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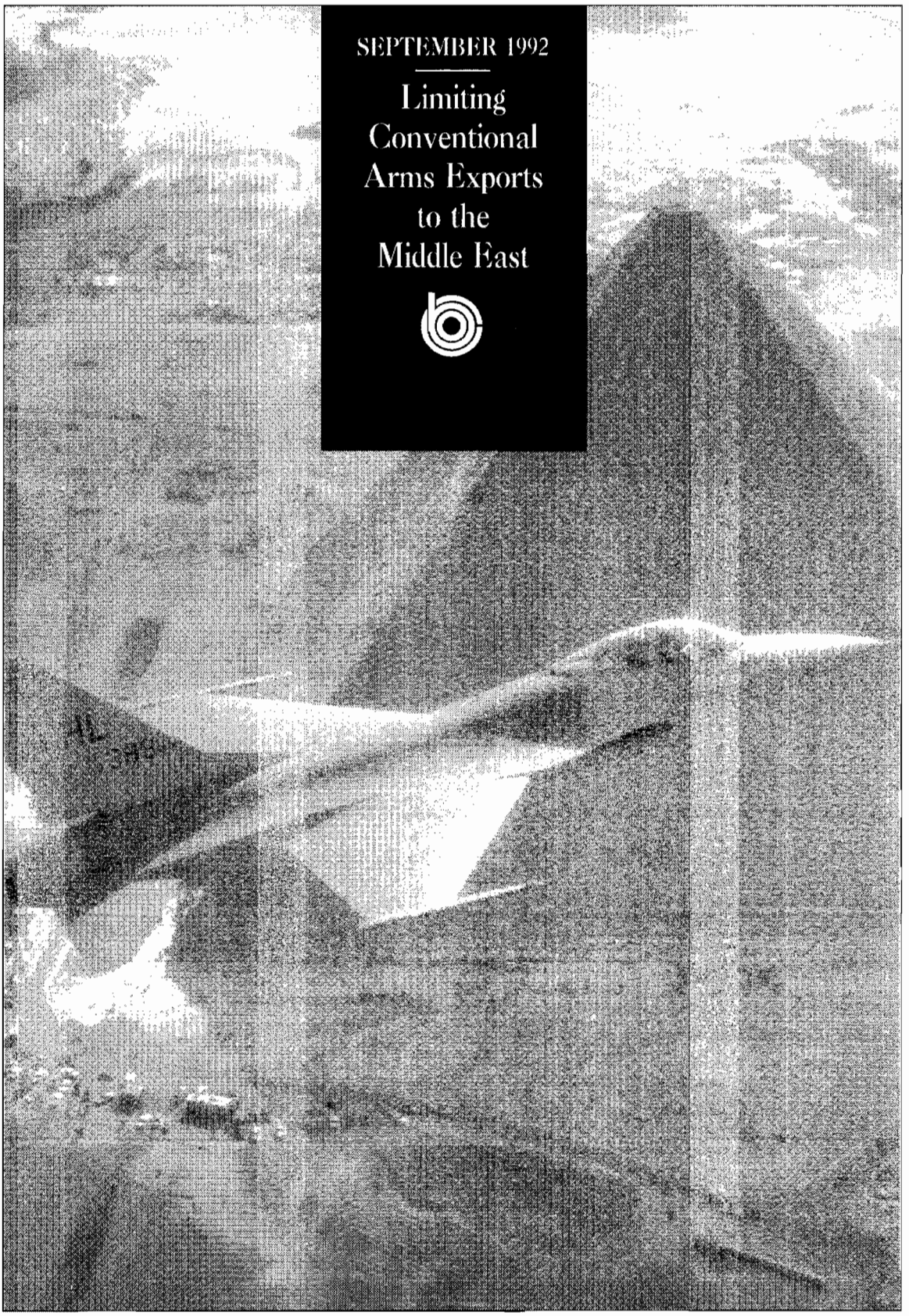
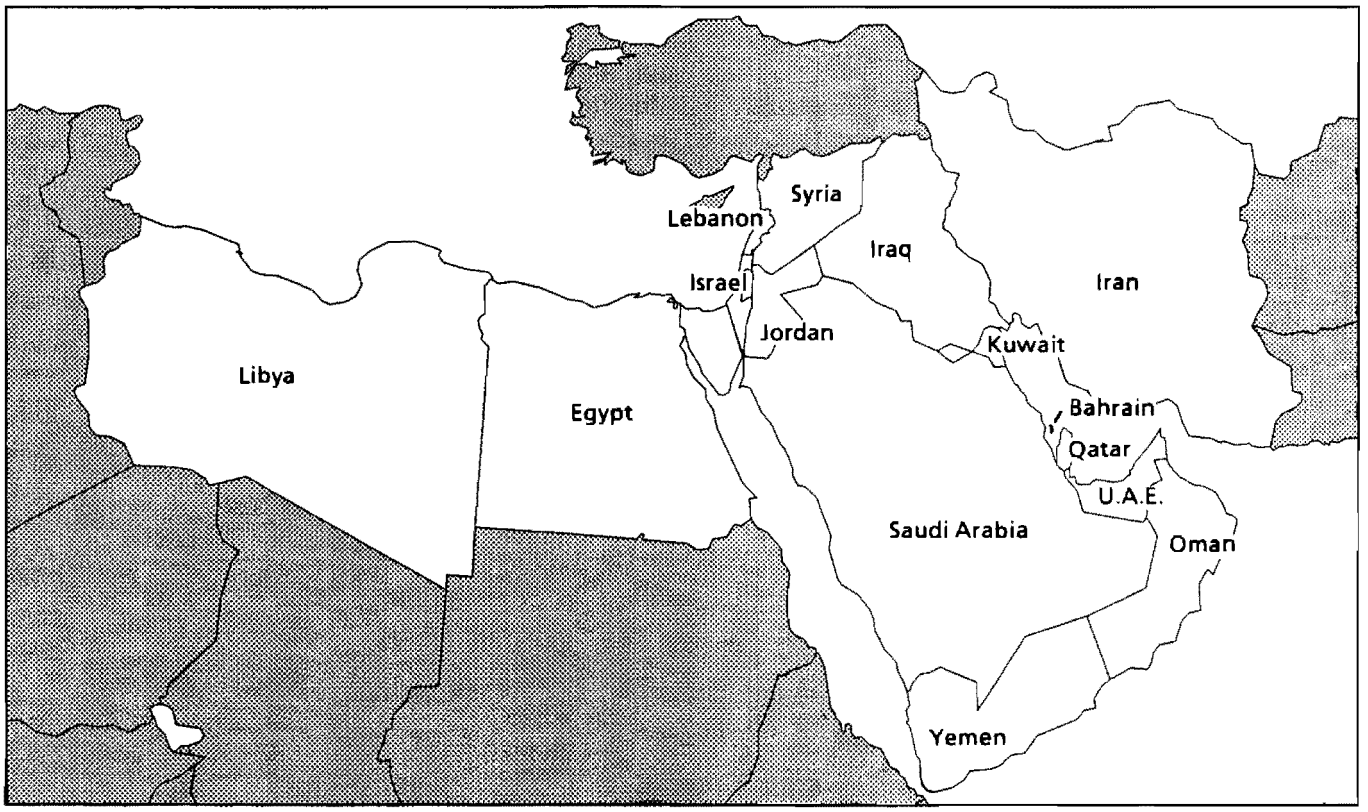
STUDY



SEPTEMBER 1992

Limiting Conventional Arms Exports to the Middle East

The Middle East



U.A.E. = United Arab Emirates

LIMITING CONVENTIONAL ARMS EXPORTS TO THE MIDDLE EAST

The Congress of the United States
Congressional Budget Office

NOTES

Numbers in the tables and text may not add to totals because of rounding.

All costs and prices in this study are in 1992 U.S. dollars unless otherwise indicated.

This study went to press just after the President proposed to the Congress that the United States sell 150 F-16 aircraft to Taiwan and 72 F-15 aircraft to Saudi Arabia, but before the Congress had acted on the President's proposals.

Cover photo: An F-16 flies over a pyramid in Egypt during exercise Bright Star '82. (U.S. Air Force photo by Staff Sgt. Bill Thompson.)

Preface

Arms sales to developing countries create conflicting feelings in the Western world. Some observers consider virtually any participation in the international weapons trade to be morally troublesome; others view the trade as necessary in a dangerous world and preferable to having U.S. troops bear a greater burden in defending other countries. Yet another group accepts that arms sales have an important role in U.S. foreign policy but is troubled by specific aspects of the current international commerce in weaponry.

This Congressional Budget Office (CBO) study, prepared in response to requests from the Chairmen of the House Committee on Foreign Affairs and its Subcommittee on Europe and the Middle East, examines the issue of arms sales to the Middle East. It sets forth and analyzes several options under which the major supplier countries could band together to limit their sales of conventional weaponry to that volatile and highly militarized region.

Michael O'Hanlon, Victoria Farrell, and Steven Glazerman wrote the study under the supervision of Robert F. Hale, R. William Thomas, and Robert Dennis. O'Hanlon designed the options and wrote most of the study. Farrell, assisted by Stephan Thurman, wrote Chapter 6 covering the macroeconomics of the subject. Glazerman wrote Chapter 2 and Appendix A on the history of the global arms trade. Michael Berger, Frances Lussier, and Lane Pierrot made insightful critiques of early drafts of the study; Lussier also helped with the military analysis. Karen Ann Watkins and Mark McMullen provided research assistance on calculations of military balance and macroeconomic calculations, respectively; Joe Whitehill gave early guidance.

The authors gratefully acknowledge the assistance of numerous outside scholars--none of whom, of course, bear responsibility for the contents of the study. Janne Nolan of the Brookings Institution, Barry Posen of the Massachusetts Institute of Technology, and Lee Feinstein of the Arms Control Association thoroughly reviewed an early draft. Alan Platt, Michael Krepon, William Durch, and other analysts at the Henry Stimson Center offered reactions to the main approach of the study, as did Spurgeon Keeny, Matthew Bunn, and several of their colleagues at the Arms Control Association.

Richard Grimmett and Robert Shuey of the Congressional Research Service, William Keller and Todd LaPorte of the Office of Technology Assessment, and a number of Congressional staff members also were very helpful.

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Additional assistance came from representatives of the aerospace industry, the Department of Defense, the Central Intelligence Agency, the Defense Intelligence Agency, the National Academy of Sciences, and the Arms Control and Disarmament Agency. Yasushi Akashi and his colleagues at the United Nations Department for Disarmament Affairs contributed to the early stages of the project.

Roger M. Williams edited the study. Christian Spoor provided editorial assistance. Cynthia Cleveland, Judith Cromwell, and Linda Lewis typed several drafts. With the assistance of Martina Wojak-Piotrow, Kathryn Quattrone prepared the manuscript for publication.

Robert D. Reischauer
Director

September 1992

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Summary

For perhaps the first time in its history, the United States is determining the size of its military forces largely in reference to the size and capabilities of the military forces of developing countries. Yet the United States and other major industrialized powers are also the main sources of modern weapon systems for those countries. The 1991 Gulf War provides a vivid demonstration of that seeming paradox: the United States and its coalition allies undertook a major combined-arms operation to defeat a country that the coalition itself had armed.

Despite a recent decline in the volume of the arms trade with the Middle East, ongoing tension and conflict in the region could spark a new arms race there--especially when coupled with excess weapons inventories and production facilities in the chief supplier countries.

But there are reasons to believe that the dynamics of the Mideast arms trade can now be changed. The major powers--who are also the major weapons suppliers--have strategic interests in the Middle East that are not fundamentally incompatible. If the major powers are prepared to take the lead in ushering in new patterns of international relations in the post-Cold War world, the Middle East may provide fertile ground for fresh ideas and new policy. Judging by its efforts in behalf of peace in the region, the Administration appears to feel that way as well.

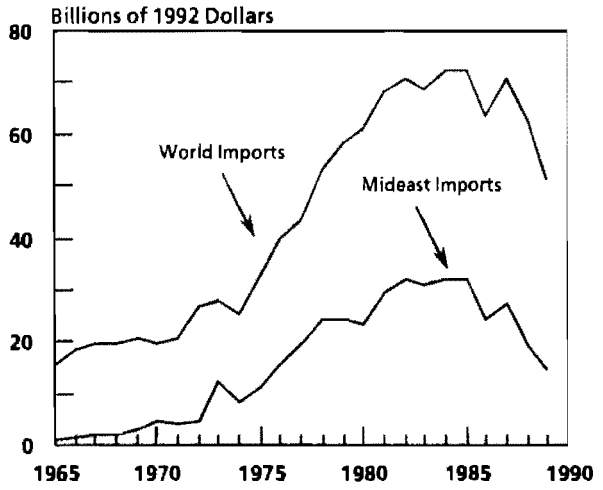
Should the trade in arms with the Middle East be limited? If so, how? What would be the military and economic effects of such limits, both in the United States and in other countries? This study discusses efforts by the Administration to apply certain nonbinding guidelines to the international arms trade with the Middle East. But it concentrates on the design and effects of several options based on multilateral, binding constraints. The study focuses on conventional arms, which exclude nuclear, biological, and chemical weapons.

Trends in the Arms Trade

The international arms trade increased about threefold between the beginning of the 1970s and the mid-1980s (see Summary Figure 1). By the 1980s, as much as $74 billion worth of defense goods was being transferred internationally each year. In the last two decades, countries in the Middle East, which together contain about 3 percent of the world's population, have imported over 30 percent of all weapons transferred among exporters and importers. That relatively high level of imports, coupled with the volatile nature of the area, accounts for the Mideast focus of this study.

In recent years, arms transfers to the Middle East have dropped off to less than half of their peak level in the 1980s. Lack of cash in some Mideast nations, fewer arms sales on favorable terms by nations of the former Soviet Union, and the international embargo on Iraq all helped produce the decline. It is possible that this downturn in arms transfers will prove durable.

Summary Figure 1.
Arms Transfers to the World and the Middle East



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTE: Arms transfers include shipments of military goods and services.

But there are also good reasons it may not. Mideast tensions remain high, creating continued pressure to buy weapons. Pressures to sell them also remain high. In view of reduced domestic purchases, the survival of some defense firms--and the jobs of the people they employ--may depend on foreign sales. It is therefore not clear that, in the absence of effective limits, arms transfers to the Middle East will remain at their recent lower levels.

The Administration's Approach

In the spring of 1991, President Bush proposed multilateral efforts to control the transfer of weapons to the Middle East. Much of the initiative restated existing Administration policies regarding limits on nuclear, biological, and chemical weapons. In the realm of conventional weapons, the Administration proposed that the five permanent members of the U.N. Security Council (the "Perm-5" countries) share information confidentially and early in the sales process about agreements to transfer major weapon systems to the Middle East. The proposal came in the wake of Congressional actions aimed at imposing various limits on sales. The Perm-5 are still discussing U.S. initiatives. Some progress appears to have been made, but the outcome of the talks remains unclear.

The Administration argues that early sharing of information might discourage transfers that could contribute to a destabilizing buildup of military capability in the Middle East. At the same time, under this approach the United States could still provide arms and related services wherever it deemed it appropriate to do so. Only with such transfers, the Administration argues, can the United States help friendly regional powers improve their security.

Although the Administration's approach may constitute a reasonable first step toward curtailing the arms trade, it could have only a limited effect. Military and political analysts frequently disagree about which weapons are intrinsically destabilizing and which Mideast countries are intrinsically more trustworthy than others. Suppliers no doubt will frequently disagree about whether a particular sale would contribute to a dangerous arms race. In many cases, destabilization results not from one sale but from the cumulative effect of numerous transactions over a period of time. Those problems and ambiguities, coupled with strong economic pressure to sell arms, could undermine any nonbinding guidelines intended to limit sales.

Indeed, Administration officials may have acknowledged as much. In recent months, the Central Intelligence Agency has stated that Iraq is likely to rearm to pre-Gulf War levels by the end of the decade--which could only happen if major suppliers send large arms shipments to the Middle East. Not surprisingly, Administration officials have concluded that, no matter how many arms are sold to Saudi Arabia and other friendly countries in

the region, the United States will have to remain the guarantor of Gulf security into the indefinite future.

Binding Limits on Supply

Rather than rely on broad, nonbinding guidelines, supplier countries could band together and agree to impose mandatory, quantitative limits on the transfer of arms to the Middle East. Many questions would have to be answered in designing such limits.

Participants

Which countries must participate in supplier-imposed limits? To be workable and fair, the limits would have to cover the vast majority of weapons produced worldwide. That criterion, though stringent, could be met with an agreement involving relatively few supplier countries. In recent years, the Perm-5 countries produced about 86 percent of all major weapons traded internationally, as measured in dollar value (see Summary Table 1 for more detail). Even without China, whose willingness to abide by supplier-imposed limits is questionable, the four remaining countries--the United States, the United Kingdom, France, and Russia--accounted for about 80 percent of all exports.

Moreover, the United States might not find it any more difficult to gain the cooperation of several other key European countries, such as Germany, Italy, and Spain. It might also be able to persuade other supplier countries with which it has good relations at least to avoid expanding their arms shipments to the Middle East. Most sources of supply to the region might thereby be controlled.

Because it already frequently consults with major suppliers regarding arms transfers, the United States may be able to gauge the prospects for achieving binding limits before it announces any initiative publicly. In addition, it might be able to use its informal security relationships with several Mideast countries--such as Israel, Egypt, and Saudi Arabia--to solicit their advice and seek their understanding of its policy goals.

Summary Table 1.
Global Arms Transfers by the Five Permanent Members of the U.N. Security Council in the 1980s (As a percentage of total shipments by all countries)

	Combined Share of Perm-5 Countries
Tanks	84
Armored Personnel Carriers	79
Supersonic Combat Aircraft	94
Subsonic Combat Aircraft	99
Field Artillery	73
Helicopters	87

SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTE: The five permanent members of the U.N. Security Council (Perm-5) during this period were the United States, the Soviet Union, the United Kingdom, France, and the People's Republic of China.

This is not to suggest, however, that negotiating binding limits would be easy or problem-free. The United States would need to ask the governments of the supplier nations to take positions that would sometimes be unpopular at home. Political relations with some Mideast importers could also become more strained.

How Limits Might Be Set

Should quantitative limits apply to exports or imports? Limits imposed on aggregate exports to the Middle East might seem less of an affront to the sovereignty of importing countries. An across-the-board, regionwide limit on exports would not, however, prevent a Mideast country from garnering more than its traditional share of weapons and building up a large arsenal. Export limits also might "lock

in" each supplier's share of the market in a way inconsistent with free economic competition. Limits on total imports by each Mideast country suffer from neither of these disadvantages but might be more difficult to design and implement.

Should quantitative limits apply to numbers of weapons or to their value, and at what level might limits be set? Limiting the numbers of weapons is a simple approach and has been used previously in arms control (for example, in the Conventional Forces in Europe Treaty). Dollar ceilings, although they involve difficult pricing issues, have the advantage of reflecting differences in the quality of weapons.

Establishing the level of any limit would certainly be difficult. The debate might be guided by the suggestion of experts that many developing countries reduce their military expenditures by about half and apply the resources to improving their economies. There is no guarantee that countries would simply accept externally imposed limits; they might try to expand domestic production or increase purchases of arms from suppliers not respecting limits. But reductions of 50 percent would not be so severe as to allow smaller suppliers outside the cartel to dominate the future Mideast market.

Limits might not apply to domestic production of arms. This exception would be of limited military significance because most Mideast countries cannot produce sophisticated arms on their own. But, to be effective, limits probably should apply to coproduction, in which an exporter supplies key components and technologies and assists a Mideast country in manufacturing weapons. And limits probably should attempt to encompass the contributions to final weapon systems made by external suppliers--such as U.S. tank engines imported by Israel for its Merkava tank.

Verification and Enforcement

Could limits on the arms trade be verified and enforced? Some Mideast countries probably would not allow on-site monitoring; after all, they are not assumed to be parties to the accord limiting arms sales. As a consequence, most verification would have to be done by the supplier countries, principally through use of satellites and other means of intelligence gathering and supplemented by detailed data bases on sales agreements and deliveries that the suppliers would share with each other.

Even with those tools, verifying transfers of smaller weapons and weapons components would probably be difficult. Monitoring the transfer of major weapons probably is feasible, however. Factories that are coproducing major weapons should also be detectable--even if their output rates could not be ascertained with complete precision. For these reasons, limits applying to major weapons probably would be effectively verifiable.

In the event that violations occurred and were detected, responses would be necessary. Significant violations, for example, could be redressed through a proportionate decrease in the offending country's allotment of weapons for the next year.

Illustrative Approaches

Supplier countries could choose one of three broad types of options: a limit on exports, a limit on imports, or a limit on both. Summary Box 1 provides more details about each of these approaches. The second, with a limit of $700 million a year on the imports of major weapons by any Mideast nation, serves as an illustrative example in much of the analysis in this study.

Summary Box 1.
Illustrative Options for Supplier-Imposed Limits on Arms Sales to the Middle East

Limit Exports

Each major supplier could be restricted in selling weapons beyond a certain number or a certain dollar value. For example, exports to the region by each supplier might be limited to a level equaling about one-half of past sales--perhaps somewhat less for the former Soviet republics.

Limit Imports

Suppliers could restrict the number or the dollar value of weapons that any one Mideast country would be permitted to import. Domestic production would not be limited, but suppliers' contributions to coproduced major weapons would be.

Limit Exports and Imports

Suppliers could initially impose modest limits on their own aggregate exports to the Middle East, showing self-restraint in an effort to minimize the affront that limits might cause to importing nations. More restrictive checks on imports could gradually be imposed to ensure that no country could amass a large stock of weapons.

Some Adverse Economic Effects

The import limit used as an illustrative example in this study would have only slight macroeconomic effects on most countries. Under the example, sales of major weapons to the Middle East would be reduced by about 50 percent relative to levels typical of the 1980s; the total value of annual arms exports to the region might decline by 35 percent to 40 percent, or $7 billion to $8 billion. Even if the United States absorbed a disproportionate share of these cutbacks, U.S. exports probably would fall by no more than $3 billion a year--some 20 percent of the country's total annual arms exports. As sales to the Middle East fell, U.S. gross domestic product (GDP) would be reduced by only about 0.02 percent (assuming that all other arms sales were unaffected)--and even this very slight loss in GDP would be only temporary.

Reductions would also be tiny in most other supplier nations. However, the former Soviet republics--and especially Russia--could feel more significant effects because their arms sales are principal sources of hard currency.

If U.S. exports were reduced by $3 billion a year, forgone sales would represent 1 percent or more of 1990 output levels in only a few of the 420 major U.S. industrial sectors. By the mid-1990s, the percentage effects of reductions in exports would be modestly higher as domestic production falls.

In the specific case of the tank industry, however, effects could be more severe. Forgone exports under this study's illustrative example might reduce production by perhaps 15 percent to 20 percent of the potential total, if reductions in tank export orders were proportional to overall reductions in exports. It is possible that a small number of other defense industrial sectors could be significantly affected as well.

As many as 75,000 jobs might be lost in the U.S. defense sector if U.S. arms sales were reduced by $3 billion a year. This potential loss represents less than 0.1 percent of the nation's total employment and less than 2 percent of all defense-related employment. New nondefense employment opportunities generally would develop fairly quickly--although many of the individuals who lost their positions might not be quickly reemployed in jobs of comparable skill and wage levels.

Effects on European defense industries probably would be modestly greater than those in the United States because exports constitute a somewhat larger part of the European arms business. Still, most large European defense firms are more diversified than their U.S. counterparts, so civilian markets should provide a cushion against losses in defense orders.

Limits on the arms trade would harm only a handful of specific companies. But the effects on those companies could be substantial. In the 1990s, a few U.S. defense firms will depend heavily on foreign sales to sustain production of certain weapons. Limits on exports could in effect close some of their production lines, with adverse effects on employees and on the economies of the local areas where the companies are located. Most local areas would eventually recover fully--many quite quickly--from the economic setbacks. But there would be acute pain in certain areas.

Closing lines would also reduce or even eliminate the ability of the United States to manufacture certain military weapons; several years could be required to restart the lines if they again became needed. But the United States may not need to maintain the capability to produce all types of weapons on a continuous basis. Some weapons would be needed only in the distant future or in the event of a major war--which in the post-Cold War era presumably would occur only after several years' warning. For those weapons, it may be acceptable to close down lines and plan to restart production as needed. Alternatively, the government could pay to maintain low-rate production, or it could upgrade existing weapons to retain productive capability.

