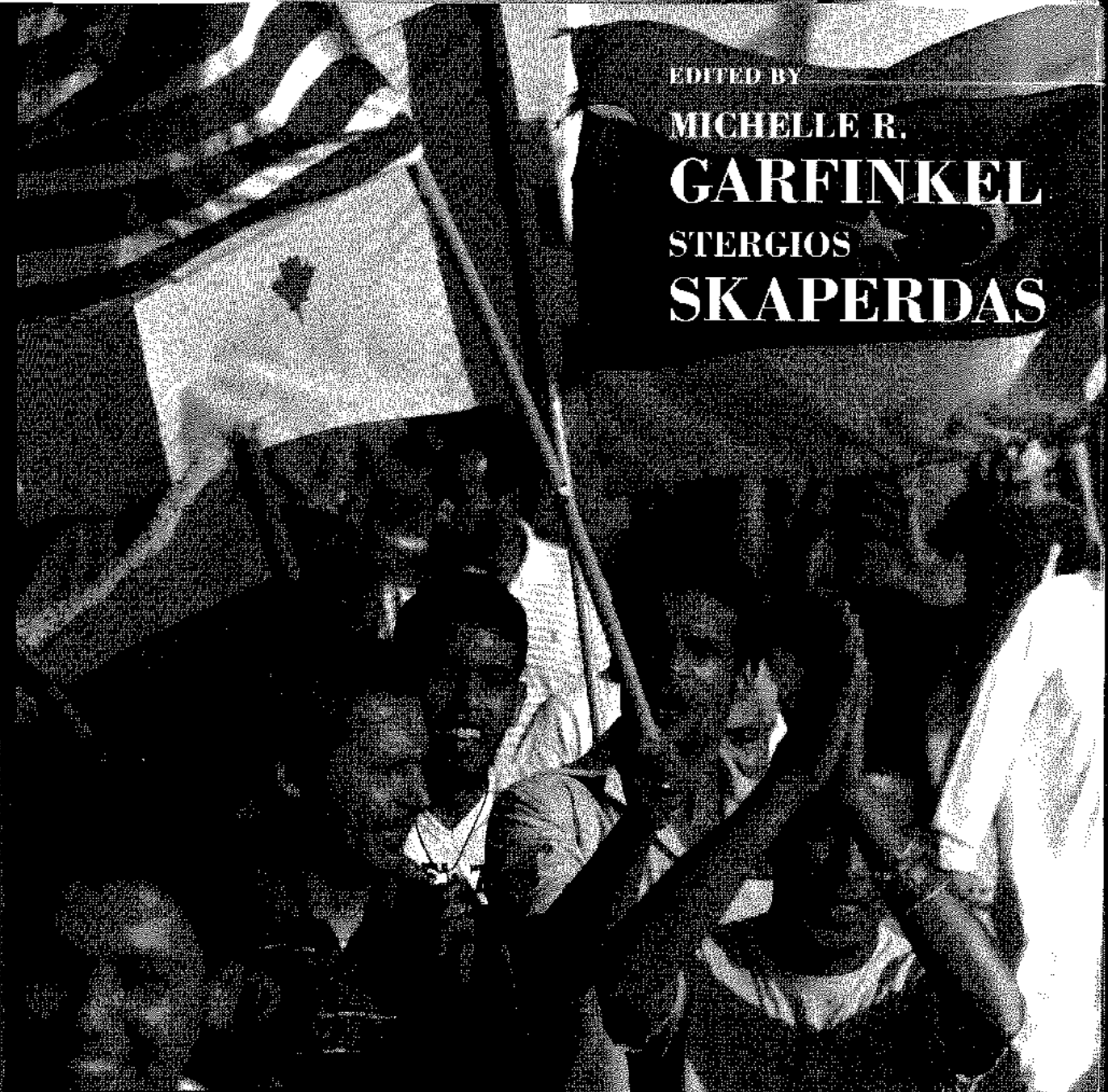


Garfinkel
Skaperdas

EDITED BY
MICHELLE R.
GARFINKEL
STERGIOS
SKAPERDAS



The Oxford Handbook of
**THE ECONOMICS OF
PEACE AND CONFLICT**

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OXFORD

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THE OXFORD HANDBOOK OF

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Dedicated to my parents, Harmon and Lorrie Garfinkel,
and to my husband, Randy German.

M.R.G

Dedicated to Marina, Eleni, and Arsenios.
S. S.

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CHAPTER 13

ESTIMATING THE
COSTS OF WAR:
METHODOLOGICAL
ISSUES, WITH
APPLICATIONS TO
IRAQ AND
AFGHANISTAN

JOSEPH E. STIGLITZ
AND
LINDA J. BILMES

1. INTRODUCTION

GOVERNMENTS spend large amounts of money in fighting wars, but until recently, these expenditures have not been subject to rigorous analysis. The reason is obvious: during a war, the priority is to win. No one wants to second-guess the generals on how much money should be spent. After a war, the issue of whether the money was well spent is of interest to historians; public attention is focused on more pressing issues, including dealing with the aftermath of the war.

The Iraq and Afghanistan wars, however, are different. Unlike most wars, they were wars of choice. Iraq did not attack the United States. The U.S. invasion of Iraq was part of a new policy termed “preemptive” war. The initial U.S. airstrikes in

Afghanistan were launched to eradicate Al-Qaeda strongholds after the bombings of September 11, 2001. But subsequently the United States made a decision to topple the Taliban government and to mount a full-scale war in Afghanistan that has continued for nearly a decade. In both Iraq and Afghanistan, the advocates of war have maintained that military actions are necessary to ensure U.S. security. However, the United States has been able to determine, to a large extent, the tempo of the wars, the scale of U.S. military intervention, the number of troops deployed, and the amount of funding devoted to these endeavors.

These wars have also been long wars—arguably the longest wars that the United States has ever fought.¹ After a year or two, it was clear that the conflicts would be continuing for an extended period of time—long enough for an analysis of the benefits and costs.

In addition, the Iraq and Afghanistan conflicts have been unpopular,² and have been accompanied by widespread unease with the way the wars have been handled. Many serving in the armed forces, for example, have objected to the length and frequency of deployments, the “stop-loss” policies,³ the heavy reliance on contractors, the decisions to withhold funding for body armor and mine-resistant transport vehicles, the lack of access to medical care and delays in approving disability compensation for veterans, as well as many other aspects of the war. Accordingly, it has not been considered unpatriotic to question how the wars have been conducted.

Perhaps more than in other wars, economics has been central. Some have argued that the invasion of Iraq was motivated largely by a desire to control the supply of oil. The Iraq War was unusual in other ways: it was the first war totally financed by borrowing, and it was the first war that relied so heavily on private contractors even to perform core security functions. Even more than in the Vietnam War, the administration seemed to claim the country could have guns and butter. But this time it was clear that our generation’s guns and butter would be at the expense of future generations’ butter.

We were among a group of researchers who undertook estimates of the cost of these wars.⁴ As we proceeded with our research, we uncovered a large number of analytic issues. In writing our book, *The Three Trillion Dollar War: The True Cost of the Iraq Conflict* (Bilmes and Stiglitz, 2008), we addressed some of these directly, but there were many others which, given the limitations of time, we could not cover. This chapter summarizes the key analytic issues, explains how we addressed them, and suggests how, with further research, better results can be obtained.

2. BENEFITS

Quantification of the benefits of war is difficult. How does one ascertain the value of increased security, or even ascertain the extent to which security is increased? The wars in Iraq and Afghanistan are, in part, directed against complex organizations that locate in nation-states, rather than purely against the nation-states

themselves. Consequently, two issues assumed paramount importance in these conflicts.

1. Securing territory may not necessarily result in greater security. There is a difference between diverting versus destroying a threat. The Obama administration, in its decision to extend the conflict in Afghanistan, focused on the importance of denying Al-Qaeda a safe haven from which to train and fight. George W. Bush argued for the initial invasion of Afghanistan and the war in Iraq on similar grounds.

Preventing a particular piece of territory from being used for such purposes only enhances security if there are no other pieces of territory from which such hostile actions can be undertaken. Al-Qaeda has been called a “protean” enemy (Stern 2003). It has cells in many countries and it has the ability to move its base of operations into Pakistan, Yemen, Somalia, or reconstitute itself in any of a host of failed states around the globe.⁵ It would not be sustainable—in human resources or funding—for the United States to pursue a strategy of chasing terrorists from place to place indefinitely. This simply emphasizes that one needs to take a global perspective in assessing impacts on security.

2. Endogeneity of forces in opposition. A traditional war calculus involves counting how many of the enemies’ troops one has killed or injured sufficiently that they are removed from the battlefield (or how many tanks and other materiel one has destroyed). The classical enemy has a fixed capacity, so it is reasonable to think that if we destroy 30% of his capacity, his strength diminishes relative to our strength. But these more recent conflicts are of an entirely different nature. Most of the “enemy” is not conscripts, but volunteers. The way the war is waged may affect the supply of such volunteers as well as the material support given to the opposition by the host population.

In such conflicts, ensuring economic stability, including employment opportunities for those who fight in the conflict, may be critical in bringing the war to a resolution. For example, during Malaysia’s 12-year battle against a fierce insurgency, the government succeeded only after it adopted a strategy of economic security and development known as “KESBAN.”⁶ The focus on strengthening governance, training the military, providing employment in rural areas (where insurgent recruits were drawn from), and providing social services eventually choked the insurgency and led to sustained economic growth. This has been a major issue in Iraq, where millions of men, mostly Sunnis, have been left without a livelihood following the 2003 invasion and the decision by L. Paul Bremer, the U.S. administrator of Iraq, to outlaw the Baath Party and dissolve Iraq’s 500,000-member military.⁷

Whenever one country invades and occupies another, the occupier risks uniting the enemy population in the name of patriotism—even if the government that has been removed is widely disliked. Under such circumstances, winning the hearts and minds of the local population is both more important and more difficult.

The two main strategies that are deployed can be thought of as the "carrot" and the "stick." The carrot in this case is to persuade the populace that life would be genuinely better under the new regime supported by the invading power. The stick approach is to persuade the populace that, in any case, the invader and his allies will win, and therefore it is rational and in their best interest for the populace to cast their lot with the invader—in other words, to make the population fear the consequences of opposing the invader.

The other side faces, of course, a similar set of choices. Part of the strategic debate on both sides is the mix of the two. But the invader is in a disadvantageous position, particularly if it undertakes the latter strategy (see, e.g., Kaldor 2006).

First, governments (state actors) usually have an institutionalized system of accountability (whereas insurgents do not). For instance, state actors may have signed conventions regarding the treatment of prisoners. (Even if the military do not fully comply, there are citizens within the country that demand compliance and there may be consequences if they do not.) Second, those defending their own country may feel morally justified in taking extreme actions against those that aid and abet the enemy. And third, those within the country that has been invaded are closer to the scene and may have a wider range of mechanisms for retribution, including social sanctions.

Finally, the "fear" strategy may be counterproductive. The U.S.-led operations in Afghanistan and Iraq have involved a great deal of "collateral damage," including widely publicized deaths of civilians and a number of scandals, such as the abuse of prisoners at Abu Ghraib prison.⁸ Informational disadvantages may make the occurrence of collateral damage more likely. The "enemy" may deliberately try to increase the collateral damage, knowing that in doing so support for the invader will be undermined. As a result, these policies often have just the opposite effect from that intended. At certain phases of the U.S. operations in Iraq, killing or imprisoning one Iraqi insurgent has probably led to an increase in the size of the opposition. Our policies have even been an essential part of the recruitment strategy of the opposition.

One of the main objectives of the U.S. counterinsurgency strategy was to change this equation. In 2006, at the peak of sectarian violence between Sunnis and Shiites, the U.S. military implemented a policy to weaken the hold of the opposition by recruiting and paying for individuals who joined pro-U.S. "awakening councils." According to *The New York Times*, the United States paid roughly \$300 a month to members of the Sunni Awakening movement "to guard checkpoints and buildings and—for those who used to be insurgents—to no longer blow up American convoys and shoot American troops."⁹ This element of the new strategy was widely credited with shifting the balance of power away from the insurgency.

