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Briefing Paper

The Economic Costs of a War in Iraq: The Negative Scenario

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EXECUTIVE SUMMARY

This paper examines the potential economic costs of a war with Iraq in a scenario in which the war is not over quickly. It follows loosely from the negative scenario developed in a recent study by William Nordhaus. The paper discusses several ways in which a war can impose large economic costs, that have not been seriously considered in policy debates to date.

The paper notes that:

1) Nordhaus' estimate of GDP loss in a negative war outcome, implies a loss of 1.6 million jobs in 2003 and 2004. It implies that the economy will have an average of 300,000 fewer jobs over the next seven years (2005-2011), as it gradually recovers from a war-related oil shock. Nordhaus' estimate of the immediate impact of a war-related oil price shock is comparable to the high-end estimates of the job loss in the United States that would result from implementing a Kyoto-type agreement restricting the emission of greenhouse gases.

2) One possible outcome of an Iraq war is to substantially increase the extent of the terrorist threat facing the United States. The Congressional Budget Office (CBO) has estimated that the security measures being implemented in the wake of the September 11th attack will reduce annual GDP growth by 0.1 percentage point, implying that GDP will be approximately 1.0 percentage points lower after a decade, as a result of these measures.

However, a more serious terrorist threat would require considerably more expensive measures. Recent developments in Israel provide an example of measures that may be necessary if the United States were to face a heightened threat of terrorism as an outcome of an attack on Iraq. In Israel, it is now standard practice for stores, restaurants, bars, and office buildings to have armed security guards posted at the door to screen everyone who enters. If every retail establishment in the United States were to post a full-time security person the cost would be more than $100 billion a year. There will also be large costs associated with the additional delays that result from more frequent security inspections. These economic costs are in addition to the non-economic costs in the form of increased insecurity.

3) Developing nations would likely be dragged into a recession along with the rich nations, in the immediate aftermath of an oil price spike. The developing nations would be hit for three reasons. First, they would also be paying higher prices for oil, which will be a large cost for most developing nations, who are net importers of oil. Developing nations will also see a sharp decline in their exports, since three quarters go to rich nations. In addition, developing nations are likely to see a sharp increase in the interest rates they pay on their debt. Investors routinely search out safe havens, such as the United States and Europe, during a time of crisis. If a war leads to a prolonged period of uncertainty, it could lead to a rise of several percentage points in the interest rate that developing nations pay on their debt. This will take a large toll on developing nations, especially the ones which are already heavily indebted. As a result of its high levels of debt, Latin America is

especially vulnerable. The countries of the region could see their third consecutive decade of little or no per capita GDP growth.

4) If a war leads to increased hostility to the United States in Muslim countries, and possibly throughout the developing world, it could lead to formal or informal boycotts of U.S. goods. The potential impact of such boycotts could be substantial. For example, if governments opt for open source software instead of Microsoft's operating system, it could eventually undermine Microsoft's position in the market. Similarly, airlines may opt to purchase Airbus planes rather than Boeing, for non-economic reasons. European contractors may find that they have an advantage relative to U.S. contractors in bids for public service contracts. In addition, hostility and the threat of violence may slow the spread of U.S. retail establishments, as is the case in Pakistan after mobs ransacked two KFC franchises in the wake of the U.S. attack on Afghanistan. The potential economic fallout from increased hostility towards the United States is substantial.

At this point, there is no way to determine the probability that the United States will face some of the costs discussed in this paper as a result of an attack on Iraq. However, it is important that policy makers and the public consider the possible costs of situations in which a war does not go as planned, not just a best case scenario.

THE ECONOMIC COSTS OF A WAR IN IRAQ: THE NEGATIVE SCENARIO

A recent paper by William Nordhaus set a range on the cost of a war in Iraq.[2] This paper set out two basic scenarios for the war. The positive economic scenario assumed that a war could be quickly won with little loss of life and damage to Iraq and its oil fields. It also assumed no post-war resistance to an occupation and that the war led to no significant increase in hostility to the United States from people or governments in the Middle East, or elsewhere in the world. In this case, the U.S. economy enjoyed some modest economic benefits from the war as a result of a projected decline in world oil prices of approximately 4 percent.

The second case examined by Nordhaus is a more negative economic scenario in which the war leads to a disruption of oil flows from Iraq and/or neighboring countries. In this case, oil prices rise to $75 per barrel in the immediate aftermath of the disruption, and gradually fall back toward their trend path. This path leads to large economic losses, estimated at $780 billion over a nine-year period.

Taking into account the costs of the war under both optimistic and pessimistic scenarios, including occupation and reconstruction of Iraq, Nordhaus estimated the costs to the US economy under the two scenarios over the next decade as $99 billion and $1.924 trillion, respectively, with a range of outcomes that could fall between these two.[3]

It is important that policy makers and the public are aware of the potential costs of a war with Iraq if it does not turn out well. With this goal in mind, this paper builds off of the negative scenario described by Nordhaus. The first section looks at the impact of the war on jobs. The study by Nordhaus produced estimates of the GDP loss that would occur in the negative war scenario. This loss of GDP implies a loss of jobs. The first section derives estimates of job loss from the Nordhaus estimates of GDP loss, based on commonly used econometric models.