Potential Improvement in Military Outlook

Although there would be some short-term adverse effects in supplier countries, binding limits on the arms trade might improve the military outlook in the Middle East. Binding limits could prevent huge military buildups of the sort that have occurred in the region in recent years. Between 1981 and 1991, for example, the weapons potential of Iraq's ground forces more than doubled, and the weapons potential of its tactical air force roughly doubled. Buildups of that magnitude would be impossible if, in accordance with the illustrative example used in this study, that country's imports of major weapons were limited to $700 million a year. That amount equals roughly one-fifth of Iraq's average annual imports of major weapons during the 1980s.

Avoiding large military buildups, and generally slowing growth in military capability, could benefit key Mideast nations that are friendly to the United States. An import limit might benefit Israel, which historically has depended less on arms imports than have its Arab neighbors. Limits could be constructed that would tend to preserve the current balances of military forces between Israel and other countries in the region--balances that at present appear to favor Israel. Limits also might enhance Saudi Arabia's military capability, especially because they could be phased in and thereby allow existing agreements to be honored before becoming fully binding. If the imports of potential adversaries were restricted, Saudi Arabia's manpower limitations--which prevent that nation from maintaining large ground forces--might not be as serious a handicap.

With or without arms limits, however, it is unlikely that Saudi Arabia will be able to achieve a sufficiently strong military posture to be able to defend itself. Thus, the United States probably will have to remain the guarantor of Saudi Arabia's security.

The illustrative limit might also leave roughly unchanged the balance of military forces among a number of other Mideast countries. For example, the balance between Iraq and Iran probably would not shift substantially.

Binding limits may not be necessary to realize these benefits. Arms sales have recently declined below levels typical of the 1980s and, because of shortages of cash and fewer concessionary sales, may remain low. Mideast tensions and domestic pressures to export in the supplier countries, however, remain high. Without effective limits on the arms trade, therefore, imports could climb again. It may thus behoove the United States and other countries at least to consider how binding

limits might be designed and implemented in case they seem necessary in the future.

Economic Benefits Possible for Mideast Countries

If limits on the arms trade can maintain or improve Mideast military security while also reducing defense expenditures, the countries of that region could obtain significant economic benefits. Mideast countries generally have been spending well over 10 percent of their annual gross domestic product on military forces. Of that amount, some 4 percent of GDP generally has financed arms imports. Under the illustrative example, arms imports would be reduced by at least one-third--probably freeing up significant resources in the majority of countries.

If devoted to consumption, the newly available resources could be used to raise living standards in the Middle East. Alternatively, some or all of the extra resources could be invested in that region. Doing that could increase the level of real GDP in major Mideast countries by 2.5 percent or more on average.

If either of these routes--consumption or investment--is chosen, increases in domestic aggregate demand in the Mideast countries in all likelihood would be accompanied by big increases in their nonmilitary imports. Such increases in nonmilitary imports would largely offset reductions in Mideast arms imports and thereby stimulate nonmilitary production in the developed countries.

Eventual Reductions in U.S. Defense Spending

Limits on the arms trade also might eventually permit reductions in defense spending in the United States. According to the Joint Chiefs of Staff, the U.S. military is now being designed for sufficient capability to engage in two major regional wars simultaneously. The most demanding potential war probably would occur in the Middle East. So if Mideast countries were less well armed, the United States itself eventually might need less in the way of modern forces.

How much might the U.S. defense budget be reduced? A precise estimate cannot be made, but the potential magnitude can be illustrated. As noted earlier, the Central Intelligence Agency has estimated that, in the absence of limits on arms transfers, Iraq might--by the end of this decade--return to the force levels it maintained in 1990. Under the study's illustrative limits, however, Iraq's capabilities would be held to lower levels--particularly in ground forces.

If the weapons potentials of other countries in the region also are controlled and if the security environment in Europe further stabilizes, the United States might be able to reduce its forces by several ground divisions and tactical air wings, as well as by some naval units. The related savings in operations costs could amount to about $10 billion a year. Total savings could be larger still if the abatement of regional threats persuaded U.S. policymakers to scale back plans to modernize forces with new and expensive weapons.

However, such savings would not be guaranteed. Depending on one's assumptions, U.S. defense needs may or may not be strongly tied to Mideast force levels. Moreover, even if limits on arms transfers did permit budgetary reductions, they might not be realized for many years.

One should not assume that additional cuts in the U.S. defense budget--beyond those the Administration has proposed--must necessarily await limitations on Mideast threats. Congressional leaders have proposed additional cuts that are not contingent on developments in the Middle East. But because the Middle East is an important factor in de-

termining U.S. military needs, effective limits on the arms trade might lead to smaller U.S. defense budgets than would otherwise be likely to emerge from the budget process.

Obstacles Remain Considerable--But So Does Promise

For reasons given above, achieving and sustaining a system of binding limits on arms transfers would not be easy. Any agreement would have to be negotiated at a high level of the U.S. government, requiring the time and attention of the Secretary of State and the President. Efforts to negotiate and implement limits could strain relations with some allies and would probably be viewed by some Mideast countries as politically offensive. Monitoring also would be challenging--and very important to the success of the limits. Most important of all, the major supplier countries would have to be willing to forgo some of the near-term economic benefits of arms exports in hopes of eventually achieving improvements in security and reductions in their defense budgets.

The challenges, although considerable, may not be insuperable. The end of the Cold War may permit substantial cooperation between the United States and the former Soviet republics on issues such as limiting the arms trade--especially in the aftermath of the Gulf War. Washington retains close relations with most other major supplier countries, and for the most part they appear sensitive to the need for reshaping international security policy in the post-Cold War world.

The benefits of limiting the arms trade may justify the costs. A system of limits--if it can be made effective--could usher in a safer and more prosperous period in Mideast history while perhaps also easing the burden military spending imposes on the U.S. economy.

Chapter One

Introduction

More than 100 countries buy or sell conventional weapons on the international market. Most of the buyers lack a national defense industrial base, so participation in the global arms trade is their only means of building a modern military force. For many suppliers, selling arms is the only way to achieve economies of scale; for virtually all of them, it is an important source of revenue and jobs.

In the Middle East and elsewhere, arms sales often serve important foreign policy goals for countries such as the United States, allowing the supplying country to help important friends and allies strengthen their own defenses as sanctioned by the United Nations Charter. Conventional arms transfers therefore enjoy a certain legitimacy in the eyes of the international community--in contrast to trade in nuclear, chemical, and biological weapons, which the major potential suppliers have taken numerous steps to stop or at least curtail.

Even though transactions involving conventional weapons are rarely viewed as inherently dangerous, certain sales have had dire consequences for global security. They have been highly destructive in various civil wars--Vietnam, Angola, Nicaragua, and Afghanistan are prime examples--and in interstate wars in the Middle East. Iraq fought U.N. coalition forces with weapons made almost entirely in several countries (France and Russia in particular) that gave the coalition its mandate.

For many reasons the Middle East is probably the most strategically volatile region of the world. It is also the region where large weapon systems--including tanks, artillery, and combat aircraft--have figured prominently in the fighting and in determining the outcomes of wars. These weapons are the most effective at waging rapid wars of conquest. They also are the weapons whose production is most heavily concentrated in several countries and whose movements are most easily monitored--meaning that they may be the most amenable to control. Thus, for reasons of political urgency and arms control practicality, this study focuses on the Middle East--although many of its findings may, once suitably adapted, have relevance for other regions of the world as well.

As history attests, it is not easy to limit arms sales. The 1950 Tri-Partite Declaration, by which Britain, France, and the United States agreed to limit sales to all parties in the Middle East, eventually proved untenable in the face of the entry of Czechoslovakia and the Soviet Union into the Mideast arms market. The Carter Administration's Conventional Arms Transfer Talks (CAT talks), after making some initial headway, ran head-on into realities of the Cold War: when all was said and done, both superpowers preferred to pursue geopolitical advantage by aiding friendly

governments rather than enter into arms control agreements. The Soviet invasion of Afghanistan provided the coup de grace.[1]

But the world has now changed in ways that may make it feasible to impose limits on arms transfers. With the end of the Cold War, Western countries and the republics of the former Soviet Union may be more willing to cooperate in limiting the arms trade. Within the last year, the five permanent members of the U.N. Security Council (the "Perm-5"--the United States, Russia, China, the United Kingdom, and France)--have begun to discuss ways of keeping a careful eye on the arms trade with the Middle East; considerably more ambitious efforts may be possible.

Security in the Middle East

Although limits on arms transfers could be applied to many areas of the world, transfers to the oil-rich Middle East warrant particular attention.[2] Oil provides the means to conduct the extraordinary military buildups and wasteful arms races documented in Chapter 2. Oil also provides the rationale for keen Western interest in what occurs in that part of the world.

The Middle East, which accounts for about 3 percent of the world's population, bought on average more than 30 percent of the world's military goods and services in the 1980s, according to the U.S. Arms Control and Disarmament Agency. The region dedicates more than one-tenth of its output to military expenditures, more than double the ratio for any other region--with the possible exception of the former Soviet Union and its Warsaw Pact allies (see Figure 1).

Many observers fear that deep-rooted tensions among Arab countries, between Israel and its Arab neighbors, and between Islamic fundamentalist and secular political forces easily could flare into major war--as they have numerous times in the past. Moreover, wars of that type have involved the highest of stakes--threatening the very existence not only of individual leaders but of their countries as well. Such conflicts have tended to occur within confined geographic bounds, where pressures quickly escalate to involve the most dangerous types of weaponry.[3]

Some suppliers recognize the dangers to peace that their arms shipments to the region create, but none is willing to take unilateral action for fear of losing markets while its competitors continue to sell. Most countries that manufacture conventional weapons place restrictions on exports, but these are usually ad hoc.

There has never been a successful, internationally coordinated policy that restrains conventional arms shipments to an entire region. But the end of the Cold War and the military defeat of the world's leading arms importer, Iraq, may provide an unprecedented opportunity to establish multilateral cooperation to stanch the flow of arms to what is probably the

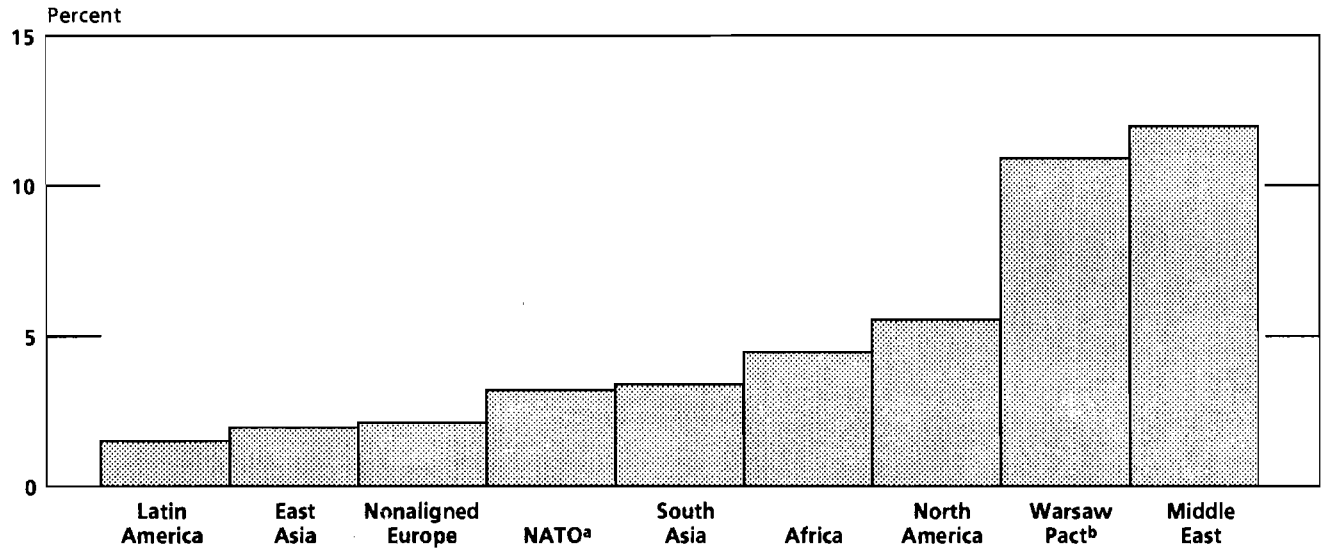
1. See Barry M. Blechman, Janne E. Nolan, and Alan Platt, "Negotiated Limitations on Arms Transfers: First Steps Toward Crisis Prevention?" in Alexander L. George, *Managing U.S.-Soviet Rivalry: Problems of Crisis Prevention* (Boulder, Colo.: Westview Press, 1983), pp. 261-281; Janne E. Nolan, "The U.S.-Soviet Conventional Arms Transfer Negotiations," in Alexander L. George, Philip J. Farley, and Alexander Dallin, *U.S.-Soviet Security Cooperation* (New York: Oxford University Press, 1988), pp. 510-523; Andrew J. Pierre, *The Global Politics of Arms Sales* (Princeton, N.J.: Princeton University Press, 1982), pp. 285-290.

   The Carter Administration's efforts were part of a broader policy, unveiled as Presidential Directive 13, that emphasized the need to avoid introducing new technologies to most regions of the world and to limit the overall flow of arms. For further discussion, see, for example, Gary Sick, *All Fall Down* (New York: Random House, 1985), pp. 13-28; and Pierre, *The Global Politics of Arms Sales*, pp. 52-54.

2. Throughout the study, the Middle East refers to Libya, Egypt, Jordan, Israel, Lebanon, Syria, Saudi Arabia, Yemen, Oman, Qatar, the United Arab Emirates, Bahrain, Kuwait, Iraq, and Iran.

3. For a comprehensive discussion of escalation, see Barry R. Posen, *Inadvertent Escalation* (Ithaca, N.Y.: Cornell University Press, 1991).

Figure 1.
Share of Regional Output Devoted to Military Spending, 1989



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTE: NATO = North Atlantic Treaty Organization.

a. Does not include spending by the United States and Canada.

b. Spending by the Warsaw Pact has declined precipitously since 1989.

most volatile and dangerous region of the world--the Middle East.

Pros and Cons of Limiting Arms Sales

Restrictions on the arms trade to the region will certainly not solve all of its security problems. After all, removing a source of weapons will not dissolve political conflicts that have persisted for generations. Nor will limiting the sophistication of weapons necessarily blunt the destructiveness of war. Infantry combat, exemplified in World War I, is inherently no less deadly than the armored blitzkrieg attacks characteristic of the 1991 Gulf War. The Iran-Iraq War, the longest and deadliest in modern Mideast history, demonstrated the lethality of relatively low-technology weapon systems.

Limits on conventional arms sales, if too restrictive, could even prove dangerous. They could introduce incentives for former arms importers to expand their own conventional armaments industries, to enter into collaborative ventures with suppliers not bound by the limits, and perhaps to accelerate their programs to develop nuclear, chemical, and other nonconventional weapons. Perhaps most ominously, such limits, if improperly devised and implemented, could increase the chances of war by allowing aggressive states to improve their relative military standing.

Yet the advantages of appropriately set limits might well outweigh those risks. A leader considering a war of aggression is most tempted by the prospect of rapid and conclusive victory.[4] Limits on armored and air

4. See, for example, John J. Mearsheimer, *Conventional Deterrence* (Ithaca, N.Y.: Cornell University Press, 1983); and Geoffrey Blainey, *The Causes of War* (New York: The Free Press, 1973), pp. 35-56.

forces therefore might reduce the prospects that war could be won quickly, definitively, and easily. And limits on conventional arms transfers seem unlikely to increase the proliferation of weapons of mass destruction. Countries wishing to develop nuclear and other nonconventional weapons generally have made great efforts to do so even when granted full access to conventional arms. Indeed, the list of recent proliferators and attempted proliferators reads like a Who's Who of major importers of conventional arms: Iraq, Iran, Syria, Israel, Pakistan, and North Korea.

Efforts to limit arms transfers could cause diplomatic rifts with other suppliers and with Mideast countries. But there could also be political benefits to finding ways of making the region safer through cooperative action. Moreover, the ongoing discussions on arms sales among the Perm-5 countries provide a ready forum for broaching such ideas with the other major suppliers, and the Mideast peace talks offer a way to secure the involvement of at least some regional states at a time when those states seem unlikely to reach wide-ranging accords on their own.[5] There is reason to think that some Mideast leaders might--at least privately--appreciate outside efforts to reduce the weight of their defense burdens. Restrictions on arms transfers could contribute to such efforts.

Limits on the size of Mideast armed forces might reduce the chances that major war will again occur in the region. The major Mideast wars of the last two decades were initiated by countries that previously had engaged in major arms buildups--for example, Iraq in 1980 and 1990, and Egypt and Syria in 1973. Preventing such buildups in the future, even if not a guarantee of peace, nevertheless might reduce the chances that a country would be sufficiently emboldened to launch a major war against a neighbor.

Finally, lower arms levels in the Middle East could make it possible for the United States to reduce further its own military spending. The Middle East has become a key factor in U.S. military force planning and seems likely to remain so. Limiting the capability of countries in the region to launch massive wars could ease requirements on U.S. military forces and reduce the scale of any war that might nevertheless take place.

Multilateral restraint as a means of increasing security in the Middle East has only recently come into open debate. Several difficult questions challenge the notion of restricting the arms trade. How can an appropriate framework be designed for restraining arms flows to the Middle East? Who should participate? How effective could the restrictions ultimately be? If successful, what would be their economic impact, and how would they affect the balance of forces in the region?

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5. See Geoffrey Kemp, *The Control of the Middle East Arms Race* (Washington, D.C.: Carnegie Endowment for International Peace, 1991), pp. 9-10, 119-130, 177-182.

Chapter Two

Buyers and Sellers: Trends in Conventional Arms Transfers

The last half-century of global arms transfers has left an important legacy in the form of weapons stockpiles and trade relationships. The options in this study for limiting arms flows must account for these products of the past. Three particular factors have a crucial bearing on the prospects for limiting arms exports to the Middle East:

- Reflecting the global trend, exports to the Middle East have dipped recently, although the levels are still higher than historical averages for 1965 through 1980.
- Because of the many years of unchecked arms trading, Mideast nations currently have extensive weapons inventories despite the destruction of equipment in war.
- A few weapons-producing nations control most of the exports to the region, so supplier cartels are theoretically possible.

Growth of the Arms Trade Since 1950

The world arms market grew slowly and steadily from 1965 through 1980, when the value of worldwide deliveries of military goods and services surged from $20 billion a year to more than $60 billion a year (see Figure 2).[1] The level then climbed to a peak of $74 billion in 1984 before skidding back to $52 billion in 1989, the most recent year for which complete data are available.[2]

The value of annual transfers to the Middle East grew even more dramatically in the 1970s--from $4 billion to $24 billion. That level peaked at $33 billion in 1984, returning to $15 billion five years later.

The apparent decline in recent years is exaggerated. As the U.S. Arms Control and Disarmament Agency (ACDA) warns, "arms transfer estimates for the most recent year, and to a lesser extent for the preceding years, tend to be understated" because of the time lag in data collection; they "can be expected to undergo some upward revision."[3]

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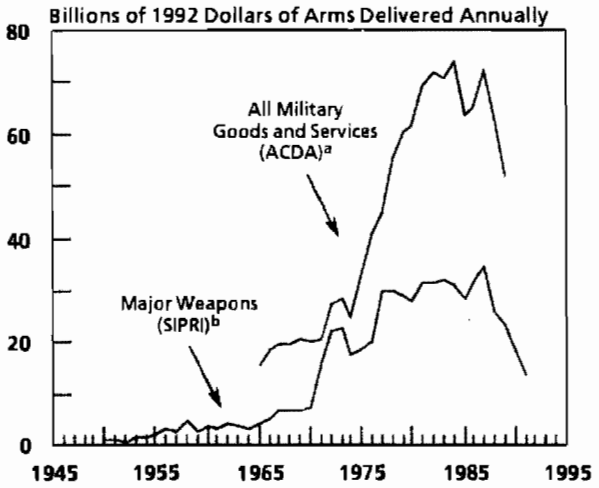
1. Here and throughout the study, amounts are represented in 1992 dollars.
2. The numbers are released by the Arms Control and Disarmament Agency, which often does not publish data on transfers until three years after they take place.
3. Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers, 1990* (1991), p. 32. An important caveat is that ACDA data exclude from U.S. exports the sale of construction and training services as well as dual-use items and items used in coproduction of military goods. Those data do not exclude such goods and services from the export statistics of any other country. See Appendix A for further discussion of the shortcomings of the data.

Figure 2.
Indicators of Arms Trade Growth, 1950-1991



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency (ACDA) and the Stockholm International Peace Research Institute (SIPRI).

a. ACDA does not release data on transfers before 1965 or within the last three years. The more recent ACDA data will be revised upward in forthcoming releases.

b. SIPRI deliveries are to developing countries only.

It therefore helps to examine another indicator of the level of arms trading. The value of major weapons transferred to developing countries, as measured by the Stockholm International Peace Research Institute (SIPRI), followed a similar pattern. The estimated value of deliveries of aircraft, armor and artillery, guidance and radar systems, missiles, and warships gradually grew to about $7 billion a year from the end of World War II to the late 1960s (see Figure 2). In the following two decades, the annual value of major weapons transfers tripled and later reached a peak of more than $35 billion in 1987 before falling back to $13 billion in 1991.

Although those dollar-value estimates of arms transfers are based on the best available data, they are prone to error. The estimates come from two sources. Official U.S. government statistics that ACDA publishes describe the overall defense trade, meaning all military goods and services, including spare parts, combat support equipment, maintenance, and training. The other source, SIPRI, tracks only trade in the five categories of weapons listed in the previous paragraph. Both ACDA and SIPRI independently estimate the value of transfers in U.S. dollar terms. The accuracy of both sources is limited by such problems as detecting clandestine transfers and pricing weapons in a common currency. Appendix A discusses those problems more fully and shows the relationship between the two bodies of data.

The pattern of arms transfers shown in Figure 2 reflects the dynamics of the Cold War and increased purchases by Mideast countries.[4] Immediately after World War II, the United States dominated the weapons trade as it armed its European allies. Then, in 1955, the Soviet Union emerged as an exporter, and the two superpowers competed for influence throughout the developing countries.

Wars in the Middle East, Korea, and Vietnam, as well as tensions in newly independent and divided South Asia, fueled the arms trade in the 1950s and 1960s. The most dramatic growth in sales occurred in the 1970s, however, when the Middle East became the leading arms-importing region in the world.

The Mideast Powder Keg

More than 100 countries buy weapons or parts of weapons abroad, but less than a dozen import a majority of the major weapons. Most of those countries are in close proximity to each other in the Middle East, where war has broken out several times in the last few decades.

4. For a history of the global arms trade going back to the 19th century, see Keith Krause, "The Political Economy of the International Arms Transfer System," *International Journal*, vol. 45 (Summer 1990), pp. 690-701; for a description with the focus on U.S. exports, see Chapter 3 of Paul Ferrari, Raul Madrid, and Jeff Knopf, *U.S. Arms Exports: Policies and Contractors* (Cambridge, Mass.: Ballinger, 1988).

An Appetite for Arms

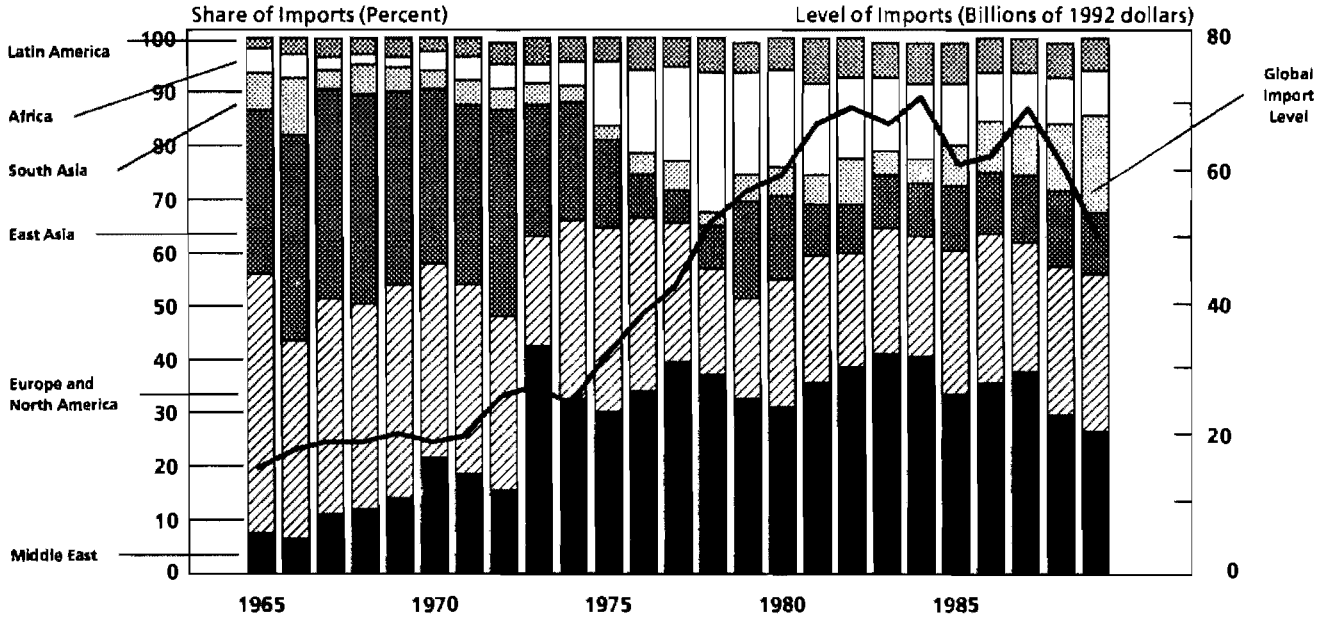
Since the mid-1970s, arms imports by Mideast countries usually have accounted for more than 30 percent of the world's total. The share of imports going to the region roughly doubled between 1965 and 1972, then doubled again the following year. Figure 3 demonstrates that, even though the Middle East's share was stable in the 1980s, the dollar volume of weapons sales grew steadily.