In the balance-of-fear calculation, if residents believe that in the long run the "invaders" will leave, then it is harder to dissuade them from supporting the insurgents. The insurgents know this, and they also understand the political dilemma that this presents in Western democracies. In the face of strong opposition to escalation

the Afghanistan War among his strongest electoral base, President Obama had little choice but to describe the increased troop support in Afghanistan as a "temporary" measure.¹⁰ However, in doing so, he provided ammunition to those in Afghanistan who doubt whether the United States is a dependable ally. The Taliban has the option to wait us out.¹¹

While the "fear" strategy for the invader is unlikely to succeed, the alternative carrot strategy of "winning the hearts and minds" is also beset with problems. Military organizations are not designed for that purpose. And it may be hard, if not impossible, for the military to restore trust among the people if the reputation of the invader has already been damaged by previous events and tactics. When the military seeks to build closer relations with the populace, local people may be wary. Even as the military focuses on restoring basic necessities, such as jobs, water, and electricity, it may be difficult, if not impossible, to establish a sufficient environment of security and normalcy. The U.S. government has invested some \$55 billion in Iraqi reconstruction, and since 2007 the military has pursued a "counterinsurgency" strategy that has focused on providing support to the population. However, the underlying sectarian conflicts have made it difficult to establish a stable economic and civic base.

The situation in Iraq (discussed later in this chapter) demonstrates this problem: the country suffered from a mass exodus of its middle-class professionals, and now, years later, only a tiny fraction of them have decided to return to Iraq.¹²

The complexity of wars and conflicts make it difficult, if not impossible, to quantify benefits. How is one to assess the benefit of driving the enemy out of country A if it has become well-established in country B during the military action in country A? Or if the groundwork for setting up in country B has been aided by local opposition to U.S. activities in country A? How is one to capture the benefit of a regime that, while more favorable to the United States than its predecessor, is also more closely allied with regimes that are less favorable to the United States? The timeframe also influences the assessment of benefits. What may seem beneficial at first may prove to be costly in the longer term, for example, if the United States becomes entangled in a second conflict with a nation that developed animosity toward us during the initial conflict.¹³

3. ESTIMATING THE COSTS OF CONFLICT

The heart of the discussion on benefits is the value of additional security obtained by the war. This is a subject on which reasonable people may disagree, since it requires assumptions (typically unverifiable) about what would have happened in the absence of the conflict. Estimating the cost of the war is easier, although several elements in the cost calculation are highly problematic. There is no doubt that wars are costly in terms of human and material resources. The questions are analytical: firstly, estimating the full magnitude

of those resources used and secondly, assigning a value to them. Each presents particular difficulties.

The taxonomy of costs centers on (i) resources spent to date, (ii) resources expected to be spent in the future, (iii) budgetary costs to the government, and (iv) costs borne by the rest of the economy. The latter costs are referred to as the *economic*, as opposed to the *budgetary* costs of the conflict. In terms of the economic costs, there are microeconomic costs—costs borne by particular individuals or firms—and macroeconomic costs—impacts on the total economy over and above the sum of the micro costs. In each step we have to assess quantities of resources used and “valuations” of these resources.

What makes the exercise especially challenging is that government accounting systems do not document most items in a way that enables an easy assessment of the resources directly used, or the full budgetary impact. Such problems arise frequently in accounting exercises, as we explain later, but in the case of war accounting, there is a further problem of transparency. Governments often want to hide the true costs of war from their electorate, especially when the war is unpopular.¹⁴ But the accounting distortions are not all one-sided. Sometimes the defense establishment has an incentive to use war funding to conceal spending for nonwar items in order to obtain extra money for pet projects (in the belief, usually correct, that it is hard for Congress to turn down a request for war funding and to sort out exactly where military appropriations are spent).¹⁵

The overall economic costs are typically much larger than the budgetary costs, but there are instances where this is not the case. An example is where payments from the government to the private sector exceed the value of the resources procured. In economic parlance, these may be called “transfer payments;”¹⁶ in ordinary language, this is called war profiteering. There is evidence of widespread war profiteering during the Iraq years. A number of impartial organizations have documented cases ranging from the payment of exorbitant sums for simple tasks such as painting walls and repairing trucks to gross overpayments to contractors such as Halliburton and Blackwater. There have also been numerous cases of outright fraud where the U.S. government has been found to have paid contractors for services that were never provided at all.¹⁷

Though such problems arise in all government procurement, there are normally safeguards in place that limit its scale. During the Iraq War, many of these safeguards were suspended or relaxed. The sheer size of the U.S. military operations in Iraq and Afghanistan (the biggest wartime mobilization since the all-volunteer force was created in 1973) placed a strain on the enlisted force, leading to an unprecedented reliance on paid private contractors. Contractors have been employed to provide many functions that are typically considered inherently governmental, such as prisoner interrogations and the widespread use of armed security guards. Controversy over the latter peaked in Iraq when private security guards killed or wounded 34 Iraqi civilians in 2007 at Nisur Square in Baghdad.¹⁸

The use of contractors has been costly in many respects. Numerous studies have identified human and budgetary costs. For instance, during the 18-month period from fiscal year 2007 through the first half of 2008, the United States spent \$34 billion on almost 57,000 contingency contracts for construction, capacity building, security, and a range of support services for U.S. forces in Iraq and Afghanistan.¹⁹ There were on the order of 200,000 contractor personnel working on these activities, and during this period there were at least 455 contractors killed and 15,787 injured.²⁰ The heavy reliance on contractors had other negative consequences. In previous wars, military commanders were able to relieve the heavy strain of conflict for their troops by temporarily assigning them to lighter support tasks (such as kitchen duty—the traditional “peeling potatoes”—or deliveries, construction, vehicle repairs, or custodial duties). This flexibility provided commanders with a tool to help soldiers dealing with stress or who had experienced unusually heavy combat for a long period. But in the Iraq and Afghanistan conflicts, virtually all of these support tasks are carried out by private contractors. This arguably has led to the relentless tempo of the wars, and may have contributed to the epidemic of posttraumatic stress disorder (PTSD) that has been observed among returning veterans.

According to the Government Accountability Office (GAO), the U.S. agencies that are managing these contracts (the Departments of Defense and State and the U.S. Agency for International Development [USAID]) do not have full or reliable data on these contracts. U.S. agencies have also relied on secondary contractors to track and monitor the primary contracts; for example, contractors provide quality assurance for the construction projects in Iraq and Afghanistan that are awarded to other contractors by the U. S. Air Force. However, the U.S. agencies have also lacked information about the secondary contractors who are supposed to be providing oversight (Government Accountability Office 2008, 2010 TK, 2011a, 2011b).

The reports of the Special Inspector General for Iraqi Reconstruction, the Wartime Contracting Commission, and auditors and inspectors general for the Defense Department, State Department, and other U.S. contracting authorities have revealed widespread systemic problems in the way that contracts have been drawn up, awarded, implemented, monitored, paid, and audited. A number of factors have contributed to these problems, including increased reliance on non-competitive bidding, weak internal controls and contractor business systems, weak systems for controlling costs, poor or incompetent oversight, poor communications and knowledge of operating procedures in unfamiliar business markets, security issues, and outright negligence—all of which have led to rampant abuses and the waste of billions of taxpayer dollars.²¹ The United States was also unable to oversee \$1 billion in funds that it was supposed to be holding in an Iraq Development Fund being held for the benefit of Iraqis. These funds (primarily derived from oil revenues) were audited by the Special Inspector General for Iraq Reconstruction (SIGIR), who found lax control systems for \$8.7 billion of the money, and \$2.6 billion could not be accounted for at all (Office of the Special Inspector General for Iraq Reconstruction 2010).

3.1 Accounting

Accurate accounting is important because it provides information on the use of resources that is essential for good governance. Such information is particularly important when there are agency problems, that is, one individual is acting on behalf of another. Whenever there is delegation of authority, there is the possibility that the agent pursues his own interest at the expense of the principal on whose behalf he is supposed to be working. The only way that such risks can be mitigated is through "transparency," so the principal knows what the agent is doing.

This agency problem is especially acute in the public sector—where government officials are supposed to act on behalf of the "public interest." It is easy for them to act in their own interests, or in the interests of particular groups, or simply to make bad decisions that end up wasting taxpayers' money. Transparency—clear, accurate financial information that is made available in a usable and timely format—is an essential part of democratic governance and accountability.

Once a government embarks on a war, it has a myriad of decisions to make. Not the least of these is the decision about when to exit. An accurate assessment of the full costs of the war is an essential ingredient in making good decisions. The budgeting and accounting systems should be able to accurately track what has been spent as well as anticipate the order of magnitude of future costs. For example, if 50,000 troops have already been wounded, it is feasible to estimate the approximate minimum future liability that the government will incur to provide these veterans with medical care and disability compensation (if a business incurs a liability to pay for injuries to some of its employees, these costs appear in its financial statements as a deferred liability; at a minimum, the notes to the balance sheet would indicate this situation, or a provision for a reserve would be set aside).²² For an ongoing war, an accurate accounting of costs incurred is important information in assessing likely costs going forward.

Financial and accounting information also affects decisions concerning the conduct of conflict. While lip service is always paid to the fact that life is priceless, in reality the military makes trade-offs. This point was made all too poignantly clear by Secretary of Defense Donald Rumsfeld's famous response to a soldier's question in Kuwait in 2004. When asked why there was insufficient material to fortify the army's vehicles, the Pentagon chief famously replied: "You go to war with the armor you have, not the armor you might want or wish to have at a later time."²³

The real point of Rumsfeld's answer was that a decision had been made: The administration had decided that the expected benefits of an immediate invasion outweighed the cost in lives and injuries that would result from lack of sufficient armor. Few believed it was impossible for the military to equip the troops fully given sufficient time and resources; after all, many parents were buying body armor on the Internet for their children in uniform. Similarly, the Pentagon decided not to purchase mine-resistant ambush-protected (MRAP) vehicles that would have saved many lives, but cost \$1 million apiece.²⁴

In the private sector, firms need accurate and comprehensive financial and cost accounting systems to make good decisions. This is also true in the public sector. Military decisions are affected by costs (even though the military faces only a part of the costs), and other government agencies bear some of the budgetary costs, while other parts of society bear some of the economic costs. But from the sole perspective of military accounting, the cost of a life is equal to \$500,000, which includes \$400,000 in life insurance and \$100,000 in "death gratuity" payments. This number does not reflect the fully loaded cost to the military of recruiting and training an individual to replace the one who is lost, and the impact on morale and mental health on the rest of the unit, which may result in higher medical costs. From an economic standpoint, the actual loss to the economy, not to mention the human loss, is closer to \$7 million, which is close to the "value of statistical life" used by civilian government agencies. However, this figure does not appear anywhere in the reckoning of war costs.

The best-run government organizations use cost accounting to estimate the direct and indirect costs of their activities. They also use accrual-based accounting to try to take future costs into account. The focus on current-year cash budgeting leads to costly mistakes. For example, the decisions early in the war not to buy more protective armor for troops and not to purchase mine-resistant vehicles certainly saved money on a cash basis. But these decisions predictably led to much higher death and injury rates. So, too, the decision not to fund the Department of Veterans Affairs adequately in 2005, 2006, and 2007 reduced current budgetary expenditures, but at the expense of increasing the long-term budgetary and economic costs of providing care to returning veterans. These and similar decisions were shaped by an accounting system that does not provide for the full long-term budgetary costs of current policies and by a budgetary system that does not estimate costs to the economy.

Many of the problems that we discuss in this chapter are well known and longstanding; for instance, most of the government still uses cash accounting, while all large firms are required by law to employ accrual accounting—and the Pentagon is widely known to have one of the worst accounting systems in government.²⁵ But these accounting problems have become increasingly significant in modern conflicts. Thanks to modern military medicine, the survival rate on the battlefield is much higher, however, the costs of caring for troops with disabilities goes on for decades after the conflict is over.²⁶ We conservatively estimated in 2008 that these budgetary costs for the Iraq War would exceed \$500 billion, a sum equal to the amounts estimated at that point for the operational costs of the conflict. Based on the actual rates of medical claims by returning veterans, in September 2010 we revised our estimate of these costs upward to between \$600 to \$934 billion. Yet our government accounting systems fail to track or recognize these future liabilities.

In this chapter we focus on the "problematic" areas of the cost calculation, areas where further research is required for the development of improved methodologies for estimating costs.

3.2 Budgetary costs

Estimating the budgetary impact of war involves three key issues: (i) expenditures incurred to date, (ii) projected expenditures, and (iii) the treatment of interest. One might have thought that the first was a straightforward matter—to determine what the expenditures on the conflict have been to date. But matters are never so simple. We can ascertain what the government *claims* to have spent on the conflict, but for a variety of reasons this may be either greater or less than the amounts actually spent. Typically, as we have noted, governments have an incentive to try to portray the conflict to the public as being less expensive than it really is, so the normal presumption is that these numbers underestimate total expenditures.