The other three sections explore some of the issues not directly addressed in the Nordhaus study. The second section examines the costs of prolonged and heightened terrorist actions directed against the United States, which could result if the war sufficiently increases hostility in the region towards the United States. The United States is already incurring significant costs as it faces the need to increase security precautions in the wake of the September 11th attacks. These

[2] "The Economic Consequences of a War with Iraq," available at http://www.econ.yale.edu/~nordhaus/homepage/iraq.pdf.

[3] Nordhaus noted that even the high estimate was not the upper limit, as these numbers "exclude any costs to other countries, omit the most extreme outcomes (such as chemical or biological warfare), and exclude [a] "worst" case in oil markets. Moreover, the quantified costs ignore any tangible or intangible fallout (except that of a potential boycott by oil producers) that comes from worldwide reaction against perceived American disregard for the lives and property of others."

costs could increase substantially if the war has the effect of increasing the frequency of terrorist attacks directed against the United States.

The third section examines the effect of a prolonged war on developing nations. In addition to increasing the price of oil and likely causing a recession in the wealthy nations, a prolonged war will increase uncertainty worldwide. This will have the effect of increasing interest rates. The effect is likely to be felt most strongly in developing nations, since investors usually turn to safe havens such as Europe and the United States in times of uncertainty. Such an increase in interest rates could have very substantial consequences for developing nations, many of whom are already struggling with the burden of large debts.

The fourth section will examine the potential impact of explicit or implicit boycotts of U.S. goods. A prolonged or bloody conflict could lead to anger against the United States in the Middle East, throughout the Muslim world, and possibly throughout much of the developing and developed world. One outcome of such anger could be formal and/or informal boycotts of U.S. exports. The latter are likely to be more common since they could take the form of governments and private corporations opting to choose non-U.S. suppliers for non-economic reasons, even if this is never explicitly stated. This section discusses some of the ways in which such boycotts could have an impact on U.S. corporations.

SECTION 1: HOW MANY JOBS WOULD BE LOST IF THINGS GO BADLY?

The Nordhaus paper provides a simple estimate of U.S. GDP loss in the case of a bad outcome of a war in Iraq. As a result of a surge in oil prices that would result from a significant amount of Mideast oil being removed from world markets, Nordhaus projected that potential GDP would fall by a total of $665 billion (in 2002 dollars) over the next nine years, an average loss of just over 0.5 percent of GDP over this period (Table A-1). This loss would be concentrated in the years immediately following the war, when it is assumed that oil prices will be highest. The losses will diminish through time, as oil prices fall back toward their trend level.

In addition to the loss of potential output, Nordhaus also projects that the economy would incur cyclical losses since it would be thrown into a recession in the immediate aftermath of an oil price spike. Nordhaus estimates these cyclical losses at $391 billion, or 1.9 percent of GDP, over a two-year period. This cyclical loss is in addition to the loss of potential output noted above, so the total lost output for these two years would be approximately 2.4 percent of GDP.

It is worth noting that this assessment runs counter to an often held view that in the short-run, war will provide an economic stimulus and lead to increased growth. Nordhaus rejects this scenario since the stimulus resulting from increased spending is likely to be far more than offset by the negative effects of war on the economy (e.g. uncertainty, loss of business and consumer confidence, supply shocks). The stimulus effect dominated and led to expansion after the onset of World War II and the Korean War because the additional spending was very large relative to GDP (more than 50 percent of GDP for WWII and 8 percent for Korea). By contrast, the direct additional spending associated with the Persian Gulf war was less than 1.0 percent of GDP. As a result, there was little stimulus provided by the spending and the war actually coincided with a recession. Nordhaus assumes that a war with Iraq will be more like the Persian Gulf War than either World War II or Korea in its short-term effects.

It is a simple matter to derive an estimate of job loss from this estimate of lost GDP, since the two are closely related. For example, projections from the DRI-WEFA model, a commonly used econometric forecasting model, imply that a one percentage point decrease in GDP is associated with a 0.6 percentage point loss in jobs.[4] Most other models show a similar relationship. Table 1 shows the job loss implied by the Nordhaus estimates of GDP loss in the bad scenario.

Table 1

GDP and Job Loss in Bad Outcome Scenario

	GDP Loss	Job Loss
2003-04	2.4 percent	1.6 million
2005-11	0.5 percent	0.3 million

As the table shows, the decline in GDP estimated by Nordhaus would be associated with a loss of 1.6 million jobs during the projected recession. The job loss due to reduced potential GDP in the subsequent years would average approximately 300,000. To put this estimate of job loss in perspective, the peak job losses projected for 2003-04 would be near the high-end of the range of estimates of job loss from a Kyoto-type agreement limiting the emission of greenhouse gases (Repetto and Austin, 1997). Most models of a Kyoto-type agreement show estimates of job loss that are considerably lower than the peak losses implied by Nordhaus' projections.