The sharp growth in the share of arms imports going to the Middle East coincides with escalating regional hostilities and rising oil prices. The biggest single-year jump occurred in 1973, during the Yom Kippur War. Iran's and Libya's imports followed those of their neighbors, growing by especially large amounts during the oil price shocks of 1974, 1979, and 1980, when real crude oil prices rose by 175, 35, and 40 percent, respectively.

Some Mideast countries financed weapons sales with oil revenues, but most are not cash customers. Saudi Arabia, Iran, Iraq, Libya, Kuwait, and the United Arab Emirates are members of the Organization of Petroleum Exporting Countries (OPEC), and each has bought substantial amounts of military hardware using the proceeds from its sales of oil. The others--especially Israel, Egypt, and Syria--received considerable outside help.

The Dynamic of the Arms Race. Each country's military buildup is also arguably driven by those of its neighbors. The U.S. treatment of Iran as a pillar of stability in the region translated into a steady flow of weapons that continued until the fall of the Shah in 1979. Reflecting distrust of its neighbor to the east, Iraq answered Iran's growing arms imports with increased imports of its own. That may have prompted Syria, a bitter rival of Iraq, to continue its buildup in the wake of a war with Israel.

Figure 3.
Relative Arms Imports by Region, 1965-1989



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTE: Data for Libya are included in the Middle East; data for New Zealand and Australia are included in totals for Europe and North America.

Table 1.
Aggregate Imports of Military Goods and Services, 1965-1989, and Major Weapons Inventories

Rank	Importer	Aggregate Imports, 1965-1989 (Billions of 1992 dollars)	Main Battle Tanks[a]	Fixed-Wing Combat Aircraft[a]
1.	Iraq	93	2,300	260
2.	Saudi Arabia	62	700	153
3.	Iran	51	700	213
4.	Vietnam	46	1,750	185
5.	Libya	46	2,150	409
6.	Syria	46	4,350	651
7.	India	42	3,100	676
8.	Israel	33	4,500	693
9.	Soviet Union	31	54,400	10,300
10.	Egypt	29	3,190	495

SOURCES: Congressional Budget Office based on data from the Arms Control and Disarmament Agency; International Institute for Strategic Studies, *The Military Balance, 1991-1992* (Riverside, N.J.: Macmillan Publishing Co., 1991).

a. Tank and aircraft inventories do not account for the quality of the weapons; a more sophisticated military analysis appears in Chapter 8.

In Egypt, arms imports fell after the government cut ties to the Soviet Union. As a result of the Camp David agreement reached in 1979 between Israel, Egypt, and the United States, Egypt was able to modernize its forces with considerable U.S. military aid. The United States supported Israel by keeping it well armed; the Soviet Union responded not only in Syria but also in Libya. Libya's arms imports did not tail off until the early 1980s, when hard currency became scarce and Libya's arsenal had become very large.

Although Iran was cut off from its chief supplier, the United States, after the revolution, Iraq continued to import heavily in the 1980s from France, the Soviet Union, China, and Brazil. During that entire period, the West worried about oil shipments from the region and therefore helped arm the member states of the Gulf Cooperation Council (GCC).[5]

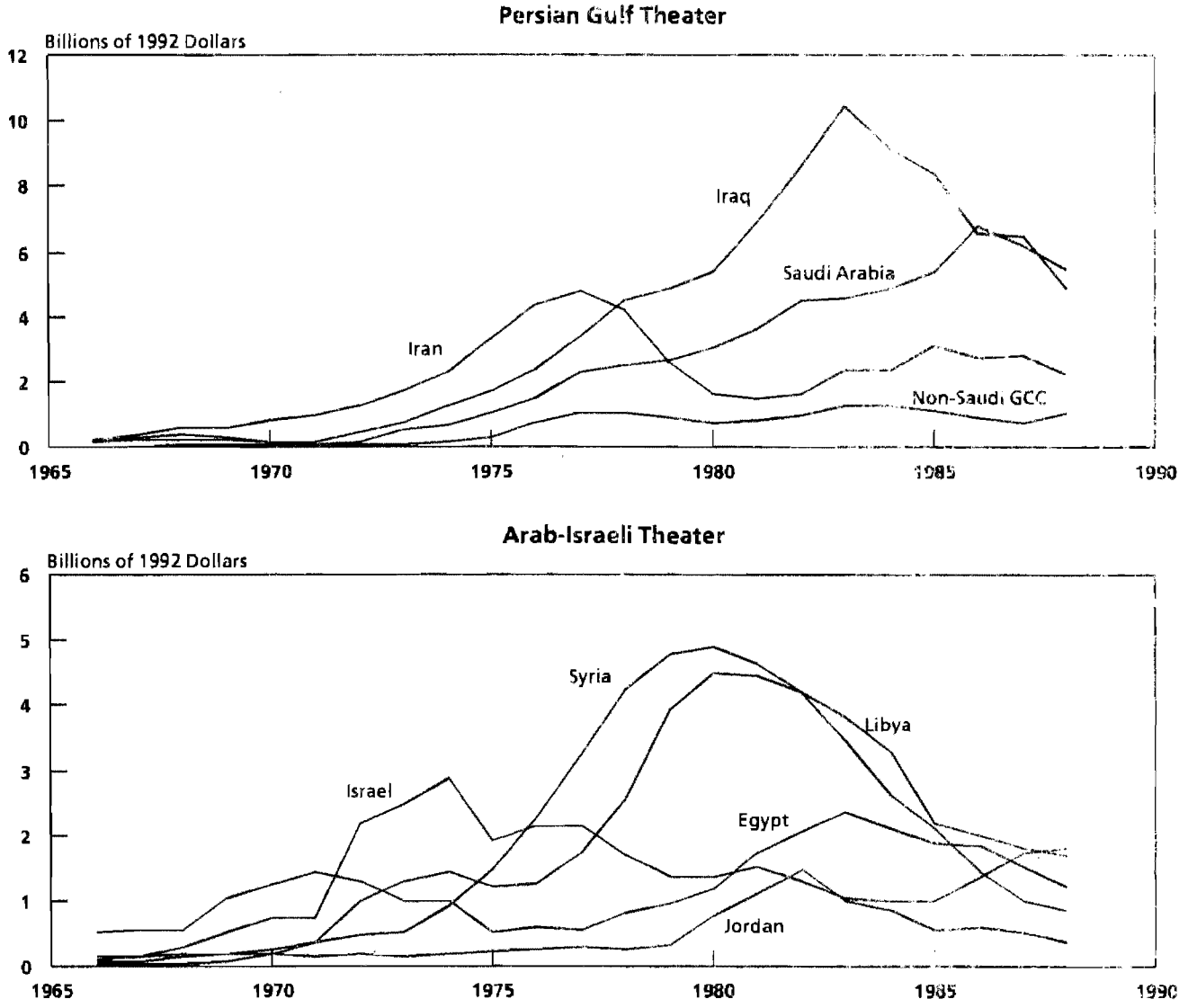
The timing of those events suggests that a significant arms race was under way. Figure 4 shows the successive increases of arms shipments to different countries in the Persian Gulf; it also shows the same phenomenon on a smaller scale occurring among Israel and its neighbors.

Arms Stockpiles Hamper Quick Reduction. The Mideast countries that have long been arms customers have acquired substantial weapons stockpiles over the years. The service life of most types of aircraft and land weapons is typically 25 years or more. Iraq, the top importer of military goods and services from 1965 through 1989, bought more than $90 billion worth of weapons during that period (see Table 1). Ranking next in terms of aggregate imports are Saudi Arabia with $62 billion, Iran with $51 billion, and Vietnam, Libya, and Syria with about $46 billion each. India, Israel, and Egypt also played prominent roles as arms customers over that 25-year span.

For some nations, the estimated dollar value of weapons imports over time is a poor indicator of arms stockpiles because it does not account for equipment lost in war. Yet the inventories of tanks and combat aircraft shown in Table 1 suggest that even countries that have lost wars and have little or no domestic arms production can amass a considerable

5. The GCC is made up of Saudi Arabia, Kuwait, Qatar, Oman, Bahrain, and the United Arab Emirates.

Figure 4.
Trends in Arms Shipments to the Middle East, 1965-1989, as Measured by the Value of Imported Military Goods and Services



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTES: All figures are three-year moving averages.
Scale of the bottom graph is 50 percent smaller than scale of the top graph.
GCC = Gulf Cooperation Council.

force.[6] Although military capability is a function of more than stockpiles and inventories, such vast accumulations of imported arms suggest that it would be many years before limits on prospective arms transfers significantly reduced the arsenals in some Mideast countries.

Markets in Other Regions Not Expanding as Rapidly. In recent years, Europe and

6. The capability of armed forces varies considerably according to the condition of their equipment. Strategy and tactics, operational experience, and the degree of integration of fighting forces with command and control systems also play critical roles.

North America have accounted for another 20 percent of world imports of military goods and services. Most of those transfers reflect defense trade within the North Atlantic Treaty Organization (NATO) and the Warsaw Pact. They include sales of weapon components and subsystems that are part of arrangements by which nations import parts and then assemble weapons locally--a process referred to as coproduction or licensed production.

The share of arms transfers to South Asian nations was about 12 percent of the world total in the late 1980s, reflecting a marked increase in arms flows to Afghanistan as well as the ongoing rivalry between India and Pakistan. The Korean peninsula has shown a similar competitive dynamic, as have Taiwan and the People's Republic of China. In contrast, Africa's share of the world arms trade has been shrinking in recent years. It peaked in the late 1970s, after Portugal decolonized its southern African possessions and newly independent Mozambique and Angola began forming new armed forces and fighting insurgencies.

Mideast States Buy the Most

The Middle East led the world in arms imports during the last two decades, not only as a region but also by individual country rankings; four of the top five importers are Middle Eastern. In the 1980s, Iraq and Saudi Arabia bought the most military goods and services (see Table 2). Syria, India, Libya, Vietnam, and Iran followed. The two principal supplier nations, the United States and the Soviet Union, also ranked among the top 10 importers.

Table 2.
Top Importers of Military Goods and Services, 1979-1989 (In billions of 1992 dollars)

Rank	Importer	Average Annual Imports, 1979-1989
1.	Iraq	6.8
2.	Saudi Arabia	4.6
3.	Syria	3.0
4.	India	2.8
5.	Libya	2.8
6.	Vietnam	2.5
7.	Iran	2.2
8.	Cuba	1.9
9.	United States	1.8
10.	Soviet Union	1.6

SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

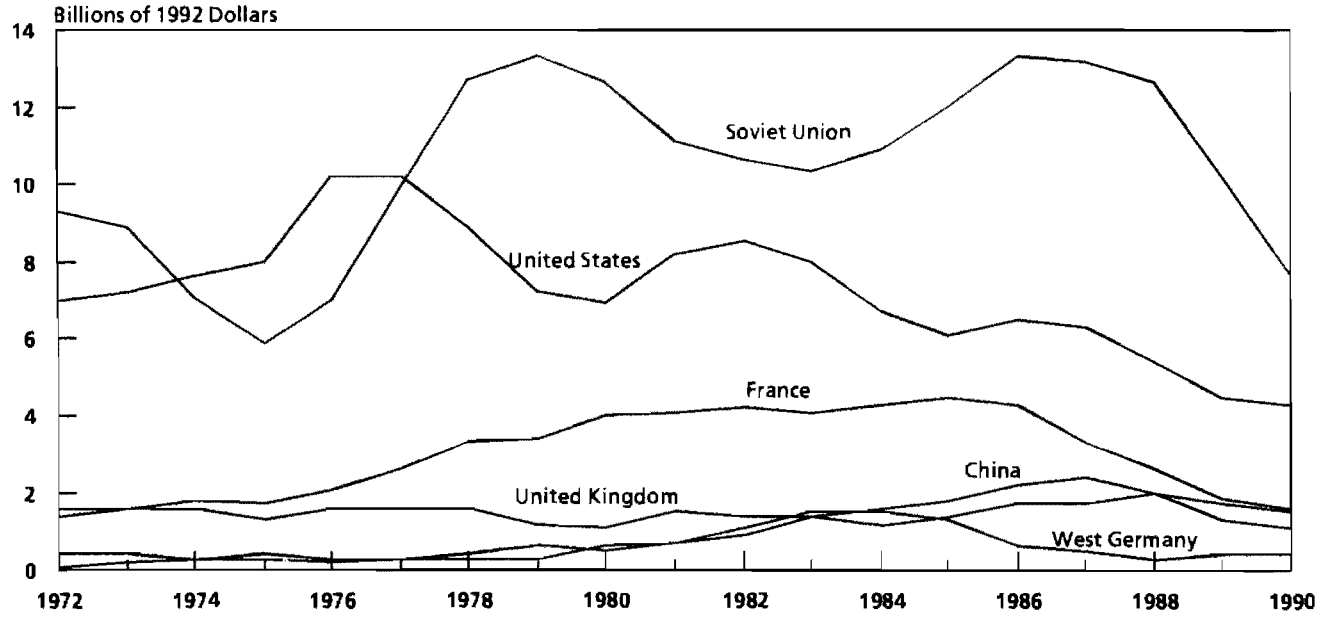
Arms Suppliers: Dominance of the Few

A handful of countries supply most of the arms on the world market. Many suppliers play specialized roles in the arms trade, but only a few key parties would have to agree in order to craft an effective system of limits or a supplier cartel. There are two ways to measure the dominance of the major supplier states. One is to estimate the dollar value of the top sellers in relation to the market as a whole. The other is to count weapons individually, such as numbers of combat aircraft or numbers of individual artillery pieces.

Concentrated Market Structure Based on Dollar Sales

Between 1979 and 1989, the United States and the Soviet Union together never accounted for less than 57 percent of the dollar value of all exports of major weapons (see Figure 5 and Table 3). Qualitatively, the two were quite different suppliers: the United States exported fewer weapons but they were generally more sophisticated and of higher quality. The Soviet Union shipped many more tanks, fighter aircraft, missiles, and artillery pieces, but the lower technology level brought the dollar value of its exports down compared with those of the United States.

Figure 5.
Trends in Exports of the Top Suppliers, 1972-1990, as Measured by the Value of Major Weapons Sent to Developing Countries



SOURCE: Congressional Budget Office based on data from the Stockholm International Peace Research Institute.

NOTE: Trend indicators are three-year moving averages.

The reasons that the superpowers dominated the export market of the 1980s, however, were the same. They were the only two countries with a local demand for arms large enough to create economies of scale for a full panoply of advanced weapons development and production. In addition, they were the only countries that actively used arms transfers at favorable rates as a foreign policy tool of the Cold War.

It is unclear which of the two superpowers was actually the top seller in the past because different sources disagree on how to count and value Soviet arms exports (see Appendix A). In 1991, however, the United States definitely became the major supplier and seems likely to remain so in the absence of major policy changes.

In recent years, the top two exporters sold 70 percent of the world's major weapons measured in dollar terms. The top five exporters--the superpowers plus France, the United Kingdom, and China--sold 86 percent of the weapons to the world at large and roughly the same percentage to the Middle East.[7]

Of the remaining nations, only Germany has been a large exporter. Before 1982, West Germany followed a cautious policy on exporting arms, in keeping with the national reluctance to exert international military influence. In that year, the country revised its arms export policy, with the new policy generally viewed as more lenient than the original. Germany's exports in the mid-1980s nearly equaled those of France and the United Kingdom. In the absence of multilateral arms limits, unified Germany seems likely to continue exporting a significant level of arms because it has established itself in various niches--for example, as a supplier of naval craft to Latin American countries.

7. The last figure includes support equipment and leaves out U.S. commercial exports, which make up about 10 percent of total U.S. arms sales.

Table 3.
Leading Suppliers of Major Conventional Weapons Worldwide, 1987-1991
(In billions of 1992 dollars)

Exporter	Average Annual Exports of Major Weapons	Export Emphasis
Superpowers		
Soviet Union	13.2	All equipment types
United States	12.9	High technology, all equipment types
Second-Tier Suppliers		
France	2.4	Across the board, especially aircraft
United Kingdom	2.0	Across the board, especially ships
China	1.7	Low technology, low cost
Germany (FRG/Unified)	1.3	Submarines and other ships
Third-Tier Suppliers		
Czechoslovakia	0.7	Soviet-designed tanks, armored vehicles, and trainer and transport aircraft
Italy	0.4	Naval systems and surface combatants
The Netherlands	0.4	Transport aircraft, ships
Brazil	0.4	Armored vehicles, missiles, and trainer aircraft
Sweden	0.3	Naval systems, electronics
Israel	0.3	Naval weapons, missiles, joint projects with the U.S.
Spain	0.2	n.a.
Yugoslavia	0.2	n.a.
Egypt	0.1	Reexport and licensed production of foreign-designed equipment
Others	1.1	
Total	37.5	

SOURCES: Congressional Budget Office based on data from the Stockholm International Peace Research Institute; Office of Technology Assessment, *The Global Arms Trade: Commerce in Advanced Technology and Weapons* (June 1991).

NOTES: FRG = (former) Federal Republic of Germany; n.a. = detailed information not available.

Excluding the countries already mentioned, the remaining NATO members are generally not well positioned to produce independently all types of advanced weaponry on a reliable and consistent basis (see Table 3). Together, however, the five permanent members of the U.N. Security Council and the other members of NATO control almost the entire world market.[8] In the late 1980s, the top eight exporters--all industrialized countries--were responsible for 92 percent of the world's exports of major weapons.

A Concentrated Market Structure

The market is also highly concentrated in terms of the number of individual pieces of equipment exported. Using numbers of weapons as a measure ignores differences in product quality, but it also avoids the difficult and uncertain process of assigning dollar values to foreign weapons.

Together, the Perm-5 and the other NATO nations accounted for more than 90 percent of the total combat aircraft sold to developing countries from 1985 through 1989 (see Table 4). Percentages are somewhat lower, but always higher than 75 percent, for key types of naval craft and land armaments. The percentages are about the same considering only exports to the Middle East. From 1985

8. The permanent members of the U.N. Security Council are the United States, the Soviet Union (now Russia), the United Kingdom, France, and China. Those countries are also the top five arms exporters.

Table 4.
Concentration of Arms Exports to Developing Countries, by Weapon Category, 1985-1989

	Total Units Delivered	Percentage of Total Units Delivered		
		Perm-5	Perm-5 plus NATO	Perm-5 plus NATO minus China
Land Armaments				
Tanks	7,302	84	85	77
Antiaircraft artillery	2,432	80	84	51
Field artillery	8,717	73	75	45
Armored personnel carriers	13,718	79	82	72
Naval Craft				
Major surface fighting ships	50	56	80	76
Submarines	24	50	96	96
Missile attack boats	8	50	75	25
Aircraft				
Supersonic combat aircraft	1,534	94	95	89
Subsonic combat aircraft	261	99	99	87
Helicopters	1,582	87	93	93

SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency.

NOTES: Perm-5 = the five permanent members of the U.N. Security Council (the United States, the Soviet Union (now Russia), the United Kingdom, France, and the People's Republic of China); NATO = North Atlantic Treaty Organization (member countries during the 1985-1989 period were Belgium, Canada, Denmark, France, Greece, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Turkey, the United Kingdom, the United States, and West Germany).

through 1989, for example, the Perm-5 were responsible for virtually every combat aircraft shipped there, as well as for three of the four submarines and nine of the 11 major surface combatant ships.

Future Trends in Arms Transfers to the Middle East

Arms exports to the Middle East have risen sharply over the last two decades, although they fell in the last few years. What direction will they take, under what kinds of pressures, in the years ahead?

Arms Transfers May Decline

There are plausible reasons to believe that exports to the Middle East will continue to fall in coming years. During the Cold War, the Soviet Union supplied military equipment to some Mideast countries on concessionary terms in order to maintain its influence in the region. Syria, Libya, Iraq, and Egypt were the major Mideast beneficiaries of Soviet largesse--but this largesse is unlikely to be appreciable in the future. Although the former Soviet republics might be poised to sell surplus equipment, the motive is likely to be desire for hard currency rather than strategic concerns. Thus, traditional recipients of aid will have to find alternative funding sources or import fewer weapons.

Syria and Libya will have oil revenues in the future that would allow them to modernize their armed forces. Economic aid from Arab donors might offset some of the loss of Soviet aid, but a very generous GCC plan would be needed to compensate for the loss of Soviet aid.

The Persian Gulf War may also reduce arms transfers. Iran and Iraq--the world's top importers in the 1980s--are now under greater scrutiny than ever; in the case of Iran, the

world community is still maintaining an arms embargo. In addition, some Mideast states are saddled with debt from the war, which could reduce their ability to buy weapons.

There are also reasons to believe that arms transfers may decline worldwide. The dissolution of the Warsaw Pact and the Soviet Union practically eliminated the traditional threat facing NATO. The new security environment could herald a reduced flow of arms among industrialized countries, both those in NATO and those that belonged to the Warsaw Pact. The Congressional Office of Technology Assessment observed that, as NATO Europe's defense spending has been falling for five years, "the outlook for U.S. and European defense procurement spending remains bleak."[9]

Arms transfers by the republics of the former Soviet Union may also remain low relative to levels in the 1980s. Apart from sales to the Middle East on concessionary terms, that nation gave weapons with generous financing to such countries as Cuba, Afghanistan, Ethiopia, Vietnam, and Angola. Those transfers, which had an estimated annual value of $8 billion in the years leading up to the end of the Cold War, have already largely disappeared.

Transfers among former members of the Warsaw Pact are also likely to decline. German unification removed as a separate arms supplier a country--East Germany--that had been selling $0.4 billion in defense goods and services annually. The realignment of the rest of Eastern Europe should reduce the remainder of the region's arms trade, which consisted of $4 billion a year in defense goods and services during the 1980s. Much of that trade was traffic in Soviet-designed systems that were built or assembled in Eastern Europe and then shipped back to the Soviet Union.

Coupled with lags in data mentioned earlier in this chapter, those factors may explain the decline in global weapons deliveries that has occurred since the late 1980s. Figure 2, for example, shows a decline of about 62 percent in the dollar value of worldwide deliveries of major weapons between the peak level of 1987 and 1991. For additional recent statistics on worldwide exports and Mideast imports of arms, see Tables 5 and 6, respectively.

Decline Not Necessarily Permanent

But the decline could be reversed. The data in Figure 2 are based on *deliveries* of weapons. Sales agreements are signed earlier--in many cases two years to five years earlier because of the time required to manufacture the weapons and deliver them--and those agreements constitute the best leading indicator of the arms trade. The drop-off in the late 1980s and early 1990s does suggest that agreements fell in the mid-1980s, perhaps for the reasons just mentioned. But it is too soon to tell whether the decline represents a long-term trend or a temporary phenomenon.

Indeed, there are reasons to believe that arms transfers to the Middle East could return to their high levels of the mid-1980s. In the wake of the Gulf War, there have been substantial transfers of arms to Saudi Arabia and the five other nations that make up the Gulf Cooperation Council. For that reason, sales agreements have surged anew, at least for U.S. weapons.

Some Administration estimates place U.S. arms sales at an all-time high. The two components of U.S. arms transfers are official foreign military sales (FMS), which are processed through the Department of Defense (DoD), and direct commercial sales (DCS). The value of FMS agreements rose to a new peak of $24 billion in 1991. Although data on commercial sales agreements are not publicly available, an indication of their relative magnitude comes from DoD estimates of future commercial deliveries, which DoD has extrapolated from agreements of the previous two years.

9. Office of Technology Assessment, *Arming Our Allies: Cooperation and Competition in Defense Technology* (May 1990), p. 53.