3.2.1 Projecting future costs

One of the key problems in estimating the future cost of war while it is still in progress is that there is always considerable uncertainty over the outcome of future military operations and political decisions. The administration typically has a bias toward underestimating these expenditures, hoping that the war will be short, while the military is often biased toward demanding as many resources as possible to ensure success. This was true in Vietnam, and it has been true in Iraq and Afghanistan.

In such circumstances the wisest course for the analyst is to recognize the uncertainty and to conduct the analysis based on alternative scenarios, such as a rapid victory, a protracted struggle, and some middle course. These scenarios can be probability weighted to give an expected outcome.

When the war is over, the costs continue. Much of the following discussion focuses on the continuing costs of caring for disabled veterans. But there are also costs of maintaining peace and stability in the aftermath of the conflict. America still has a presence in Japan, Korea, and Germany decades after the end of those conflicts.²⁷

This chapter assumes that the analyst can collect or produce sufficient data to make reasonable projections of the resources required to conduct the war. We focus on the problems associated with calculating the budgetary impact of the conflict.

4. ESTIMATING BUDGETARY COSTS

There are seven major categories of difficulties:

- allocating joint costs;
- ascertaining incremental costs: the counterfactual;
- hidden conflict expenditures;
- projecting future costs;
- impacts on nondefense budgets;

- timing—delayed expenditures; and
- cash versus accrual accounting.

4.1 Allocating joint costs: overview

Allocating joint costs, especially shared indirect costs, is a standard problem in accounting. The problem of allocating joint costs arises because some war expenditures are interlinked and shared with nonwar expenditures. The secretary of defense must still be paid whether there is a war or not. There is, in this sense, no incremental cost. But the conflict absorbs a large fraction of his or her time, and it would be wrong not to include the value of the time he and others at “headquarters” spend on managing the conflict. There is an opportunity cost, even if there is no obvious incremental budgetary cost.

There is also a wide range of significant costs that are shared but not allocated to individual conflicts, for example, the costs of recruiting (which increase if a war is unpopular), the costs of providing medical care to active duty troops (which increase if the number, length, and intensity of deployments is high), the costs of depreciation of equipment that is used across different theatres (e.g., aircraft carriers), and the costs of specialized training. Typically none of these indirect costs is attributable to a specific war. If the military had better accounting procedures, it would allocate at least some fraction of personnel and other expenditures attributable to specific conflicts.

While there are inherent problems in allocating “joint costs,” there are also many instances in which the direct costs that are paid from outside the military and veterans budgets should be attributed to the conflict. This would include, for example, the Social Security disability compensation that is paid to disabled veterans from the war who can no longer work. It is important in war accounting, in particular, to include a comprehensive accounting of all the “direct” as well as the indirect conflict expenditures (e.g., not just personnel in the war theater, but those providing logistical and other support wherever they are located).

4.1.1 An example

The problems of “cost allocation” are pervasive, and are nicely illustrated by the following example. Consider the case of a soldier who has done three tours of duty, two in Iraq and one in Afghanistan, and has spent half his time in rotation back in the United States. Six months after discharge he manifests severe symptoms of PTSD, and is rated as severely disabled. As a result, he will receive disability payments and health benefits for the rest of his life. How much of those costs should be attributed to the Afghanistan War? It would be wrong to “allocate” to the wars just 50% of the costs, because the cumulative effect of the wars led to the psychological condition. On the other hand, it would also be wrong to allocate all of the costs to the last tour of duty (in Afghanistan). Had he not served two previous tours of duty in Iraq,

he might have been able to get through his tour of duty in Afghanistan without psychological damage.

Or consider a soldier who was injured in Iraq, recovers, and is returned to the battlefield, only to be injured again in Afghanistan. Again, the cumulative effects may be far greater than the "single" effects. The cost of caring for a patient with two injuries may be more than twice that associated with caring for one because of adverse interaction effects.

4.2 Incremental costs

In principle, the costs of the Afghanistan conflict should be the incremental costs, but in practice we allocate costs in proportion to time spent in each conflict. As the war drags on, if the size of the standing armed forces is not increased, the distortion resulting from this methodology becomes increasingly large. A better system of cost accounting would make note of the high costs of increasing the size of the standing armed forces; this information would help lead to a better decision about whether or not the size of the armed forces should be increased.

For instance, medical studies have shown a strong correlation between the number of firefights a soldier is exposed to and his or her likelihood of developing PTSD (see Seal et al. 2009). We could estimate, with the current size of the standing armed forces, the fraction of troops that would have to serve a second, third, fourth or fifth tour of duty and the average time between deployments for alternative war scenarios. On the basis of past data, we can predict the disability rates associated with each successive deployment, and on that basis we can estimate the total incidence of disability and costs. We could then redo the calculations under the assumption that the size of the armed forces was increased. This would allow us to estimate the expected cost associated with disability of increasing the size of the armed forces.

Some critics of an early draft of our study on the costs of the Iraq War pointed out that the costs associated with injuries were overstated because young men would have experienced high injury (or even death) rates even if they were not in military service. They argued that we should limit ourselves to the incremental costs. This argument may be correct in estimating economic cost, but for a budgetary estimate, the government bears the costs of such injuries whether or not they might have been sustained in civilian life. It is certainly important to know the incremental impact of conflict on injury, death, and disease rates. To ascertain this, we analyzed death rates among peacetime military (in a period before the war) and compared them with the numbers emerging in the Iraq conflict.²⁸

This is a subject that requires further study. For example, we need to account for "selection bias." As the military has expanded, there has been a change in demographics. The demographics of the military are different from that of the population as a whole, which is why we cannot simply compare, for example, morbidity and mortality using statistics for the population as a whole (age and sex corrected).

4.3 Opportunity costs

Any cost calculation must take into account opportunity costs, even when there are not incremental cash expenditures. There is always an opportunity cost to having the military engaged in a specific conflict. For example, the opportunity cost of using the National Guard to fight in Iraq was evident in the aftermath of Hurricane Katrina in New Orleans in 2005, during which nearly 2000 residents died and which caused \$80 billion in property damage. At the time, 7000 National Guardsmen from Louisiana and neighboring Mississippi, and much of their equipment, were stationed in Iraq. Although these positions were backfilled, many of the most experienced and skilled National Guard personnel were not at home to deal with this homeland emergency.

4.4 Future costs

Part of the difficulty in assessing long-term health (and disability) costs is that some of these costs manifest themselves only with delay, and there may be controversy over whether they are directly related to war service. For example, the problems associated with Agent Orange in Vietnam and Gulf War Syndrome show that such costs may take decades to be recognized and to be directly attributed to the conflict. In July 2010 Congress appropriated \$13 billion in benefits for veterans of the Vietnam era who had been exposed to Agent Orange nearly 50 years earlier.²⁹ Again, the question relates both to incremental economic costs as well as to budgetary costs.

"Delayed" expenditures are often a reflection of a long-standing deficiency in government accounting. Most firms (larger than a corner grocery store) use accrual accounting rather than cash accounting. One wants to know the costs incurred this year in connection with production this year. But there are a variety of ways in which costs incurred this year may not lead to spending this year. Most businesses have retirement benefits, and the expected present discounted value of the increase in retirement benefits is an accrued cost; if the firm actually sets aside money (pays it out into a retirement account), then, of course, there is a cash outflow. If not, there is an accrued obligation. In the case of the military, the gap between current and accrual costs is large and growing, for several reasons. It is not a trivial exercise to convert the government's accounting to an accrual and cost basis. Part of the difficulty lies in valuing government assets. Even so, some 20 years after enactment of the Chief Financial Officers Act, the Pentagon has made the least progress of any government department in this area.

4.5 How wars can increase nonwar expenditures

Another complexity is that the war can increase the cost of nonwar acquisitions. For example, the U.S. Army and Army Reserves faced difficulty in recruiting new soldiers during the worst years of the Iraq War because the war was unpopular and was perceived to be going badly.³⁰ In response, the army raised compensation

and enlistment bonuses and lowered the standards for fitness and education for new soldiers. These additional costs were borne by the entire military, even for personnel not serving in conflict zones.

The fact that the military had to pay more to recruit troops is clear,³¹ but there is a further difficulty in estimating the extent to which those costs are due to the conflict itself. There may be other factors contributing to those increased costs. Even in the absence of the war, costs may have increased. This is another instance of the well-known problem of the counterfactual—what the world would have been like but for the war.

The United States now faces a recession, with high levels of unemployment. This may enable the military to reduce its costs of recruitment—perhaps even below the level that prevailed before the war. But it would be wrong to conclude that the conflict has not imposed a cost. Given the recession, the costs of recruitment would have been even lower had there not been a war. Multivariate regression techniques can be used to estimate the supplemental cost of recruitment; these are likely to be related not only to the war itself and its popularity, but also to the manner in which it is conducted, including the risk of disability and death, the risk of multiple deployments, and the risk of being forced to stay in beyond the standard length tours of duty.

4.6 Impacts of wars on other conflict expenditures

A fourth complexity that played a role in the cost calculations for the Iraq War was an estimate of the expenditures that are saved by fighting a conflict. In the case of Iraq, the United States and its allies maintained active no-fly zones over northern and southern Iraq from 1991 until the date of the invasion in 2003. Once the war began, this was no longer needed. In our estimate of the cost of the war, we subtracted these costs.³² However, we were unable to tabulate the full impact on the military forces—for example, the no-fly operations were conducted primarily by the air force and the navy, whereas the army and marines have been the main actors in the Iraq War.

4.7 Incremental budgetary costs outside of defense

One of the reasons that a full budgetary accounting is so difficult is that a conflict imposes innumerable costs on other aspects of the budget. One of these—perhaps the largest amount—is interest costs when a war is financed by debt, as was the case for the Iraq conflict. Our research also identified that a significant chunk of war costs is paid by agencies that do not fall directly in the military budget. Many of these are for services provided to returning veterans—such as job training for returning veterans provided by the Department of Labor, housing benefits paid for in part by the Department of Housing and Urban Development, veteran's assistance at the state and local level, and education and training benefits. The largest were additional costs

imposed on the Social Security Administration for providing disability insurance and the Department of Health and Human Services for additional costs to Medicare, welfare benefits, etc.³³ Another example is that the Department of Labor pays for much of the cost of providing death and disability insurance for military contractors.

In each of these cases there is the difficult task of assessing the incremental costs associated with the conflict. Even if veterans have, on average, a higher incidence of public services usage, there can be a selection bias, that is, those who choose to go into the armed forces differ, in one way or another, from those that do not. Differential costs between veterans who have and who have not served in the conflict would provide a better estimate of the incremental budgetary costs.

In some cases there can be budgetary savings. If the life expectancy of returning troops is lower, then their expected Social Security benefits will be reduced.³⁴

4.8 Interest and the time value of money

Because costs occur over a long period of time, past and future expenditures have to be converted into "current" dollars, reflecting the time value of money. There is an enormous literature on the appropriate discount rate to use in public cost-benefit analysis.³⁵ Most of the complexities relate to discounting economic costs, and are discussed later in section 5. In estimating the budgetary costs, it makes sense to use the actual borrowing costs of the government as reflected by the interest rate on 10-year government bonds.

Another problem is uncertainty about the future rate of inflation. Even if we knew with precision how much real resources would be required to, say, care for a disabled veteran, we do not know the future budgetary costs (there is no such problem in converting past expenditures into current "real" dollars, since we know both past nominal interest rates and rates of inflation).

The market provides a partial answer. Since 1997 the U.S. Treasury has been issuing inflation-indexed bonds (Treasury inflation-protected securities [TIPS]), which protect investors against the effects of inflation. The interest rate on these bonds can be subtracted from the "nominal" interest rate on conventional bonds to provide the market's best guess about likely future price inflation. However, this inflation indicator is most relevant for the general price index; the inflation rate relevant for future health care expenditures, for example, is likely to be substantially higher than the inflation rate in general.³⁶

5. IMPACT OF FINANCING METHOD

One of the largest costs associated with the Iraq and Afghanistan wars is the interest costs associated with financing the wars. Any homeowner (or car buyer) knows the issue: the total amount paid in interest on a 30-year mortgage is likely to be much greater than the principal amount borrowed. But including interest payments in estimated war costs has generated a great deal of debate.

Some economists suggest that to include these costs amounts to double-counting. They argue that we should only consider the present discounted value of what we will spend on the war, in the same way that we do not include interest payments when we cite the price of a car or a house.

The present discounted value of the conflict is an important piece of information. But so too is the total budgetary cost—including the interest associated with paying for it.

