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Brits-Krieg: The Strategy of Economic Warfare

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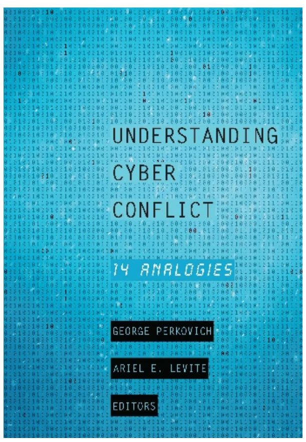

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THE STRATEGY OF ECONOMIC WARFARE

NICHOLAS A. LAMBERT

> To bring the pressure of war to bear upon the whole population, and not merely upon the armies in the field, is the very spirit of modern warfare.
>
> ALFRED THAYER MAHAN, November 1910

During the last quarter of the nineteenth century, for statesmen with an interest in national security, understanding the strategic implications of *globalization*—the phenomenon by which national economies became entwined with and progressively subsumed within the international economy—was one of the thorniest and most mentally challenging problems they faced. Today, as national economies become increasingly dependent on and intertwined with cyberspace, the topic of cybersecurity moves steadily up the defense agenda. Now critical to the global economy on which societies depend, cyber systems are a major factor in national defense and international stability.

Like globalization, cyber warfare is a multifaceted yet amorphous subject: barbed, hard to define, and difficult to conceptualize. The paucity of tangible examples of cyber warfare does not help matters, because it is difficult to theorize about a subject when one does not understand the parameters of the possible. Until very recently there was but one reasonably well-known instance of cyber warfare, Stuxnet. For a period, indeed, its name became almost synonymous with the term "cyber warfare." Yet to frame an understanding of a subject on a single manifestation would clearly be unwise. In conceptual terms, moreover, Stuxnet was the cyber equivalent of a precision tactical weapon, whereas it is possible to think of other forms of cyber warfare. For instance, it is generally acknowledged that cyber weapons have been developed for use in conjunction with combat forces. Similarly, the possibility of attacking an enemy's critical economic infrastructure to degrade their military or civilian capabilities has now become widely known.

Yet even these uses do not exhaust the possibilities. The employment of cyber warfare to assist combat forces is operational, while targeting critical economic infrastructure is a precision attack on physical assets. But could not a state use cyber means as a weapon of mass destruction or disruption, targeting an enemy's confidence as well as its infrastructure, with the aim of causing enemy civilians to put political pressure on their government?

To consider such scenarios it is helpful to seek an analogy. As it happens, recent history affords several possible examples of strategies to which this type of cyber warfare—we might call it strategic cyber warfare—might profitably be compared. These attacks are often described as forms of economic warfare. The most commonly employed historical example is the Allies' strategic bombing campaign in World War II; less common are the German U-boat campaigns of the First and Second World Wars and the US submarine campaign against Japan during 1942–45. A better historical analogy for thinking about cyber warfare is Britain's economic warfare plan implemented at the outbreak of the First World War.[1] For several reasons this analogy is especially attractive.

First, the international economy of today bears a closer resemblance to that of the three or four decades preceding the First World War era than to the more recent era encompassing the two world wars. The world economy was relatively more globalized (less autarkic) during the fifty-year period prior to the outbreak of the First World War than it was during the fifty years afterward. During the first era of globalization, as in the second (i.e., today), the stability of the national economies and the international economy rested on the free movement around the globe of goods, money, knowledge, and information. The flow of physical goods over the seas also hinged on a parallel yet separate flow of real-time information via undersea cables. Accurate and instantaneous information relaying details of supply, demand, and prices was essential to all businesses and especially to the financial services industry that facilitated the movement of commerce with ever-increasing velocity. The flow of information, paralleling the international flow of goods and services, became integral to economic systems.

Second, then as now, defense policymakers seeking to forecast the nature of future wars found themselves in a very new, almost alien, strategic environment—and with good reason. The advent of new military technologies changed the ways in which wars could be fought, but more fundamentally the transformation of the world economic system introduced changes in the nature of war itself. In particular, the development of the cable network impacted the structure of the world economy in ways that presented multiple strategic challenges and opportunities. Not only could militaries use the cable network to achieve unprecedented speeds of communication but, more important, businessmen and consumers around the world also came to depend on the smooth functioning of the cable network. Interrupting the network could therefore impact civilians—not just their governments or armed forces—more directly and more rapidly than had previously been possible. This interruption need not even be achieved by the armed forces. The very parameters of warfare were changing.

Third, before 1914 the British government had devised an economic warfare strategy that included the targeted disruption of the aforementioned, complex global communications network. In fact, the economic warfare strategy as implemented in August 1914 aimed at more than disrupting specific industries or elements of national critical infrastructure. Here, the term "economic warfare" is not referencing bombing ball-bearing plants or oil refineries (done with precision or otherwise), as in the Second World War, nor even the interdiction of global supply chains, as in the German and US submarine campaigns. These forms of economic attack were all comparatively limited in scope, intended to create bottlenecks and choke points in critical-path supply chains in the hope of producing knock-on systemic consequences. In 1914 the British aim was far higher: to "derange" the enemy's entire national economy, thereby delivering an incapacitating knock-down blow that would obviate the need for less intense but more prolonged types of war. Put another way, economic warfare transcended specific systems; it was not intended to be systems specific but society specific. Indeed, Britain's plan for economic warfare may well have been the first attempt in history to seek victory by deliberately targeting the enemy's society (through the economy) rather than the state. To be more precise, the target was the systems supporting the society's lifestyle rather than the society itself. This was a novel approach to waging war.

To be clear, economic warfare, as envisioned in 1914 and as defined here, was not analogous to the Allies' strategic bombing campaign from 1942. The differences are fundamental. Whereas strategic bombing targeted the ability of the state to make war and could work only through attrition, economic warfare targeted the enemy's society by deranging its national economy with the object of rapidly undermining the legitimacy of and domestic support for the enemy state. Similarly, whereas in strategic bombing civilian casualties were typically viewed as collateral damage, in economic warfare civilians were the target. These differences are summarized in table 8.1.