To make this job loss estimate more concrete, Table 2 shows a state by state estimate, which simply assumes that job loss would be distributed in proportion to current employment levels. In fact, the job loss will not be evenly distributed, some states will have lost proportionately fewer jobs, and could even experience gains if they are the beneficiaries of large amounts of war-related spending. However, in other states, the job losses will be considerably larger than the estimates shown in Table 2.

Table 2

State by State Job Loses in Negative Outcome Scenario in Thousands

[4] This calculation is taken from projections in *The Economic Impact of ANWR Development*, 1990, Bala Cynwyd, PA: The WEFA Group.

State	2003-04	2005-11		2003-04	2005-11
Alabama	29.7	6.2	Montana	6.5	1.4
Alaska	4.4	0.9	Nebraska	13.2	2.8
Arizona	33.6	7.0	Nevada	14.1	2.9
Arkansas	17.4	3.6	New Hampshire	9.8	2.0
California	237.4	49.5	New Jersey	58.5	12.2
Colorado	32.4	6.8	New Mexico	11.6	2.4
Connecticut	24.1	5.0	New York	122.6	25.5
Delaware	5.8	1.2	North Carolina	54.8	11.4
District Of Columbia	3.8	0.8	North Dakota	4.8	1.0
Florida	106.8	22.3	Ohio	81.5	17.0
Georgia	58.1	12.1	Oklahoma	23.1	4.8
Hawaii	8.3	1.7	Oregon	24.4	5.1
Idaho	9.3	1.9	Pennsylvania	83.5	17.4
Illinois	87.1	18.1	Rhode Island	7.0	1.5
Indiana	43.1	9.0	South Carolina	27.6	5.7
Iowa	22.2	4.6	South Dakota	5.7	1.2
Kansas	19.9	4.2	Tennessee	39.5	8.2
Kentucky	27.4	5.7	Texas	145.2	30.3
Louisiana	27.9	5.8	Utah	15.7	3.3
Maine	9.6	2.0	Vermont	4.8	1.0
Maryland	39.9	8.3	Virginia	52.1	10.9
Massachusetts	46.5	9.7	Washington	41.3	8.6
Michigan	71.4	14.9	West Virginia	11.1	2.3
Minnesota	39.3	8.2	Wisconsin	42.0	8.8
Mississippi	17.8	3.7	Wyoming	3.7	0.8
Missouri	41.0	8.5	Puerto Rico	16.5	3.4

Source: http://www.bls.gov/schedule/archives/laus_nr.htm[5] and authors' calculations.

A slightly different way of examining job loss is to consider the impact by industry. Again, a simple approximation is that the job loss will be proportionate to current industry employment. This is shown in Table 3. Of course, in reality the percentage of jobs lost will vary significantly across industries and, as with the states, some industries could show job gains.

Table 3

Industry Job Loses in Negative Outcome Scenario in Thousands

Industry	2003-04	2005-11
Goods-Producing	321.0	68.8
Mining	7.9	1.7

[5] These estimates assume that each state loses 1.4 percent of its jobs in the years 2003-04 and 0.3 percent in the years 2005-11 following the GDP loss projected by Nordhaus, based on the 2001 average employment in each state.

Construction	93.6	20.1
Manufacturing	247.7	53.1
Durable Goods	148.9	31.9
Non-durable Goods	98.8	21.2
Service-Producing	1497.7	320.9
Transportation and Communication	98.9	21.2
Wholesale Trade	94.9	20.3
Retail Trade	329.3	70.6
Financial	108.0	23.1
Services	573.7	122.9

Source: http://www.bls.gov/webapps/legacy/cesbtab1.htm[6] and author's calculations.

To sum up this discussion, the number of lost jobs implied by the Nordhaus estimate of GDP loss in a negative scenario is 1.6 million in the recession immediately following a war, and 300,000 in subsequent years as the economy adjusts to higher oil prices. The peak job losses projected during the recession are comparable in magnitude to the high-end projections of the job loss associated with a Kyoto-type agreement to reduce greenhouse gas emissions.

SECTION 2: THE COSTS OF HEIGHTENED SECURITY

Since the September 11th attack the United States has implemented a wide variety of security measures to protect against future acts of terrorism. The most obvious of these measures are the increased security precautions at airports, but hundreds of thousands of factories, offices, stores and apartment complexes across the country have installed cameras, hired security personnel or in other ways taken steps to reduce the likelihood of a terrorist attack. All of these measures impose costs on the economy, as resources that could have gone to consumption or investment are instead being diverted to security. In the aggregate, these costs are substantial. The Congressional Budget Office estimated that the security measures adopted in response to the September 11th attack would reduce the rate of annual GDP growth by 0.1 percentage point.[7]

While this loss may seem inconsequential, it adds up to a substantial loss in output through time. For example, after five years, the CBO estimate implies that GDP will be 0.5 percentage points lower as a result of the post September 11th security measures. After 10 ten years, the loss in output would be equal to approximately 1.0 percentage point of output. Again, these output

[6] These estimates assume that each industry loses 1.4 percent of its jobs in the years 2003-04 and 0.3 percent in the years 2005-11 following the GDP loss projected by Nordhaus, based on the average employment in each industry in 2001.