One of the reasons for taking this cost into account is that government is different from an individual. It is costly for government to raise money. There are distortions associated with the imposition of taxes. If taxes aren't raised, other expenditures have to be cut back. We know that the marginal returns on government investments are very high—the difference between the borrowing costs and these returns is testimony to the high costs of taxation. (If there were no such costs, presumably public investment would occur to the point where the marginal return is equal to the marginal cost of borrowing.)

One reason is that the supply of savings to fund government borrowing is not infinitely elastic. Financial markets have a view of what is an acceptable ratio of debt to GDP. Smaller countries are more sensitive to such constraints, but in every case, as debt- and deficit-to-GDP ratios increase beyond certain levels, countries find it more difficult and more expensive to finance their ongoing deficits. Southern European countries have recently encountered these limits, obliging their governments to make large and unanticipated reductions in government spending in order to retain financial market confidence. Markets focus not on the primary surplus or deficit (what the surplus or deficit would be without interest payments), but the full surplus or deficit. Hence a legacy of war debt has effects years later.

These are among the reasons why we care about the overall budgetary costs of the war, and how the government finances the war is relevant to its budgetary impact. Quantifying the impact is, however, not so easy. Again, it is a matter of counterfactual analysis: what would the government have borrowed but for the conflict? And what is the incremental cost of borrowing—the government, as it becomes more indebted, may have to pay higher and higher interest rates. This incremental cost of borrowing will vary depending on the prior level of indebtedness, other aspects of economic performance, and the extent to which the country has to rely on foreign borrowing. For example, Japan, with its high domestic savings rate, seems able to borrow at low interest rates even with a very high debt-to-GDP ratio.

Normally, governments finance a war through a combination of borrowing, cutting back on other expenditures, and raising taxes.³⁷ The Iraq conflict was highly unusual in that a case can be made that it was entirely financed by debt. Even as the country went to war, taxes were cut and other expenditures were increased, even though there already was a large deficit. Similar issues are raised when it comes to financing future expenditures, including future interest costs. (Should we assume that the government borrows, at the margin, to pay the interest on the money that has already been borrowed to pay for the war?)³⁸

While it can be argued that the Iraq and Afghanistan wars were completely debt-financed, that may not be the case in future conflicts. One needs to ask whether taxes have been increased to pay part of the costs. In the past, governments have not forced current taxpayers to pay for all the current costs of wars. It is not unreasonable to take as a working hypothesis that there is some crowding out of other expenditures. One approach is to lay out the budgetary costs under alternative scenarios, for example, that war expenditures (including increased interest to pay for the conflict) do not crowd out any other expenditures—a scenario with total debt financing, or that, say, a quarter of the expenditures are “paid for” by reduced nonwar spending.

There is another reason that the true incremental budgetary costs of the Iraq War may have been particularly high: spending on the war was repeatedly authorized in Congress by means of “supplemental” appropriations.³⁹ This procedure has distorted the view of how much we are spending in the annual budget, which has led to higher deficits than Congress anticipated—arguably significantly higher than could have been tolerated if all spending had been consolidated into an annual budget, during which the Defense Department is required to prepare much more detailed explanations of its funding requests. Consequently Congress did not have the opportunity to make targeted cuts in war spending, and arguably felt less pressure to make offsetting spending cuts in other areas because the war appropriations were handled separately.

The incremental indebtedness as a result of the Iraq and Afghanistan wars has been considerable. Since 9/11, U.S. debt has risen from \$6 trillion to \$14 trillion in 2010. Even moderate estimates suggest that the debt for wars has been a major contributor of this increase.

The analysis of the overall economic costs of the war, to which we now turn, is less sensitive to some of these matters, but more sensitive to a host of other issues. However, the budgetary analysis cannot be fully separated out from the economic analysis. For instance, by crowding out government investment, budgetary costs (through interest payments) may be reduced, but then there is a new set of budgetary impacts: the lower spending on investment lowers growth, and lower growth has an indirect effect on the government budget.

6. ECONOMIC COSTS

6.1 General principles and differences between budgetary and economic costs

The costs of conflict that are most important—and frequently not counted at all—are the comprehensive economic costs, the value of the resources used to fight the conflict, including the value of our human resources injured and killed in the war.

There are marked differences between budgetary and economic costs. In some instances, budgetary costs exceed economic costs (e.g., as we noted earlier, overpayments to contractors⁴⁰). In many other cases, the budgetary costs are smaller than the economic costs. For instance, those injured in the war and their families typically face costs far higher than what the government pays out in health care costs or even disability payments.

In this section we provide a broad taxonomy of these economic costs, highlighting key analytic issues in the measurement and valuation of the resources used in the conflict and the broader economic impact.

There are two kinds of economic costs: microeconomic costs, which are costs to individuals, families, and firms; and macroeconomic costs, which are costs to the economy at large.

Again, a recurring issue is the counterfactual—what would have happened but for the conflict—for example, what would the soldiers have earned if their tours of duty had not been extended? What would reservists have earned had they not been called to active duty?

Major conflicts (like World War II) introduce a further complexity. Typically, in assessing costs, we assume that a government project leaves unaltered, say, the wage rate or the costs of goods. But this assumption is not valid for a large war where government recruits a large enough fraction of the labor force. In these circumstances, there are impacts on wages. Similarly, when a war takes a large fraction of the output of some industry, then there are impacts on prices. In this chapter we will ignore these effects, since most recent conflicts, while very costly, do not have these general equilibrium effects.⁴¹

6.2 Microeconomic costs

Even a comparatively small war like the Iraq conflict can have pervasive and long-lasting effects (measured as a percentage of GDP). It can stir up anti-American feelings that result in American businesses losing sales. As we noted earlier, National Guardsmen deployed abroad are not available for service at home. The increased demand for veterans' services (in particular, health services) by new returning troops (without a corresponding increase in budgetary allocations and expanded capacity to provide care) may result in harm to veterans of previous wars. Indeed, the volume and complexity of disability claims and medical needs for recent Iraq and Afghanistan veterans have had effects on other veterans: the waiting times for processing the claims of older veterans has increased, and it has made it harder for them to get doctor's appointments in the VA system in some specialties. There may even be incidental (but significant) benefits: the development of techniques for caring for badly injured individuals, including the development of better artificial limbs, will be helpful to those who suffer injuries in other ways. It is important to identify these effects, even if one cannot fully quantify them.⁴²

It may be possible to quantify some of these impacts: one could, first instance, assess the loss of sales in the Middle East by American firms (e.g., by using a multivariate analysis that identifies the consequences to firm sales of being "American").

The hardest problems arise from nonmarketed goods and services, such as the value of the "insurance" provided by having the National Guard available to address emergencies. The value of the lives and property saved by their services in the normal course of affairs provides a lower bound to the value of these services, since individuals are risk averse and willing to pay a risk premium for the avoidance of such losses.

In the following subsections we discuss some important areas in which quantification is possible—and some of the problems posed in attempting to get an accurate estimate of the costs.

6.2.1 Statistical value of lives and fatalities

The most significant nonmarketed "cost" is that associated with lives lost and injuries sustained. The budgetary cost of a lost life is the payments made by the government to the individual's survivors (currently paid out by the U.S. military in the form of life insurance plus a "death gratuity" payment). The real (economic) cost is far higher.

There is a large literature on estimating the value of a life lost. It is more than the value of the goods and services the deceased would have produced, though that provides a lower bound.⁴³ The standard approach attempts to estimate how much individuals would have been willing to pay to avoid a risk of being killed, information that is typically revealed by individual choices. Individuals are, for instance, willing to accept employment in a job with a higher risk of death in return for increased compensation.

Government agencies routinely use estimates of the value of life in making decisions, such as weighing the costs and benefits of a car safety regulation, or road safety improvement, or an environmental regulation. When drawing up regulations, government agencies put a value on human life and then weigh the cost versus the lifesaving benefits of a proposed rule. The less a life is worth to the government, the less the need for a regulation, such as tighter restrictions on pollution.

Consider, for example, a hypothetical regulation that costs \$18 billion to enforce but will prevent 2500 deaths. At \$7.8 million per person (the figure used by the U.S. Environmental Protection Agency [EPA]), the lifesaving benefits outweigh the costs, and it makes sense to adopt the regulation. This methodology is used across the government, in regulatory areas such as food and drug evaluation, transportation, and environmental protection.⁴⁴

Similarly courts have to assess appropriate damages in compensation for a wrongful death. Systematically, in both the public and private sectors, the value put on life is an order of magnitude greater than the budgetary costs.⁴⁵

The same methodology can be used to assess the value of a disability, such as the loss of a limb. In the case of a disability requiring ongoing care, there are additional costs, beginning with the costs of medical care, but which go well beyond this.

Estimating future medical costs is itself complicated. One cannot necessarily extrapolate costs from previous conflicts. Each conflict is different. Many of those surviving the wars in Iraq and Afghanistan have horrendous multiple injuries, known as "polytrauma." In previous wars, soldiers with such multiple damage types typically did not survive. Advances in modern battlefield medicine have made it possible to treat severe casualties from Iraq and Afghanistan in situ and then airlift them to Landstuhl Regional Medical Center in Germany. However, many of the victims, though surviving, will never fully regain their physical or mental functions. There is no way of quantifying their pain and suffering—though we know that were they to have suffered far less damaging injuries in an automobile accident, they might have received millions of dollars in compensation.

As of this writing, some 1.4 million veterans have returned from Iraq and Afghanistan. Approximately 6300 U.S. servicemen and women have died and more than 100,000 have been wounded in action or injured seriously enough to require medical evacuation. However, nearly 650,000 have already been treated in VA medical facilities for issues ranging from brain injuries to hearing loss.

There are two cost streams associated with the wounded and injured: (i) the medical costs of caring for veterans over their lifespans, and (ii) the cash compensation and benefits (such as housing loans and rehabilitation) that are awarded to eligible veterans and their survivors. Some of these benefits are payable to all veterans, regardless of their disability status, including five years of free medical care in the VA health care system upon their discharge from active duty. Veterans can qualify for a range of compensatory benefits and cash stipends on approval from the medical and administrative apparatus of the VA. Additionally, veterans may be eligible to receive assistance from other government agencies, such as supplementary disability compensation from the Social Security Administration if they can no longer work. The evidence from previous wars shows that the cost of caring for war veterans peaks in 30 to 40 years after a conflict. The costs rise dramatically over time as veterans get older and their medical needs grow.

The number of veterans who will be entitled to receive lifetime medical care and disability compensation is significant, and is currently close to 50% of returning servicemen. We included the cost of all those who were wounded in combat and those who were injured in noncombat situations (e.g., transportation, construction, mental health diagnoses, rare diseases) over and above the rate of such injuries during peacetime. This was determined by comparing rates of noncombat injury in the army for five years prior to 2001 to the five subsequent years (Horton 2007).

Our initial estimates of the cost of caring for Iraq and Afghanistan veterans were based on a study of historical patterns. We projected that the long-term cost of providing medical care and paying disability compensation for veterans of the Iraq and Afghanistan wars would be between \$400 billion and \$700 billion, depending on the length of and intensity of the conflict and future deployment levels.

We now have analyzed the actual records of more than 400,000 recent veterans. Based on these data, we have revised our estimates upward to be between \$589 billion and \$934 billion (depending on the length and intensity of combat).⁴⁶

Our earlier estimates have proven to be excessively conservative. In 2008 we projected that between 366,000 and 398,000 returning Iraq and Afghanistan veterans would file disability benefit claims by 2010. In fact, more than 600,000 veterans have already applied for VA disability compensation. We also underestimated the complexity of these claims, the number of disabling conditions being demonstrated, and the likely increases in disability ratings over time for veterans who have been diagnosed with PTSD.

Similarly, our original estimates of medical costs turned out to be too low. In our earlier analysis we estimated that fewer than 400,000 returning veterans would be treated in the VA health system by 2010. In fact, the VA has already provided medical treatment to 650,000 returning troops.

Veterans from Iraq and Afghanistan are utilizing VA medical services and applying for disability benefits at much higher rates than in previous wars. The higher medical use and claims pattern are the result of several factors, including (i) higher survival rates for seriously wounded troops; (ii) higher incidence of PTSD and other mental health ailments; (iii) more veterans who are willing to seek treatment for mental health problems; and (iv) more generous medical benefits, more presumptive conditions, and higher benefits in some categories. The Department of Veterans Affairs has also expanded several programs to expedite claims and increased some categories of benefits and outreach.