In positing this analogy, I do not mean to suggest that there exist direct parallels down to every last detail between the British strategic thinking before 1914 and the cyber problems of today. Nor do I mean to suggest that the nature of the technological problems and possibilities are similar, for in fact they are quite different. Rather, I seek to offer a different way of thinking about the possibilities of cyber warfare from what seem to me to be the most common approaches. The points that I wish to emphasize and the questions that I raise, therefore, pertain to the economic, political, and legal implications of waging warfare within a globalized trading system and to the difficulties and dangers of trying to weaponize any of the underpinning infrastructure. The analysis should serve also as a reminder of how serious the stakes can be when warfare—cyber or

Table 8.1. Differences between economic warfare and strategic bombing

Economic warfare	Strategic bombing
Targets the society	Targets the state
Fast acting	Slow acting
Psychological damage	Matériel damage
Shock strategy	Attritional strategy

otherwise—disrupts the global trading system and thereby causes significant economic collateral damage. As the British discovered in 1914, employing an economic warfare strategy is easier said than done.

There are four basic parts to the story. First, why would one choose to weaponize the international trading system in the first place? We must understand how Britain came up with the strategy of economic warfare and why some British planners thought it would work and others thought it too dangerous. This question pertains to the strategic environment created by globalization, which must be described in some detail to set up the analogy to our cyber era. Second, how did British strategists intend to implement their strategy? Clearly the technologies were different from those of today, but if we accept that cyberspace might include a psychological aspect, and not just electronic and virtual dimensions, then we can begin to see how the British conceptualized their offensive and think about some functional requirements or opportunities. Third, we must look at the consequences of implementation, both unexpected and underestimated. Last, our final basic questions are, can one prepare to defend as well as to attack? What are some inherent risks in and opportunities for defense against economic warfare? How does a state prepare to endure economic warfare as opposed to preparing to wage economic warfare?

Globalization and Its Strategic Implications—Then and Now

Historians have long marveled at the tremendous expansion in world trade during the long nineteenth century and concomitant dramatic rise in the ratio of foreign trade to global economic output. Between 1800 and 1913, world output per head doubled; over the same period the volume of world trade per capita multiplied by a factor of eleven.[2] By far the greatest upward leap occurred during the last third of the nineteenth century. Led by Great Britain, between 1870 and 1896 the volume of world trade doubled, and by 1914, in the space of just seventeen years, it had doubled again. All nations, especially the industrialized European powers, saw a steady rise in the ratio of foreign trade to economic output.

The late-nineteenth-century growth in international trade has been attributed mainly to the remarkable fall in the cost of long-distance transportation, with nods to the parallel communications revolution and developments in financial services.[3] A series of innovations in steam technology led to a steady drop in the cost of carriage by land (railways) and by sea (steamships). These changes made it economically practicable to transport bulk commodities, or staples with a low value-to-weight ratio, over great distances. Between 1868 and 1902, for instance, the cost of transporting wheat across the Atlantic fell by more than three-quarters.[4] Delivery was not only cheaper, moreover, but also quicker and more reliable.

The four or five decades before the outbreak of the First World War are now regarded as the first "golden age" of globalization. Although in many respects the facts are not new—historians were long aware that the volume of world trade had majorly increased during this period—the conceptual shift in interpreting those facts is. This shift is significant. In the words of the Cambridge historian Martin Daunton, "The context for thinking and writing about British economic growth has changed: the late nineteenth century can now be interpreted less as a period of decline and more as an era of globalization." Similarly, the tremendous increase in the volume of world trade is now more viewed as "the consequences of the new steam technology of the industrial revolution."[5] Here Daunton uses the concept of globalization to rethink the story of British power at the turn of the century and to relate the increase of global trade to industrialization.

Although the work by historians of globalization is extremely valuable, it does not fully capture all the macroeconomic aspects of the phenomenon. The process of globalization involved much more than an increase in trade driven by the application of industrial technology to long-distance transportation. It included also the development of a truly global commodities market, which was primarily in agricultural products and not, as the focus on industrialization might suggest, in manufactured goods. While the transportation revolution gets pride of place in most accounts of globalization, the communications revolution was at least as important.[6] The creation of the network that permitted instantaneous communication between almost any two points on the globe profoundly changed the ways in which business was conducted and commerce transacted on a day-to-day level. Within just twenty-five years, most international (and much domestic) commerce became reliant on access to cable communications to allow buyers and vendors to find each other in the first place; to negotiate contracts; to determine a fair market price; to arrange credit financing (a bill of exchange drawn on a London bank), insurance, and shipping; and to schedule payment and final delivery.

The development of the financial services industry, in conjunction with the communications revolution, is another crucial though underappreciated part of the story. As the cost of transportation fell and the global communications network spread, merchants looked farther afield for produce to buy and resources to exploit. As they did so, one by one, distant local markets became subsumed into the single world market. This process was particularly clear in the international grain trade, which before 1914 was the single most traded commodity. During the second half of the nineteenth century, the price of wheat in each distant locality increasingly came to be determined by the conditions of demand and supply in all parts of the world. News of a drought in India, for instance, or the expectation of a bumper crop in the Ukraine had an immediate effect on the price of wheat quoted in Liverpool and Chicago. The creation of a world market—and world price—was reflected in the general convergence of global prices. In 1870 the spot price of wheat in Liverpool exceeded Chicago prices by 57.6 percent. By 1895, however, the gap was down to 17.8 percent and in 1913 to just 15.6 percent. Price convergence was equally evident within national markets: in 1870 the wheat price spread between New York City and Iowa was 69 percent; by 1910 it had fallen to just 19 percent.[7] In short, globalization represented a fundamental shift in the structure and shape of the world economic system.

While it is important to understand the macroeconomic aspects of globalization, we must not lose sight of its microeconomic and social aspects, which were arguably of greater strategic importance. Globalization was more than a disembodied large-scale economic phenomenon. Like the development of cyber at the end of the twentieth century, with incredible rapidity it penetrated every nook and cranny of life. Writing in 1961 about the phenomenal growth in British trade during the late nineteenth century, before the term "globalization" had even been coined, the economic historian William Ashworth discerned the national and local impact of these global changes: "The country had moved away from self-sufficiency farther and more rapidly than before. A bigger proportion of the fundamental necessities of life and industrial livelihood was brought from abroad; a wider range of the commodities produced at home incorporated, directly or indirectly, a certain amount of irreplaceable imports; and the communities of more and more localities found in their midst some export industry whose fortunes appreciably affected the amount of their sales and income."[8]

In their seminal volume on *Globalization and History*, Kevin O'Rourke and Jeffrey Williamson agreed that "by 1914, there was hardly a village or town anywhere on the globe whose prices were not influenced by distant foreign markets, whose infrastructure was not financed by foreign capital, whose engineering, manufacturing, and even business skills were not imported from abroad, or whose labor markets were not influenced by the absence of those who had emigrated or the presence of strangers had immigrated."[9] In effect, commercial supply chains had begun to stretch around the world, with national and local economies growing ever more dependent on each other and on the global trading system.