Table 5.
Arms Exports, 1987-1991 (In billions of 1992 dollars)

Country	1987	1988	1989	1990	1991
CIA Estimates of Deliveries of Arms by the Perm-5 Countries to the Entire World					
China	2.5	4.2	2.4	1.3	0.8
France	6.9	6.9	6.9	7.5	3.1
United Kingdom	5.9	2.9	4.3	5.3	3.6
Soviet Union	28.8	26.3	22.6	17.0	7.7
United States	20.5	19.2	12.4	9.6	13.5
Total, Perm-5	64.5	59.4	48.7	40.6	28.8
SIPRI Estimates of Deliveries of Major Arms to the Middle East[a]					
Perm-5					
China	2.2	1.6	0.1	0.1	0.1
France	1.7	1.2	1.5	1.2	0.4
United Kingdom	0.7	0.8	1.7	1.0	0.2
Soviet Union	5.8	3.5	1.7	1.3	0.1
United States	5.1	1.7	0.3	3.1	3.2
Subtotal	15.4	8.8	5.4	6.7	4.1
Other	1.7	1.8	0.9	0.6	1.0
Total, All Suppliers	17.1	10.6	6.3	7.3	5.1
CRS Estimates of Agreements on Arms with the Third World[b]					
Perm-5					
China	5.7	2.5	1.8	2.3	0.3
France	3.8	1.5	4.2	3.4	0.4
United Kingdom	0.6	1.0	1.2	1.9	2.1
Soviet Union	24.5	14.4	12.8	12.1	5.2
United States[c]	6.3	10.1	8.4	19.7	14.6
Subtotal	40.9	29.6	28.5	39.3	22.5
Other	6.8	6.3	5.7	5.0	2.8
Total, All Suppliers	47.7	35.8	34.1	44.4	25.4

SOURCES: Central Intelligence Agency, personal communication to the Congressional Budget Office, March 16, 1992; Stockholm International Peace Research Institute, *SIPRI Yearbook 1992, World Armaments and Disarmament* (New York: Oxford University Press, 1992); Richard Grimmett, *Conventional Arms Transfers to the Third World, 1984-1991* (Congressional Research Service, July 1992).

NOTE: Perm-5 = the five permanent members of the U.N. Security Council.

a. The Stockholm International Peace Research Institute's (SIPRI's) definition of the Middle East includes Saudi Arabia, Iraq, Egypt, Israel, Syria, Iran, the United Arab Emirates, Kuwait, Bahrain, Jordan, Oman, Qatar, Yemen, and Lebanon. Major arms include tanks, other armored combat vehicles, large-bore artillery, attack helicopters, combat aircraft, major naval vessels, and large radar and missile systems.

b. The Congressional Research Service's (CRS's) definition of the Third World includes all countries except the United States, the former Soviet republics, Canada, Japan, Australia, New Zealand, and the European countries.

c. Estimates do not include U.S. contracts for direct commercial sales because precise data are not available. Those sales are probably on the order of $1 billion to $4 billion a year

By that measure, DCS agreements of recent years also are rather high.

The future level of militarization in the Middle East depends on the result of two opposing trends. Several factors dampen the flow of arms to the region: Iraq is currently a pariah state among arms suppliers and will probably remain under U.N. embargo as long as Saddam Hussein is in power; many Gulf states are saddled with war debt; and Syria

Table 6.
Mideast Arms Imports, 1987-1991 (In billions of 1992 dollars)

Country	1987	1988	1989	1990	1991	1988-1991
SIPRI Estimates of Deliveries of Major Arms, Top Importing Countries[a]						
Saudi Arabia	2.8	2.6	2.1	2.7	1.2	8.6
Iraq	5.8	3.0	1.6	0.6	b	5.2
Egypt	3.1	0.5	0.3	1.3	0.7	2.8
Israel	2.1	0.6	0.1	0.2	1.7	2.8
Syria	1.5	1.5	0.4	b	0.3	2.2
Iran	0.9	0.7	0.4	0.9	0.2	2.2
United Arab Emirates	0.1	0.1	0.8	0.8	0.2	1.9
Kuwait	0.1	0.2	0.1	0.3	0.6	1.1
CRS Estimates of Deliveries of Arms, Top Importing Countries[c]						
Saudi Arabia	n.a.	n.a.	n.a.	n.a.	7.3	28.9
Iraq	n.a.	n.a.	n.a.	n.a.	b	9.6
Iran	n.a.	n.a.	n.a.	n.a.	1.5	7.5
Syria	n.a.	n.a.	n.a.	n.a.	0.6	4.3
Egypt	n.a.	n.a.	n.a.	n.a.	0.7	2.9
CRS Estimates of Agreements on Arms, Top Importing Countries[c]						
Saudi Arabia	n.a.	n.a.	n.a.	n.a.	8.0	37.0
Iran	n.a.	n.a.	n.a.	n.a.	2.0	10.5
Egypt	n.a.	n.a.	n.a.	n.a.	2.7	8.3
Kuwait	n.a.	n.a.	n.a.	n.a.	0.6	5.2
Libya	n.a.	n.a.	n.a.	n.a.	n.a.	3.9
Syria	n.a.	n.a.	n.a.	n.a.	0.6	n.a.
United Arab Emirates	n.a.	n.a.	n.a.	n.a.	0.6	n.a.

SOURCES: Congressional Budget Office based on data from Stockholm International Peace Research Institute, *SIPRI Yearbook 1992, World Armaments and Disarmament* (New York: Oxford University Press,1992); Richard Grimmett, *Conventional Arms Transfers to the Third World, 1984-1991* (Congressional Research Service, July 1992).

NOTE: n.a. = not available.

a. The Stockholm International Peace Research Institute's (SIPRI's) definition of major arms includes tanks, other armored combat vehicles, large-bore artillery, attack helicopters, combat aircraft, major naval vessels, and large radar and missile systems.

b. Less than $50 million.

c. To convert the Congressional Research Service's (CRS's) data for the 1988-1991 period from current to constant dollars, the Congressional Budget Office used an inflation adjustment factor of 8 percent. CRS data do not include U.S. direct commercial sales contracts. These orders are probably on the order of several hundred million dollars a year for the Middle East as a whole.

and Libya no longer have access to generous subsidies for the purchase of Soviet weapons.

Yet Iraq and Iran seem intent on rearming, and the heightened sense of vulnerability in the Gulf Cooperation Council will create incentives for buildups in those countries. Even amid uncertainty in the region, the United States will probably continue to give military aid to Egypt and Israel at or near current levels; and future oil revenues for Iran, Iraq, the GCC countries, and to some extent Libya and Syria, will provide the hard currency that many arms suppliers--especially Russia and China--desperately need.

Those competing tendencies mean that transfers of arms may decline significantly only if limits are placed on the arms trade. The next chapter discusses the Administration's attitude toward and approach to limiting that trade, especially in the Middle East.

Chapter Three

The Administration's Efforts to Limit the Arms Trade

In a speech at the Air Force Academy in May 1991, the President laid out his Middle East arms control plan aimed at limiting arms sales to the region and promoting stability there. The new approach built on an earlier initiative, unveiled in December 1990, that is known as the Enhanced Proliferation Control Initiative.

The Administration's plan for controlling arms exports is based on two premises: (1) that some types of weapons are intrinsically destabilizing, especially in the Mideast context, and all supplier countries should agree never to sell them to countries in the region; and (2) that by arming relatively stable and nonaggressive countries in a manner intended to help them provide for their own defense, and by applying pressure on suppliers of arms to aggressive regimes, one can improve military security. The first element applies especially to weapons of mass destruction and missiles; the second, primarily to conventional armaments. Largely because of Congressional legislation passed in 1991, the second now includes an ongoing consultative process with the four other permanent members of the U.N. Security Council about arms transfers to the region.

The Administration's Approach to Non-conventional Weapons

Although outside the immediate focus of this study, U.S. policy initiatives on nonconventional weapons help place the Administration's plans for conventional forces in broader perspective, showing how de facto supplier cartels already are being used to regulate weapon flows into the Middle East. They are therefore discussed briefly in this chapter.

The Administration's approach in this area focuses primarily on controlling such armaments as nuclear and chemical weapons, as well as surface-to-surface missiles that could be used to deliver weapons of mass destruction against major population centers. The approach reaffirms, and in some cases strengthens, existing U.S. policy.

In its policy statements in December 1990 and May 1991, the Administration emphasized that the United States would try to ban acquisition and testing of all surface-to-surface missiles in the Middle East and to ban acquisition of fissionable materials. In addition, the United States encouraged all Mideast countries to join both the Chemical Weapons Convention (CWC), which will call for the elimination of all chemical weapons, and the existing Biological Weapons Convention (BWC), which does the same with regard to biological weapons. The United States already is a party to the BWC and will join the CWC as well.

The Administration thus envisaged a Middle East free not only of chemical weapons but of missiles and nuclear and biological weapons.[1] The efforts of the Administration to

1. See, for example, *Fact Sheet on Middle East Arms Control Initiative* (The White House, May 29, 1991); and British-American Security Information Council, *Summary of Recent Initiatives to Control Arms Transfers* (Washington, D.C.: BASIC, August 1991), pp. 6-7.

clamp down on nuclear, chemical, biological, and missile technologies has been called the four-zeros approach.[2]

The specific provisions of the Administration's approach generally reflect policies that existed before the announcements in December 1990 and May 1991. The provisions are now codified in the Missile Technology Control Regime, the Nuclear Non-Proliferation Treaty, the Nuclear Suppliers' Guidelines, and the Australia Group's list of controlled chemicals. The recent announcements spurred new efforts to gain the compliance of more countries and to complete the Chemical Weapons Convention.

Although the Administration has enunciated the four-zeros approach, debate continues about whether the Middle East should become a nuclear-free zone. Such a goal may be unrealistic and perhaps even undesirable in the absence of significant progress toward Arab-Israeli peace. On the other hand, there is considerable pressure in the Arab world--even among regimes such as Egypt's that are friendly to the United States--to apply to Israel the same standards on nuclear weapons and missiles that are being applied to the Arab countries.[3]

The Administration's Approach to Conventional Weapons

In the realm of limiting transfers of conventional arms, the Administration takes a two-tiered approach. First, it wants to continue to sell U.S. arms to friendly countries in the Middle East and otherwise help them enhance their self-defense capabilities. That policy reiterates a long-standing U.S. commitment to aid Egypt, Israel, and the countries of the Gulf Cooperation Council in developing capable defense forces.

Second, to counter threats that unfriendly countries may pose, the Administration proposes that major suppliers--early in the sales process--share information on the quantity and type of weapons to be exported. The Administration adopted this element after considerable bipartisan prodding from the Congress in early 1991.

The United States has discussed its proposal with the four other members of the Perm-5. Information would be shared regarding those categories of weapons limited by the Conventional Forces in Europe (CFE) Treaty--tanks, other armored combat vehicles, large-bore artillery, combat aircraft, and attack helicopters--as well as naval vessels and some missiles. This approach would provide a means of scrutinizing--and perhaps heading off--proposed sales among the major suppliers. It would also make other suppliers as forthright about pending arms sales as the United States already is, through its Congressional oversight procedures.

The Administration's proposal has borne some fruit. The Perm-5 members have generally agreed to share information on arms transfers. A number of important points have not yet been completely spelled out, however, and some are still subject to negotiation. For example, it is not clear if the notification of agreements will be given before they are finalized or only before deliveries are made. Nor is it clear how much detail would be exchanged. But some type of compromise may emerge from the talks in the course of 1992.

Another element of the Administration's approach to restricting sales of conventional arms involves support for efforts by the U.N. General Assembly to maintain an internation-

2. The nature of this initiative led the United States to propose including Algeria, Tunisia, Morocco, and Libya in the definition of the Middle East used by the five permanent members of the U.N. Security Council. But China countered this proposal by suggesting that Turkey and Cyprus be included in the region as well. The outcome of all the jockeying is not yet clear.

3. See, for example, Alan Cowell, "Egypt's Arms Control Plan for Region," *The New York Times*, July 5, 1991, p. A5.

al registry of arms sales and, perhaps eventually, of defense procurement. The General Assembly approved the registry in December 1991.[4] Beginning in April 1993, and during each April thereafter, it will record deliveries of arms made during the previous calendar year--to the extent that member states supply the information.

The U.N. initiative will cover the CFE categories of arms as well as warships displacing 850 metric tons or more and missiles with ranges of 25 kilometers or more. Depending on the outcome of a study by an expert panel, data on military holdings and domestic production may be requested of the member states. The resolution also calls on them to inform the Secretary General of existing domestic procedures to approve or disapprove arms sales.[5] Compliance with all of the provisions, however, is strictly voluntary.

Evaluating the Administration's Approach to Limiting the Conventional Arms Trade

The Administration's proposal for controlling the conventional arms trade has touched off a spirited debate, with supporters and critics putting forth arguments in a variety of forums.

Arguments in Favor

As noted earlier, the Administration's approach is founded on the principle that one can and should distinguish between trustworthy and untrustworthy regimes in the Middle East. The former should be helped to develop self-defense capabilities; the latter should be given only limited access to weaponry. Secretary of Defense Dick Cheney, in testimony before the House Committee on Foreign Affairs on March 19, 1991, made those points clearly. He argued that the United States must sell arms to friendly nations in the Persian Gulf region so that, in the event of future aggression, they can defend themselves long enough for U.S. forces to return to the region. Without such sales, he said, the United States would have to maintain even more military forces in order to guarantee the stability of the region. In the Secretary's words:

> [Current policy is] . . . to minimize the U.S. military presence on the ground in the region. It would probably be easier to help our friends like the Saudis, the Gulf states, have sufficient capability to be able to defend themselves long enough for us to be able to get back . . . if, in fact, we are not going to allow our friends in the region to acquire the capabilities they think they need to provide for their security, we will simultaneously be accepting a larger burden ourselves to do it with U.S. forces . . . [I would be] . . . perfectly happy to listen to proposals for conventional arms control, but in the final analysis, I think our friends in the region will benefit significantly, not only from the ties and commitments to the United States in time of trouble, but also in terms of their abilities to defend themselves. . . .[6]

Others have supported the Administration's proposal to continue making selective arms sales to friendly countries in the Middle East. The former commander of the U.S. military's Central Command, General Norman Schwarzkopf, sounded the same theme in testimony before the House Committee on Armed Services in June 1991.[7] In his words, "Every one of those nations has the ability to purchase what they need, and they are going to purchase what they need. . . . If we don't participate, someone else is going to do it anyhow."

The new commander of the Central Command, General J.P. Hoar, also supported selective sales. In testimony before the House

4. Cuba and Iraq abstained from the vote; China and Syria were absent.

5. U.N. General Assembly, Resolution 46/36/L (1991).

6. *Aerospace Daily*, March 20, 1991, p. 470A.

7. Testimony of General Norman Schwarzkopf before the Senate and House Committees on Armed Services, June 12, 1991.

Committee on Armed Services, he contended that the threat Saudi Arabia poses to Israel is less acute than the threat Iraq and Iran pose to Saudi Arabia and that the United States would therefore contribute to Mideast stability by continuing to sell arms to the Saudi government. General Hoar also noted the advantage to the United States of selling its own equipment to countries it might help defend. (For example, parts and munitions can more easily be stocked in the region in peacetime and later shared during any conflict that might occur.) The policy also permits parts and munitions to be cut off if a formerly friendly country undergoes an undesirable change of regime or adopts aggressive policies.[8]

Not surprisingly, the Administration's approach appears to have considerable support in the U.S. defense industry. For example, Joel Johnson, vice president of the Aerospace Industries Association, argues that it is unrealistic to think that--for most types of weapon systems--unilateral U.S. restraint will do anything but send prospective buyers elsewhere.[9]

Even though the Administration's approach does not propose binding limits on the arms trade, it may nevertheless embody what noted theorists like Thomas Schelling and Morton Halperin mean by the broad expression "arms control."[10] According to Schelling and Halperin, it need not be formal and can include unilateral measures. Discretionary, targeted arms control by the United States, generally in concert with its allies and other friendly countries but sometimes unilateral, may work better than ambitious attempts to negotiate multinational agreements; for one thing, such agreements might only lead regional countries to turn to other ready sources of supply.

Arguments Against

Critics find much fault with the Administration's approach to conventional arms exports. The key concerns are that it depends on broad principles and voluntary adherence and that it imposes no specific or binding limits on conventional arms.

In a pursuit as difficult as limiting arms sales, broad principles may not work well as the basis for specific policy decisions. It can be difficult to identify particular sales that would be clearly destabilizing to the military balance in, say, the Middle East. Military balances are too hard to measure, offensive weapons too hard to define, and competing political philosophies and goals often too complex to assess for this type of determination to be possible. In many cases it is the action/reaction process involving numerous arms transactions over a period of time that is truly destabilizing. Neighboring states arm partly to pursue an advantage and partly to avoid losing their position vis-à-vis potential adversaries that also are arming. That process is repeated for many years, gradually ratcheting up arms inventories. Many observers used this action/reaction concept to explain the Cold War competition between the United States and the Soviet Union over nuclear arms, but it also applies to conventional forces in the Middle East.

It will also be difficult to overcome commercial pressures to sell arms with broad principles of restraint--especially during a period when major European countries are reducing their own defense procurement budgets and when Russia and other former Soviet republics are badly in need of hard currency.[11] In that regard, a recent statement by Boris Yeltsin is surprising perhaps only for its directness: "Today, trading in arms is a necessity for us. Soviet weapons are highly popular in the world and easily find buyers." A somewhat different light was cast on the problem

8. "Saudi Security Outweighs Israeli Concern on F-15 Sale: CENTCOM Chief," *Aerospace Daily*, March 12, 1992, p. 409.

9. Laura Lumpe, *Arms Sales Monitor*, no. 4-5 (1991), p. 4.

10. Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (Elmsford, N.Y.: Pergamon-Brassey's Publishers, 1985), pp. xi-xiii.

11. See, for example, "Mr. Bush Waffles on Mideast Arms," *The New York Times*, May 31, 1991, p. A30; and Office of Technology Assessment, *Global Arms Trade* (1991).

by a leading Soviet defense specialist, Andrei Kokoshin, who said, "I think if other countries would have started reducing arms deliveries, this would have had some effect, but it turned out that most democratic countries are not stopping arms sales, but increasing them. . . . Naturally, it's very disappointing to our arms producers to see . . . other countries advancing on our markets."[12]

A Senate delegation, including Senators Sam Nunn and John Warner of the Senate Committee on Armed Services, confirmed those trends and reported on Russia's plan to fund eventual defense conversion by first earning proceeds from arms sales to foreign countries.[13] The armed services and defense ministry are making some of these sales; others are being made by the individual republics and recently formed private firms with access to military equipment--and perhaps by small, informal groups of soldiers or government officials.[14]

Indeed, one of the Administration's own arguments about arms sales--that they are virtually inevitable in the current environment and thus might as well be made by U.S. firms--implies that general and rather vague guidelines to limit arms sales multilaterally will have scant success. Correspondingly, U.S. officials do not appear sanguine about being able to control the Middle East arms race. General Hoar suggested in recent testimony that Iraq might be able to return to its 1990 levels of military force within eight or nine years. Director of Central Intelligence Robert Gates was even more pessimistic, arguing that Iraq and Iran would compete for regional hegemony and that Iraq--with or without Saddam Hussein in power--might return to pre-Gulf War levels in three to five years.[15] It is presumably for reasons such as those that Secretary of State James Baker seemed interested in more ambitious efforts to limit arms shipments in the immediate aftermath of the Gulf War.[16]

Some critics of the Administration's approach to limiting conventional arms also disagree with the policy of arming countries that do not have democratic governments or that violate principles of human rights. Their critique bears most directly on the current policy of arming Saudi Arabia--a policy similar to that toward Iran in the 1970s. In a region beset with international and domestic political volatility, the argument goes, it may be unwise to invest heavily in the long-term staying power of any such ruling regime.

Nor is there universal agreement with an argument that the Administration makes in defense of its approach: that selling arms, and their essential spare parts, allows the United States some semblance of a veto over the military actions of a Mideast country through an ability to shut off the flow of those spare parts. Critics counter that existing stocks of spare parts would be sufficient to permit successful attacks, especially if the attacks enjoyed the benefit of surprise and initial success.

In addition, the United States is not likely to become a supplier to several of the more aggressive Mideast states: Iran, Iraq, and Syria. The countries that supply that trio may be less likely to interdict the flow of spare parts or withdraw technical support during political crises or conflicts. In addition, the suppliers might help their client states acquire either large stockpiles of spares or the capability to produce spares themselves.

12. Fred Hiatt, "Russia Boosts Weapons Sales to Aid Economy," *The Washington Post*, February 23, 1992, p. A1.

13. Andrew Weinschenk, "Senate Delegation Says 'Nyet' to Russian Arms Sales," *Defense Week*, March 11, 1992, p. 3.

14. See, for example, Serge Schmemann, "The Red Army Fights a Rearguard Action Against History," *The New York Times*, March 29, 1992, p. E4.

15. Statement of Robert Gates, Director of Central Intelligence, before the Defense Policy Panel of the House Committee on Armed Services, March 27, 1992, pp. 4, 8, 11-16.

16. David C. Morrison, "Boom Times for the Arms Trade," *National Journal*, December 14, 1991.

Finally, it may be necessary to limit conventional arms sales in order to reduce or eliminate nonconventional capabilities in the Middle East. In order to convince Israel (the primary nonconventional power in the region) not to expand but to reduce its capabilities, it may be necessary to heighten Israel's sense of safety from attacks of the type it has undergone several times since its creation.

The most important means of achieving that goal is probably the Mideast regional peace process. But reducing the growth of offensive power that Israel's adversaries possess may be just as important--and also much more susceptible to direct control by Western countries. Presumably that achievement would also abet the peace process by making Israeli leaders less wary of territorial compromises and regional agreements to control arms.

Noting shortcomings in the Administration's approach does not, of course, constitute an alternative policy. Thus, the next two chapters address the task of developing and exploring possible alternatives.

Chapter Four

Supplier-Imposed Limits: Forming a Cartel

Although it cannot negotiate with foreign governments, the Congress has shown considerable interest in stimulating a search for a new and more restrictive national policy on arms transfers. In the foreign aid and foreign relations authorization bills for fiscal year 1992, the House of Representatives voted to impose a moratorium on U.S. arms sales to the Middle East. Framers of the moratorium intended that it remain in place until supplanted by a lasting, multilateral regime for controlling the export of weapons or--failing that--until some other nation concluded a major arms transaction with a Mideast country. The Senate passed a bill endorsing, in nonbinding fashion, the formation of a suppliers' cartel to limit arms transfers to the Middle East. Neither of those efforts resulted in the imposition of binding limits, as the legislation was changed in conference in the face of a probable Presidential veto. But the legislative effort may have prompted the Administration to make the proposals and begin the negotiations discussed in the preceding chapter.

How might a system of multilateral, quantitative limits on the Mideast arms trade be constituted? It would, in effect, be a suppliers' cartel, akin to most existing ones but with a notable difference: the supplier group would not have as its goal the maximization of profits. This chapter considers the issue of which countries should participate in such a cartel; the next deals with detailed questions about the design and implementation of supplier-imposed limits.

The analysis here involves only multilateral restraints that would be imposed simultaneously on many countries. Possible methods for improving the U.S. regulatory framework are not considered. This omission does not imply that such reforms should not be considered; rather that only multilateral restraints seem likely to alter significantly the global flow of arms.[1]

The limits discussed in this study would not be outright bans; some trade would be allowed to continue. But the limits would not supersede embargoes imposed on individual countries for particular reasons. Thus, for example, Iraq would not be allowed to buy any weapons until it was deemed in compliance with U.N. Security Council Resolution 687 and other resolutions. In the future, other countries deemed deficient in their human rights policies or foreign policies conceivably might also be cut off from arms transfers entirely.

As those experienced with arms control negotiations and treaty implementation can at-

1. See Michael T. Klare, "Gaining Control: Building a Comprehensive Arms Restraint System," *Arms Control Today* (June 1991), pp. 9-13, for a discussion of other possible reforms. They include requiring the Congress to approve rather than to disapprove sales (thus putting the burden of proof on those who advocate sales rather than on opponents) and unifying oversight of all military-related exports, including dual-use exports, under the aegis of a single agency. See also House Committee on Government Operations, *Strengthening the Export Licensing System, First Report*, House Report 102-137 (1991).

test, it is never simple to arrange new international accords. The types of supplier limits discussed here would be no easier than previous arms control treaties to devise and put into effect. The chief obstacle probably would be gaining the support of key supplier countries. Other challenges, discussed in the next chapter, include finding an acceptable way to measure the arms trade and limiting international production arrangements (commonly termed coproduction), which provide a Mideast state with the material help of an outside power to build those weapons the state wants.