The high incidence of PTSD is likely to ensure that the medical costs of the current conflicts will continue to rise for many decades. This has been the experience with Vietnam veterans diagnosed with PTSD, and recent studies have documented that PTSD sufferers are at higher risk for heart disease, rheumatoid arthritis, bronchitis, asthma, liver disease, peripheral arterial disease, and other conditions. Traumatic brain injury, which is estimated to affect some 20% of Iraq and Afghanistan veterans (often in conjunction with PTSD) also places sufferers at higher risk for lifelong medical problems, such as seizures, decline in neurocognitive functioning, dementia, and chronic diseases.⁴⁷

In addition, veterans who can no longer work may apply for Social Security disability benefits. We estimate that the present value of the lifetime benefits for these veterans will range from \$33 billion to \$52 billion.

5.3 Other budgetary costs

These estimates do not include a range of additional costs that will be paid by departments across government, including veterans' home loan guarantees, veterans' job training, concurrent receipt of pensions, and higher costs to Medicare and Medicaid for Life for veterans who are not enrolled in the VA system. It also does not include costs paid by state and local governments, or the GI Bill, which is an

investment that will yield significant economic benefits, but will also add to the budgetary cost of the war. Taking these costs into account, the total budgetary costs associated with providing for America's war veterans from Iraq and Afghanistan approaches \$1 trillion.

In 2008 we derived our initial estimates by looking at the costs for early returning veterans and by extrapolating costs on the basis of the pattern observed in previous wars. These estimates were considerably higher than the estimate by the Congressional Budget Office (CBO), in large part because CBO used early data for returning Iraq veterans, which suggested that the cost of care for these veterans would be less than the average costs for veterans. We projected that these costs would become more apparent and grow larger over the lifetime of the veteran, whereas CBO projects out for only a decade.

We believed that these veterans' costs would rise for four reasons: (i) the early costs were disproportionately associated with diagnosing and initial check-ups, rather than the more expensive long-term care; (ii) those returning early were less likely to have had multiple deployments, and we anticipated that the costs, especially from PTSD and other psychological problems associated with multiple deployments, would increase disproportionately; (iii) the evidence from previous wars shows that the costs of caring for veterans extends well into the future (the peak year for paying veterans' disability compensation to World War I veterans was 1969—more than 50 years after the armistice; the largest expenditures for World War II veterans came in 1982, and payments to Vietnam and the first Gulf War veterans are still climbing); and (iv) many of the costs are manifested as they interact with the aging process. For example, a number of conditions that can occur in later life, such as prostate cancer, are automatically presumed to be related to a veteran's service, thus entitling the veteran to some financial compensation. We also looked at the fact that the Iraq and Afghanistan wars are producing a larger number of casualties than in previous conflicts—and that the majority of veterans filing for disability compensation are submitting claims for a greater number of separate disabling conditions. All of these factors suggested to us that the long-run costs for these veterans would be even higher than the historical average costs.⁴⁸

By 2010 more than two million troops had served in the Iraq and Afghanistan conflicts, more than half of whom had been discharged. The actual data collected on these veterans, including their physical medical needs, incidence of mental health problems, and disability claims, has already far exceeded our predictions.⁴⁹ This evidence has shown that we were excessively conservative and that the CBO initially underestimated these costs and the impact on the VA budget. Moreover, the long-term costs associated with interactions of disability with aging have not yet occurred.

In October 2010, the CBO issued a new report that substantially increased its projections for the medical cost of veterans care (Congressional Budget Office 2010). The new CBO analysis projects that the health care costs for Iraq and Afghanistan veterans will rise from \$2.0 billion in 2010 to \$5.8 to \$8.3 billion in 2020. CBO predicts VA cumulative health care costs for Iraq and Afghanistan veterans for the years 2011 to 2020 will be \$40 billion to \$54 billion (depending on troop deployment

levels). It also predicts that these costs will rise steeply as the veterans get older. The new CBO figures are consistent with our findings.⁵⁰ However, the CBO does not include the cost of paying disability benefits, Social Security compensation, or other compensation that will also be paid throughout the veterans' lifetimes.

This discussion highlights another aspect of the difficulties of estimating the incremental economic cost of conflict. There can be budgetary costs whether the conflict increased the true economic costs associated with aging. One of the reasons that all veterans are entitled to certain benefits is in fact the difficulty of sorting out whether a particular malady is or is not a delayed consequence of an injury suffered in war. But for our analytic purpose, attempting to identify the true cost of the conflict, we want to know the incremental costs. Studies comparing how costs increase as individuals age for those with and without certain injuries would provide the basis of an analysis of these incremental costs.

We anticipate that the life expectancy of those with multiple injuries will be shorter, and a full economic analysis would attempt to assess the value of this loss of life expectancy. (This provides another area where budgetary and economic costs may differ markedly. The shorter life expectancy may be reflected in a savings in Social Security payments.)

Another instance of the difference between budgetary and economic costs arises from the significant costs of care borne by the families of those injured. For instance, between 15% and 24% of military personnel reported that a friend or family member was forced to leave his or her employment to be with them or act as a caregiver. We can calculate the opportunity cost of these workers, and it is significant.

6.3.1 Economic impacts on women service members

Many of the economic and social costs associated with the war will not be fully known for decades. One example is the impact on women service members, who comprised 11% of the service members deployed in Iraq and Afghanistan. More than 40% of women on active duty have children. Female service members are also much more likely to be single parents than their male counterparts—a staggering 30,000 single mothers had been deployed overseas by March 2009. (The army gives women only 4 months to remain in the United States with their newborns before deploying to a war zone for a standard 12-month tour.) The impact on the female troops, in terms of lack of time to spend with their newborns, work-life balance, mental health and social integration issues, and divorce are just beginning to appear.⁵¹ A recent study by the Iraq and Afghanistan Veterans of America reported that divorce rates for female troops were three times higher than for male soldiers, and female veterans are up to four times more likely to be homeless than civilian women (Mulhall 2009).

6.3.2 Opportunity cost of time

Historically, most countries have relied on conscripts to fight wars. The fact that such troops are serving involuntarily implies that, on average, their compensation is less than that required for voluntary service. Thus the budgetary cost is less than

the opportunity cost of their time, taking into account the nonmonetary costs and benefits (e.g., the risk of death and injury). In these cases, a full cost calculation should include an estimate of the opportunity cost of time, with an adjustment for the nonpecuniary costs. The latter are particularly hard to estimate, but even the former presents problems, for several reasons. If everyone were conscripted, then there would be no "selection bias," and one could use the average wage as a measure of the opportunity cost. But typically there are selection standards, and hence those serving are not fully representative. It should be possible, however, to make the appropriate quality adjustments.

A second adjustment relates to the fact that the "learning" in a military job may be different than that of an individual who has entered into a civilian career path. Thus wages of young people may be lower or higher than they otherwise would be because of the value of this learning.

Third, because of taxes (and possibly other market distortions), wages received by individuals may be less than the value of the (marginal) product of the workers.

In the case of the United States, with an all-volunteer armed forces, it might seem that none of these concerns is relevant. But that may not be correct, for several reasons. First, there is evidence that there may be "deceptive" recruitment practices, with some overzealous recruiters not fully informing enlistees of the risks they may face. Second, young individuals enlisting may not have fully comprehended these risks, especially since this conflict has been conducted differently from previous ones. In particular, reservists and those enrolled in the Ready Reserves had no reason to expect the length and intensity of their deployments.

This argument applies with even more force to those who signed up for the National Guard. The National Guard was viewed as a "national" guard, not an international brigade, but this was changed suddenly and without warning as the U.S. entered the Iraq conflict. The motivation for many individuals who volunteered for the National Guard was to safeguard their immediate community—primarily from disasters such as floods, tornadoes, earthquakes, hurricanes, forest fires, oil spills, and other emergencies. Thus it is reasonable to assume that the compensation they received to enter the National Guard did not fully compensate them for the services they rendered in Iraq.⁵²

In this context, it is natural to look at the opportunity cost of their time (and the other costs they bore) compared with the wages they received for their services. One study suggested that the two were roughly commensurate (Klerman, Loughran, and Martin 2006). While there were technical problems with this study, it raises a number of conceptual issues. One we referred to earlier: the value of a job should include the learning benefits and the impact on future job prospects. Learning a technical skill such as how to disarm a mine, may have limited value once the individual returns to civilian life. Moreover, there are large economic costs associated with maintaining two homes. Third, there are large economic costs associated with a temporary interruption in a career. Most of those volunteering for the National Guard had not anticipated this kind of interruption, as opposed to the enlistees who saw this as part of their career path (or entered the armed forces because of the absence of

an alternative). This is especially the case for those who were self-employed, where their deployment made it impossible to continue their source of livelihood.

6.3.3 Discounting

The economic costs of a conflict, like the budgetary costs, occur over a long time period. It is necessary to convert these into current dollars to calculate the present discounted value. The key question is the interest rate to be used in discounting. Presumably the appropriate interest rate is that confronting the individual, the interest rate at which he borrows (if he is, by and large, a net borrower) or invests (if he is, by and large, a net investor). Because, in practice, we typically do not know which interest rate is appropriate for each individual, the best that we can do is to "bracket" the present discounted value, using a range of reasonable interest rates, from say 2% (for an individual investing in Treasury bills) to 30% (for an individual borrowing from a credit card company). Some suggest that the appropriate discount rate is the average marginal return on capital, something like 7%. Others suggest that, especially when the impacts are long lived, we should be focusing more on the costs borne by different generations, and using a "social discount rate," reflecting not how any particular individual discounts future consumption, but on how society discounts dollars given to different generations. Such discount rates are typically low—lower than the 7% average return on capital.

While there is no consensus on the appropriate discount rate, the costs can be sensitive to that rate, especially when there are costs extending over long periods of time (as in the case of health care and disability costs). Low discount rates will result in a much higher present discounted value.

6.3.4 Iraq costs

The discussion thus far has focused on the costs facing one side of the conflict. But both sides face costs. In the case of the Iraq War, the costs to Iraq have been enormous in terms of the destruction of property, lives, and societal institutions. It is difficult to measure the full cost to a society and an economy that was almost completely destroyed, and to compare that to the benefits of a society that is just beginning to be restored. Here again, it is almost impossible to estimate the counterfactual: what would have befallen Iraq and the region if Saddam Hussein had stayed in power?

The analysis of costs in Iraq presents a distinct set of issues. One of the most difficult aspects is quantifying how the war affected Iraqi society. Just one example of a cost with sweeping implications is the issue of refugees and displaced persons. The population of Iraq is approximately 30 million. Prior to the U.S. invasion there were 20,000 Iraqis living outside the country. During the war, two million Iraqis fled to Syria, Jordan, and elsewhere.⁵³ To date, only a tiny fraction—about 51,000—of these refugees have returned to Iraq, despite generous financial inducements offered by the government (Brookings 2010). The refugees have had a major impact on the economies of the countries where they are now residing, in addition to the effect of their absence on quality of life in Iraq.

But even this does not tell the whole story. The population that left the country included many of the middle-class professionals who formed the backbone of society. For example, Iraq had 34,000 medical doctors prior to the U.S. invasion; an estimated 20,000 fled the country and another 2000 were murdered. By December 2008, despite government efforts to educate new physicians and the return of a small number of the doctors who left the country, Iraq has only 16,000 medical doctors. In turn, the lack of doctors during the worst years of the war contributed to the death, disease, and disability of many thousands of other Iraqis (Brookings 2010).

The nation has 2.7 million "internally displaced persons" in addition to the 2 million refugees outside the country. Most of these are people whose lives were disrupted by the sectarian violence during 2005–2007 and who cannot return to their previous homes. Despite much government effort, fewer than 200,000 of these individuals have been able to return to their former neighborhoods. This means that nearly 16% of the Iraqi population (combined refugees and internally displaced persons) was displaced during the war. Due to time limitations, we were unable to measure the impact on society and the costs to individuals, but they are considerable.

Another topic in measuring the costs to Iraq is the costs to the economy, including vital oil production. Prior to 2003 Iraq was producing 2.5 million barrels of crude oil per day and exporting about 2 million barrels. By January 2006, oil production had fallen by 40% and exports were cut in half. It was not until mid-2008 that production and exports were restored to prewar levels. Since then, Iraq has struggled to achieve any increase, as struggles over oilfield ownership have persisted. This volatility has itself led to major disruptions in the Iraqi economy, which has impaired the lives of Iraqis in many ways (e.g., lack of income, power, electricity, and public services, and impacts on hospital services, water treatment, schools, and businesses) and contributed to higher rates of death and disease.