While most contemporary commentators applauded globalization for the host of benefits it brought in its train—unparalleled levels of economic prosperity, generally higher standards of living, and cheaper food for populations around the world—others became apprehensive at the potential detriments. From the standpoint of national security, for example, dependencies translated into vulnerabilities. As in the cyber world of today, moreover, the fear was that the critical economic (and social) systems of the newly globalized world seemed not only intrinsically fragile and susceptible to disruption but also extraordinarily difficult to protect. Writing in 1902, the noted geostrategist and pundit Capt. Alfred Thayer Mahan echoed the worries of many when he observed that "the vast increase in the rapidity of commutations has multiplied and strengthened the bonds knitting the interests of nations to one another, till the whole now forms an articulated system, not only of prodigious size and activity, but of an excessive sensitiveness, unequalled in former ages. National nerves are exasperated by the delicacy of financial situations and national resistance to hardship is sapped."[10]

The deleterious strategic implications of globalization were most visible at the microeconomic level. For instance, in the grain market, which before 1914 remained the premier internationally traded commodity, the microeconomic behavior of merchants and farmers changed. For merchants engaged in the storage and handling side of the business, for instance, who bought and stockpiled wheat for resale at some future date, their business was now significantly riskier. An unexpected piece of news from a place far away could change overnight the worth of the wheat stored in their elevators and silos. Since they had purchased this stored grain with borrowed money, they might have to default on their loans.

Put another way, in the grain business, as the single market came to encompass more and more of the global supply, the number of variables in the pricing matrix exponentially increased. As a result, anyone who bought and held wheat for any period (including millers and bakers) was exposed to potentially catastrophic financial risk. If the price dropped between a merchant's purchase and sale, a competitor was sure to buy cheaper and cut prices, thereby compelling the merchant to follow suit and sell at a loss. Farmers too suffered from price risk. From sowing to flowering, crops were in the ground for six months, during which time the price could dramatically change. Obviously, when farmers chose what grain to sow, be it wheat or barley or whatever, they could not know with any certainty what price they would receive for their crop in six months' time.

The solution to the increase in business risk that accompanied globalization was found in a new financial instrument called a futures contract, also known as a *derivative*. The primary purpose of derivatives is to mitigate risk caused by likely price fluctuations; it is only their secondary purpose to facilitate commercial trade, though in fact they do and indeed are necessary to the conduct of business in a globalized economic world. Derivatives allowed merchants to project their future costs and revenues with much greater certainty. Very simply, whenever a grain merchant purchased grain, he could at the same time sell an equivalent amount at an equivalent price to a "futures" broker—that is, a professional financier who specialized in analyzing global market information (crop forecasts and the like) to predict future movements in prices—thus "hedging" himself against the risk of a significant shift in market prices during the period between his purchase of the grain from the farmer and his sale of the grain to the miller. In effect, in willingly shouldering the risk that merchants in the grain trade found intolerable, the broker anticipated that he could exploit his superior market intelligence to correctly predict the future price of wheat and turn a profit on the "future" he purchased. Thus, the derivatives market was the result of microeconomic calculations by merchants about the risk—itself a result of the increased complexity of a globalized market—that they were willing to tolerate.

Despite intense opposition from farmers, futures markets remained in operation because no credible alternative system for managing risk could be devised. The excesses of the system, such as rampant corruption and market manipulation, were undeniable.[11] But the fact remained that without such a system to mitigate risk, merchants who traded commodities in a global marketplace could not safely conduct their business without prohibitive risk of bankruptcy.[12] Futures trading became—and remains—fundamental to the entire international commodities market system.[13] From the strategic standpoint, the development of futures trading was as significant as it was illustrative of the increased complexity in the global economic system. It solved the problem of complexity (the risks created by a more complex and thus less predictable business environment) by introducing an additional layer of complexity (a market in grain futures as well as grain), thus making the entire system even more vulnerable to failure in the event of a major system shock.

Another set of microeconomic adjustments to globalization with macroeconomic and strategic implications was the sharply growing practice of "just-in-time" ordering. Contemporaries more colorfully called it living from hand to mouth. Traditionally, because of so many uncertainties in the market—due especially to the inability of vendors and customers to communicate in real time over any distance or to exchange market information concerning supply, demand, and prices—at all stages in the supply chain there was a need to protect against the unexpected by maintaining significant buffer stocks, a practice that incurred storage and other costs. With the advent of the cable, the emergence of the continuous market, the ready availability of supply, and the expectation that it would be possible to communicate with sellers at the last minute, however, merchants assumed they could safely reduce or eliminate their buffer stocks and trim their costs, thereby reducing their exposure to losses due to changes in price. As the chairman of the Baltic Exchange remarked in 1904 to a British government inquiry,

> The whole course of [the grain] trade is altering in order to save warehouse and other charges. When millers and others want grain, the merchant sells it to them on cost, freight and insurance terms, or, in the case of Liverpool, ex quay. That grain goes direct to the mills, and the charges for warehousing and other things are escaped. Therefore our trade is getting every day into one of cost, freight, and insurance, or of selling ex-ship, without incurring any of the other charges.[14]

Again, these changes in microeconomic behavior had macroeconomic and strategic effects. British defense planners were startled to discover, for instance, that between 1893 and 1903, average stocks of wheat held in the United Kingdom declined by no less than 40 percent, coming to be measured in terms of weeks rather than months of supply. At the most basic biophysical level, then, globalization had created a major new strategic vulnerability. Thanks to the advent of just-in-time ordering, cities contained no stockpiles beyond what was on the shelves, at most enough to last for a few weeks, and therefore were dependent on systems that brought them a steady supply of food.