Why Supplier-Imposed Limits?

The notion of supplier-imposed limits might seem counterintuitive because existing agreements to control conventional arms involve the countries whose security is directly at issue rather than outside powers.

To be sure, it would be better if regional states agreed on limits among themselves, with outside countries providing only technical and diplomatic advice. That approach, however, is probably unrealistic at present, particularly in areas like the Middle East. Attempts to restrict the numbers of weapons in Europe demonstrate that negotiations on arms control can be long and arduous--even when states are not contending for disputed territory.[2] Given the importance of the Middle East to the international economy and global security, the world may not be willing to wait for the region's importers to act.

That is not to say consultations with importing nations are pointless. Efforts to consult with regional states can minimize the chance of externally imposed limits being seen as an infringement on those states' sovereignty. Moreover, without consultations, suppliers might impose limits inconsistent with the basic concerns of the importing countries.

Consultations could be woven into the arms control talks that are part of the Mideast peace process, possibly helping to prepare the ground for what is likely to be a very long and difficult endeavor. Consultations also could take place in bilateral talks between the United States and countries in the region that are friendly to it, in a setting more amenable to frank and direct exchange.[3]

There is reason to think that some of the region's governments might concur--at least privately--with outside efforts to reduce their defense burdens. Two former presidents of the World Bank, Barber Conable and Robert McNamara, have recently made that point.[4]

Negotiating a Cartel: Who Should and Who Would Participate?

The biggest challenge to limiting arms flows to the Middle East is also the most obvious: getting enough key supplier countries involved. Cartels are generally quite hard to devise; and, once in effect, they are prone to break down because suppliers put short-term financial interest above the broader, enduring interests of the group as a whole.

With arms exports, however, there may be hope. There is a rich history of precedent for controlling arms flows, although the precedents have generally involved nonconvention-

2. For a discussion of this point, see Geoffrey Kemp, *The Control of the Middle East Arms Race* (Washington, D.C.: Carnegie Endowment for International Peace, 1991), pp. 9-10, 119-130, 177-182.

3. See Kemp, *The Control of the Middle East Arms Race*, pp. 9-10, 119-130, 177-182.

4. Barber B. Conable, Jr., "Growth--Not Guns," *The Washington Post*, December 24, 1991; Robert S. McNamara, *The Post-Cold War World and Its Implications for Military Expenditures in the Developing Countries* (Washington, D.C.: World Bank, 1991), p. 23.

al weapon systems (see Box 1). A few suppliers control the vast bulk of the global arms trade, and most of them see benefits to keeping the Middle East stable. But they also face powerful domestic pressures to sell arms in order to earn money and maintain jobs at home. Given those competing factors, perhaps all that can be said with confidence is that the feasibility of supplier limits on conventional arms sales to the Middle East can only be tested by actual negotiations.

In order for the cartel to stand a good chance of succeeding, it would be highly desirable to enroll at least the five permanent members of the U.N. Security Council. As Chapter 2 showed, those countries--the United States, Russia, China, the United Kingdom, and France--have been responsible for at least 80 percent of exports in most categories of major weapons.

The willingness of that group to negotiate controls on conventional arms transfers cannot, of course, be taken for granted. The group has had trouble simply agreeing on how to exchange information on proposed arms sales. The United States could, however, rely on the closeness of its relations with the United Kingdom and--albeit to a somewhat lesser degree--France to lobby for limits. If the United States can make a persuasive case that limits would help stabilize the Middle East, those two countries presumably would have a difficult time standing in the way of efforts to fashion a new approach to international relations in which European countries played an important role. As members of the U.N.-sponsored coalition, they, too, had soldiers facing fire in the Gulf War from a country that the coalition itself had armed--a sobering event for any arms exporter. Indeed, domestic political sentiment in favor of limiting arms exports has gained momentum in the United Kingdom and France since the war took place.

The current opportunity to reach accord with Russia, and to weave it into a broader

Box 1.
Limiting Trade in Weapons Technologies

The history of efforts to devise supplier-imposed limits provides some sobering lessons. But history also offers some encouragement to those who hope to limit the arms trade; supplier cartel arrangements have succeeded in controlling the spread of certain specialized technologies. Formal mechanisms for doing so have been the Nuclear Non-Proliferation Treaty (NPT) and the organization responsible for verifying compliance with it, the International Atomic Energy Agency (IAEA). Although Iraq and some other countries clearly have been able to circumvent the purview of the NPT and the IAEA, the treaty and agency combined have prevented most countries of the world from obtaining direct access to the fissionable materials needed to make nuclear weapons. Moreover, in enhancing the legitimacy of the nonproliferation cause, the NPT and the IAEA have made it easier for the United States and other countries to pressure noncompliant regimes. That is especially important in the case of Iraq, which has demonstrated both a proclivity for aggressive foreign policy and a disposition to acquire nuclear and chemical weapons.

The informal Nuclear Suppliers' Guidelines have been established to provide a multilateral framework for controlling trade in sensitive technologies. So has the Missile Technology Control Regime, which has had some success by stopping the Condor II program of Argentina, Egypt, and Iraq, and in pressuring China to reduce its sales of surface-to-surface missiles to Pakistan, Syria, and Saudi Arabia. The Australia Group was formed by a number of major industrial powers to restrict trade in chemical weapons and "precursor" chemicals. And the Coordinating Committee on Multilateral Export Controls (COCOM) provided the West with an oversight mechanism to slow the spread of advanced technologies to Eastern-bloc countries during the Cold War.

agreement on foreign aid and arms control, is historic in magnitude. The United States and its European allies, with their considerable political and economic leverage, should stand a good chance of persuading Russia to abide by supplier-imposed limits.

China's willingness to consider limits is questionable--especially given its reaction to President Bush's proposal to sell 150 F-16 fighter aircraft to Taiwan--but should not be ruled out. An article by Hua Di, a Chinese scholar writing at Stanford University, provides insights into the nuances of China's current position on arms exports. Although it deals principally with the issue of surface-to-surface missiles and the Missile Technology Control Regime (MTCR), the article relates to broader subjects as well. According to Di:

> The Chinese position is thus clear. The MTCR, stipulated by [a] few Western countries, is unreasonable. The three-hundred-kilometer and five-hundred-kilogram criteria are arbitrary and groundless. Ballistic missiles are nothing special and are certainly not weapons of mass destruction in their own right. Their export must be discussed by the United Nations within the framework of general restrictions on all arms sales. Any regime negotiated otherwise would not be comprehensive or balanced. It is unfair that China was not involved when secret talks on the MTCR started in 1983 or when it started developing tactical ballistic missiles for export in 1984. It is unfair that the sales of strike aircraft are unrestricted, and unfair to impose the MTCR on China by means of power politics.[5]

Although it reflects a stern reaction by China to current attempts at limiting arms transfers, the statement suggests that China might be willing to negotiate limits that were more "comprehensive or balanced" than the MTCR and that also required restraint on the part of the United States and other countries. Even if that proved not to be the case, Beijing would have a harder time defending its opposition to arms sale limits if the United States proved itself serious about restraint. If China still did not cooperate on setting multilateral limits, the United States might be willing to bring its considerable economic leverage to bear. The United States might, for example, link the textile quotas allotted to China to the quantitative level of Chinese arms exports to the Middle East.

Even if all that failed, China's refusal to respect supplier-imposed controls would not doom them to failure. China currently exports no more than 5 percent of all weapons sold internationally, and typically 5 percent to 10 percent of those bound for the Middle East, as measured in dollar value. China could, of course, expand its exports. But it is not a major producer of high-performance weaponry such as sophisticated fighter aircraft and tanks. China certainly could not offset a decision by the other four Perm-5 members to limit sales of those important weapons.[6]

It would be preferable, of course, to expand the supplier cartel beyond the Perm-5 in order to lend a global character to the limits and to include a higher percentage of the international supply within the framework. Such an expansion may be feasible. Any agreements that France and the United Kingdom endorsed probably could be extended to most other major arms suppliers who are members of the North Atlantic Treaty Organization or the European Community or both--Germany, Italy, Spain, and so on. If those countries joined with the Perm-5, the supplier cartel would control 80 percent to 99 percent of the production in most categories of major, high-performance combat systems. That degree of control should place the goals of the cartel well within reach.

5. Hua Di, "The Arms Trade and Proliferation of Ballistic Missiles in China," *Proceedings from the AAAS Science and Security Colloquium* (Washington, D.C.: American Association for the Advancement of Science, 1991), p. 5.

6. See Chapter 2 of this study, as well as Richard A. Bitzinger, *Chinese Arms Production and Sales to the Third World* (Santa Monica, Calif.: RAND Corporation, 1991), p. vi.

It may be possible to do even better. Obtaining the participation of Ukraine, Czechoslovakia, and Poland might be no more difficult than obtaining the participation of Russia. The United States might seek independently to encourage restraint in the arms production and exports of its two closest Mideast friends, Egypt and Israel--as well as a nearby ally, Turkey, and such key Asian allies as Japan, South Korea, and Australia. Doing so would prevent those countries from reducing the effectiveness of a negotiated limit on sales.

The United States also might be able to use a combination of economic carrots and sticks, as well as diplomatic channels and its collective persuasive forces, to obtain the support of several other countries. It would be useful to bring aboard Brazil, Argentina, India, and South Africa--countries that otherwise might be tempted to expand their production efforts--and East Asian countries, including Taiwan, Thailand, Malaysia, Indonesia, and Singapore.

If, however, coordinating a suppliers' group of 10 or more countries seemed too cumbersome and too delicate politically, the United States might seek to limit the exports of some smaller suppliers through informal understandings that they not exceed past levels of sales to the Middle East. Under this approach, perhaps only the Perm-5 countries and five or six other major European exporters might be included in the formal cartel. Such an arrangement would impose direct controls on as much as 90 percent of the historical flow of arms to the Middle East and limit the rest less formally. A cartel of such scope would be formidable.

Although cooperation by other countries is desirable, it is not essential to the success of the controls. Smaller producers generally do not have the single-handed capability to develop major state-of-the-art combat systems, especially tanks, combat aircraft, submarines, attack helicopters, and high-quality artillery

Box 2.
Developing Countries and Modern Weapons

Developing countries trying to compete in the modern arms market face a variety of problems. Brazil lost a major customer for the Astros II artillery rocket with the defeat of Iraq. In addition, Iraq reportedly was unable to use the system effectively and left its Brazilian maker, Avibras, saddled with debt. Avibras and Engesa, two of the country's three largest arms exporters, are emerging from protracted bankruptcy proceedings.[1] The third of these exporters, Embraer, was recently scheduled to be auctioned off to private and foreign interests.[2]

Egypt tried in the 1970s to mount an Arab-financed arms production program called the Arab Organization for Industrialization. But Arab buyers recently have been reluctant to turn to Egypt, in spite of the closer ties forged during the allied operation in the Persian Gulf. Egypt's poor record of maintenance and support for weapons after they have been delivered might account for that reluctance.[3] Given the importance of logistics and support in modern war, this type of problem will be seen as fundamental by prospective buyers.

Some developing countries--including South Korea, India, South Africa, and Israel--have marketed major weapon systems. But those countries generally have relied on the principal supplier countries for technical help in these ventures.[4]

1. David Fulghum, "Latin American Defense Exports Suffer in Wake of Gulf War," *Aviation Week and Space Technology*, June 17, 1991, p. 129.
2. *Jane's Defense Weekly*, April 11, 1992, pp. 599, 609.
3. Philip Finnegan, "Arabs Shun Egypt Arms Plan," *Defense News*, December 16, 1991, p. 1.
4. Michael Brzoska and Thomas Ohlson, *Arms Production in the Third World* (New York: Oxford University Press, 1986).

and infantry fighting vehicles.[7] Efforts by most developing nations to create such capability have failed or are decades away from succeeding (see Box 2). Moreover, those countries that have been at least partly successful have relied on today's major exporters for vital components or technology and continue to rely on them. Such cooperation might be reduced or cut off if any of those countries acted in blatant disregard of the goals of the supplier cartel.

7. See Office of Technology Assessment, *Global Arms Trade* (1991), pp. 68, 72, 123:

"European defense firms are required to export substantial quantities of defense equipment in order to gain the production efficiencies and cost reductions that lead to affordable armaments and research and development....

"The major suppliers--France, Germany, and the United Kingdom--are the only nations in Europe that possess the industrial, research, and financial capacity needed to produce a broad array of complete weapons systems. The policies of these countries dominate the overall arms productions situation in Europe and will determine its future size and shape. Italy stands in a somewhat half-way position. It has industries that can serve as prime contractors in only one weapon system (helicopters) and one major subsystem (electronics).

"... Defense production, particularly in the aerospace sector, is one of the most complex manufacturing activities, and requires extensive industrial inputs from such sectors as steel, metallurgy, machinery, and electronics."

Chapter Five

Supplier-Imposed Limits: Design and Implementation

One possible approach to limiting the arms trade involves placing multilateral, supplier-imposed limits on the quantities of arms transferred. Building on the discussion in Chapter 4 of how the supplier system could be constituted, the following discussion provides detail on the actual limits that could be set and the ways in which they could be implemented. The focus remains on the Middle East.

Several variants employ dollar-denominated limits, and others use simple limits on units of equipment. Several envisage ceilings on the total exports of individual suppliers to the Middle East; others shift the focus to the total *imports* (from all suppliers combined) of individual Mideast buyers. For all options, a core group of countries supplying weapons would devise and implement the limits.

In developing and examining those approaches, this chapter addresses the following questions:

- Which weapon systems should be limited?
- Should the limits apply to aggregate exports by the suppliers or aggregate imports by the Mideast countries?
- Should limits apply to the numbers of weapon systems shipped or to their value (as measured in dollars or some other unit that reflects quality as well as quantity)?
- How should coproduction and other cooperative arrangements be handled?
- What measures are needed to ensure effective verification of the limits?
- What phase-in period would be required?
- How should any noncompliance, and other possible means of evading the intent of the limits, be countered?

Which Systems to Limit?

This study focuses on trade in conventional weapons, a type of trade that most people consider acceptable in some degree because it allows states to provide for their self-defense needs as legitimized in the U.N. Charter and international law. But which conventional weapons should supplier-imposed limits explicitly control? Although it might be desirable to control all weapons in some way, such an ambitious agenda may not be practical. The conventional weapons included in most of the study's options are those that are most important for blitzkrieg-style offensive warfare and those that are most easily monitored because of their size. They also are the weapons whose production is most highly concentrated in a few supplier countries, simplifying the task of forming the cartel.

To be specific, most options include weapons limited by the Conventional Forces in Europe Treaty (tanks, other armored combat vehicles, large-bore artillery, attack helicopters, and combat aircraft of short and medium range) plus major naval vessels and submarines, training and long-range aircraft, and large missiles (ballistic, guided, and cruise) together with their radars. The limits exclude small conventional weapon systems as well as munitions and spare parts; trucks, transport aircraft, and other ancillary equipment; nonlethal special-purpose equipment, including communications gear and dedicated reconnaissance platforms; and airfields and other infrastructure. Those types of weapons are either too small to monitor, indistinguishable from systems used for nonmilitary purposes, or not particularly threatening.

Indeed, it might be advisable to choose an even narrower set of military systems to limit. So few countries produce tanks, combat aircraft, advanced attack helicopters, and submarines that it might be simpler and more feasible to focus only on them. To be sure, narrowing the scope of the supplier limits would provide only partially effective limits. But it might be better to accept a restricted framework that can be well enforced than to be overly ambitious. Noncooperative supplier countries would pose less of a problem under this approach because--with few exceptions--they probably would not be able to produce tanks, submarines, advanced aircraft, and attack helicopters even if they wanted to.

This study excludes still other types of weapons--nuclear, chemical, and biological--because they should be limited much more strictly than conventional weapons or banned outright. For certain other arms--napalm, cluster bombs, fuel-air explosives, weapons incorporating stealth technologies, shoulder-launched surface-to-air missiles, advanced attack aircraft, and advanced air-to-ground missiles--limits would apply unless those arms were also banned.[1]

This study also does not take up several important but different problems in the arms export arena, including civil warfare involving small arms in many of the smaller and poorer countries and human rights violations associated with weapons transfers.[2] However, it does draw on some of the promising efforts by the international financial institutions to link eligibility for loans to levels of military spending--not by application of this principle to each country but by application of the principle to the region as a whole.

Limit Exports or Imports?

Limits on the arms trade could be applied either to exporters or importers of weapons, or to some combination of the two.

Limiting Exports

The major producers of weapons could place limits on themselves, restricting the total magnitude of their transfers. To some importing countries, that approach might seem less of an affront to their sovereignty than would attempts by the suppliers to limit imports of individual Mideast countries.

1. For an excellent discussion of the international trade in these technologies, see Janne E. Nolan, "The U.S.-Soviet Conventional Arms Transfer Negotiations," in Alexander L. George, Philip J. Farley, and Alexander Dallin, *U.S.-Soviet Security Cooperation* (New York: Oxford University Press, 1988), pp. 510-523; National Academy of Sciences, *Finding Common Ground* (Washington, D.C.: National Academy Press, 1991); Janne E. Nolan, *Trappings of Power* (Washington, D.C.: Brookings Institution, 1991); William C. Potter, *International Nuclear Trade and Nonproliferation* (Lexington, Mass.: Lexington Books, 1990); Coit D. Blacker and Gloria Duffy, eds., *International Arms Control* (Stanford, Calif.: Stanford University Press, 1984), pp. 148-172; House Committee on Government Operations, *Strengthening the Export Licensing System, First Report*, House Report 102-137 (1991).

2. For more on this, see David A. Koplow and Philip G. Schrag, "Carrying a Big Carrot: Linking Multilateral Disarmament and Development Assistance," *Columbia Law Review* (June 1991), pp. 993-1059.

In the United States more than most other countries, limits on exports are somewhat amenable to legislative action. The Congress cannot create a supplier cartel on its own. But it can place limits on total U.S. exports as an inducement to the President to pursue multilateral limits through negotiations with other suppliers. For example, U.S. exports to the Middle East might initially be frozen at the previous year's level and reduced gradually thereafter--according to one suggestion, 5 percent a year over 10 years.[3] An alternative would be to limit exports to one or two key countries of concern. With such a policy, the Congress might find it easier to deal with individual proposed sales in some type of broader framework.

There are, however, two major disadvantages to focusing control efforts on the exporters of arms. Such limits would be no guarantee against a Mideast country's accumulating a large stock of armaments--as Iraq did in the 1980s. It could do so by acquiring a disproportionately high percentage of the total arms shipped to the region. That problem might be dealt with by limiting the exports of each supplier on a country-by-country level rather than a regional level. But another issue might still remain: export limits in that case probably would wind up maintaining the market share of each major supplier at or near previous levels. Contrary to the principles of free competition, such an approach could be expected to meet resistance from many firms and their national governments.

The initial market allotment for each potential supplier would also be difficult to negotiate. Would a supplier's share be based on average sales in the 1980s, the level in 1990, or some other benchmark? Who would be "charged" for the export of a collaboratively produced weapon system? (An example of such a system is the European Fighter Aircraft; if it continues as a program, Italy, Spain, and the United Kingdom will jointly produce it.)

Perhaps most difficult, what about the share for the former Soviet republics? Many observers view past Soviet exports, which went largely to radical regimes, as manifestations of an aggressive foreign policy and would argue that such behavior should not be rewarded with a high market share in the future.

Still, this approach should not be dismissed out of hand, especially in the event that only one or two Mideast countries seem to be causes for concern. A number of Mideast countries have serious cash flow problems from debt accumulated during recent military buildups and wars. At least in the immediate future, they may not be able to sustain large military buildups. In addition, Iraq may continue to have difficulty importing weapons for a number of years--especially while Saddam Hussein remains in power.

In such circumstances, it might make sense for the suppliers to set ceilings on their individual exports to one or two countries. Doing that could combine some of the effects of across-the-board ceilings on imports with the simplicity of ceilings on exports. It could be expanded to a broader set of limits in the event that a regionwide arms race began to show signs of heating up.

Limiting Imports

An alternative approach would involve placing limits on each Mideast country's aggregate imports. In other words, each regional state could import a certain amount of equipment each year from all suppliers combined; suppliers would have to share information to ensure that no country imported more than its aggregate allotment.

Setting Ceilings by Country. The level of the import ceilings might be set in many ways. The ceilings could, for example, be tied in

3. Kurt Gottfried and Jonathan Dean, "Nuclear Security in a Transformed World," *Arms Control Today* (November 1991), pp. 13-14. Since the Congress does not directly control deliveries, but only agreements, it would have to devise annual ceilings that would apply to agreements.

some way to a country's gross domestic product, land area or perimeter, or population.[4] Most such measures, however, involve significant problems in the context of the Middle East. The countries of the Persian Gulf subregion that have both oil and sizable populations--namely, Iran and Iraq--cause the greatest security concerns in the short and medium terms. An approach to import limits that was based on an index of wealth or population would codify their military superiority and thus seems ill advised.

Linking allowable imports to the length of national frontiers would be equally troublesome. It would treat countries such as Israel and Kuwait very unfavorably. And it is doubtful that having a certain amount of military force per mile of border that must be defended (that is, having a given "force-to-space" ratio) can provide defensive capability that inspires confidence--regardless of the armaments employed.[5]

In a broader sense, there is little reason to believe that a balance of power can be adequately defined and measured or that, even if such a balance is established, it will promote military or political stability. Surprise attack, innovative tactics, new technologies, or superior morale could help one country achieve military victory--even if opposing forces appear equal. In reality, the most stable power balance probably arises in cases where a peace-loving state is clearly stronger than its neighbors. But such states are hard to find and difficult to identify convincingly.[6]

Establishing Equal Ceilings. Another approach would establish equal ceilings on imports for all countries in the Middle East. The idea is relatively simple and would help deflect charges that the arms control framework was discriminatory. Moreover, it would avoid intractable debates among the different suppliers over which countries in the region legitimately require more weaponry than others.

Countries, however, vary widely in the security concerns they pose to each other. So why would suppliers want to set equal ceilings, thereby implicitly striving for relatively even force levels among all major states in the region? The main arguments in favor of this approach are not theoretical but specific to the Middle East. Some of the largest arms importers in the region are precisely the countries that have demonstrated the most aggressive and irredentist policies in recent years: Iran, Iraq, Syria, and, to a lesser extent, Libya. Using equal ceilings to hold down imports to those nations may be sensible.

Saudi Arabia is also a major importer, but it might find equal limits acceptable. They would constrain the imports of its chief potential adversaries. Moreover, at lower regional levels of armament, the thinly populated Saudi state might be less disadvantaged and more able to develop a capable self-defense. That would be especially likely in the event that limits on actual deliveries of weapons were phased in gradually. Saudi Arabia would thus be able to approach parity with Iraq--at a time when Baghdad remains unwelcome among the international weapons traders--and to maintain parity thereafter.

Regardless of how many arms Saudi Arabia imports in the next few years, however, the United States probably will need to guarantee its security for the indefinite future. Regardless of the nature of arms control, Saudi Arabia is simply too short of manpower and too geographically vulnerable to be able to develop a robust capability to defend itself.

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4. For a discussion of one such approach, see William W. Kaufmann and John D. Steinbruner, *Decisions for Defense: Prospects for a New Order* (Washington, D.C.: Brookings Institution, 1991), p. 70.

5. See Joshua M. Epstein, *Conventional Force Reductions: A Dynamic Assessment* (Washington, D.C.: Brookings Institution, 1990), pp. 51-65.

6. See, for example, Eliot A. Cohen, "Toward Better Net Assessment: Rethinking the European Conventional Balance," *International Security* (Summer 1988), pp. 59-81; Richard K. Betts, *Surprise Attack* (Washington, D.C.: Brookings Institution, 1982), pp. 3-24, 87-149; Jonathan Shimshoni, "Technology, Military Advantage, and World War I: A Case for Military Entrepreneurship," *International Security* (Winter 1990/1991), pp. 187-215; Geoffrey Blainey, *The Causes of War* (New York: The Free Press, 1973), pp. 112-115, 248.

Secretary of Defense Dick Cheney implicitly acknowledged this point when he said, in March 1991, that U.S. arms sales would help Saudi Arabia defend itself long enough to permit the United States to come to its ultimate defense.[7] Consistent with that view, Pentagon planners reportedly consider the possibility of Iraq's again invading Kuwait, and also attacking Saudi Arabia, as among the most demanding hypothetical conflicts for which the United States must plan in the post-Cold War era.[8] If the United States remains the guarantor of Saudi security, equal limits on imports--which should lead to smaller military capability in countries such as Iran or Iraq--may make such a role easier and less costly to play.