[7] *The Budget and Economic Outlook: Fiscal Years 2003-2012*. Washington D.C.: Congressional Budget Office, 2002, Tables 2-5.

losses translate into fewer jobs. After five years, the job loss implied by the CBO projections would be approximately 400,000. The projections imply that the nation would have lost approximately 800,000 jobs after ten years as a result of the post-September 11th security measures.

But the security measures that the United States is currently in the process of implementing are still rather limited in scope. At present, the threat of terrorism is seen as rather distant -- there has been no major attack on U.S. soil since the Sept 11th attack.[8] However, one possible outcome of an attack on Iraq is a qualitative increase in the amount of terrorism directed against the United States. This could be the case if the attack against Iraq is viewed as unjustified, or if the conduct of the war and a subsequent occupation arouses anger among large segments of the Arab or Muslim world. In this situation the costs of coping with a much larger terrorist threat would be considerably greater than CBO estimated.

Israel is the obvious model for a nation living with an ongoing and extreme threat of terrorism. This threat has imposed large economic costs on both the government and private sector. For example, all flights of El Al planes, the government-run airline, have an armed member of Israeli security on board. In addition, guards inspect every car that enters Ben Gurion International Airport in Tel Aviv, the country's major airport. The government also stations armed guards on city buses.[9]

The costs to the private sector are even larger. Virtually every public gathering place -- restaurants and bars, movie theaters, schools, hospitals, sports stadiums -- now has armed guards posted at the doors, who question all customers. Similarly, retail stores and malls also typically have security guards checking parcels to prevent against suicide bombers.

Even with this heightened security, the Israelis are much less willing to spend time in public places than in the past. In addition, parents are reluctant to allow their children to go on school field trips or even to play outside. The threat of terrorism has seriously altered almost every aspect of normal life in Israel.

While it would not be easy to put a price tag on the ongoing fear of terrorist attacks, it is possible to estimate the costs of some of the security measures that Israel has implemented in the last two years. For example, if every retail establishment in the United States had to hire one full-time security guard, it would be equivalent to imposing a tax of more than $100 billion a year on the retail sector.[10] Even this figure would underestimate the costs to the retail sector, since stores

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[8] The possible exception is the Anthrax attacks in the fall of 2001, but the motivation for these attacks is still not known.
[9] Accounts of the security measures that Israel has adopted in the last two years can be found in "Mideast Violence: Fear," *National Post* (Israel), May 25, 2002; A15; and "Safety First for Israelis; Fear Brings Tighter Security," *New York Daily News*, May 21, 2002; A7; "The El Al Approach: A Look at the Israeli Airline's Security Procedures," *Business 2.0*, November, 2001 [http://www.business2.com/articles/mag/0,1640,17508,FF.html].

[10] This assumes one full-year worker works 2000 hours (fifty weeks at forty hours per week), and receiving the average hourly compensation of $21.39 per hour (Mishel,L., J. Bernstein and H. Boushey, 2002. *The State of Working America 2002-2003*, Washington, D.C.: Economic Policy Institute, Table 2.3). The Census Bureau estimated that there were

could adopt -- as they have in the past -- other measures that have added costs, such as installing mirrors, cameras, alarm systems and other security devices.

The additional delays associated with increased security measures will also impose a measurable economic cost in the form of lost time. The sources of these delays are numerous:

i. more careful inspections at airports,
ii. screening and inspections at train and bus stations, stadiums and theaters, stores and restaurants,
iii. evacuations of buildings or areas due to bombings or bomb threats,
iv. re-routing of traffic, including trains, planes, and buses as a result of actual or potential terrorist acts.

While it is not easy to find a basis for estimating how much time could potentially be lost due to increased security measures that may be instituted as a result of an increased risk of terrorism to the United States, the potential costs could be quite large. For example, if the average worker lost an additional hour per week, due to such measures, it would imply an economic loss of approximately $150 billion a year.[11]

If terrorism does increase markedly in the wake of a United States attack against Iraq, the threat to life and the loss of personal security will be of much greater concern than the purely economic costs associated with additional security measures. However, it is important to recognize that terrorism can impose large economic costs as well. Israel is currently in the midst of a severe recession, which is at least partly attributable to the costs it has incurred to protect its citizens against terrorism. In a worst case scenario, the United States could be facing a similar situation.