But the new strategic vulnerabilities went beyond the biophysical. The drive for improved efficiencies touched commodities other than food. As the need to hold reserves of commodities declined, the global economic system became increasingly optimized for profit, and lengthier chains of dependencies developed that often extended over the seas. Whether they were aware of it or not, the microeconomic behavior of individuals in industrial, urbanized societies had adjusted to globalization. Their economic well-being now required uninterrupted access to, and a steady flow of goods and staples through, the global trading system, which in turn required high levels of global economic prosperity.[15] Not only did consumers need imports but also producers depended on selling their goods in a constant stream of commerce. If it piled up on the wharves, they would be in deep trouble, as would the banks that had extended loans to them. National economies were dependent on each other and on the globalized economy, while the social and political stability of nations was dependent to a considerable degree on everyone's economic well-being.

These changes generated two related but distinct types of fragility. One was the fragility of the economic system itself, a product of increasing optimization and of correspondingly declining resilience. The other related to the fragility of politically aware industrial societies, whose socioeconomic stability at the national level increasingly depended on the smooth functioning of an optimized but fragile global economic system. This fragility was rooted in the microeconomic, day-to-day changes wrought by globalization. Vast numbers of ordinary people had come to depend on the smooth functioning of the global economy quite literally for their daily bread, to say nothing of all the other goods with supply chains now stretching around the world. For them, a shock to the system would not happen at the abstract level of the state or society; instead, it would happen in their daily lives by having to pay much more for items they needed, if they could procure them at all. Given time, they could return to the old ways or otherwise adapt, but time was quite literally of the essence. The key questions that troubled pre-1914 statesmen across Europe were, how much time was needed for businesses and economies to adapt? And, of course, what would happen in the interim?

If one intersection of microeconomics and strategy caused by globalization was futures trading and another was the drive for newly possible efficiencies, a third may be found in international law. The entire structure of international maritime law pertaining to war at sea, and specifically the law of contraband, was based on an understanding of centuries-old commercial practices. For instance, international law assumed that a belligerent—its navy and its prize courts—could determine from papers found on board a merchant vessel its ultimate destination and the ownership of its cargo. In the age of the cable and express mail steamers, however, these assumptions were no longer valid because of fundamental changes in the day-to-day conduct of international trade: Ownership papers no longer accompanied cargoes but were held as collateral by the (London) bank that financed the cargoes, cargoes in transit frequently changed ownership during the voyage, and even at the port of unloading a cargo might not have a clear owner.

Already at the beginning of the twentieth century, vendors in the United States commonly dispatched from New York wheat-laden merchantmen without an ultimate intended destination. Even the master of the vessel in question did not know his ultimate destination until late in the journey. Only after crossing the Atlantic, a voyage that took approximately ten days, and touching at

Falmouth (UK) to refuel would the master of the ship obtain his instructions on where to discharge the cargo (be it London, Rotterdam, or Hamburg). In 1903 one authority estimated that 60 percent of all wheat discharged in British ports had been purchased through an exchange while already on the ocean in transit.[16]

Again, these microeconomic changes had strategic implications. The day-to-day conduct of international trade had changed so fast, as a result of globalization, that no means or mechanism—national, municipal, or international—existed anywhere to verify the ownership or destination of merchant ships' cargoes. Even in peacetime, financial trails that paralleled each international transaction were notoriously difficult to follow. In wartime, merchants bent on contraband running in the pursuit of fabulous profits found it all too easy to shroud the ownership question in a tangle of paperwork. Existing international law offered no guidance to those judges attempting to decide whether cargoes were contraband without tangible proof that a specific parcel of goods was destined for an enemy. The implications were stark. In time of war, the immutable rights of neutrals under international law to maintain their legitimate trade had become fundamentally irreconcilable with the equally immutable rights of belligerents to prevent illegitimate contraband from reaching their enemies. Quite simply, even with the best will in the world, disputes could not be settled by applying international law. That the square peg of modern commercial practices would have to be banged into the round hole of laws designed for the age of sail did not mean that no one would try, however.

The Idea of Economic Warfare

Toward the end of the nineteenth century, various commentators with an interest in strategic affairs and political economy began to speculate that the ever-growing interdependencies and interconnections between the great industrial powers must reduce the likelihood of war between them. Such thoughts sprang not from idealism but from widespread perceptions of brittleness within urban-industrial societies and the belief that the new global economic system was inherently fragile and susceptible to shock. In the extreme, some argued warfare that dislocated global trade, and the world economic system, would be so catastrophic as to raise the specter of social collapse. Theoretically warfare (certainly protracted warfare) would then be an existentially self-defeating proposition for anyone contemplating it. "The future of war," the Polish railway tycoon turned military theorist Ivan Bloch wrote in his famous treatise on warfare, "is not fighting, but famine, not the slaying of men, but the bankruptcy of nations and the break-up of the whole social organization."[17] The idea that globalization made protracted, large-scale warfare unlikely, if not impossible, was popularized by Norman Angell in his 1911 edition of *The Great Illusion*, which sold more than two million copies.

Although military planners (and theorists like Alfred Thayer Mahan) balked at this extreme viewpoint, many (including Mahan) nevertheless seem to have admitted the plausibility of the central argument: a major war would severely dislocate the world economic system, resulting in severe economic, political, and social consequences that would have strategic implications. More than any other, this idea stimulated the belief that the next war "must"—of economic and social necessity—be short in duration. The most important variable in any future war, in other words, would not be the relative military prowess of the combatants but the relative economic, social, and political resilience of the warring societies amid an economic Armageddon. If victory could not quickly be achieved, then a prompt negotiated peace would be necessary to avert socioeconomic collapse. Hence, the widespread conviction in 1914 was that the troops would be home before the leaves fell or that the war would be over by Christmas.

Standing at the epicenter of the global trading system, at the hub of the global communications network, Great Britain appeared to have more to lose than most from a war-induced meltdown of the global economy. Yet from about 1901, Admiralty planners began toying with the strategic possibilities of deliberately deranging the global economy to undermine an enemy's socioeconomic stability. In effect, they contemplated weaponizing the global trading system. They believed that in such an eventuality Britain would suffer relatively less than other powers, especially Germany, because Britain's dependence on the smooth functioning of that system was matched by its considerable control over the levers of the system, whereas Germany's was not. In effect, Britain was in a position to deny Germany access to world markets while retaining access for itself.