Among the most interesting and difficult analytical issues are those presented by attempts to estimate the number and value of lives lost.

In the midst of war it is difficult to gather accurate data about the number of civilians killed. One side has an incentive to try to minimize the number claimed, the other to maximize it. In the case of Iraq, two studies highlighted a new methodological approach. Surveys of death rates during the war were compared to death rates before the war. Such an approach would include deaths not only from violence but also from the deteriorating conditions—such as the lack of clean water, lack of refrigeration, leading to more spoiled food; and the killing or exodus of a large fraction of doctors, leading to reduced health care. Such studies suggest that the war led to an additional 420,000 to 800,000 deaths in the initial years (Burnham et al. 2006). Other studies have used different methodologies and reached the conclusion that civilian deaths directly from violence due to the war are in the range of 150,000 (Iraq Family Health Survey Study Group 2008). The latter study also found that there was a near doubling of overall death rates as a result of the war. Thus the two are not necessarily inconsistent, since the indirect impacts described previously are far greater than the direct impacts.⁵⁵

6.4 Macroeconomic costs

Wars can have macroeconomic costs and benefits. World War II is often credited with bringing the United States out of the Great Depression, but this highlights again the issue of the counterfactual: if we had spent a similar amount of money on domestic investment, would the country's long-term growth and its standard of living been higher? (One might argue that that does not accurately characterize the feasibility set: it would not have been politically possible to sustain those levels of expenditures and deficits in the absence of war.) The resources used in the war could have been used for other purposes, and this could have affected growth.

6.4.1 Beyond aggregating microeconomic losses and the counterfactual:

What would otherwise have been the case?

When the economy is not at full employment, then war expenditures can stimulate the economy. But if the government faces a budget constraint, and war expenditures displace other forms of expenditures, then the war expenditures may lead to an economic contraction. The reason is simple: the multiplier effects⁵⁶ associated with war expenditures (especially when, for instance, the expenditures go to finance foreign contractors) are typically lower than for other forms of expenditure.

Similarly, if the war expenditures are financed by an increase in taxes, the effects may depend on the nature of the tax increase. In general, there is a positive multiplier associated with an increase in expenditures accompanied by a tax increase. But if the expenditures are to pay foreign contractors (so there are no second-round multiplier effects) and the taxes are imposed on poor individuals, then the impact could be contractionary.

Ascertaining the appropriate counterfactual is not easy. In the case of the Iraq War a compelling case can be made that Bush's tax policies were quite independent of the war, and while some of his chief economic advisers openly professed the idea that deficits did not matter, concerns about deficits, particularly among members of his own party, did constrain spending, so a fraction of the war spending crowded out other forms of spending.⁵⁷

In the case of the Iraq War, more significant than these "expenditure-tax" macroeconomic effects were those generated by the increase in the price of oil. Wars often give rise to shortages of certain critical materials. In normal market economies this gives rise to large changes in prices, and these price changes in turn can have large macroeconomic consequences.

In the case of the Iraq War, the price of oil increased from \$23 a barrel just before the war to \$140 at its peak. The large increase in the price of oil resulted in a large transfer of income from oil-consuming countries (like the United States) to oil-producing countries. A redistribution of this magnitude has global macroeconomic effects, especially as the recipients are aware that it is unlikely that the price will remain high and hence have a strong incentive to save a considerable fraction of the amounts received. Increased spending on oil imports by the United States meant

that Americans had less to spend on other goods, including goods made in the United States. Without countervailing actions on the part of monetary and fiscal authorities, it resulted in a weakening of aggregate demand, and given that the United States' economy was already weak, as it was just emerging from recession, it contributed to an increase in unemployment.

The high price of oil had another macroeconomic effect—increasing inflationary pressures. One of the factors widely cited for the bout of inflation that marked the 1970s was the large increases in the price of oil. The increase in the price of oil translated into concomitant increases in the prices of other energy sources, and with the development of biofuels, an increase in demand for the use of cropland for energy rather than food. Thus high oil prices eventually led to high food prices. In the United States, these inflationary pressures were muted because of the overall weak economy, but in developing countries where food and energy constitute a large fraction of the market basket of goods, rates of inflation began to increase significantly.

Monetary and fiscal authorities do not, of course, sit idly by while these impacts are felt. In those countries facing inflation, interest rates often were increased, especially given the predominant doctrine among central bankers of inflation targeting. While such increases in interest rates did little to tame global prices of food and energy, they had some effect on domestic inflation, both by reducing domestic aggregate demand (increasing unemployment) and increasing exchange rates (relative to what they might otherwise have been). The net effect, however, was to reduce global aggregate demand.

In the United States, the concern was more about the weak economy than inflation. With the already large deficit limiting the ability of the government to respond by fiscal policy, the burden of maintaining the economy at near full employment was placed on the Federal Reserve, which responded with a flood of liquidity and lax regulations (e.g., concerning housing), fueling the housing bubble.⁵⁸

We now know that that bubble—and its breaking—has imposed enormous costs on our economy (and the global economy), costs that will be borne for years to come, and which will reach into the trillions of dollars. Not only did the bubble lead to a massive misallocation of resources before it broke, but the breaking of the bubble has resulted in the economy operating well below its capacity for a period expected to last more than a half of a decade.

While it is possible to estimate the overall short- and long-run costs of the bubble and its aftermath, the question is, how much of those costs should be attributed to the war? To answer that question we have to answer two further questions.

First, to what extent should we blame the cost of the war on the way the macroeconomic consequences of the war were managed? They might have been managed better, in which case these costs would have been markedly smaller. But in estimating the cost of a war, we do not ask what the cost of the war might have been had we fought it better. Ideally the war might have been won at a far lower cost. But humans are fallible, and we know when we go into war mistakes will be made. When we estimate the costs of the war, we estimate the costs, as it was actually fought

(or is likely to be fought). When we estimate the macroeconomic costs of the war, we should similarly estimate the costs as they were actually borne, not how they might have been.

The second question is to what extent can the increase in the price of oil be "blamed" on the Iraq War (similar issues arise in all conflicts). The price of oil is determined by many conditions in the global economy, and clearly the conflict in Iraq is only one of the contributing factors. Casual history is of only limited relevance: the fact that as the war wound down so too did the price of oil might suggest that the war was critical; but correlation is not causation. As the war came to an end, the bubble broke, and the global economy weakened, reducing the demand for oil.

Ascertaining how much of the increase in the price of oil was due to the war was one of the more difficult issues we encountered in our estimates of the cost of the Iraq War. We attributed only \$5 to \$10 of the total increase to the war, because we did not want this to be a major bone of contention. There was a broad consensus that at least that amount was attributable to the war.

In making our argument we brought to bear evidence from futures markets, which anticipated before the war that the price of oil would remain at roughly \$25 per barrel. The market was aware that there were large increases in demand arising from the fast-growing emerging markets, but there seemed an ample supply to meet these needs, especially from the Middle East. One could plausibly argue that the war, by bringing a high level of instability to the region that was the low-cost producer, upset that equation.⁵⁹

Often there is also a concern about the distributive consequences of allowing price changes associated with war-related shortages. The result is that governments impose price controls and rationing. This imposes other distortions and costs on the economy.

The increase in oil prices also had an effect on the budgetary cost of the war. The U.S. military is the largest single purchaser of fuel in the world, and the Iraq and especially the Afghanistan conflicts have been extremely fuel intensive, requiring oil products to generate power at the hundreds of military bases constructed in Iraq, as well as for aircraft, tanks, transports vehicles, weapons, and equipment.⁶⁰

6.4.2 Full employment versus underemployed economy:

Short-term impacts

The Iraq War occurred at a time when the American economy was weak, and hence the macroeconomic analysis focused on the impact on aggregate demand. But some wars (and some parts of wars) occur when the economy is at full employment. When war expenditures displace other forms of expenditures. Fiscal and monetary policies determine whether it is consumption, investment, or public expenditures that are displaced. In these cases, the value of the resources used (described earlier) becomes a reasonable estimate of the short-run economic costs of the war.

6.4.3 Long-term impacts on investment

But there are likely to be longer-term economic impacts on economic growth, and the magnitude of those long-term impacts depends on how the war is financed.

We noted earlier, for instance, that the Iraq War almost surely crowded out other government expenditures, and among the government expenditures that are often easiest to crowd out are investments, since the impact of such cutbacks is not felt for years after the crisis (and politicians tend to be short sighted, with a horizon little longer than the next election cycle). Government investments in education, infrastructure, and technology have been shown to have high economic returns, reducing those expenditures lowers long-term economic growth.

Many of these investments are complementary with private investment. For instance, the Internet, which was originally publicly funded, has been a major spur to private investment. Curtailing public investments now leads to lower private investments in the future.

The way a war is financed can also have long-term effects. The increase in debt to finance a war normally leads to higher long-term interest rates (lowering real investment). An asset (a government bond) is created that is a partial substitute for private capital goods.

Calculating the magnitude of these long-term growth effects is not easy, partially because it entails a long-term general equilibrium analysis: what investment would have been in the absence of the increase in government debt. This is especially so in a modern open economy, where countries can borrow from abroad.

Of course, even if the country borrows from abroad, so that private investment is not crowded out, there are costs to future standards of living. The debt has to be serviced.

If the economy consisted of a single individual living infinitely long, and if there were no costs in transferring money from the private sector into the public sector or market imperfections, then it would be wrong to add on the future impacts to the current resource cost: it would be double-counting. But these assumptions are not valid, as we have already noted. The returns to public investment typically exceed the return on long-term Treasury bonds, and by a considerable amount. Hence there is a forgone cost. (There are, in addition, intertemporal distributional consequences, with, in effect, future generations bearing the costs of wars waged now. Valuing these distributional consequences is a contentious matter; it entails assessing likely increases in per capita income.)⁶¹

6.4.4 Assessing indirect impacts: budgetary impacts and dynamics

So far we have largely discussed budgetary and economic costs in isolation from each other, but there are some important interactions that need to be taken into account that can be of first-order importance. If, as we have suggested, a conflict can have a significant effect on GDP (both in the short and long term), then these macroeconomic effects will impact tax revenues. There will be budgetary consequences. (There can be second- and third-round effects: the budgetary impacts may, in the

force further cutbacks in, say, public investment, which will have further adverse growth effects, with further budget consequences.)

7. CONCLUDING COMMENTS

It is commonplace today for governments to undertake extensive cost-benefit analyses of individual projects and regulations to assess and, where possible, quantify the benefits and costs. Our analysis of war follows in this tradition. In some ways our analysis is similar to cost-benefit analyses in other areas of the public domain: many of the costs and benefits involve nonmarketed goods and services, and therefore are hard to value; the markets with which we are concerned are often distorted, so that one cannot be sure that market prices give correct social values. Particular problems are raised in the valuation of goods and services over time. There can be large distributional impacts (both within and across generations), and these too have to be valued. In addition, while the impact of a typical road project or environmental regulation is sufficiently small that one can ignore effects on the macroeconomy or on market prices, this is not so for conflicts like the wars in Iraq and Afghanistan.

In assessing these broad impacts it is often necessary to address the counterfactual: what would have happened but for the war? Reasonable people can differ on the answer. Would spending on infrastructure have been greater? Would taxes have been lower? Would debt be smaller? What we do know is that something (and in most cases, many things) would have turned out differently.

The true costs of the Iraq and Afghanistan conflicts may well be in the range of \$4 to \$6 trillion, or even higher, once the long-term budgetary and economic costs are factored in. But in addition to the known costs of conducting current and future military operations, caring for war veterans, and macroeconomic impacts, the most sobering costs of the Iraq conflict are in the category of "might have beens"—what economists call opportunity costs. Specifically, in the absence of the Iraq invasion, would the United States be mired for so long in Afghanistan? Would oil prices have risen so rapidly? Would the U.S. federal debt be so high? Would the economic crisis have been so severe?

Arguably, the answer to all four of these questions is "no."

The Iraq invasion diverted U.S. attention from Afghanistan, a war that is now in its tenth year and which threatens to destabilize nuclear-armed Pakistan. While "success" in Afghanistan might always have been elusive, the United States would probably have asserted control over the Taliban, and suffered less expense and loss of life, if it had maintained its initial momentum and not been sidetracked in Iraq. Between 2003 and 2006, the United States spent five times as much money in Iraq as in Afghanistan. It is likely that the U.S. and NATO forces would have done far better if those resources had been devoted to Afghanistan before the Taliban reestablished

The second cost is the higher price of oil, which has had a devastating effect on the economy. In our conservative \$3 trillion estimate, we attributed only \$10 of the increase in the price of oil to the war. But, given our thirst for imported oil, even that small amount has a big impact—it translates into a much higher import bill for the United States. We now believe that a more realistic estimate of the impact of the war on the price of oil over a decade is at least \$10 to \$15 per barrel. That translates into a \$250 billion increase in the cost of war.