SECTION 3: THE EFFECT OF A NEGATIVE WAR OUTCOME ON DEVELOPING COUNTRIES

Although most developing countries are not likely to be directly involved in a war or supporting activities, they could end up paying a high economic price if the war turns out to be prolonged. Developing countries could suffer for three reasons. First, if the United States and other wealthy nations experience a recession as a result of higher oil prices, this will deprive developing nations of the major market for their exports. Second, an increase in oil prices will be a negative shock to most developing nations as well, with the obvious exception of those that are net oil exporters. Third, a prolonged war, and the resulting uncertainty, is almost certain to lead to

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2,350,000 retail establishments in 1998 (U.S. Census Bureau, 2001, The Statistical Abstract of the United States, Washington, D.C.: U.S. Government Printing Office, Table 712).

[11] This calculation assumes that 135 million workers lose one hour per week, compensated at the average hourly rate of $21.39.

higher interest rates. Higher interest rates would be a serious obstacle to growth, especially in highly indebted countries.

The link between the impact of recession in the wealthy nations and the exports of developing countries is straightforward. Nearly three quarters of the exports of low- and middle-income countries go to rich countries, as opposed to other developing countries.[12] If the United States and other wealthy nations are thrown into a recession as a result of higher oil prices and higher interest rates, then their imports from developing nations will decline.

Higher oil prices will be a shock to developing nations in the same way as they are to rich nations. If oil prices rise to $70 a barrel, as they are projected to in the negative outcome scenario described by Nordhaus, then this will be a serious blow to the vast majority of developing countries, who are net importers of oil.

The largest negative impact on developing nations would probably be the higher interest rates that would result from a prolonged period of uncertainty. While it is likely that interest rates will rise even in the United States, the increase in developing nations will likely be much larger, since investors are likely to turn to more secure assets. A recent study projected that a negative war outcome would lead to an increase of approximately 3.5 percentage points in the spread between the yields on ten-year U.S. treasury bonds and U.S. corporate bonds.[13] It is reasonable to assume that the spread between the yield on foreign debt and U.S. treasury bonds would rise by a comparable amount.

This would lead to a very dangerous situation for many developing nations because they already have very large debt burdens. For example, in Latin America, the interest rate shocks of the 1990s resulted in two sovereign debt defaults: Ecuador in 1999, and Argentina (the largest ever) in 2001. A number of countries, including Brazil, still have large debt burdens that could be vulnerable to further increases in international interest rates. In order to prevent its debt to GDP ratio from becoming explosive, Brazil needs both reasonably low interest rates, and at least moderate growth throughout the course of the next decade.[14] If a war in Iraq results in a sharp run-up in interest rates and a world recession, it could push Brazil to a restructuring of its debt. Given the unwillingness of the international financial institutions to facilitate such restructuring, an Argentine-type default and the accompanying financial meltdown cannot be ruled out.

While Brazil's debt burden is worse than that of most middle income countries, a substantial rise in interest rates will pose a serious problem for the developing world and may push many countries to the brink of default. The region that is likely to be most negatively impacted by such a rise in interest rates is Latin America, since most countries in the region are heavily indebted.

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[12] World Bank, 2002. *Global Economic Prospects and the Developing Countries 2002*. Washington, D.C.: World Bank, Table A3.7.

[13] Meyer, L. "After an Attack on Iraq: The Economic Consequences: Conference Summary," Washington, D.C.: Center for Strategic and International Studies, Chart 5 [http://www.csis.org/features/attackoniraq_summary.pdf].

[14] See Weisbrot, M. and D. Baker, "Paying the Bills In Brazil: Does the I.M.F.'s Math Add Up?" Washington, D.C.: Center for Economic and Policy Research, 2002.

After having endured two decades of almost zero per capita GDP growth, the consequences of a negative war outcome could subject the region to one more decade in which there is little real economic progress.

SECTION 4: THE COSTS OF WAR-RELATED BOYCOTTS OF U.S. GOODS

As recent polls in the wake of the Afghanistan war have shown, the United States has an increasingly negative image in large parts of the developing world.[15] While attitudes towards the United States are most strongly negative in predominantly Muslim countries, surveys have shown that much of the developing world holds a negative view of the United States.[16]

One possible result of a war in Iraq is that its standing will fall even further, with many people developing an active hostility to the United States. This is especially likely if the United States is seen as being the aggressor in the war, or if the war is conducted in a way that leads to many Iraqi deaths or widespread suffering among the Iraqi population. A war could also hurt the United States' standing in the developed world. There is considerable opposition to a U.S. attack on Iraq across Europe. Widespread suffering in Iraq is likely to increase the extent of European opposition to a U.S. attack.

A possible outcome of this hostility is a formal boycott of U.S. made products -- which some groups in countries with large Muslim populations have already been trying to pursue. It is difficult to try to assess the probability that such a boycott will have much success, but in the past, it has generally proven difficult for political activists to build boycotts that had more than symbolic value. It seems unlikely that large numbers of consumers in developing nations will decide not to buy U.S.-made goods, in support of a boycott. Corporations also seem unlikely to openly embrace a boycott, since it could considerably complicate their dealings with shareholders, banks, and other creditors. Similarly, even the governments most hostile to the United States are unlikely to explicitly endorse a boycott out of fear of retaliation.