This assessment was predicated on several factors. First, the Royal Navy was the most powerful navy in the world, with an unrivaled capability to exert direct control over seaborne trade. Second, the Admiralty possessed by far the most sophisticated information- and intelligence-gathering network in the world, as well as an understanding of how to leverage this relative advantage into global situational awareness. Third, British economic institutions generally appeared to the Admiralty to be better placed than those of other nations to weather the financial and economic storm that was expected at the outbreak of war. Alone among the great powers, the British state possessed impeccable creditworthiness. In time of war, the state's ability to borrow and spend freely could not be overstated.

Most prominently, British companies dominated the physical and virtual infrastructure of the global trading system. The cable networks strung across the globe, the maritime insurance and reinsurance industry, the banks financing international sales, the discount market for bills of exchange, and, of course, the companies that owned the merchantmen that transported goods and staples across the oceans—all were based in London. In the eyes of British defense planners, this dominance meant that the British government could potentially wield effective monopoly control over the critical infrastructure on which the global trading system depended. The close connections between Westminster and the city of London are well documented. Less well known are the close links between the Admiralty and key international companies such as Lloyds of London (insurance), the Baltic Exchange (freight forwarding), and the Eastern

Telegraph Company (cables). In modern parlance, there were numerous private-public partnerships in the sharing of information.

Above all else, however, was a conceptual breakthrough: the Admiralty realized that the strategic environment within which navies must operate was substantively defined by the structure and character of the world economic system. Naval planners recognized that the nervous and circulatory system of the global economy increasingly depended on the sea and in ways that were not entirely obvious to others. Whereas sea communications—traditionally the target of naval pressure—had once been limited to merchant ships carrying goods and letters, by the early twentieth century they also encompassed the networked international financial services industry, which was built on the global undersea cable communications grid. It can be easy to miss the novelty and significance of these developments. From the strategic perspective, this expanded definition of "communications" opened the door to recognizing that an array of new vulnerabilities and opportunities now existed.

What is more, very little of this new, expanded strategic environment was governed or regulated by internationally agreed rules and laws. Whereas plenty of precedents governed the interdiction of ships and goods in wartime, almost none governed the interdiction of electronic information; yet seaborne trade could now be interdicted just as effectively through non-naval as well as through naval means. At the same time, however, older laws governing maritime economic warfare retained a superficial applicability (to observers then and to most historians since) even though the commercial practices they governed had fundamentally changed. As explained before, the entire structure of international maritime law pertaining to war at sea, and specifically the law of contraband, was based on an outdated understanding of trading practices. For better or for worse, the inapplicability of international maritime law to modern commercial practices would make it difficult to judge with confidence that Britain's (or anyone else's) wartime conduct was illegal.

Against this background, to exploit the changed strategic environment to Britain's benefit, Royal Navy planners conceived the strategy of economic warfare. The essence of the proposed strategy was for Britain to exploit the natural economic and financial forces set in motion by the outbreak of war, forces that were expected to cascade though the economies of all nations and leave widespread chaos in their wake. In other words, Britain would take certain naval (and non-naval) measures calculated to channel and intensify the magnitude of the inevitable and inescapable economic shock expected to strike the global economy.

The aim of this form of economic warfare was fundamentally different from others that sometimes receive the same moniker. The Admiralty's means were not to pressure choke points through simply restricting an enemy's maritime trade (as in submarine warfare) or precisely attacking specific individual industrial or military targets (as in strategic bombing) but to undertake a wide range of actions designed to undermine confidence in the commercial access and financial systems underpinning Germany's economy. Britain's strategic aim was not merely to interrupt enemy military operations but rather to quickly destabilize and disorganize civilian economic systems, to create chaos and panic, and ultimately to generate social upheaval and political unrest.

It needs to be understood, furthermore, that British actions were calculated to target both the physical and the psychological. Weaponizing the infrastructure of global trade would translate into a shock—not attritional—attack on an enemy society. The means and ends of this plan were also very different from a traditional *blockade* (the term most often used to describe Britain's wartime economic warfare campaign). Blockade predated the globalized world economy and was based on older trading practices and international law. Moreover, it worked by targeting an enemy state's revenues through the interdiction of physical goods, and it could work only slowly. The new economic warfare, by contrast, targeted an enemy's society (not state) psychologically (not physically), and it could work quickly. This conceptual model was fundamentally novel.

It should be further noted that contemporary planners, grasping for the vocabulary to describe their new ideas, sometimes resorted to the old phrase "blockade" when they meant something quite different. For instance, when in September 1913 First Lord of the Admiralty Winston S. Churchill referred to the strategy in a letter to the prime minister, he used the word "blockade," yet the context in which he used it made clear that he envisioned something new and very different. "The one thing that really matters to the Admiralty is the power of effective blockade. We want to be able to cut off and arrest completely the sea-borne trade of Germany, and by this means to injure and dislocate her *economic system* so as to compel a peace."[18] Traditional blockade did not seek to dislocate an enemy's economic system; the new economic warfare did.

It is perhaps not surprising, in view of the novelty of the Royal Navy's thinking, that its new strategy faced criticism from more traditionally inclined thinkers. When the navy first mooted its ideas in 1905, during discussions between the army and navy general staffs concerning British war policy in the event of war with France, economic warfare was ridiculed as an "invertebrate measure of offence" (!). The director of military operations (the head of the army's planning staff) dismissed the navy's proposals as nonsensical, holding that they reflected "a very grave divergence of opinion . . . not so much on the general question of strategy as upon the whole question of war policy, if not indeed upon the question of what war means."[19] The general, of course, was quite correct: the conceptual implications of the navy's thinking was much more than a new approach to the application of naval force; its economic warfare plan involved a wholesale rethinking of what war meant. No longer would war consist only of armed forces seeking to impose their will through physical violence, a paradigm to which even the revolutionary *levée en masse* (mass conscription) of the late eighteenth century could be accommodated; now it might be waged without physical violence by public-private partnerships. And these "invertebrate" means, its advocates insisted, could potentially collapse an enemy's ability and will to fight more certainly and cheaply than "vertebrate" means ever could.