Equal ceilings on imports also seem compatible with Israel's security interests. The four or five Arab countries that pose the greatest threats to Israel have also been those most heavily reliant on arms imports in recent years. Thus, Israel's worst-case fears might be alleviated by limits on arms imports, even if its own imports were curtailed slightly. Such considerations are consonant with comments that Israeli Prime Minister Yitzhak Shamir made last year: "The main danger that threatens us is by conventional arms. We want limitations on this."[9] Equal import ceilings might even improve the prospects for control of nuclear arms in the Middle East by giving Israel fewer fears about its security.

Equal ceilings also would be compatible with the security interests of Egypt and the smaller states of the Arabian peninsula, although in most cases those countries face less pressing threats than does Israel.

Equal Ceilings on Total Acquisition. A variant on equal import ceilings would explicitly recognize, and count against a single ceiling, both imports and domestic production of major weapons. This approach would remove one of the largest potential loopholes of import ceilings: the possibility that some countries might greatly expand domestic production of arms.

Placing ceilings on total acquisitions of arms would, however, pose serious challenges in the area of verification. Measuring another country's domestic production is an imprecise process, even when using reconnaissance satellites. In addition, Israel and Egypt currently produce more weapons than other Mideast countries. Those friends of the United States would lose some advantage under this variant of the equal-ceiling method.

A further potential drawback to equal ceilings is that they might smack even more of heavy-handed Western foreign policy than would limits on arms transfers. Some analysts would argue that although countries such as the United States have the right to control what they do with their own goods, they do not have as clear a right to monitor and interfere in the internal affairs of a whole set of other countries. That sort of political concern is addressed more fully in Chapter 8.

A Combination of Export and Import Ceilings

It would be possible, and perhaps advantageous, to combine export and import limits into a single framework. Politically, that would allow the exporters to argue that they were exercising self-restraint. But it also would directly limit the imports of the countries that cause greatest concern in the region.

If both export and import ceilings were made equally restrictive, of course, some of the disadvantages of the former--in particular, the question of how to apportion market share--would come into play. Thus, relatively modest

7. See David B. Ottaway, "U.S., Saudis to Study Long-Term Defense Needs of Gulf Region," *The Washington Post*, April 21, 1991, p. A26; and *Aerospace Daily*, March 20, 1991, p. 470A.

8. Patrick E. Tyler, "Pentagon Imagines New Enemies to Fight in Post-Cold-War Era," *The New York Times*, February 17, 1992, p. A1.

9. *The Jerusalem Post*, March 29, 1991.

restraints on exports might be used to jumpstart the process of limiting the arms trade, with the import ceilings later kicking in and becoming the operative limits over time.

Limit Quantities or Value?

Export or import ceilings could be based on numbers of weapons or on the monetary value of the weapons. The limits probably should be annual--although in order to facilitate medium-term planning and sensible acquisition policies, they probably should be allowed to accrue. Permissible transfers in any one year might be the total of that year's allowance together with any unused balance from the previous two years or so, and possibly the next year's allowance as well.

Limit Numbers of Weapons

The simplest and most direct way to limit annual imports would be to restrict each country to a certain number of new pieces of equipment in each major weapon category. Limits could apply either to annual transfers or to the total number of systems a country could have in its inventory. (In the latter case, if a country had 990 tanks and was allowed no more than 1,000, it could import only 10 tanks before it had to begin verifiably destroying old tanks to "make room" for new ones.)

Advantages and Disadvantages. Focusing on numbers of weapons would facilitate limits on arms transfers in two important ways. It would simplify verification because monitoring would have to identify only the general type of weapon, not specific models. Perhaps even more important, it might simplify negotiation of the accord.[10] Trying to devise a commonly acceptable set of values for every major type of equipment sold internationally would be very challenging. Though possible, it would pose the thorny kind of technical challenge that can appear daunting even to seasoned negotiators on arms control.

Limits on numbers of weapons would also permit explicit control of certain types of armaments, such as tanks and attack aircraft. Many proponents of this approach argue that some weapon systems are intrinsically more threatening or destabilizing than others and that arms control should therefore focus on those weapons.[11] With their mobility, armor, precise firing capabilities, and other attributes, tanks provide an aggressive capability that small arms and many types of artillery do not offer. And as the 1967 Six-Day War demonstrated, highly capable tactical aircraft provide the means for surprise attack that can be decisive in combat.[12]

This argument should not be taken too far. In theory, Mideast countries may be able to defend themselves against existing offensive forces in the region through reliable defensive weapons, such as antitank and surface-to-air missiles. But strictly defensive weapons are hard to define, and a military posture relying only on them is not guaranteed to succeed. Thus, for overall purposes of deterrence, they may need buttressing by offensive weapons that can attack an enemy's territory or large formations of its forces. Overly strict limits on tanks, aircraft, and the like might deny the

10. Richard F. Grimmett, *Conventional Arms Transfers to the Third World, 1983-1990* (Washington, D.C.: Congressional Research Service, 1991), p. 76.

11. See, for example, Andreas von Bulow, "Defensive Entanglement: An Alternative Strategy for NATO," in Andrew J. Pierre, ed., *The Conventional Defense of Europe: New Technologies and New Strategies* (New York: Council on Foreign Relations, 1986), pp. 112-151; John Grin and Lutz Unterseher, "The Spiderweb Defense," *Bulletin of the Atomic Scientists*, vol. 44, no. 7 (September 1988); Carl Conetta and Charles Knight, *After Conventional Cuts: New Options for NATO Ground Defense* (Brookline, Mass.: Institute for Defense and Disarmament Studies, 1990); and Carl Conetta, Charles Knight, and Lutz Unterseher, *Toward Defensive Restructuring in the Middle East* (Cambridge, Mass.: Commonwealth Institute, 1991).

12. See, for example, Center for International Security and Arms Control, *Assessing Ballistic Missile Proliferation and Its Control* (Stanford, Calif.: Stanford University Press, 1991).

defender the ability to mount counterattacks.[13] So efforts to control "offensive" weapons, although worth exploring, probably should not be seen as the core of arms control efforts.

Perhaps more compelling than the security argument is a practical factor: limits on tanks, tactical combat aircraft, and attack helicopters may be the most workable. To avoid gaping loopholes in a broader cartel, many producers of artillery, armored combat vehicles, and other, smaller systems would have to cooperate with it. Because very few countries in the world actually produce highly capable tanks and combat aircraft, controlling them may be the most practicable approach.

Options that limited numbers of weapons rather than capability or overall value could have other drawbacks. Simple limits on numbers would encourage suppliers to sell their most elaborate systems in order to maximize dollar returns. They also would spur importers to buy the best systems available in order to maximize their capabilities within the numerical ceilings.

From a competitive perspective, this approach would be advantageous to the United States, which produces some of the world's most expensive and effective combat systems. But it could undermine other arms control goals--most notably, the efforts to control the spread of some advanced and potentially destabilizing weapon systems and components.

To be workable, therefore, limits on numbers of weapons probably would have to be coupled with an explicit agreement among suppliers to restrict the technological sophistication of arms sold to Mideast countries. Suppliers might agree, for example, to sell more capable weapons only if prior consultation among all of them had determined--by a two-thirds or even unanimous vote--that such transfers would enhance security.[14]

With such features in place, the idea of limiting numbers of systems might prove highly attractive. It would be consistent with the way in which European arms control has historically been pursued, culminating in the Conventional Forces in Europe Treaty that restricts the numbers of tanks, other armored vehicles, large-bore artillery, attack helicopters, and combat aircraft. It also would be relatively simple to devise and implement.

One difficult question would have to be answered, however: how would such limits be applied to coproduced systems--for example, Israeli tanks made with U.S. components or T-72 tanks produced largely in Iran but with Russian assistance? This tough question might most easily be answered in one of two ways. Either a coproduced system could be counted as an import of exactly one unit of that system, or it could be counted as some fraction of the system--the fraction being determined in advance, for whatever component was involved, and listed on the suppliers' data base.

Establishing Numerical Limits. If limits on numbers of systems are feasible, what should the limits be? Agreement could prove difficult. Discussion could be guided by the goal of limiting Mideast spending on the military to roughly what the rest of the world spends on it as a percentage of total output.

Such discussions might be a precursor to negotiating a "Conventional Forces in the Middle East" (CFME) Treaty, analogous to the CFE treaty that has limited weapons in Europe. For example, if it was decided that--as at least an interim measure--a reasonable tank force level for a Mideast country was about 1,000 vehicles, and if it was estimated that the average tank has a service lifetime of

13. For a discussion of concentration and counterconcentration, see Epstein, *Conventional Force Reductions*, pp. 14-27; and Stephen Biddle, D. Sean Barnett, and David Gray, *Stabilizing and Destabilizing Conventional Weapons* (Alexandria, Va.: Institute for Defense Analyses, 1992), pp. iii-v.

14. Alan Platt, ed., *Report of the Study Group on Multilateral Arms Transfer Guidelines for the Middle East* (Washington, D.C.: Henry L. Stimson Center, 1992), pp. 43-47.

about 30 years, the annual import quota on tanks for each country might be set at about 35 vehicles (making a slight allowance for attrition resulting from peacetime accidents). In that way, supplier limits imposed in the short term could help lead to a system of regional arms control in the medium to long term.

Dollar-Denominated Ceilings

Rather than limit the number of weapons, suppliers might limit the monetary value of exports or imports. Dollars probably represent the most convenient currency for such limits and are the measure used in the following discussion.

Compared with equipment limits, an equal-dollar ceiling would offer at least two advantages. It would be simpler in the sense of involving only one annual limit. It also might be more acceptable to importing countries in the Middle East because it would permit them to shape their military forces themselves--rather than having to accept detailed outside limits. Dollar limits would, however, pose challenges in negotiating the values of various weapons and in monitoring.

Establishing Values. Limiting the dollar value of sales would require that suppliers agree on dollar-denominated prices for different models and types of major weapons. In most cases, the prices could be based on what has actually been paid for the weapon system in the past, adjusted to dollars at prevailing exchange rates and not counting spare parts or cooperative training arrangements.

Care would have to be taken in determining weapon values. During the Cold War, several suppliers--the United States and Soviet Union in particular--often sold equipment to friendly countries on favorable terms. At unrealistic prices, purchasers might be able to acquire a large amount of capable military hardware at a bargain. The problem is visible today with surplus military equipment in Russia and several other countries; under such conditions, equipment may well be sold at low prices. Where confusion arose, the problem could be solved by applying the higher prices that a given piece of equipment commanded in the past.

However, some suppliers might consider information on past sales confidential. They probably also would disagree over the appropriate exchange rates to use in converting currencies. Other methods might therefore be used to form a second data base for establishing values. That data base could be used to help resolve disputes over actual transaction prices. For example, prices could be based on the estimated military value of the weapons, which in some cases might differ considerably from the transaction price.

Because military value is at least partially subjective, there undoubtedly would be some disagreement about the proper prices for different types of equipment. Negotiations on the issue would have to be an important part of discussions leading to controls imposed by suppliers.[15] But analytic means could be used to establish prices that reflect approximate military value, and some of those means would not require access to classified data about true production costs or transaction prices. The formulation of The Analytic Sciences Corporation comparing different types of military hardware, known as TASCFORM, was developed for the Department of Defense (DoD) and is used elsewhere in this study (see Chapter 8 and Appendix B). TASCFORM provides scores for a wide range of military equipment, both foreign and domestic. The scores are based on the technical characteristics of a specific model of weapon, as well as on the judgments of military experts about the importance of that type of weapon in combat.

A set of dollar values for weapons could be established by starting with prices that DoD pays for U.S. weapons. The "shadow price" for

15. See Natalie J. Goldring, *The International Arms Industry: A Framework for Analysis* (Washington, D.C.: Defense Budget Project, 1991), p. 9; and Gordon Adams, *Arms Exports and the International Arms Industry: Data and Methodological Problems* (Washington, D.C.: Defense Budget Project, 1991), p. 5.

a similar foreign system would then be derived as the ratio of that system's TASCFORM score to the U.S. system's score, multiplied by the dollar value of the U.S. system. In this way, each weapon's shadow price would reflect its capability.

Take, for example, a U.S. aircraft such as the F-16C/D. It is scored as worth 15.5 TASCFORM points--averaged across its different possible missions--and it costs DoD about $20 million to purchase. A Russian aircraft such as the Su-24, with a TASCFORM score of 12 points, might be assigned a shadow price of about $15 million; a similar number would be assigned to French aircraft such as the Mirage 2000. Similarly, with an M1A1 scoring about 6 on the TASCFORM scale and costing about $3 million, a modernized Soviet T-72 or T-80 tank with a score of about 4 might be assigned a shadow price of $2 million, and the British challenger tank with a score of about 5 might be valued at $2.5 million.

TASCFORM already has assessed most major weapon systems currently in use throughout the world. Thus, although negotiations would determine the actual system of prices principally on the basis of what had been charged in the past, the TASCFORM-based technique could be used to ensure that the negotiated schedule of prices was reasonable.

Older types of weapons generally would be valued less than newer models, for the simple reason that they usually are technologically inferior. M60 tanks score well below M1 tanks, for example. But because the age of equipment sold would be difficult to monitor, it probably would not make sense to price secondhand equipment much lower than new versions of the same model.

Establishing the Level of Dollar Ceilings on Imports. Ideally, a dollar ceiling on imports should meet the "Goldilocks test"--not too high and not too low. The ceiling should be set high enough to achieve two goals: allowing countries to maintain forces adequate for self-defense without relying heavily on domestic production; and assuring that suppliers who refuse to join the supplier cartel could not sabotage the intent of the limits. At the same time, the ceiling should be low enough to do other things: keep defense spending from exacerbating regional poverty or consuming too much of the funding needed for investment and economic development; and reduce the likelihood of regional arms races such as those that characterized the Middle East in the 1970s and 1980s.

History and judgments of various experts can suggest plausible ceilings. During the last year or so, a number of people--including two recently retired presidents of the World Bank--have called for substantial reductions in global military spending: Robert McNamara advocated reductions of 50 percent for all countries; Barber Conable argued that countries spending more than about 5 percent of their gross domestic product on defense should not expect favorable consideration of their requests for aid from international lending institutions.[16]

Since 1985, the Mideast countries have devoted more than 10 percent of their aggregate GDP of about one-half trillion dollars a year to military spending.[17] Of that amount, $20 billion to $25 billion a year went to arms imports, with major weapons probably accounting for about 50 percent of the total. Thus, Conable's suggestion involves reducing Mideast military spending by at least half.

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16. Robert S. McNamara, *The Post-Cold War World and Its Implications for Military Expenditures in the Developing Countries* (Washington, D.C.: World Bank, 1991), pp. 16, 24; and Barber B. Conable, Jr., "Growth--Not Guns," *The Washington Post*, December 24, 1991. McNamara also notes that the report of the Independent Group on Financial Flows to Developing Countries, chaired by former German Chancellor Helmut Schmidt, suggested that countries spending less than 2 percent of their GDP on the military be given special consideration for loans.

    Mideast countries that in recent years have relied on the assistance of the international financial institutions include Egypt, Jordan, and Yemen. See World Bank, *World Debt Tables, 1991-1992* (Washington, D.C.: World Bank, 1991).

17. See, for example, International Institute for Strategic Studies, *The Military Balance, 1991-1992* (Riverside, N.J.: Macmillan Publishing Co., 1991).

Applying the standard of a 50 percent cut would reduce the region's total imports to about $10 billion a year, with imports of major weapon systems limited to $5 billion to $6 billion. The latter goal could be accomplished by limiting imports of major weapons to about $700 million per country each year. (Historical averages suggest that the limit probably would affect only seven countries--Iran, Iraq, Saudi Arabia, Syria, Israel, Egypt, and Libya; the imports of other Mideast countries have averaged well below that level.)

A higher ceiling might be set at $1 billion a year per country; a more restrictive limit, if desired, could be set at $500 million. The overall limits probably should be set only after weapons values are negotiated. In that way, if suppliers had somehow managed consistently to underprice their equipment during the negotiations, overall limits could be set lower than they otherwise would have been.

A ceiling of about $700 million also seems reasonable in view of the magnitude of weapons production in countries that might not join the cartel. Over the last decade, smaller arms producers outside the Organization for Economic Cooperation and Development (India, Israel, Brazil, Argentina, the Koreas, Taiwan, South Africa, Egypt) together have been exporting an average of about $3 billion a year in armaments. One or more of them might not be willing to join the suppliers' group--or to freeze exports to the Middle East at past levels. Their combined capacity for export of major weapon systems--some $1 billion to $2 billion annually, worldwide--should remain considerably lower than the target figure the main group of suppliers adopts. The $700 million import limit on each Mideast country, which implies a regional level of about $5 billion to $6 billion, should accomplish that goal. So would the lower annual limit of $500 million.

In theory, these other exporters in concert could provide enough weapons to a particular Mideast country to make it regionally dominant. But because they are not all aligned in a particular ideological bloc, it seems highly unlikely that they would do so. Moreover, as discussed below in the section on noncompliance, the supplier group would be able to deal with such a development.

A reduction of about one-half in imports also should permit Mideast countries to maintain substantial forces for self-defense. Over the long term, each major country probably could sustain the equivalent of two to three U.S. armored divisions and two to three wings of U.S. tactical aircraft. That is roughly the capability several of the large Mideast powers now possess, although it is considerably below that of prewar Iraq and somewhat below the current force levels of Israel, Syria, and Egypt.

Which Transactions Should Count?

Negotiators would have to decide which types of transactions to count toward any arms limits. CBO's analyses assume that all shipments of weapons would be included: sales, gifts, barter arrangements, or transfers out of excess inventory. Transfers would count even if the arms were purchased to replace equipment lost because of peacetime training accidents. (There might, however, be a special allowance for a country that had lost equipment during a war that the suppliers determined it had not started.)

In the case of import ceilings, estimated transfers by suppliers not in the cartel probably should also be counted. They could be subtracted from the original ceilings; the cartel members would then compete for whatever allotments remained.

Limits might best be applied to actual deliveries of weapon systems because the shipment is generally easier to verify than the signing of agreements. Limits on agreements to sell weapons, however, would be useful ancillary devices and would prevent any large backlog of undelivered orders that might otherwise de-

velop. In particular, the total value of agreements pending delivery might be limited so as not to exceed--for any one country--the dollar value of deliveries that are allowable over a period encompassing that calendar year, the previous two years or so (the allowable "backlog"), and the following two to three years.

Coproduction

Several Mideast countries produce equipment in collaboration with foreign firms, importing parts of systems--and often designs of the systems as well as the equipment for making them--to complete production or assembly on their own territory. The process is called coproduction or licensed production, depending on its exact nature in a particular case. To avoid gaping loopholes in the supplier-imposed limits, weapons components used to produce finished systems would have to be counted against import or export ceilings or limited in some other way. So would certain types of industrial machinery, called dual-use equipment because it has both military and nonmilitary applications, if that machinery was used to set up weapons production facilities.

Next to the fundamental problem of getting the main suppliers to form a cartel, coproduction probably poses the greatest obstacle to successfully implementing supplier-imposed limits on conventional arms transfers to the Middle East. If it proves absolutely intractable for verification reasons, the only recourse may be for the suppliers to freeze coproduction at or around existing levels--although such a freeze probably would be only roughly verifiable.

The best way to count coproduction and licensed production probably would be according to dollar value--not of the entire major weapon system but of the portion contributed from abroad. If that proved too difficult, one could count the entire value of the weapons produced.

In principle, there could be a separate dollar ceiling for coproduction and licensed production. But that might encourage Iran, Iraq, and other countries that do not currently have many large coproduction projects to start more of them. In the process, it could help those countries improve their own defense industries--not necessarily a desirable outcome at this point in history. A separate dollar ceiling on coproduction is therefore not incorporated in any of this study's options.

This approach to counting joint production could be generalized to handle the problem of upgrades of existing weapons. Imports of essential spare parts for the routine replacement of engines, tank treads, and so forth presumably would not count against ceilings. But the value of imported components used to improve the capability of weapons probably should be counted.[18] To facilitate monitoring, the suppliers probably would need to exchange information on all the equipment they shipped (including spare parts for routine maintenance, even though those would not count against ceilings, because they might resemble upgrade equipment that would be counted). With such exchanges, it would be easier for the United States to detect noncompliance and to prove it without revealing the sources and methods of its intelligence.

Retransfer

Each supplier would have to verify the final destination of all of its own exports--even those to countries outside the Middle East--in order to prevent retransfer of military goods to a Mideast country from a third party in circumvention of the accord. Any such action would have to be documented and counted against the relevant ceilings as an export from the producer to the final recipient.

18. For an extensive discussion of the issue of cooperative development and production, see Office of Technology Assessment, *Global Arms Trade* (1991).

Similar arrangements would apply to weapons produced collaboratively by a major supplier in the cartel and a smaller supplier country that were then shipped to the Middle East. At a minimum, the prorated contribution of any major supplier should be counted against relevant ceilings.

The issue also raises concerns about monitoring. To mitigate them, the chief suppliers might have to agree not to initiate new coproduction agreements with suppliers unwilling to respect the arms trade limits. In addition, the main suppliers might threaten to cut off arms shipments to any Mideast country that received large amounts of retransferred equipment and to suspend existing coproduction agreements with noncartel countries that made large retransfers.

No Limit on Domestic Production

Most of the supplier-imposed limits discussed above would not restrict domestic production of weapons. The suppliers have little direct control over domestic production of Mideast countries--and less justification for concerning themselves with it than with their own sales to the region. Perhaps most important, their ability to monitor what takes place in the interior of a foreign country is not as great as their ability to track international shipments of goods. An agreement to extend the U.N. registry to domestic production, which may be forthcoming, would aid the efforts of major suppliers to monitor domestic production and transfers by third-party suppliers. But such an agreement, even if the General Assembly concluded it, does not seem likely to produce voluntary and accurate data submissions on the part of all major Mideast countries.

In the event that a regional state undertook a major expansion of its domestic capacity to produce arms, however, the suppliers might need to reduce or even suspend shipments to the offending country. Such steps probably would be necessary if and when a country's own production of major weapons grew by several hundred million dollars a year.

Excluding current domestic production from the purview of most options would give a slight relative advantage to those regional countries--Israel, in particular--with the most capabilities for advanced arms production. In the case of Israel, this feature of most of the options would offer some insurance against the enduring possibility that it could again face a military coalition of several states.

Data Bases, Implementation, and Verification

Because large weapons cannot be easily put inside airplanes or crates, one can probably assume that the U.S. intelligence community and perhaps some others can follow their movement reasonably well. There are a limited number of large ports in the Middle East and a limited number of times one can successfully hide a 50-ton tank or a combat aircraft when moving it. The success of U.S. intelligence in following Soviet MiG transfers to Cuba illustrates the point. This observation forms the basis for the conclusion that deliveries of major weapon systems can be monitored quite accurately but that shipments of smaller systems and dual-use equipment probably cannot.

Coproduction and domestic production of major weapon systems fall somewhere in the middle of the verifiability spectrum--that is, detectable but less precisely verifiable than shipments of large weapons. Although overhead reconnaissance generally can locate large weapons factories, their actual production rates often cannot be estimated precisely. Based on experience with monitoring Soviet production rates during the Cold War, one

source estimates that uncertainty in measurement might be on the order of plus or minus 10 percent.[19]

Even for shipments of large weapons, verification would require effort. A committee of supplier nations--perhaps analogous to the Standing Consultative Committee that monitors the Strategic Arms Limitations Talks (SALT) agreements--presumably would have to be created. It would monitor compliance with limits and adjudicate any disputes that arose between countries. Arrangements for arms transfers would continue to be made privately between buyer and seller countries. Once a deal was made and approved by the individual countries--and before it resulted in delivery--it could be registered in a data base. The committee and its support staff would then maintain and monitor a schedule of deliveries to ensure that no country violated the limits.

The process might work best if, at the end of each calendar year, the committee and staff could work with supplier countries to arrange a delivery schedule for the next year for all deals that had been registered. The general presumption might be: "first deal arranged, first delivery made." If such rules were clearly conveyed in advance, the Mideast states might feel obliged to conclude only those deals that were truly important to them--and would be less tempted to try to exceed their ceilings by sowing confusion among the suppliers about which deals took precedence. (Ultimately, if confusion arose as to which of two agreements had been reached first, the suppliers might have to force the prospective recipient to choose which delivery it wanted first and to wait for the other one.)