However, even if the possibilities for a formal boycott may prove limited, there are numerous channels through which hostility to the United States could have a negative impact on U.S. businesses, even if this is not an explicit motivation. The discussion below describes some of these channels.

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[15] See, for example, "What the World Thinks In 2002: How Global Publics View: Their Lives, Their Countries, The World, America," The Pew Research Center for the People and the Press, 2002, [http://people-press.org/reports/display.php3?ReportID=165]. Other surveys have found similar results.

[16] In the aftermath of the September 11th attack , the Chinese government marketed a video that showed the destruction of the World Trade Center towers in a favorable light. The video was apparently quite popular within China ("Beijing Produces Videos Glorifying Terrorist Attacks on 'Arrogant' US," by Damien McElroy; *London Telegraph*, 4-11-01).

Computer Software

Microsoft is the dominant provider of computer operating systems throughout the world. As is widely recognized, the main reason for Microsoft's dominance is not the quality of its Windows operating system, but rather the fact that it is already installed on the vast majority of computers operating throughout the world. This means that nearly everyone who uses a computer is already familiar with the Microsoft system and that virtually all types of accessory software are designed to be compatible with the Microsoft system. If someone were to try to avoid the Microsoft system, then they would incur significant costs, both from having to retrain users on a new system and in producing accessory software that was compatible with an alternative system. In addition, there is the problem of ensuring that material produced on a Microsoft system can be converted to the alternative system, and vice-versa.

While these barriers to alternative operating systems are substantial, there have been efforts to switch to non-Microsoft systems. The most frequently cited alternative is the Gnu-Linux system, which has the advantage of being free. Several governments have sought to make this operating system the basis for the computers used by their employees.[17] It is arguably a reasonable business decision to switch from Microsoft to a free operating system, especially since there seems little restraint on Microsoft's ability to raise its prices in the future. However, if governments had an added motivation resulting from resentment over the war, it is likely that many more would opt for the free Gnu-Linux system rather than the Microsoft system.

Over time, such a trend would pose an enormous threat to Microsoft. As an alternative came to be increasingly adopted, the advantage to Microsoft from its monopoly position would erode. A larger portion of the computer-using population would be familiar with the alternative system, and therefore require no additional training to use it. Furthermore, the volume of software applications designed to operate on the alternative system would rise so that it would be more competitive with Microsoft in the range of usable applications. Eventually, Microsoft could be left trying to sell an operating system in a market in which an equal or better operating system is available at zero cost.

Whether the actions of governments and corporations that are hostile to the United States could push the market in this direction is impossible to determine. But this sort of outcome is possible, even in the absence of an official boycott of U.S.-made goods.

Copyrighted Music and Video Material

A major concern of United States trade negotiators has been the enforcement of copyrights on music and movies in developing nations. This was one of the goals of the Trade Related Aspects of Intellectual Property (TRIPS) provisions that were part of the Uruguay round of the WTO. Under this agreement, developing nations were required to establish U.S. type patent and copyright laws. In principle, this would ensure that the entertainment industry could receive royalty payments on recorded music and video material that is distributed in developing nations.

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[17] For example see, "Europe's Microsoft Alternative," *Washington Post*, November 2, 2002, Page A1.

Increased hostility to the United States could make the enforcement of these copyrights more difficult for two reasons. From the standpoint of the consumer, there may be a greater willingness to buy unauthorized copies of recorded material. The decision to buy an authorized version of a CD or videocassette typically means paying a price that is considerably greater than the price charged for an unauthorized version. Consumers will be more likely to buy the authorized version if they consider the higher price legitimate and if they fear penalties from purchasing the unauthorized version. An environment in which tens, or hundreds, of millions of people throughout the developing world view the United States with hostility may lead many to question the legitimacy of the higher prices charged for authorized copies of recorded material.

At least as important, it may undermine the resolve of governments in developing nations to enforce copyrights. It may be difficult for a government to act as a collection agency for Disney or AOL-Time Warner in a country in which large segments of the population view the United States with anger and disgust. Under such circumstances, a government would be far more likely to turn a blind eye towards the manufacture and distribution of unauthorized versions of material that is copyrighted by U.S. corporations.

Copyrighted material has been an important source of export growth for the United States in recent years. According to the industry trade group, real exports of copyrighted material rose at a rate of 10.8 percent between 1991 and 1997, comprising just under 7.0 percent of total exports by the end of this period.[18] If disregard of the copyrights of U.S. corporations became more widespread as a result of increased hostility toward the United States, it would be a serious loss to the affected industries.