As they struggled to turn theory into a workable strategy and at the same time gain a more sympathetic audience for their new approach to warfare, naval planners made and acted on several additional conceptual breakthroughs. First, they realized that they needed advice from the people who conducted and studied international trade if they wanted to understand the global economy in the necessary detail. As a result, they began speaking to leading economists, bankers, shippers, and businessmen. Second, they recognized that very significant legal implications would arise with British interference with global communications. Already Admiralty officials were conducting what would now be called lawfare, as they were doing their best to ensure that British negotiators at international legal conferences such as the Hague Conference of 1907 favorably shaped the international maritime legal environment (though with limited success, it must be said, because the British civilian plenipotentiaries would not cooperate). Third, they realized that interfering with communications would affect the interests of multiple foreign and domestic stakeholders who had significant political influence. Implementation, therefore, would require the highest political approval. Theirs was not simply a naval strategy, in other words, but a national strategy. As a result, they encouraged and participated energetically in interdepartmental discussions.

Victory in these interdepartmental discussions was far from assured. From the perspective of the political executive (represented by the prime minister and eight other senior cabinet ministers), the Admiralty's plan for economic warfare required revolutionary innovations in the strategic policy process and the assumption of enormous political risk. Both requirements derived from the extensive array of stakeholders whose interests would be affected by a campaign of economic warfare. They included British consumers, British businesses (especially in the shipping, communications, and financial services industries), and foreign neutrals. In the British government, these stakeholders were represented chiefly by the Board of Trade, the Treasury, and the Foreign Office.

The mere act of including the Board of Trade in strategic defense discussions was itself revolutionary by the standards of the day. Traditionally, strategy had been a matter for the Admiralty, the War Office, and perhaps the Foreign Office. In January 1912 Arthur James Balfour, a former prime minister (1902–5) who remained a permanent member of the Committee of Imperial Defence (CID), observed in a letter to another CID member "that war is no longer carried on solely by the Admiralty and War Office, and that every branch of the Public Service is concerned, are truths which have become more and more clear in consequence of the investigations of the CID."[20] By the same token, the mere act of trying to enlist the support of British business interests for the strategy—to say nothing of actually adopting or implementing the strategy—required substantial expenditures of political capital. The British government in the years before the First World War was Liberal, which then meant it was ideologically committed to free markets and free trade. Quite simply, seeking businesses' support for wartime government control over the three pillars of global communications—cables, merchant ships, and financial services—risked alienating the government's core constituency.

For more than a year, between February 1911 and May 1912, a group of senior government officials sat as members of a committee chaired by Lord Desart to assess the relative risks of economic warfare. The establishment of the Desart Committee reflected the political executive's recognition that economic warfare was too important a matter to be left to the admirals. Adopting their strategy would be a matter of national strategic policy—or grand strategy—and weighing its merits and drawbacks required input from multiple governmental and nongovernmental stakeholders. The Desart Committee's investigation, which included testimony from leading bankers, shippers, and insurers, made clear that implementing economic warfare would meet powerful and significant resistance from British business.

The Board of Trade and the Foreign Office voiced their concerns about the domestic and foreign costs of the strategy very plainly. They argued, correctly, that economic warfare would entail large-scale state intervention in the workings of both the domestic and international economy, starkly challenging traditional ideas about the role of government. Moreover, the military's adoption of economic warfare, and the unprecedented state intervention into the economy that would ensue, would far exceed established boundaries of what constituted national strategy and indeed the very nature of war. The domestic and diplomatic backlash, the Board of Trade and Foreign Office predicted, would be massive.

Though disconcerted, the political executive discounted these warnings. Impressed by the Desart Committee's assessments of the potentiality of economic warfare, the political executive (acting in conjunction with the CID) gave the defense establishment permission to forge ahead with preparations for offensive warfare. The government resolved that in the event of war it would assert its right to intervene in the economy. In secret, the government drafted a set of regulations and penalties to govern the activities of British companies in wartime that would prevent their trading with the enemy or on the enemy's behalf. They were articulated in a series of royal proclamations, drafted before the war, that forbade British merchants, financiers, and shippers—any imperial subject—to trade or conduct business with the enemy. The naval authorities were further granted "pre-delegated authority" (a truly extraordinary innovation in defense arrangements with huge constitutional implications) to implement immediately upon declaration of war stringent controls over a wide range of commercial enterprises connected with international trade.

Implementation and Abandonment, August–October 1914

When Britain declared war on Germany at 11:00 p.m. on August 4, 1914, the global economy was already in disarray. The mere expectation of war during the previous week caused a virtual cessation of world trade, an impact more dramatic than even the most pessimistic commentator had forecast. By July 31, every stock exchange around the world (including Wall Street) had shut its doors. There was a global liquidity crisis. Banks recalled their loans. Foreign exchange was simply unavailable though on the gray markets in New York, sterling was selling for $6.00 (up from par $4.86). In London, meanwhile, the accepting houses that funded international trade were unable to meet their obligations and technically were bankrupt. The British government was compelled to step in and underwrite the entire stock of outstanding bills of exchange (in the world), thus increasing the national debt obligation *overnight* by approximately three-quarters.[21]

The British government went to war extremely nervous about the health of its domestic economy and worried by the specter of large-scale unemployment. "The chief fear that haunts ministers," the well-connected Lord Esher noted in his journal on August 3, "appears to be not the naval or the military situation, but the inevitable pressure of want of employment and starvation upon the operatives in the North and Midlands; this may lead to a highly dangerous condition of affairs."[22] "Distress will come upon us very swiftly," Herbert Samuel, the government minister responsible for unemployment, wrote to his wife on August 4. "In a fortnight's time," he immodestly anticipated, "mine will be the heaviest task of all, except the Admiralty's."[23] A further, more tangible measure of concern was the cabinet's insistence on retaining at home one-third of the available infantry divisions to meet anticipated civil disorder in the industrial north instead of sending them to France to help stem the German invasion.[24]

Such worries notwithstanding, the cabinet tacitly approved the implementation of economic warfare. In so doing, it compounded the global economic chaos, as had been intended. Then came the backlash, which the Desart Committee had foreseen, but it was far swifter and more intense than expected. As the scale of the economic devastation became increasingly apparent, domestic interest groups became ever more vocal in clamoring for relief and lobbying for special exceptions, and neutrals howled in outrage at collateral damage to their interests. In the government, their protests received a sympathetic hearing from officials at the Treasury, the Board of Trade, and the Foreign Office who had never fully approved of economic warfare in the first place. Compounding the problem, inadequate economic data clouded understanding and spawned uncertainty, leading to hesitation. Political commitment to the strategy began to crumble; more and more exceptions to the published rules were granted, thereby further undermining the effectiveness of economic warfare; and implementation stalled.