Third, the war added substantially to the U.S. federal debt. It was the first time in America's history where a government cut taxes as it went to war, even in the face of continued government deficits. The U.S. debt rose from \$6.5 trillion to \$10 trillion between 2003 and 2008, before the financial crisis. At least one-fourth of that debt is directly attributable to the wars. Of course, this does not include unfunded future liabilities, for instance, the more than \$500 billion dollars in future health care costs and disability payments for returning troops.

This increased indebtedness meant that the United States had far less room for maneuver in dealing with the global financial crisis. Worries about the debt and deficit constrained the size of the stimulus.

But the crisis itself was, in part, due to the war, and while the estimates that we provided in our book were overly conservative overall (e.g., in estimating future health care and disability costs), the most serious underestimate involved the macroeconomic consequences of the war. The increase in oil prices reduced domestic aggregate demand—money spent buying oil abroad was money not available for spending at home. The war spending itself provided less stimulus to the economy than other forms of spending—giving money to foreign contractors working in Iraq neither stimulated the economy in the short term (compared to investments in education, infrastructure, or technology) nor did Iraq spending provide a basis for long-term growth. Loose monetary policy and lax regulations kept the economy going through a housing bubble, whose breaking brought on the global financial crisis.

Counterfactuals—what might have happened if we had not gone to war—are always difficult, and especially so with complex phenomena like global financial crises with many contributing factors. What we do know is that one of the true costs of war is its contribution to a worse economic recession, higher unemployment, and larger deficits than might have otherwise occurred.

While expenditures on the military represent the single largest item for many countries, war has largely been immune from this kind of scrutiny. Even if such an analysis does not change the decision to go to war, it can alter how the war is fought—and possibly even how and when to exit. We have argued that faulty budgeting and imperfect accounting systems, and broader attempts to obscure the true cost of conflict from the public, have in fact increased those costs; attempts to limit the short-run budgetary impact may have increased those costs; and attempts to limit the costs to the government may have increased the long-run impact on the economy. The large disparity between the budgetary and full economic costs of war means there is a need for a comprehensive reckoning of the cost to the economy

as a whole. Going forward, it is important that major decisions in the military arena, especially when they are decisions of choice, be subject to the same sort of rigorous analysis, both budgetary and economic. No estimate and no accounting system will be perfect. But the discipline that comes from applying these techniques routinely should increase the quality of debate and enable us, as a country and a government, to make more informed decisions in the future.

We hope that the kind of analysis that we conducted for the Iraq and Afghanistan wars, and which has now been performed by the Congressional Budget Office, will become routine. Wars not only use up resources, the violence has broader societal effects, some of which are becoming manifest. The incidence of suicide and violence by returning troops is alarming.⁶² Most importantly, there are costs on others—for example, the collateral damage on civilians—that are seldom taken into account as countries contemplate going to war. While the kind of economic calculus that we have conducted can only capture a fraction of the broader costs of war, we believe that even a greater awareness of these immense economic costs may have a salutary effect.

At the very least, we believe that democratic processes require an informed citizenry—and an informed citizenry must have a sense of the costs that are likely to be encountered before it embarks on war.

NOTES

- 1 As this book goes to press, the Afghanistan War has been going on for more than a decade, and the United States is finally pulling the majority of its troops out of Iraq after eight years. This is the longest period of direct U.S. combat participation in U.S. history. The previous record for U.S. participation in a war was in Vietnam (8.4 years from the Gulf of Tonkin resolution in August 1964 to the U.S. withdrawal in January 1973). The length of earlier wars were the American Revolutionary War (6.7 years), American Civil War (4 years), World War II (3.8 years), Korean War (3.1 years), War of 1812 (2.5 years), Mexican-American War (1.8 years), World War I (1.6 years), Spanish-America War (8 months), and the Persian Gulf War (1.5 months).
- 2 Since early 2006, clear majorities of Americans, ranging from 60% to 68%, have opposed U.S. involvement in Iraq, according to CNN/Opinion Research Corporation polls (2010). Regarding Afghanistan, 52% of Americans say the United States did not make a mistake in the initial invasion (Gallup 2010), but as of June 2010, Americans oppose the U.S. war in Afghanistan by 56% to 42% (CNN/Opinion Research Corporation 2010). When asked, "All in all, considering the costs to the United States versus the benefits to the United States, do you think the war in Afghanistan has been worth fighting or not?" Americans say it has not been worth fighting by a margin of 55% to 42% (*Washington Post* 2010).
- 3 "Stop-loss" refers to the involuntary extension of a service member's active duty service in order to retain them beyond the original end of their term of service. In a campaign speech in 2004, while he was the Democratic presidential candidate, Senator John

Kerry described stop-loss as a "backdoor draft." Between 2002 and 2008, 58,300 troops were affected by stop-loss; in 2008 troops served an average of 6.6 months of additional service (Brook 2008). In March 2009 Defense Secretary Robert Gates called on the military to reduce the use of this policy.

4. Our book, *The Three Trillion Dollar War: The True Cost of the Iraq Conflict*, was published in February 2008. The book estimates that the total budgetary and economic cost of the wars in Iraq and Afghanistan will exceed \$3 trillion, depending on the duration and scale of U.S. involvement. A number of economists have attempted to project the costs of the war, and most of these studies, adjusting for different methodologies and timing of the work, have projected costs in a similar range. These include William Nordhaus (2002), Katrina Kosec and Scott Wallsten (2005), and the Joint Economic Committee of the U.S. Congress (2007). An exception was the work of Steven J. Davis, Kevin M. Murphy, and Robert H. Topel (2006), from the University of Chicago, who co-authored a paper that attempted to compare the cost of toppling Saddam Hussein with the cost of containing him. In 2008 Davis said he underestimated the cost. "It's quite apparent in hindsight the reason the war has been so expensive is because we have now maintained well over 100,000 and maybe closer to 200,000 troops in theater for five years" (Coile 2008). During the 2008 presidential campaign, in which he advised Senator John McCain, Davis said that "there was an active resistance in the [Bush] administration to thinking about the long-term cost impacts of this [invasion of Iraq] decision." A number of the different approaches to costing the war have been compared and described by Ryan Edwards (2010).
5. There is an analogy in anticrime efforts. For example, placing more policemen in one suburb can reduce crime in that suburb, but the criminals may simply find other equally satisfactory places, from their perspective, to operate. The Colombian government's successful antidrug effort has led to growth of drug cartels in other countries, such as Mexico, because the underlying demand for drugs in the developed world has not been reduced.
6. KESBAN is the local acronym for "Security and Development," a strategy adopted by the Malaysian military and other government agencies during the 1970s to combat the communist insurgency.
7. In May 2003, two months after the U.S. invasion, Bremer dismissed all senior members from their government posts and dissolved Iraq's military. In November 2003 Bremer established a Supreme National Debaathification Commission to root out senior Baathists from Iraqi ministries. All military officers above the rank of colonel were barred from returning to work, as were all 100,000 members of Iraq's various intelligence services. The Debaathification Commission was officially disbanded in 2004, but internal Iraqi politics kept an effective ban in place for years afterward.
8. The *New Yorker* broke the famous Abu Ghraib story in May 2004, in a report that included graphic photographs of prisoner abuse (Hersh 2004). The revelations were an international scandal.
9. See *The New York Times* website: http://topics.nytimes.com/top/news/international/countriesandterritories/iraq/awakening_movement/index.html?inline=nyt-classified (accessed September 8, 2010). A key component of the "counterinsurgency" strategy implemented by U.S. General David Petraeus after he assumed command in 2007 was to pay cash to former Sunni insurgents in order to change their financial incentives. Many observers credited this effort with decreasing the cycle of violence between Sunnis and Shiites and preventing an all-out civil war. Critics warned that such attempts to "buy" allegiance—without deeper and longer-lasting solutions to the

country's economic, social, and political problems—was only buying time. Their support would only continue so long as the money flowed, and there was not a higher bidder. This discussion illustrates the complex multiperiod behavioral analysis that has to be part of any strategic analysis—in many ways, far more complex than the game theoretic analyses that underlies earlier analyses of military strategies during the Cold War.

10. When President Obama announced in December 2009 his request for 30,000 additional troops for Afghanistan, he announced at the same time that they would be withdrawn in 2011. The December 1, 2009, address is available on the White House website: <http://www.whitehouse.gov/the-press-office/remarks-president-address-nation-way-forward-afghanistan-and-pakistan> (accessed September 8, 2010).
11. There may be what economists refer to as a situation with multiple equilibria. If people inside the country believe that the Taliban, for instance, will win, they will not support the "Western invasion," making its success less likely—a self-fulfilling prophecy. By the same token, if the citizens of the "invaders" believe that their invasion will fail, they too will provide less support. It will be more difficult to recruit citizens for a war. Part of the political and military strategy of each side is to try to move the conflict toward their preferred equilibrium. Shock and awe in Iraq was designed to persuade Iraqis that they would lose; the Tet offensive in Vietnam (by many accounts, a military disaster for Vietnam) was designed to persuade Americans that they would lose, and thus undermine support. In our earlier book we argued that the Iraq War deflected attention from Afghanistan to Iraq. The fact that the conflict in Afghanistan has lasted so long with so few convincing results has undermined support from the North Atlantic Treaty Organization (NATO) allies who bore the brunt of the responsibilities for the war during the Bush years. War fatigue has set in, making it increasingly likely that we have moved toward the equilibrium favoring the Taliban.
12. The Brookings Iraq Index, which is updated regularly, tracks such statistics (see Brookings Iraq Index 2010).
13. This argument can be developed from many political perspectives. There are those who believe that the Iraq conflict was the result of our failure to pursue Saddam Hussein during the 1991 Gulf War. In this analysis, the Gulf War appeared at first to be successful and inexpensive, but once the cost of Iraq is factored into the equation, it turns out to be far more costly.
14. Of course, incentives for deceptive accounting are pervasive. Firms want to persuade the tax collector that their income is lower than it really is, and investors that it is higher than it really is. The tension between the two may help lead to more "honest" accounting—so long as firms are not allowed to keep two separate books (see Stiglitz and Wolfson 1988). Part of the creativity of the financial and accounting sector in recent years has been directed at finding ways in which firms can report low profits for taxation and high profits for investors (see Stiglitz 2003).
15. During the years since the U.S. military intervention in Afghanistan, the overall U.S. military base budget has increased by a total of \$1 trillion. It is difficult to sort out which of the tens of thousands of items that received funding increases were related, directly or indirectly, to the wars. For example, the cost of TRICARE, the military's health care plan for the active duty armed forces, grew from \$19 billion in 2001 to \$30.7 billion for 2010. This is undoubtedly related to the wars in Iraq and Afghanistan, but it is also due to independent factors such as general health care inflation and advances in battlefield medicine. See the discussions of the difficulties of untangling