Patented Drugs

The TRIPS agreement also required developing nations to create U.S.-style patent laws for pharmaceuticals. This issue has already become a major source of conflict between the United States and developing nations, since the patent-protected price of many drugs -- most notable the anti-retrovirals used to treat HIV infection and AIDS -- is well beyond the reach of most people in developing countries. In spite of the potentially enormous human costs, the United States has used its power at the WTO and other forums to try to impose strong protections for U.S. drug patents in developing nations.

While the public and governments in many developing nations have resisted these efforts, their resolve may be strengthened if a war in Iraq leads to increased hostility toward the United States. Under the patent rules that the Bush Administration would like to see established, developing nations will incur large costs as a result of buying drugs from brand name manufacturers in the United States, rather than generic producers in India, Brazil, Thailand and

[18] *Copyright Industries in the U.S. Economy -- The 1999 Report*, Washington, D.C.: International Intellectual Property Alliance, Table 9.

elsewhere in the developing world.[19] There will be much less willingness to incur these costs in a climate of general hostility to the United States.

The Airplane Industry

A major item in the business press in the last few years has been the extraordinary success of Airbus, the European Union's consortium, at the expense of Boeing. At present, the two companies appear roughly evenly matched. They compete vigorously for every major sale of commercial aircraft. While Boeing may be able to hold its own under current circumstances, if many of the potential buyers around the world approached the purchase decision with a negative assessment of Boeing as a U.S. company, then it is likely to see its market share reduced through time. In fact, given the economies of scale in the airline industry, if Boeing can only count on getting fair consideration in the U.S. market, its civilian airline division may not be able to maintain the scale of output necessary to remain a viable competitor with Airbus over the long run.

The Fast Food and Retail Industry

Although the number of people in the developing world who opt not to eat at McDonald's or buy coffee from Starbucks because of a war with Iraq may be relatively small, the ability of these chains to grow in the developing world may be seriously hampered by increased hostility to the United States. In the immediate aftermath of the U.S. attack on Afghanistan, angry mobs attacked two KFC franchises in Pakistan.[20] According to the press accounts, the stores were largely destroyed by the mob's actions.

The prospect of this sort of attack -- or other acts of vandalism -- makes it far more risky to establish an outlet of a U.S. chain. The risks become much greater, as would the costs of insurance, if a war against Iraq substantially increased hostility to the United States. This would significantly reduce the amount that people would be willing to pay to buy a franchise in such an environment and reduce the profit potential for a chain if it intended to open its own store. As a result, domestic chains or the chains of other developed nations would enjoy a significant advantage over their U.S.- based competitors. Major U.S. retail chains, such as WalMart, who are also planning to expand their operations overseas, may face similar obstacles.

Public Sector Contractors

In the last two decades governments throughout the world, and especially in the developing world, have sought to privatize many services that had previously been provided by

[19] A set of estimates by the World Bank showed that the TRIPS provisions of the WTO will cost the developing nations included in its sample an average of more than 2.0 percent of GDP. This is discussed in "The Relative Impact of Trade Liberalization," by Mark Weisbrot and Dean Baker, Center for Economic and Policy Research, 2002 [http://www.cepr.net/relative_impact_of_trade_liberal.htm]. See also World Bank, 2002. *Global Economic Prospects and the Developing Countries 2002*. Washington, D.C.: World Bank, Table 5.1.

[20] "Air Strikes on Afghanistan: Muslim Reaction -- Shots Fired as Rampaging Protesters in Pakistan," *The Independent* (London); October 13, 2001, Saturday; A7.

government agencies or government-owned corporations. For example, the provision of electricity, telecommunications, and water has been turned over to private firms in many developing (and developed) countries in the last two decades. In addition, governments will regularly have occasion to offer large construction contracts -- for example for the construction of airports or dams -- which will often be the subject of bids by major multinational corporations.

Several large U.S. corporations have actively solicited this business in developing nations. For example, the Bechtel Corporation and Halliburton have both sought to take over the operation of municipal water facilities in several developing countries. General Electric has built oil or natural gas pipelines in many parts of the world. Prior to its bankruptcy, Enron was involved in the construction of power generation facilities in many developing countries. The list of U.S.-based corporations that either already supply contracted work to foreign governments, or whom are competing to supply such services is a long one.

In the event that there were a substantial increase in hostility toward the United States among people in developing nations, it is likely that the share of these contracts that goes to U.S.-based companies will diminish through time. In most categories of services, U.S. corporations are already facing stiff competition from firms in Europe, Japan, or the middle-income developing nations. Widespread disapproval of the United States' actions in Iraq could lead many officials to opt for a foreign competitor, even if the bid put forward by a U.S. corporation may in principle have been the best. This sort of attitude of hostility could seriously obstruct the efforts of U.S. corporations to be major providers of these services throughout the developing world.

It is also worth noting that the hostility of buyers can interact with a heightened threat of terrorism to make the prospects for U.S. businesses even more troublesome. If U.S. citizens have to be worried about being the targets of terrorist attacks in foreign countries, then sales agents for U.S. corporations will be more reluctant to pursue foreign contracts. This will make it even more difficult for U.S. firms to compete with businesses based in Europe, Japan, and elsewhere.