In October 1914, aware of evasions and growing outright defiance by domestic interests, combined with mounting pressure from powerful neutrals (especially the Woodrow Wilson administration), the economic warfare strategy was aborted. As a result, the British were compelled to wage war in ways they had previously agreed were undesirable, unthinkable, unworkable, and even fatal. The reasons bear consideration by any nation contemplating a similar strategic policy.

What Went Wrong?

The war exposed the limits of prewar planning, and of the political will to engage in prewar planning, in several ways.[25] One was the failure to understand fully how relatively narrow technical details in economic warfare could have large political consequences. For example, in 1914, to prevent trading with the enemy, the British cable censors required that all messages be transmitted in plain English (i.e., no shorthand or abbreviations or code) and that each telegram include the recipient's full name and address of recipient (i.e., no internationally registered abbreviations such as LAMP32, which is akin to a dot-com address like "shoes.com"). In so doing, however, they either forgot or did not appreciate the finite limitation in cable capacity or bandwidth, to use the modern term. The net effect of the new regulations governing telegram content doubled or even tripled the length of each message; consequently, a communications logjam grew, exacerbating the global commercial paralysis. Overruling objections from the military censor, the government quickly relented, dialed down the regulations, and agreed to share communications resources with corporations (both nominally British and foreign).

Another way in which the war exposed the limits of prewar planning concerned the behavior of British businesses. Before the war, faced with abundant evidence that they would resist government regulation but seeking to avoid a politically damaging confrontation, the government defaulted to blithe hopes about private sector conduct. The government expected that moral suasion would translate into effective control, that businesses would cooperate with regulations, and that capitalists would forgo enormous opportunities to make a profit on the black market out of patriotism. Such an assumption ignores the reality that capitalistic economies are built on a reward system that encourages firms (and individual businessmen) to deviate from the conventional and to pioneer new methods. Those who succeed earn disproportionate rewards; those who fail risk bankruptcy. Put crudely, the instinctive and essentially rational behavior of businessmen is to make money through innovative means. It might be said that conforming to government expectations is antithetical to business mentality.

Aside from the political costs of confrontation, the prewar structure of British business made measuring its compliance with regulations extremely difficult. Tracking large corporations was one thing; tracking small businesses, through which an enormous amount of economic activity flowed, was another. Generally speaking, then as now, an inherent conceptual bias when talking about the problem is reflected in envisioning the economy only in terms of large corporations, big systems, and big data. In reality a vast (unquantifiable) amount of economic activity flows through the enormous base of small businesses. In any case, the prewar British government never set up sufficient detection and enforcement mechanisms to ensure compliance with the announced prohibitions on trade.

As a result, certainly within six months, perhaps within three, certain British businesses were conducting a roaring trade with the notional "enemy," and most of it was financed though British banks, which also financed most contraband from Americans to Germany via neutrals. To add insult to injury, much of this trade was transacted over British cables and the goods carried to the enemy in British ships. Although these violations were apparent to some degree, the military authorities responsible for waging economic warfare found themselves powerless to prevent these violations and perhaps often lacked the commercial expertise even to recognize what was happening. Early attempts to improvise a better organization were resisted by other government departments (whose assistance was needed), while political leaders turned a blind eye. In the meantime, British trade with "previously unknown" corporate entities located in countries contiguous to Germany grew exponentially. For more than a year the British government remained unaware of the scale of the problem, as it lacked the means to gauge it and did not want to believe the worst.

The government's ability to impose effective control over the economy developed only gradually and not because British businessmen suddenly discovered a hidden reservoir of patriotism. By 1916 many in the private sector were sufficiently worried by the prospect of a social revolution that they were seemingly willing to tolerate relatively moderate state interference as a preferable alternative to arbitrary confiscation of private property by a radicalized socialistic society. The government and businesses had different understandings of what constituted a security emergency: for the government, the national security emergency was the prospect of military defeat; for businesses, the corporate security emergency was the prospect of social revolution. In other words, when businesses finally began to cooperate with the government, they did so not because the government's prewar expectations about corporate patriotism were correct but because they came to fear something more than government regulation.

The government's failure to anticipate the behavior of British businesses reflected its even more fundamental failure to reach consensus with key stakeholders about the proper relationship between the state and society in wartime. While the authority of the state to conscript its citizens was well enough established during the nineteenth century, cemented by Prussia's victory over France in 1870, the state's right to conscript never extended to private property. Social cooperation with a strategy that affected property interests had to be voluntary; it could not be legally compelled (and still cannot?). For the government, voluntarism was necessary not only to avoid legal challenge but to acquire the information—in effect, the "targeting data"—needed to prosecute the strategy of economic warfare. National security imperatives required society to reconceptualize its relationship to the state, but neither party realized the degree to which reconceptualization was necessary.

The Commons Strike Back: Implications for Cyber Warfare

In seeking to disrupt global communications, broadly defined, via economic warfare, Britain enjoyed many advantages:

1. A near monopoly over the communications infrastructure of international trade
2. Naval officials with the imagination to understand that the character of the global economic system had redefined the navy's operating environment and to spot resulting new strategic opportunities
3. Government officials who acknowledged that they lacked expertise on economic behavior and day-to-day business practices and were willing to seek civilian assistance
4. Other officials who realized that any attempt to interfere with maritime communications posed serious legal problems and attempted to shape the legal terrain accordingly
5. The broad recognition that any attempt to interfere with maritime communications was a grand strategic rather than an operational problem that required input from multiple stakeholders both inside and outside government
6. A political executive willing to conduct strategic discussions with multiple stakeholders, even at the risk of alienating its core political constituency
7. A strong prewar political commitment to the strategy of economic warfare, manifested concretely in the pre-delegation of authority

Even with all these advantages, however, Britain's strategy of economic warfare still failed. Indeed, it was barely tried.