To facilitate monitoring of coproduction and of upgrades, as discussed above, the data base should include all weapon systems that appear on current munitions and dual-use lists. The most comprehensive of those are the U.S. Munitions List and the U.S. Commodity Control List, developed in conjunction with the Coordinating Committee on Multilateral Export Controls (COCOM). The West used COCOM during the Cold War to limit the flows to the Eastern bloc of munitions and technologies with military uses. To facilitate verification, the data base probably should specify not only weapons shipped but also dates and routes of shipments. Such information should help minimize the risks of undetected shipments, make it easier to identify any that took place in violation of the limits, and improve accuracy in determining the size and composition of individual deliveries.[20]

Maintaining a data base would not, of course, solve the problem of clandestine shipments. To keep track of them, the monitoring committee would have to depend on the assistance of the intelligence agencies of the supplier nations.

Another problem requiring attention relates to the export controls of Russia and other former Soviet republics. Even if central governments could be persuaded or pressured into accepting limits on their exports, they might not be able to enforce these limits without good export regulations and customs systems. This concern is particularly germane in countries where lines of authority are changing and where discipline and cohesion in the ranks of government employees are suspect. Clearly, the countries of the Commonwealth of Independent States (CIS) could fit this model. These observations suggest that the United States would have to pay special attention to monitoring CIS borders (as it probably already is) and that it might need to give technical assistance to border officials, in the event that conventional arms transfer limits were negotiated.

Even with all these efforts, verification would remain a challenge to the successful implementation of supplier-imposed limits. It

19. Malcolm Chalmers and Lutz Unterseher, "Is There a Tank Gap?: Comparing NATO and Warsaw Pact Tank Fleets," *International Security* (Summer 1988), p. 11.

20. See, for example, Adams, *Arms Exports*; and Goldring, *The International Arms Industry*.

would have to be evaluated as the limits came into effect, with possibilities for improvement continually explored. But most--if not all--of the monitoring of weapons flows that the U.S. intelligence community would have to perform is already being done for normal reconnaissance and intelligence purposes. Thus, although information would need to be processed differently in some cases, and although more data might have to be shared with other governments than is now the case, the data collection process probably would not need to change very much.

Close attention to details--including the legal frameworks governing exports and the maintenance of very capable customs services and other monitoring bodies--would have to complement the professed good intentions of governments to respect supplier limits. The challenge could be formidable--and require Western assistance--in the former Soviet republics.

Phase-In Period

Once agreed to, limits could be phased in gradually. Such a transition would allow existing agreements to be honored or grandfathered--something that suppliers such as the United States, France, and Russia probably would insist on in order to maintain preexisting commitments to key regional allies. The phase-in period would need to be about two to three years because that is the characteristic time lag between agreement and delivery for many weapon systems, especially those made to order. A delay of that length also would allow the United States and its Western allies to strengthen the Gulf peninsular countries during a period when sales to Iraq remain embargoed.

Because most Mideast states are significantly indebted, the phase-in would probably not become a major loophole in the limitation of arms transfers--especially not for those Mideast countries that cause greatest concern to U.S. planners. For most countries in the immediate future, only modest trading seems likely--with or without institutionalized limits. Still, each major supplier probably should commit itself to shipping no more during this phase-in period than it had shipped in the two or three previous years.

Noncompliance

Although massive violations probably would not occur under the limits discussed here, a number of countries might attempt to violate the letter or spirit of limits for financial or political gain. Therefore, if a cartel member failed to comply, a nonmember made a large shipment, or a Mideast country greatly expanded domestic production, proportionate responses would be needed. The supplier group as a whole might consider imposing sanctions on the noncompliant party, perhaps reducing its allowable shipments for the next year or imposing broader penalties. Suppliers might also choose to relax temporarily the limits on sales to a country that was threatened by a major buildup in a neighboring state. Such mechanisms would make it possible to deal with violations of the limits without leading to a collapse of the control framework.

Effects of Limits on Arms Transfers: Key Assumptions for Subsequent Analysis

The three remaining chapters analyze the economic, military, and political effects of multilateral supplier limits on conventional arms transfers to the Middle East. For simplicity, most of the analysis assumes the imposition of an equal-dollar limit on imports, with an annual limit on major weapons of about $700 million a year per Mideast country. This illustrative ceiling encompasses

coproduction and upgrades in major weapons, as well as shipments of finished goods and dual-use technologies that might be used to build military production facilities.

The analysis applies equally well to limits on actual numbers of weapon systems that would correspond to a total value of about $700 million a year for each country (assuming that top-of-the line equipment was being transferred). In addition, if results are scaled proportionately, the economic analysis also applies to options that would use different dollar ceilings.

The economic analysis in Chapters 6 and 7 assumes that imports of smaller weapons and ancillary equipment also would decline, although not so drastically as those of major weapons since no direct limits would be imposed there. In particular, regionwide trade in major weapons is assumed to be reduced from $10 billion to $5 billion a year, and trade in all other military equipment from $10 billion to $7.5 billion. Total reductions in imports thus would be in the $7 billion to $8 billion range, a cut of 35 percent to 40 percent compared with levels typical of the 1980s. (The sales precluded by arms transfer limits actually might be less, since the Middle East's appetite for arms may no longer be quite as voracious as it was in the 1980s.)

To avoid overstating the benefits of reduced arms sales to the region, no other reductions in military spending are assumed. In reality, some additional cuts might well occur because fewer arms imply smaller forces and thus lower expenditures on manpower, fuel, and the like. Yet limits on the arms trade also could lead one or more Mideast countries to expand their domestic production of arms or to increase imports of nonlimited military hardware, nullifying some of the intended economic benefits.

Chapter Six

The Macroeconomic Benefits and Costs of Arms Transfer Limits

As limits on the arms trade are debated, questions arise about their economic effects. Would restricting arms sales hurt the economy of the United States and other major Western exporters? How would the economies of the Mideast nations be affected? Would there be an impact on the former Soviet republics?

Obviously, limiting the arms trade could eventually enhance the welfare of people everywhere. If limits are achieved through a regime that ensures at least as much national security for all countries as they would have attained otherwise, economic resources that would otherwise be spent on arms would be available for other uses. In the long run, if sensible economic policies are pursued, world consumption should rise. In the short run, however, there could be some adverse effects, especially for the former Soviet bloc.

In analyzing the potential effects on various nations in quantitative terms, this chapter presumes that the illustrative arms control regime presented in the preceding chapter is in place. Under its terms, each country in the Middle East would be permitted to import no more than $700 million a year in major weapons. Such a limit would reduce total shipments of arms to the Middle East by 35 percent to 40 percent relative to typical levels of trade in the 1980s. For purposes of analyzing effects on particular countries, this study assumes that these reductions are allocated as shown in Table 7.

The macroeconomic analysis yields three major conclusions:

- The macroeconomic effects of limiting the arms trade with the Middle East could be large and beneficial for countries in the region, resulting in substantial increases in their domestic aggregate demand and nonmilitary imports and, under some circumstances, significant long-run increases in real GDP;[1]
- The macroeconomic effects on the United States and other developed countries that supply arms would be tiny;
- Because the arms trade with developing countries remains an important source of hard-currency earnings for the former Soviet republics, a significant reduction in arms exports might contribute to adjustment problems within the former Soviet economy in the near term.

Effects on Countries in the Middle East

For Mideast countries, the overall net effects of successfully limiting arms transfers are likely to be positive. The nature of each country's policy choices would determine

1. Gross domestic product for a given country is the value of all production of goods and services in the current year within the given country.

Table 7.
Assumed Values of Arms Trade Reductions in the Mid-1990s Relative to Levels Typical of the 1980s (In millions of dollars)

	Reduction
Arms Exports	
OECD Members	
United States	3,000
EMS members	
United Kingdom	750
France	750
Germany	250
Other EMS	500
Subtotal	5,250
Other OECD	250
Total	5,500
Former Soviet Republics	
Russia	1,500
Ukraine	250
Total	1,750
Czechoslovakia	250
Total Exports	7,500
Arms Imports	
OPEC	
Iran	2,150
Iraq	2,150
Saudi Arabia	1,000
Libya	700
Total	6,000
Syria	700
Israel	400
Egypt	400
Total Imports	7,500

SOURCE: Congressional Budget Office.

NOTES: Figures are CBO projections of Mideast trends, based on testimony by the Central Intelligence Agency and industry sources. Beyond 1992, the U.S. reduction in arms exports, in inflation-adjusted terms, is kept at the same percentage of U.S. real gross domestic product as in 1992. All other reductions in arms exports and imports are scaled proportionately to the U.S. reduction.

OECD = Organization for Economic Cooperation and Development; EMS = European Monetary System; OPEC = Organization of Petroleum Exporting Countries.

whether those net benefits accrue largely as additions to present consumption or as additions to future consumption.

Overall Effects

Many of the Mideast countries have spent substantial shares of GDP on arms. In 1989, spending amounted to about 2 percent of GNP for Iran and between 4.5 percent and 5.5 percent of GNP for Saudi Arabia, Syria, Libya, and Iraq.[2,3]

Because their arms imports are large, a limitation could result in sizable economic gains for those nations.[4] Economic benefits could be obtained by using the resources that would otherwise pay for arms imports to stimulate domestic aggregate demand, either directly or indirectly, and also by increasing nonmilitary imports. The increases in nonmilitary imports could be relatively large (see Table 8). Syria, for example, could expand its merchandise imports by nearly 30 percent under the limits assumed in this chapter, or 2.4 percent of GDP. Egypt, Israel, and Saudi Arabia could expand nonmilitary imports by roughly 1 percent of GDP; Iran and Libya, by around 2 percent; and Iraq, by as much as 6 percent. Alternatively, countries could use their freed-up resources to borrow less from abroad or to invest more abroad (as may be the case with Saudi Arabia).

2. Gross national product (GNP) equals gross domestic product (GDP) plus net factor income flows, where the latter equal the foreign earnings of domestic residents minus the domestic earnings of residents of the rest of the world. Throughout this chapter, the discussion is presented in terms of real GDP--except where GNP is used to be consistent with quoted sources of historical statistics.

3. For a discussion of some of those numbers, see Norman S. Fieleke, "A Primer on the Arms Trade," *New England Economic Review* (November/December 1991), p. 50.

4. The Congressional Budget Office assumes that, in the absence of an arms transfer limitation, most of the countries in question would be paying hard currency for all of their arms imports in future years.

Table 8.
Potential Increase in Nonmilitary Imports by Mideast Countries

	1992 Increase (Millions of dollars)	Increase as a Percentage of	
		Merchandise Imports	Gross Domestic Product
Iran	2,150	10.6	2.2
Iraq	2,150	19.5[a]	6.1
Saudi Arabia	1,000	3.8	1.0
Syria	700	29.2[b]	2.4
Libya	700	7.8	1.8
Israel	400	2.4[b]	0.7
Egypt	400	2.7	1.3

SOURCE: Congressional Budget Office.

a. Based on merchandise imports in 1989.

b. Based on merchandise imports in 1990.

Countries could use the additional resources that the arms limitation freed to increase their domestic investment, which eventually could lead to significant increases in real output. If all the resources were devoted to domestic investment, the increase in real GDP could eventually average more than 2.5 percent for the seven countries (Israel, Egypt, Libya, Iraq, Syria, Saudi Arabia, Iran) that CBO analyzed in detail.[5] The full effects might not be realized for 20 or 30 years, however, because of the time required for investments to increase GDP.

Cash Customers

The specific effects on individual countries in the Middle East would vary according to their situations. Economic gains from reduced arms purchases would be largest for those countries that spend cash.

By making funds available for other uses, a reduction in arms imports would offer such a nation a number of options. First, the country might reduce its defense spending and government borrowing, thereby increasing its national saving rate. That would enable the country to borrow less from abroad or to devote more of its resources to domestic investment and--in the longer term--would increase the income of its citizens. Second, it might increase consumption in the near term. It could also choose to follow a combination of those strategies.

How would the two broad national strategies--increasing saving or increasing consumption--produce economic benefits? Increasing saving would require the government to reduce its own deficit as it reduces spending on arms. Lower government borrowing is likely to improve confidence that the government would be able to pay its debts, and also might reduce the interest rate it pays when borrowing from abroad. And lower government borrowing from domestic residents is likely either to lower domestic interest rates or to loosen controls over the allocation of domestic credit. Thus, the rate of domestic investment would increase. Alternatively, the lower government borrowing could reduce borrowing from abroad and the burden of future debt service on the economy, enabling the citizens of that country to enjoy a larger proportion of the fruits of their production.

Most cash customers, however, would probably not follow that first strategy, at least not exclusively. A reduction in arms imports would free resources that could be used directly or indirectly to stimulate domestic aggregate consumption. Such an expansionary policy could consist of increased nondefense spending by the government, increased transfer payments to the citizenry, or reduced taxes. Depending on whether unused resources--unemployed labor or idle factories--existed in the economy and depending on how the government in question manages its exchange rate, some of these outcomes might also increase aggregate national production in the short run.

5. The long-run increase in real GDP for these countries is calculated using conservative assumptions for output-to-capital ratios and the lifespan of physical capital.

In most options, including that of stimulating higher domestic investment spending, the government of the Mideast country in question would also change its position in the foreign exchange market sufficiently to create in the end a large increase in nonmilitary imports. Because the former arms imports were purchased with foreign exchange, the government would reduce its demand for foreign currencies to make available the domestic currency that it must have in order to pursue most of its other options. If the Mideast government does not directly increase nonmilitary imports or does not invest more (or borrow less from) abroad, that would greatly reduce its demand for foreign exchange. As a result, there would be either a significant reduction in the price of foreign exchange or a significant increase in its official allocations at a fixed price to private residents. In turn, therefore, that would probably result in a large increase in nonmilitary imports.

If the Mideast country does not invest more--or borrow less from--abroad, the ultimate expansionary effects on domestic aggregate demand, and the substantial increases in nonmilitary imports that would accompany the domestic stimulus, would have opposing effects on real GDP in the short run. In many of these cases, the net effect on real GDP in the short run would be nil.[6]

Most countries would be likely to follow a combination of the two broad national strategies--increasing consumption somewhat in the short run while also increasing national saving. If the increase in domestic aggregate demand included investment spending, there could over time be significant growth in stocks of productive physical capital in the Middle East. That would raise real GDP significantly in the long run, further elevating nonmilitary imports.

6. In some cases, the short-run effect on real GDP could be substantial and positive. At the opposite extreme, if the government in question continues to maintain a fixed price of foreign exchange that is below the price that would obtain in a free market, reduced domestic taxes or increased transfer payments to citizens could actually result in a lower real GDP in the short run.

Petroleum-Exporting Countries

Although they are importers that pay cash for arms, some petroleum-exporting nations--particularly Saudi Arabia--might have high saving rates that would permit them to react differently to limits on arms transfers. The different reaction would produce different economic effects.

The typical wealthy member of the Organization of Petroleum Exporting Countries has a small population and an export sector--petroleum--that is largely insulated from the rest of the domestic economy. Given the OPEC country's past ability to import whatever it wanted, it is unlikely to increase nonmilitary imports in response to an arms transfer limitation and thus has little incentive to reallocate domestic resources between sectors. It also may have little incentive to change either the level or the composition of domestic investment. Thus, the increase in net national saving would more likely end up being invested abroad--thereby tending to apply downward pressure to worldwide interest rates.

It is not clear how many OPEC nations would be affected in that manner. Not all OPEC countries have high saving rates, and some of the high savers have recently faced extraordinary demands on their resources because of the Gulf War. Perhaps because of cash flow problems, even Saudi Arabia, which does have a high saving rate, paid its share of the cost of the Persian Gulf War in installments.

Israel and Egypt: Credit Recipients

Israel and Egypt differ from other Mideast nations in that both receive substantial foreign military financing (FMF) grants from the United States. The United States has been paying for more than half of Egypt's arms imports through FMF and last year forgave some $7 billion of that nation's debt--in effect converting a loan into a grant.

Under some circumstances, a limit on arms transfers would affect Israel and Egypt in the same manner as it affects countries that import arms and pay cash for them. The multilateral arms transfer agreement analyzed in this chapter could lower annual transfers from the United States to Israel and Egypt by $400 million each compared with sales in the 1980s. The United States currently finances those transfers through the FMF program. If they are limited, the foreign military financing might be converted to general economic aid. If such a conversion took place, and if the transfer agreement did not induce changes in the arms exports of those two nations, the arms transfer limit would benefit Egypt and Israel in the same way as it benefits other countries that pay cash.

If FMF grants are reduced at the same time that arms transfers are limited, however, Egypt and Israel would neither benefit nor suffer from limits on them. In that case, their arms imports would decline, and there would be no direct effect on their current-account balances or their general government deficits because credits as well as outlays would be reduced. Therefore, these countries could not increase their imports of civilian goods and would not enjoy the economic gains previously described.

Effects on Developed Nations That Export Arms

Limits on arms transfers could in several ways affect the economies of the developed countries outside the former Eastern bloc. But the overall effects are likely to be tiny. In the short run, the loss of arms exports could slightly weaken the economies of the developed-country suppliers. But as they adjusted to the new pattern of international trade flows that would result from the arms limitation, some economies would actually be strengthened relative to a base case in which transfers remain unlimited, and the negative effects on other countries would become smaller over time and might even turn positive.

Changes in International Trade

Limits on arms transfers could alter the types of goods that are traded internationally. If Mideast countries substitute imports of nonmilitary goods for the imports of arms, nondefense production would increase in the developed countries as arms production for export declined. Based on current trade shares, the new distribution of developed-country exports by supplier would be different: some countries would increase their exports because of the new composition and pattern of trade, and others would experience a decline.

If the Mideast countries responded to the limit on arms trading by increasing their domestic investment spending, real productive capacity and output in the Mideast countries would be higher in the long run, and the level of their nonmilitary imports would rise further. Thus, the absolute level of trade between the former arms-supplying and arms-importing countries might increase, benefiting all countries.

Reallocation of Existing Resources: Productivity Gains or Losses?

Limiting arms transfers could also affect productivity in the exporting nation, although the nature of the aggregate net effect cannot readily be determined.[7] If limits are imposed, existing economic resources would be switched from the production of arms for export to the production of other goods that would include higher nonmilitary exports to the developing

7. Productivity is the measure of output per unit of resource input.

world.[8] It can be argued that the productivity of resources employed in certain lines of arms production is relatively high. Resources may be more or less productive in other industries, and, as a result, a country may or may not possess a comparative advantage over other countries in certain types of export sales.[9]

For example, some analysts believe that the United States has a comparative advantage in aircraft production.[10] Therefore, the resources currently employed in the production of military aircraft for export might be *less* productive in the manufacture of other goods. Military aircraft and parts accounted for about 37 percent of total U.S. military exports over the 1980-1990 period.[11,12]

As a related example, it has been argued that export sales have allowed European aircraft manufacturers to attain economies of scale in production.[13] Therefore, an elimination of export sales might lower productivity by raising the cost of aircraft.

There are counterarguments, however. Arms exports include more than simply aircraft, and the productivity of the resources employed in the production of those other arms exports could be significantly lower. Subsidization of arms production by some supplier countries may disguise the lack of productivity of the resources employed. With the achievement of true market union within the European Community, not every EC country will need to maintain separate producers in all lines of arms production; economies of scale could result from having a given country or international consortium produce some types of arms for all EC countries. In addition, some economists would argue that, because of the special relationships between defense firms and governments, the defense sector is generally less competitive than the rest of the economy. In this case, switching resources from the production of defense goods into other sectors would increase the degree of competitiveness and bring on greater efficiency and productivity.[14]

In any event, the gains or losses in net productivity that the reallocation of existing resources would produce--within each arms-supplying nation--would probably be small relative to the direct changes the new pattern of international trade brought about.

Magnitude of Effects

Although arms limits could engender many types of economic effects, their magnitude is likely to be very small compared with the sizes of the economies of the developed nations. Based on assumptions noted below, CBO estimated the macroeconomic effects of a reduction of 35 percent to 40 percent in total arms sales to the Middle East.[15] For major exporting nations, the loss in real GDP is not likely

8. Some net dislocation of labor will occur during the adjustment period, as reflected in a near-term decline in real gross domestic product. In addition, some physical capital may become obsolete.

9. If one country has a comparative advantage over others in a certain type of production, that country's sales of the product in question are highly competitive on export markets. Roughly speaking, the relative productivity of a given country's economic resources in alternative lines of production determines its comparative advantage.

10. For a discussion of this issue, see Fieleke, "A Primer on the Arms Trade," p. 52.

11. Ibid.

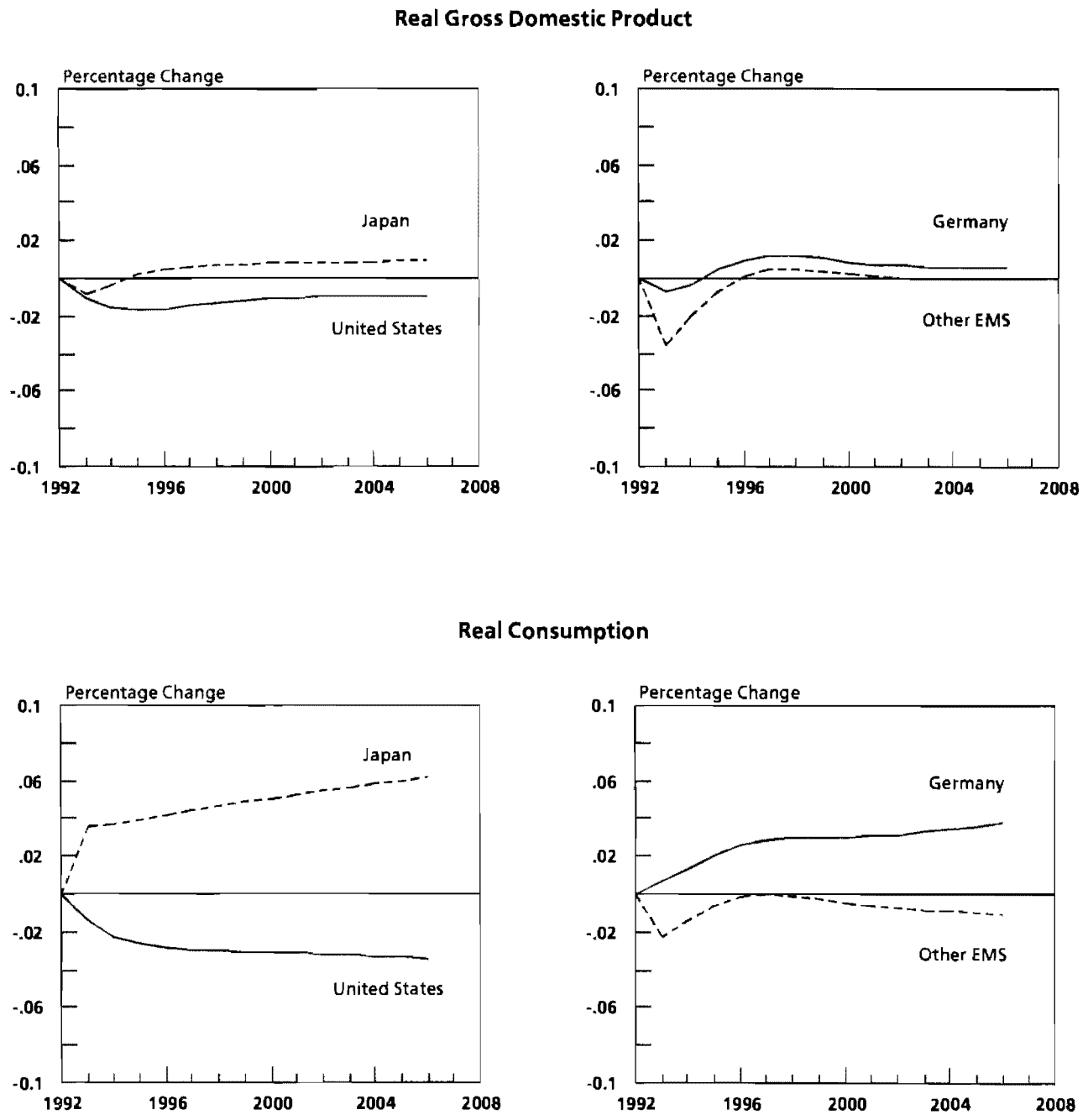
12. It might also be argued that U.S. aircraft producers exert some degree of discriminatory pricing power over sales on export markets. The issue is not addressed in this study. But note that it is not entirely clear whether an arms transfer agreement would lessen or strengthen such discriminatory pricing power. That would depend on the success of the cartel of arms suppliers in restricting supply.

13. Fieleke, "A Primer on the Arms Trade," p. 54.

14. See comments by economists Lawrence R. Klein and David Wyss in "Economists Cite Benefits of Arms Cuts," *The New York Times*, February 3, 1992.

15. To perform these simulations, CBO used the McKibbin-Sachs Global (MSG) model, developed by Warwick McKibbin of the Brookings Institution and Jeffrey Sachs of Harvard. This forward-looking model assumes that financial and other markets anticipate future changes in government policy. International capital flows freely among the developed countries and reacts immediately to changes in relative interest rates among the developed countries.