In short, there are plausible scenarios in which hostility to the United States could negatively impact a wide range of U.S. businesses. If a war with Iraq proves to be a factor that substantially raises an already high level of hostility throughout much of developing world, the sales and profits of many U.S. corporations might suffer.

It is difficult to quantify the increase in hostility that can be reasonably predicted from a war with Iraq, if any. It is also difficult to provide a basis for predicting the economic effects of any increase in hostility. But it is reasonable to believe that these costs could be substantial.

CONCLUSION

This paper has examined the potential costs associated with a negative outcome of a war with Iraq. This scenario is one that involves a prolonged occupation that encounters continuing resistance, an insurrection in one or more of the major oil producing countries in the region, and/or an enlarged and sustained terrorist assault on the United States. While such a scenario is presumably not the most likely outcome of a war with Iraq, the possibility of a such a negative outcome cannot be dismissed. A recent conference at the Center for Strategic and International Studies put the probability of a seriously negative outcome to an Iraq war at 5-10 percent.[21]

The first part of the paper examined the implied job losses that would be associated with the GDP loss projected by William Nordhaus in his assessment of a negative outcome to a war. Nordhaus had projected that a negative war outcome would lead to a recession, which would lower GDP by approximately 2.4 percent for the next two years. Using conventional estimates of the relationship between GDP and employment, this projection implies a loss of 1.6 million jobs. Nordhaus projected that higher than trend oil prices would lower potential GDP by approximately 0.5 percent over the following seven years. This implies 300,000 fewer jobs in the years from 2005 to 2011.

The next section explored some of the economic costs that the United States could incur if it must cope with a heightened terrorist threat, comparable to that currently faced by Israel. This discussion is necessarily speculative, since the exact nature of such a threat cannot be predicted in advance. Nonetheless, the experience of Israel suggests that the economic costs -- apart from the costs in lives and increased insecurity -- would be substantial. For example, if retail establishments felt the need to maintain armed security guards at their entrances in order to ensure their customers' security, as is currently the case in Israel, the cost would be more than $100 billion a year. Similarly, the need for increased inspections could impose substantial costs in the form of the additional time required to travel, shop, or engage in other activities. The Congressional Budget Office has estimated that growth will be 0.1 percentage point lower each year as a result of the additional security measures already being implemented. This implies that after ten years, GDP will be 1.0 percent lower, and there will be 670,000 fewer jobs, than if the country had not taken these additional security measures. If a heightened terrorist threat requires a further increase in security measures, then the economic impact will be larger.

The third section discussed the impact of a negative war outcome on developing countries. In this scenario, developing nations will suffer for three reasons. First, if there is a recession in the developed world, the developing countries will see a drop in their exports, most of which go to rich countries. Second, most developing countries are net importers of oil. If there is a spike in the price of oil, it will impose substantial costs on their economies. Third, it is likely that the uncertainty that would exist in a negative war scenario will lead to a sharp rise in the interest rates paid by developing nations. This is likely to take an exceptionally harsh toll on the countries of Latin America, due to their heavy debt burdens. If it pushes Brazil and/or other countries into an Argentina type melt-down, it could lead to the third consecutive decade in which Latin American countries have achieved little or no per capita GDP growth.

[21] Meyer, L. "After an Attack on Iraq: The Economic Consequences: Conference Summary," Washington, D.C.: Center for Strategic and International Studies, 2002, page 7.

The fourth section examined some of the ways in which an increase in hostility to the United States could lead to substantial economic consequences for various industries. This discussion is also speculative, since the ways in which such hostility manifests itself is difficult to predict. One simple way in which hostility can effect business prospects is by making the environment more dangerous for U.S. businesses. For example, the fact that mobs in Pakistan burned down two KFC franchises after the U.S. began its war in Afghanistan, substantially reduced the prospects for U.S. retail outlets in the country. Similarly, hostility directed towards the United States could lead to formal or informal boycotts of U.S. products in the Muslim world, and possibly the developing world as a whole. For example, this could mean decisions to choose open source operating systems over Microsoft, Airbus planes over Boeing planes, and European construction contractors rather than U.S. contractors. It may also reduce the willingness of developing countries to respect U.S. copyrights on movies and music or patents on medicine. In short, if the United States incurs enough hostility from the developing world, there could be substantial economic costs.

The size of the costs that the United States may incur in a negative outcome from an Iraq war -- like the probability of a negative outcome -- are difficult to gauge accurately. Nonetheless, it is important that policy makers and the public be aware of these possibilities. As Nordhaus noted, there has been a tendency to seriously underestimate the costs of war in the past. The planning that led to the Vietnam War provides the most glaring example of such an underestimation. It is important that some consideration be given the possibility that a war against Iraq may not turn out well -- and the costs that such an outcome would imply.