britain a mere tenth behind not only China and Japan but Korea as well. China relies on massive imports of iron ore from Australia and Brazil, while two-thirds of its oil supply comes from the Persian Gulf. Earlier we had occasion to quote the fifteenth century Portuguese Tome Pires' statement that "the lord of Malacca has his hand on the throat of Venice". The effective 'Lord of Malacca' today is the US Navy, a geopolitical fact that is undoubtedly not unknown to the CCP leadership. Chinese warships are now sailing in the Indian Ocean for the first time since Zheng He in the fifteenth century. As we noted earlier, national security is a "normal good" with an income-elasticity of demand probably much greater than unity, so we can confidently expect defense expenditures in China to rise even faster than the double-digit growth of GDP. Moreover, it would make little sense for China to attempt to match the US Navy simply by building aircraft carriers, nuclear submarines and guided missile cruisers. Instead a strategy of "leap-frogging" on to space-based weaponry would seem to be the better bet. Russia meanwhile still has an enormous nuclear arsenal but its more potent weapon is its control over the energy supplies from itself and Central Asia to the EU, the pipelines replacing Mackinder's railways as the key indicator of geopolitical influence.

The world will undoubtedly continue to see relatively low-intensity, asymmetrical warfare of the "Tomahawk vs. Kalashnikov" type as Michael Howard (2002) describes it and as the US is now waging in Afghanistan against the Taliban. The main threats of war involving states come from Iran and North Korea and their nuclear ambitions and intentions. Here one hopes that both China and Russia have an interest in the continuation of the globalization that has proved so beneficial to both of them and that this will trump any desire to stick a thumb in the eye of the United States, tempting though that might be, and lead them to assist in resolving issues peacefully. Meanwhile the stalemates over Palestine and Kashmir continue with no apparent end in sight, waiting for something to set these time-bombs off.

World trade shrank by over 20% in 2008-9 as a result of the financial crisis. While deplorable and dangerous, the crisis may also be salutary if taken as a warning sign that the endless expansion of world trade is not guaranteed, and that the strengthening of

financial regulations and other improvements in the economic and geopolitical framework within which it is conducted are necessary and long overdue.
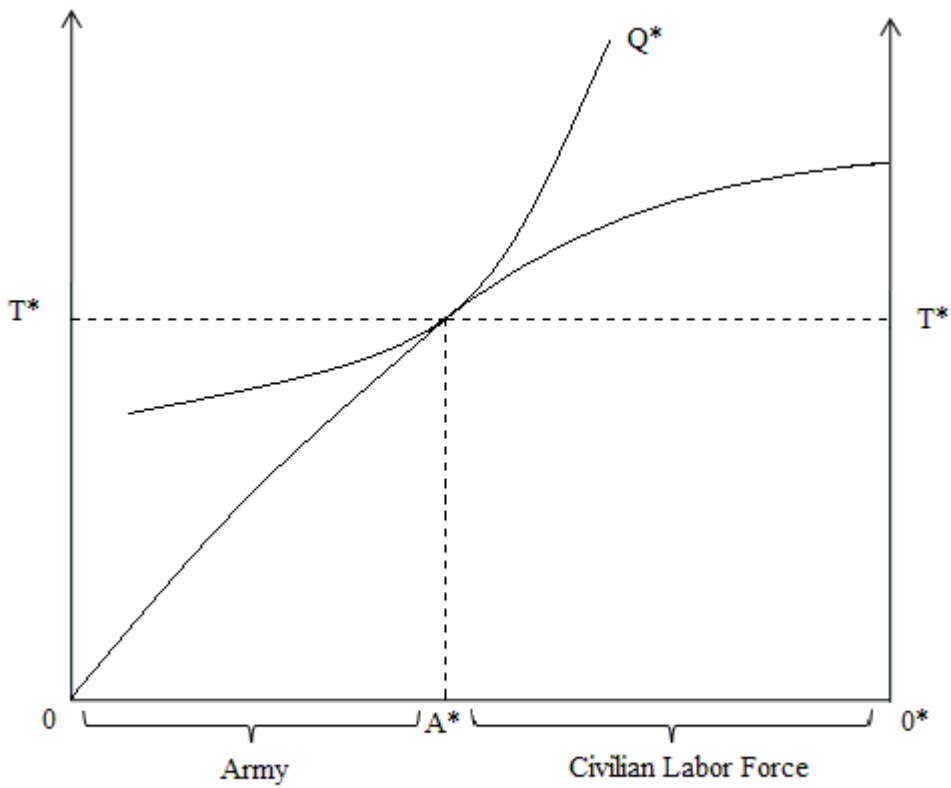
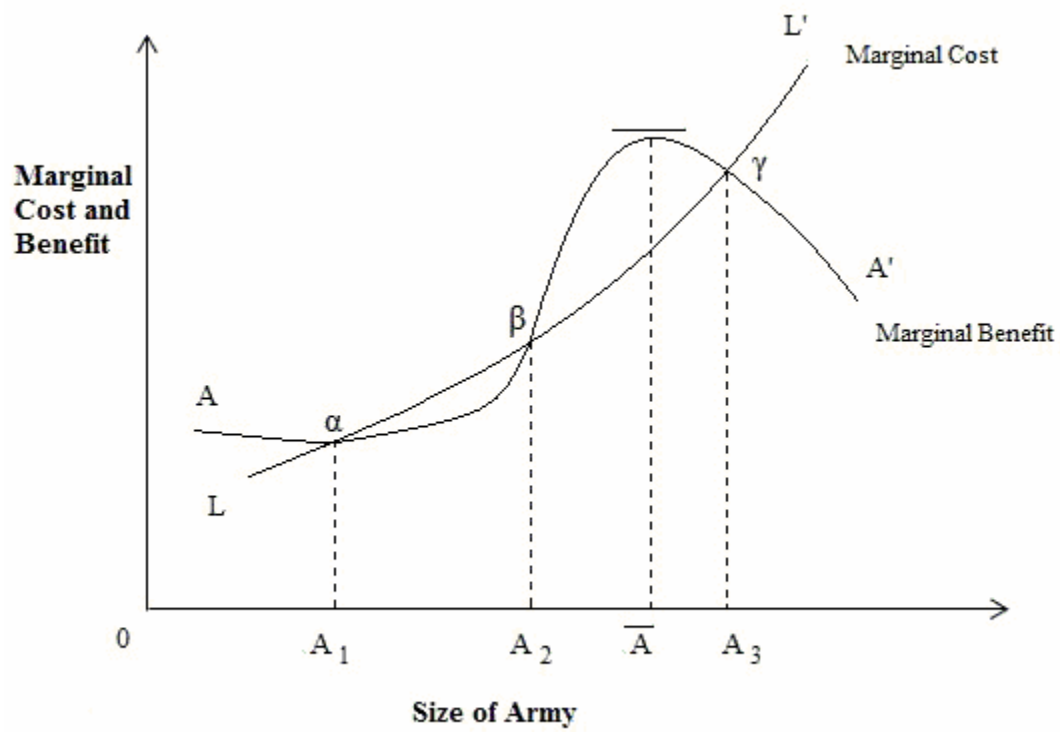**Optimal Volume of Army, Territory and Output**

Figure 1.

Figure 2.

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