The planners of cyber warfare could use this story to assure themselves that they would not make the same mistakes today. Moreover, they could use it as an opportunity to ask whether the United States (as the present hegemon) or any other actor enjoys the same advantages that Britain enjoyed and to think through some of the difficulties they might face and the risks they would be running.

One obstacle is simply to define cyberspace. Just as definitions of maritime communications were not self-evident before World War I, so definitions of cyberspace are not self-evident today. How does one distinguish private from public cyberspace, or one state's cyberspace from foreign cyberspace? Will it suffice to defend just one's own military cyber systems and critical infrastructure and key resources? Further, given that the health of the national economies of the United States, most European states, China, Japan, and others depends so very greatly on a healthy world economy, should national security measures encompass this too? Where does one draw the line?

It may be helpful to consider potential parallels between maritime space and cyberspace. The maritime space most readily identified as the *global commons* are the high seas, or oceans, but they are contiguous with progressively smaller and more sovereign (i.e., non-common) waters: gulfs, bays, deltas, ports and harbors, rivers, inland seas, lakes, and so on. Some of these waters may be reachable by continuous voyage, while some may be more isolated. Determining exactly where the commons turns into a sovereign area is not easy. By analogy, the private sovereign areas of cyberspace are the cyber equivalents of inland seas, ports and harbors, great lakes, and so forth. Permission from their owners, or sovereigns, may be required to enter these “places.” Alternatively, entrance to these spaces without permission is tantamount to use of force and espionage. The idea of cyberspace as a commons coexists uneasily with various private, sovereign claims.

As if the challenge of defining interests in cyberspace is not enough, it also involves very difficult legal questions—just as the challenge of defining maritime communications posed very difficult legal questions. The fact is US firms dominate cyberspace, with very large portions of global Internet traffic passing through the United States, but other states host data and traffic too. China, for example, has taken numerous steps to wall off its critical information infrastructure from the outside world and subject it to state control.[26] Will societies so readily accept claims by their own or a foreign government of the right to commandeer or withhold bandwidth by which one gains access to cyberspace—in other words, the radio frequencies used by the mobile communications systems through which users increasingly interact with cyberspace—as mobile platforms and related applications proliferate? Similarly, the US government, without necessarily owning cyberspace, presumes to control access to portions known as dot-gov and dot-mil because it has control over the servers and the content. Does it own the interaction space, or the protocols and gateways by which people gain access to those servers and data? In the Western world at least, does any state’s exercise of sovereignty amount to legal ownership? Does ownership per se confer the right to control access? Does the United States or any other government have an international legal or moral right to defend, regulate, or control access to cyberspace in ways that will very likely impinge on others’ interests? What would be the political costs in asserting such claims?

In wartime these and related questions will push their way to the front of political awareness. The exact answers are less important here than the recognition that these questions must be asked. The British experience with economic warfare suggests that it would be very dangerous for the United States or any other government to assume that it could readily translate national dominance of cyberspace—however defined—into legal or effective state control.

If a state does decide to wage cyber warfare, how will it insulate itself from the collateral damage caused by deranging the global commons, whether the state’s own law authorizes the action or not? How will the United States or any other government gain the cooperation and monitor the compliance of its private companies, many of which are multinational in their ownership and operations? How will countries respond when their consumers complain about rising prices and when businesses protest heavy state regulation, unfair foreign competition, and falling profits? What will states do when allies and neutrals complain that actions targeted at belligerents are hurting them? The issue is not necessarily that the United States or any other state will be unable or unwilling to act unilaterally within cyberspace. Rather, the issue is that *if* the United States or any other globally connected state acts unilaterally, *then*, for a variety of reasons—primarily economic but also political and diplomatic, not to mention legal—such action will impinge on the critical interests of others and risk a backlash. Effective measures that a highly globalized state might take in cyberspace could hurt its own and foreign interests so much that it might be compelled to call off its attack, just as Britain had to do in October 1914.

To illustrate this potential dynamic, consider a state-authorized cyber attack that corrupted the integrity of data or algorithms in a major international bank or stock exchange. Such an attack could be intended to damage and thereby coerce a particular country. But what if the effects undermined trust in wider international financial systems, thereby jeopardizing the stability of the international economy? Even if the effects were successfully localized—perhaps because the attacking state was relatively unconnected (which seems implausible) or unimportant to the international financial system—should other states attribute the attack to their satisfaction, then they would be expected to take retaliatory action. Such action could then impose economic pain on the attacking state and its population, including through sanctions. Depending on the ensuing political-economic developments in the attacking state, the consequences could resemble those that Britain experienced in 1914.

Britain's campaign of economic warfare is a parable of unintended consequences. If the British experience has a single lesson, it is that the infrastructure of a globalized economic system makes for a weapon of mass destruction rather than a precision strike weapon. Accordingly, weaponizing it entails pervasively political problems. It is not a problem for computer experts or national security agencies to tackle alone.

To have any hope of success, a strategy to weaponize critical economic infrastructure requires acknowledging the multiple stakeholders involved—foreign and domestic, inside and outside the government—and gaining their cooperation. Its formulation demands direction from the highest political authority and the assumption of substantial political risk by elected officials even to seek cooperation from powerful constituencies, let alone to alienate them by actually implementing the strategy. The more aggressive the weaponization of the global economic infrastructure, the more severe the damage it will cause not only to its intended target but also to collateral stakeholders, including neutral nations, domestic business interests, and domestic consumers who vote.

For the strategy to survive the likely backlash, or for the intensity of the backlash to be reduced, a case must be made to stakeholders before the strategy is implemented that the costs of an alternative strategy, or no strategy, would be even worse—say, a war that drags on for four years, costs millions of lives, and raises the specter of revolution at home. These stakeholders would include not only the citizens and the businesses of the state contemplating cyber-economic warfare but also the allies, the friends, and the major trading partners as well as the multinational financial institutions whose stability is vital to the international system. It may be impossible to secure the cooperation of all interested parties, but it is certainly impossible to do so without realizing that their cooperation is necessary.

In the event of a future major conflict, waging economic warfare within the context of a very different global economic structure would be, as it was a century ago, quite different in its character from anything experienced before. It thus behooves us now to devote serious and persistent thinking to the subject.

Notes

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