- military from war spending in Congressional Research Service reports (Belasco 2005 updates). Government Accountability Office (2005), and Wheeler (2007).
16. Transfer payments are simply payments from one party to another; they do not involve the use of resources.
 17. Statements by the Department of Defense Deputy Inspector General, the Defense Contract Audit Agency, the Special Inspector General for Iraqi Reconstruction (SIGIR) (2009), the Special Inspector General for Afghanistan Reconstruction (SIGAR) (2010), the Government Accountability Office (2008, 2010a-c), and the congressionally mandated bipartisan Commission on Wartime Contracting in Iraq and Afghanistan have all reported widespread profiteering and fraud involving bribery, kickbacks, conspiracy, awarding of lucrative contracts to relatives, setting up of fraudulent "shell" companies, and other problems. Investigations into fraud in Iraq have led to hundreds of indictments and dozens of convictions.
 18. See Commission on Wartime Contracting (2010). Commission cochair and then-congressman Christopher Shays said: "There's a vigorous debate in policy circles whether or to what extent security can or should be contracted out in combat zones. As we saw, contractor incidents can have a direct and devastating effect on United States objectives and public support for our presence."
 19. The U.S. Army generally uses two types of contractors to support military operations: system contractors and contingency contractors. System contractors typically provide support to specific weapon systems or to specified sets of components. They tend to perform very specific and precisely defined activities, and they serve during both wartime and peacetime. Contingency contractors provide a variety of support services primarily during operations. They usually provide more generic logistics support. The majority of contracts awarded in Iraq and Afghanistan have this designation, including the huge Logistics Civil Augmentation Program (LOGCAP) service contracts awarded to Halliburton subsidiary KBR. For data, see Government Accountability Office (2008).
 20. See Government Accountability Office reports (2008, 2010a-c). Note that the U.S. government does not keep track of the number of contractors killed and wounded; these numbers are based on reports to the Department of Labor (which provides insurance) and is likely to be an underestimate.
 21. See Commission on Wartime Contracting (2009). See also written testimony on May 24, 2010, of Deputy Inspector General Ginger Cruz from the office of the Special Inspector General for Iraq Reconstruction, Assistant Director Kevin L. Perkins of the Federal Bureau of Investigation's Criminal Investigative Division, and Deputy Inspector General James Burch of the Defense Criminal Investigative Service in the Department of Defense. All testimonies are available on the commission's website: <http://www.wartimecontracting.gov/index.php/hearings/commission/hearing2010-05-24> (accessed September 8, 2010).
 22. It is difficult to project the exact costs for wounded veterans because of uncertainty over the long-term course of each patient's medical treatment. But it is possible to estimate a range of outcomes and to project a minimum amount that will need to be paid for disability compensation. See chapter 3, "The True Cost of Caring for Our Veterans," in Bilmes and Stiglitz (2008); see also Bilmes and Stiglitz (2010).
 23. Secretary of Defense Donald Rumsfeld's answer to a question by Army specialist Thomas Wilson of the 278th Regimental Combat Team in December 2004, during town hall meeting with 2000 U.S. troops in Kuwait. The question posed by Wilson to Rumsfeld was, "Why do we soldiers have to dig through local landfills for pieces of

- scrap metal and compromised ballistic glass to up-armor our vehicles? And why don't we have those resources readily available to us?" (CNN 2004).
24. MRAP vehicles are designed with a V-shaped hull that enables them to better protect against improvised explosive devices (IEDs), which have caused the majority of U.S. deaths in Iraq. The U.S. Marines tested them in 2004 and in early 2005 requested that MRAPs be purchased in large quantities. However, the Pentagon did not authorize widespread purchase of the vehicles until May 2007. During this interval, more than 1000 U.S. troops were killed by IEDs.
 25. In 1990 Congress enacted the Chief Financial Officer and Federal Financial Reform Act of 1990 (also called the CFO Act), which mandated that federal agencies prepare and audit annual financial statements, modernize financial management systems, strengthen internal controls, develop cost information, and integrate program, budget, and financial systems. Since then, 20 of 24 cabinet-level departments have been able to achieve clean audit opinions. The Defense Department has never been able to produce auditable financial statements and consequently has flunked its audit (by external and internal auditors) every year. This has prevented the U.S. government from achieving the goal of the CFO Act, which is a complete, unqualified set of accurate financial statements. The Pentagon also lacks a cost accounting system.
 26. The ratio of deaths to wounded in hostile combat is 1:8 in Iraq and Afghanistan, compared with 1:36 in Vietnam and 1:2 or lower in previous wars. Including those injured in nonhostile incidents (such as nighttime vehicle accidents, accidents during transport to and from the theater, diseases, and other problems requiring medical evacuation), the ratio in Iraq and Afghanistan is 1:15 (see Leland and Oboroceanu 2010).
 27. In 2008, the United States had troops stationed in more than 130 countries worldwide. The largest contingents included Germany (56,222), Japan (33,122), and South Korea (26,339) (Department of Defense 2008).
 28. See Horton (2007). This paper shows that the Iraq and Afghanistan conflicts caused approximately 190 additional accidental fatalities compared with what would have occurred during peacetime deployments, by comparing the rate of accidental casualties in the five years prior to the invasion of Iraq and five years after. Extrapolating this to accidental injuries suggests that the rate of nonhostile injuries during the current conflict is 50% higher than during peacetime.
 29. Agent Orange is a chemical that was widely used by the U.S. military during the Vietnam War. Recent studies have shown that Agent Orange exposure increases the risk of developing some cancers (see, e.g., Chamie et al. (2008) and Shah et al. (2009)).
 30. According to a Pew Research survey conducted in February 2008, 54% of Americans said the United States made the wrong decision in using military force in Iraq, while 40% said it was the right decision. This percentage has climbed steadily since 2003. Between February 2005 and March 2007, the percentage of Americans saying that the war "was not going well" increased from 42% to 56%. During this period, the U.S. Army, Army Reserves, and Marines have faced difficulty in meeting recruiting targets. The fact that there is deterioration in the quality of personnel is an example of a nonpecuniary cost that should be included in the cost calculation. If there were a good metric of performance, then the wage per efficiency unit would be seen to have increased. Unfortunately, in the military, such metrics may not exist.
 31. The purpose of the no-fly zones was to prevent Iraqi military aircraft from flying over northern Iraq (Kurdish lands) and southern Iraq (near Kuwait). U.S. and British forces flew the majority of sorties, and France also participated until 1998. We estimated that

the cost to the United States of Operation Northern Watch and Southern Watch was \$12 billion per year, which we credited as a cost savings due to the war.

33. It is likely that the future costs of Medicare will increase because medical costs for the majority of the two million veterans of the Iraq and Afghanistan wars (those who are not disabled) are likely to be higher than average. These individuals will be outside of the Veterans Affairs (VA) health care system after their five years of free access expires. While this cost may eventually be very large, we were unable to estimate it in our analysis.
34. This is an obvious and dramatic example of a difference between budgetary and economic accounting. While shorter life expectancies lower budgetary expenditures on Social Security, few would suggest that there is an overall positive economic benefit from shorter lifespans.
35. For a discussion of the literature and some of the central references, see chapter 2 of Bilmes and Stiglitz (2008).
36. For instance, during the period May 2005 to May 2010, the consumer price index rose by an average annual rate of 2.0% while the rate of health care inflation rose at a rate of 3.4%. (In fact, the variance was even greater because some health care is factored into the CPI.) The rate of health care inflation has increased at a higher rate than the CPI every year between 1980 and 2010. See Congressional Budget Office (2007) and Health Inflation News (2010).
37. See Hormats (2007) for an interesting discussion of how previous wars have been financed.
38. In our book, we included three items: (i) the interest already paid on money borrowed for war operations to date, (ii) the interest payable through 2017 on money borrowed to date, and (iii) an estimate of interest payable on future borrowing for war operations under different scenarios for the war. In order to be conservative, we did not make a provision for (iv) additional funds that will need to be borrowed to pay for this interest, although that is likely, and (v) interest costs after 2017. If we had included (iv) and (v), the budgetary cost of the war would be much higher (Bilmes and Stiglitz 2008).
39. The Iraq and Afghanistan conflicts have been almost entirely financed through a series of "supplemental" appropriations bills, which bypass the normal vetting process for annual budget bills. There are a number of consequences to this method: one of the most troublesome is that congressional appropriators have not been able to obtain the same level of detail on spending plans as through the normal process, which has led Congress to approve billions of dollars in war spending with minimal scrutiny.
40. Payments to contractors are transfer payments, imposing a cost to the budget, but not a payment for resources deployed. In this case, the overpayments to contractors are direct hits to the budget, which exceed the value of any economic activity.
41. An exception may be oil. Since the U.S. military is the world's single largest purchaser of fuel, there may be an argument that the Iraq and Afghanistan wars, which have been highly fuel intensive, have had some effect on oil prices.
42. See chapters 3 and 4 of Bilmes and Stiglitz (2008), for a comprehensive listing of the impacts.
43. Matters are actually more complicated than that, since it could be argued that one should subtract the value of food and other resources used to sustain the individual.
44. In 2008 the EPA under the Bush administration lowered the estimate of the value of life for environmental regulations from \$7.8 million to \$6.9 million, which triggered public outcry, because it was seen as a way to weaken pollution rules. However, the water division of the EPA still uses a figure of \$8.7 million. See Associated Press (2008).

45. In our book we used a figure of \$7.2 million for the "value of statistical life" (VSL), which is in the range used by various civilian government agencies (Bilmes and Stiglitz 2008). There is an extensive literature on this topic. See numerous articles by W. Kip Viscusi and Joseph E. Aldy regarding VSL and the range of estimates for different ages. They estimate the VSL for men peaks at age 35 to 40 at \$9.9 million (Aldy and Viscusi 2008).
46. Three-quarters of this increase is due to higher claims activity and higher medical utilization of Iraq and Afghanistan veterans, 18% is due to a higher number of troops deployed, and 6% is due to the difference in Congressional Budget Office (2010) projections through 2020 instead of 2017.
47. See Hoge et al. (2002); also see work from the Veterans Health Research Institute.
48. Data include both living veterans and deceased veterans whose dependents received survivor benefits. Source data derived from the Annual Report of the Secretary of Veterans Affairs, VA's Annual Accountability Report, U.S. Census Bureau's Statistical Abstracts of the United States, and Institute of Medicine studies. See also Edwards (2010).
49. As of September 2010, 2.1 million U.S. troops had served in the Global War on Terror (GWOT) in Iraq and Afghanistan and there were 1.25 million veterans who were discharged. We had predicted that by 2010 some 29.7% (best-case scenario) and 3.7% (moderate scenario) of these veterans would have filed disability claims. But by September 2010, more than 40% of returning veterans had applied for disability benefits, with the average number of disabling conditions per claim also exceeding our estimates. Similarly, we expected that 33% of returning veterans would be treated in the VA health system by 2010. The actual number is running at more than 45%. See Bilmes and Stiglitz (2010).
50. We estimate the present value of total lifetime health care costs for these veterans (beginning in 2001 and projecting out 40 years to cover the age span 25 to 65 years of age) will be between \$201 and \$355 billion.
51. Even this analysis ignores potential impacts on the children.
52. See chapters 3 and 4 of Bilmes and Stiglitz (2008).
53. As of January 2009, there were 1.2 million Iraqi refugees in Syria, 450,000 in Jordan, and 300,000 in other Middle East countries, with thousands waiting for asylum in Europe (Brookings 2010).
54. Brookings (2010). However, Iraq earned more income in 2008 from its lower oil exports because of the high global price for oil.
55. Such studies typically are based on sampling techniques looking at, say, a randomly chosen stratified sample. Such an approach is far better than direct enumeration, especially since not all deaths, say, in rural areas, are reported or recorded.
56. The multiplier is just the amount by which GDP increases when government spending increases by a dollar. Different kinds of spending can have different multipliers.
57. Vice President Cheney was quoted as saying to Treasury Secretary Paul O'Neill that "Reagan proved deficits don't matter" (Weisman 2004). However, others in the administration, including O'Neill and subsequent Treasury Secretaries John Snow and Henry Paulson, were known to be concerned about the increasing national debt.
58. Interestingly, while the war may have contributed to the bubble indirectly, as it continued it may have contributed to the breaking of the bubble. While the high oil prices initially may have contributed to low interest rates, as the high oil prices eventually translated into broader scale high energy and food prices with resulting inflationary pressures, it may also have partially led to the increase in interest rates. It

- was the increase in interest rates that led to the breaking of the bubble. Of course, every bubble eventually bursts, it was just a matter of time.
59. There were two other factors that took on increasing importance over the same period. The first was the increasing importance of global warming, which meant that it became increasingly likely that the international community would eventually impose significant limitations on carbon emissions, reducing the market value of (demand for) oil. The second was the seeming increasing awareness of limitations in the total available supply of oil. The peak oil theory gained currency, though it was never clear the extent to which this was a theory pushed by the oil producers to justify the high oil prices that they were able to impose during this period. The analysis of the oil market is particularly difficult, because it is far from competitive, with governments either directly or indirectly making key supply decisions. It is hard to relate the large changes in oil prices in the 1970s to fundamental changes in the demand and supply of oil.
 60. The Department of Defense alone consumes 2% of all fuel in the United States and is the single largest purchaser of liquid fuel worldwide (U.S. Defense Energy Support Center 2004).
 61. That is, we have to compare the value of a marginal dollar to the current generation with an extra dollar to some future generation. Even if we weigh different generations equally, if future generations are better off, then the value of a marginal dollar will be smaller.
 62. News reports called the 32 Army suicides in June 2010 the "highest number in a single month since the Vietnam era" (Mount 2010). In 2009 the *New York Times* reported that suicides among soldiers had reached the highest rates in three decades (Alvarez 2009). Meanwhile, the Department of Defense reports that veteran suicides account for 20% of all U.S. suicides (Miles 2010).

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