Figure 6.
Effects of Arms Transfer Limits on Developed Countries, 1992-2006



SOURCE: Congressional Budget Office using the McKibbin-Sachs Global model.

NOTE: Other EMS = members of the European Monetary System other than Germany.

to exceed 0.04 percent, and the increase in real private consumption is likely to be less than 0.06 percent (see Figure 6). Indeed, as the developed countries adjusted to the new pattern of international trade flows, some economies would be strengthened slightly; that is particularly true of Japan and Germany, which export few arms to the Middle East.

The likely macroeconomic effects are slight because even total arms exports are a small percentage of GNP for the developed-country arms suppliers. In 1989, total arms exports were only 0.4 percent of GNP for the United Kingdom, which that year had the highest percentage among developed countries.[16] (U.S. exports in 1989 represented 0.2 percent of GNP.[17])

Those calculations are based on several assumptions. As arms imports to the Middle East decline, nonmilitary imports are assumed to grow by the same amount, and domestic investment in the Mideast countries is assumed to remain unchanged. World prices for oil are also assumed not to change.

Effects of Investment Changes. By contrast, if the Mideast countries were to invest some of their increased nondefense resources domestically rather than spend it for consumption, the benefits to the developed countries of the arms transfer limit could be underestimated by Figure 6. In that case, the Mideast countries would increase their stocks of productive physical capital, thereby raising their real GDPs and further raising their demand for imported goods and services. In other words, the absolute level of international trade would increase in the long run.

Effects of Change in Oil Prices. An increase in world oil prices would adversely affect the economies of most arms-exporting nations. But it is not clear how an agreement to limit arms transfers would affect those prices. Only Saudi Arabia is a truly effective price-setter for this commodity, because in the long run it alone has the capacity to increase or reduce the world's supply by a substantial amount. Thus, if the arms transfer limit were agreeable to Saudi Arabia, it is unlikely that other OPEC countries would be able to raise the world price of oil for an appreciable period of time. Moreover, the curtailment of arms imports by OPEC nations could reduce the demand for foreign-exchange earnings within several OPEC countries, thereby exerting an indirect, moderating influence on the price of oil.

Finally, another war in the Middle East could dramatically increase the price of oil by disrupting the world supply. To the extent that an arms transfer agreement would reduce the likelihood or magnitude of such a war, it would also reduce the likelihood of sharp price hikes and disruptions in supply. Obviously, maintaining an uninterrupted world supply of oil is a major reason why the United States and the rest of the developed world have such a strong interest in the Middle East.

Effects on the Former Eastern Bloc

Trade restrictions are likely to affect the former Soviet republics that export arms much more adversely than they affect Western arms suppliers--because arms exports are larger relative to the size of the republics' economies and because they have limited ways of earning hard currency.

The contribution of arms exports to the GDP of the former Eastern bloc has been quite large but appears to be declining. During the 1985-1989 period, the Soviet Union and various Eastern European countries were major arms suppliers to developing-country markets. During the same period, arms exports averaged 0.7 percent of GNP for Poland, 0.9 percent for the Soviet Union, 1.0 percent for

16. See Fieleke, "A Primer on the Arms Trade," p. 50.

17. Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers, 1990* (1991).

Bulgaria, and 1.1 percent for Czechoslovakia--in each case, at least twice the share of their Western counterparts. But by 1989, total arms exports as a percentage of GNP were reduced to 0.3 percent for Bulgaria, 0.7 percent for Czechoslovakia, and 0.7 percent for the Soviet Union.[18] Other data indicate that Soviet arms transfers to developing countries fell from $19.4 billion in 1988 to $16.5 billion in 1989 and $12.9 billion in 1990.[19]

Nonetheless, the arms trade with developing countries remains an important source of hard-currency earnings for the former Soviet republics. Soviet export sales to the developing world for hard currency declined by a much smaller amount than total arms exports in recent years; hard-currency sales to developing countries remained about $9.1 billion per year in 1987, 1988, and 1989 and then fell in 1990--but only to $7.5 billion.[20] The published data on both arms transfers and hard-currency trade suggest that the arms exports of at least some countries of the Eastern bloc declined right along with their official military grants and their soft-currency sales to developing countries, with less change in the importance of hard-currency arms sales.

Furthermore, the surplus on hard-currency trade with developing countries has helped to finance a substantial deficit in hard-currency trade with the nations of the Organization for Economic Cooperation and Development. The Soviet Union ran a surplus with developing countries of roughly $4.0 billion in 1989 and $2.2 billion in 1990; even so, in both of those years, the Soviet Union's total current-account balance in hard currency was more than $4.0 billion in deficit, after having run a surplus for many years in a row.[21]

If, under the illustrative example analyzed in this chapter, the limits on arms transfers reduced hard-currency earnings by $1.75 billion (as in Table 7), with no compensating gain elsewhere, imports of goods and services would also decline by the same amount, and that would push down real GDP in the former Soviet republics. A significant reduction in arms exports might therefore exacerbate the already serious problem of adjustment in the post-Soviet economy.

Western aid could of course offset that effect of a transfer agreement. For the reasons given above, analysts who believe that the developed nations should provide substantial capital to Russia and other former Soviet republics might think that a limitation on arms transfers strengthens their argument. In fact, it may be difficult to get the former republics to participate in a multilateral transfer agreement without some hard-currency compensation.

18. Fieleke, "A Primer on the Arms Trade," p. 50.

19. Central Intelligence Agency, *Handbook of Economic Statistics, 1991* (September 1991); and Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers* (annual volumes).

20. Central Intelligence Agency, *Handbook of Economic Statistics, 1991*, and the corresponding handbooks for 1989 (published in September 1989) and 1990 (published in September 1990).

21. See Central Intelligence Agency, *Handbook of Economic Statistics, 1991*.

Chapter Seven

The Effects of Arms Limits on Industries and Firms

The previous chapter concluded that limiting arms exports to the Middle East would have little impact on the economies of the United States and most other developed countries that are major exporters. The effects would be more pronounced, however, at the level of industries and firms. This chapter discusses the effects on particular industries and firms in the United States, as well as some effects in other countries. As in Chapter 6, the analysis is based on an illustrative example of arms limits. The example assumes that limitations on the arms trade would reduce the annual imports of Mideast countries collectively by about $7.5 billion--a cut of about 30 percent from average levels in the 1980s.

Effects on U.S. Industries

Under such limits, reductions in U.S. exports might total as much as $3 billion a year. That would equal about one-fifth of total foreign military sales and about one-twentieth the level of current procurement spending by the Department of Defense.

Based on historical market shares, it would be reasonable to estimate that U.S. exports might decline by only $2 billion or so a year under the illustrative import limit on major weapons of $700 million per country per year. Most of the large Mideast importers have not traditionally been U.S. clients, so limits on their imports would not imply cuts in U.S. exports. This study nonetheless uses the figure of $3 billion, partly because of the current popularity of U.S. weapons on the world market and partly to ensure that the adverse economic effects of arms trade limits on U.S. firms are not underestimated.

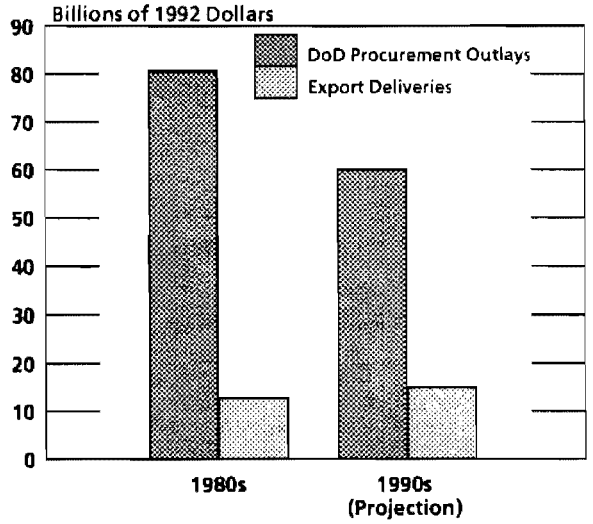
Effects on Sales and Profits

A reduction of $3 billion a year in arms sales, which would constitute a cut of about 1 percent in U.S. merchandise exports, would not significantly affect the vast majority of exporting industries in the country. When examining cuts of some $20 billion in annual U.S. defense purchases, CBO found that only six of 420 major industrial sectors would suffer sales reductions of 5 percent or more, relative to the 1991 baseline.[1] A cut of $3 billion in orders would have much smaller effects.

Arms exports do, however, constitute a growing share of the business in some defense industries. During the height of the U.S. military buildup that occurred during the 1980s, exports of arms were about one-eighth as large as U.S. defense procurement. In the 1990s, however, as a result of declining spending by the U.S military services, exports seem likely to be about one-fourth as large as U.S. defense procurement (see Figure 7). In the case of

1. Congressional Budget Office, *The Economic Effects of Reduced Defense Spending* (February 1992), p. 23.

Figure 7.
U.S. Arms Production



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency and the Department of Defense.

tanks and tank components, export limits could reduce sales by as much as 15 percent to 20 percent of output in 1995, assuming that reductions in tank exports are proportional to the overall $3 billion reduction in U.S. arms exports. But in all other industrial sectors, the expected impact would be less--in the vast majority of cases, far less.

Some of these industrial sectors, such as aircraft manufacturing, are also among the United States' most competitive in world markets. Aerospace exports generated almost $40 billion in revenues in 1990, which represents about 10 percent of all U.S. merchandise exports. However, four-fifths of those sales involved commercial rather than military aircraft. Another sector with strong export markets is electric and electronic equipment. Those sectors are likely to continue to grow because of growing commercial demand, even if arms sales are cut back.

Profits in some defense industries might decline by a higher percentage than sales. In aerospace, for example, profit rates from exports are much higher than the 3 percent to 5 percent that typifies all sales. Export sales typically take place toward the end of the production cycle of a weapon system, when production costs are low and most investment expenses have already been amortized. If profits equaled one-sixth of revenues, a $3 billion reduction in annual sales would reduce defense industry profits by a half billion dollars a year--nothing to ignore, but still no more than a small percentage of total profits in the arms-producing sectors of the economy.[2]

Effects on Jobs in Defense Sectors

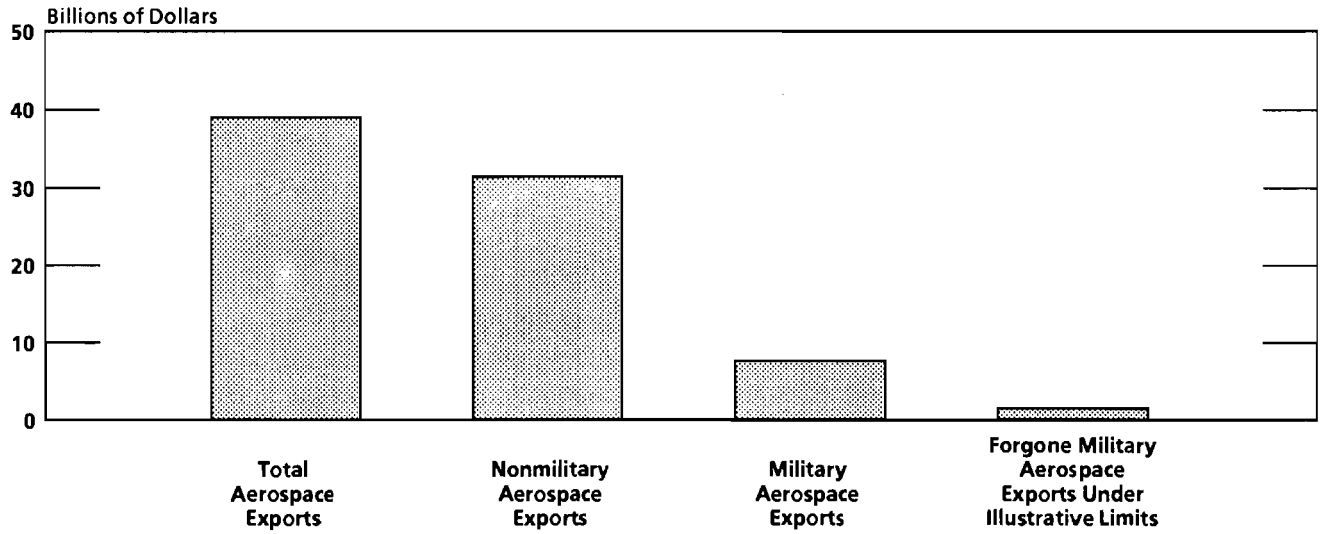
Under the illustrative limit and the pessimistic assumption that U.S. arms exports might decline by $3 billion a year, as many as 75,000 jobs might be lost nationwide. The job losses would be in prime-contractor industries that receive direct payments from DoD as well as in subcontractor firms indirectly receiving payments.[3] The losses would occur primarily in the aerospace, communications, electronics, and combat vehicle sectors. The last named could suffer significantly. Because of their large civilian markets, aerospace and communications would not experience major losses relative to their size. Aerospace, for example, might lose about $1.5 billion, or 4 percent of its annual exports, under the illustrative limit (see Figure 8).

The individuals losing jobs would represent slightly less than 2 percent of all defense workers (both government and nongovernment) and less than one-tenth of one percent of all U.S. workers. The estimate of 75,000 is based on simulations of the effects of reduced U.S. defense spending on the economy.

2. See Aerospace Industries Association, *Aerospace Facts and Figures 91-92* (Washington, D.C.: AIA, 1991), p. 157; and Office of Technology Assessment, *Global Arms Trade* (1991), p. 53.

3. Congressional Budget Office, *The Economic Effects of Reduced Defense Spending*, pp. 5-26.

Figure 8.
Dependence of the U.S. Aerospace Industry on Arms Exports, 1990



SOURCE: Congressional Budget Office based on data from the Aerospace Industries Association.

NOTE: The calculation assumes that forgone aerospace exports under the illustrative limits are proportional to the overall reduction in arms exports.

Not all of those whose positions were eliminated would become unemployed. Of those who did, most would probably find work in nondefense businesses, many in a relatively short period. Those shifts would not be painless, however. Workers would have to acquire new skills and might have to relocate; localities where defense plants closed would face a period of retrenchment until new sources of employment could be established.

In all but a handful of cases, the output of any given state would decline by less than one-tenth of one percent as a result of the illustrative arms limit. But certain localities and firms could suffer significantly.

Effects on Specific Firms

Arms limits could have much more important effects at the level of the firm than of industrial sectors. The U.S. government has canceled orders for a number of weapons because of declining needs stemming from the end of the Cold War. Foreign sales for those weapons may be the only remaining means of keeping production lines open in some cases.

For example, sales to Egypt, Saudi Arabia, and possibly other countries of the six-member Gulf Cooperation Council could keep production of M1 tanks by the General Dynamics Corporation going until the end of the decade; without all of those sales, production could end earlier.[4] The production line of F-15 aircraft at the McDonnell Douglas Corporation might be kept open about three years longer if a major sale is made to Saudi Arabia. Those sales also would preserve the possibility of producing the F-15 or a derivative for U.S. or allied forces at a later date.

If limits on the arms trade led to scaling back or canceling some foreign sales, however, several production lines might close sooner than would otherwise be the case. Closing lines, inevitable with or without limits on exports during a major defense drawdown, raises

4. Air Force Association, *Lifeline Adrift* (Arlington, Va.: Aerospace Education Foundation, 1991), p. 6.

two types of problems: the loss of jobs in local areas and the erosion of the defense industrial base.

Job Losses in Local Areas

Many U.S. defense firms are highly specialized and less able than their counterparts in Europe to shift workers from defense to nondefense work if the former is reduced.[5] When they lose defense work, therefore, U.S. firms tend to close plants and lay off significant numbers of employees. Local economies may not be sufficiently flexible to offer new employment possibilities. Substantial layoffs already have occurred in certain localities because of the downturn in U.S. defense procurement. Reductions in arms exports to the Middle East, although of much smaller magnitude than the reduction in U.S. defense spending, would add to this distress.

A recent study by the Office of Technology Assessment argued that the pain of defense layoffs is most acute for blue-collar workers--machinists, welders, electricians, and the like--because they have fewer opportunities for alternative employment than do engineers and white-collar office workers, especially in regions experiencing long-term decline in their manufacturing sector.[6] Many major weapons, however, are produced in large metropolitan areas that have economies that are diversified. The growth in unemployment in most such areas probably would be of modest duration.[7]

Erosion of the Defense Industrial Base

The other concern associated with closing production lines is the reduction in the number of companies that are available to produce weapons--collectively referred to as the defense industrial base. Keeping lines active, even at the minimum rates of output associated with foreign sales, sustains the industrial base in three ways.

First, it retains a cadre of engineers and technicians thoroughly familiar with the practical problems of producing weapon systems. Although some experience in defense production could be retained simply through repair and upgrade work or through work on research and development prototypes, there are advantages associated with actually producing new systems from start to finish.

Second, continued production helps to preserve subcontractors and suppliers. Many specialized skills--such as those associated with titanium technologies, optics coatings, infrared sensors, and certain radar technologies--are found at this lower tier of the production process. And the number of suppliers in many key technologies is very small.

Third, uninterrupted production retains factory floor space and machinery that could be needed in the event of a major war. Shifts of workers can be added fairly quickly to step up output, as exemplified by the expanded production of certain munitions and spare parts before and during the Gulf War.[8] In contrast, restarting a major production line that has been shut down, even when the facility and equipment have been carefully preserved, can take three to five years.

The United States may not, however, need to maintain an active production line for each major weapon in order to meet possible threats. For major weapons, which generally take two or more years to build even when production lines are "warm," an open line does not help in such situations as the Gulf War. That type of operation must be handled with

5. Office of Technology Assessment, *Global Arms Trade*, pp. 76-77.

6. Office of Technology Assessment, *After the Cold War* (1992), pp. 59-99.

7. Congressional Budget Office, *The Economic Effects of Reduced Defense Spending*, pp. 31-42.

8. Air Force Association, *Lifeline Adrift*, pp. 6, 14.

existing weapons.[9] An open line might help in the event of a major war that required large numbers of U.S. forces and lasted a number of years. But in the post-Cold War era, such a war seems highly unlikely. Moreover, if one did occur, it probably would begin only after a period of warning sufficient to permit the reopening of closed production lines. Perhaps for those reasons, the Pentagon itself appears to have doubts about the need to sustain a large industrial base.[10]

Moreover, it is not clear that export sales can keep the lines now operating open long enough to bridge the gap between the end of current production and the point when the U.S. military begins to buy next-generation weapons. Foreign sales *may* keep the F-16 aircraft line open long enough to allow General Dynamics to make a relatively smooth transition to production of the F-22 Advanced Tactical Fighter, which it is slated to help build later this decade. But a delay in the F-22 program could oblige the United States to find a more reliable means of preserving the F-16 line--such as the continued low-rate production of F-16 aircraft approved this year by the House of Representatives. Similar circumstances characterize the U.S. tank industry.

If it is necessary to keep a production line open, that can be done by a method other than fostering arms exports--although that method would add to U.S. defense costs. The government could continue to place minimal orders for new weapons, or it could upgrade older ones. For combined expenditures of a couple of billion dollars a year, for example, the military could maintain production of limited numbers of F-16 aircraft and Apache helicopters and could convert some of the oldest M1 tanks to the newest, M1A2 configuration. At present, a number of industry officials and Members of Congress appear to favor something akin to this policy. They argue that the so-called prototyping strategy that emphasizes research and development of new systems over production may be deficient in some ways because it does not sustain subcontractors or a pool of individuals with a fresh, working knowledge of production processes.[11]

Production lines could also be closed and restarted if and when needed. In the case of the M1 tank, for example, about three-quarters of a billion dollars would be required to restart the line--what it probably would cost to maintain minimal rates of production for about two years.

Effects on Other Supplier Countries

Arms limits also could have adverse effects on firms in other countries that are major arms suppliers. The effects are important because the threat of them could undercut the willingness of those countries to cooperate in limiting the arms trade with the Middle East. CBO does not have the models and data necessary to assess the specific effects of arms limits on firms abroad. It is possible, however, to combine data to suggest how some effects might compare with those in the United States.

Western and Central Europe

The effects of arms limits on firms in Western Europe would probably be somewhat more severe than in the United States. Measured in dollar terms, European members of the North Atlantic Treaty Organization typically exported in aggregate nearly as much as the United States during recent decades: more than $10 billion a year, including major and minor systems, with the vast majority of the arms being shipped out of the region. But their aggregate procurement budgets amount

9. Office of Technology Assessment, *Global Arms Trade*, p. 51; and Air Force Association, *Lifeline Adrift*, p. 7.

10. *Inside the Pentagon*, February 20, 1992, pp. 4-5.

11. See, for example, Air Force Association, *Lifeline Adrift*, p. 20.

to less than half that of the United States--meaning that Europe's relative dependence on exports has been at least twice as great.[12] In France, for example, exports constituted about 30 percent of total orders in the 1980s, in contrast to the U.S. figure of about 12 percent.[13]

Two factors mitigate this apparent importance of exports. As mentioned, key European arms manufacturers typically are more diversified and thus less dependent on military production. On average, the top 12 Western European defense firms gained only 17 percent of their total 1988 revenues from arms sales, in contrast to an average of about 40 percent for a comparable group of U.S. firms.[14] Thus, they are generally less vulnerable to losses in arms exports than are their U.S. counterparts.

In addition, most European arms manufacturers saw sales to the Middle East slip in 1991. The embargo of Iraq was largely responsible. In addition, the reputation of U.S. arms rose when they performed so effectively during the Gulf War. Thus, European arms manufacturers seem headed toward a smaller arms business regardless of any supplier-imposed limits that might be negotiated.

Many European firms have such small domestic markets that they have trouble realizing economies of scale and amortizing research costs. Because of the complexity of modern military equipment, major weapon systems generally cannot be developed and produced economically without production runs worth billions of dollars. As global budgets for defense procurement decline, this problem will become even more acute. Unit costs for next-generation systems continue to grow rapidly--in the case of many combat aircraft, more than doubling in constant dollars from one generation to the next.[15] Thus, European firms may experience even stronger pressures to export in order to keep their production operations solvent.

Yet the possible loss of about one-fifth of their export sales, representing about 5 percent of their total arms sales, would not be as significant to European arms manufacturers as two other factors: broader pressures imposed by the end of the Cold War, and technological innovation that drives up the costs of equipment. Modest reductions in defense exports might hasten consolidation somewhat, but they would not form the primary impetus for the ongoing restructuring of the European defense industrial base.[16]

Other Major Exporters

Elsewhere on the continent, dependence on the arms trade and hence the likely effects of arms limits do not differ greatly from those in Western Europe. During the last decade, Eastern Europe (excluding the former Soviet Union) exported about $3 billion to $4 billion a year in aggregate, and the rest of Europe about $1 billion to $2 billion a year.

In the former Soviet republics--especially Russia and to a degree Ukraine--the arms industry represents a much larger share of the economy, and exports have played an important role in that industry. Thus, lower foreign sales could significantly harm firms in the former republics. The adverse effects will occur regardless of whether arms limits are im-

12. Stockholm International Peace Research Institute, *SIPRI Yearbook 1991* (New York: Oxford University Press, 1991), pp. 132-133.

13. Office of Technology Assessment, *Global Arms Trade*, pp. 35-44; and Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers, 1990* (1991), pp. 1-22, 135-144.

14. Office of Technology Assessment, *Global Arms Trade*, pp. 76-77.

15. Statement of Robert F. Hale, Assistant Director, National Security Division, Congressional Budget Office, before the Subcommittee on Conventional Forces and Alliance Defense of the Senate Committee on Armed Services, April 22, 1991, p. 42.

16. Elizabeth Kirk and Robert Goldberg, *U.S. and European Defense Industries: Changing Forces for Cooperation and Competition* (Washington, D.C.: American Association for the Advancement of Science, 1991), pp. 7-13; and Margaret Berry Edwards, *EC 1992: Potential Implications for Arms Trade and Cooperation* (Congressional Research Service, 1989), pp. 1-13.

posed, however. Many of the Soviet Union's exports were financed by grants or credits that are not likely to be available in the future.

In both central Europe and the former Soviet republics, economies will remain unsettled for a number of years. Declining defense budgets, changing prices of raw materials, the environment for foreign trade, privatization, and other changing economic conditions guarantee that these industries will undergo a period of fundamental restructuring with or without any constraints on their arms sales to the Middle East.

Firms in the People's Republic of China--generally state-owned and likely to remain that way--may not fare much worse than those in the United States. China equips its armed forces with thousands of pieces of most major types of equipment and has about the same number of military personnel as do NATO's European members in aggregate. The roles that exports play in the Chinese economy and defense industrial base thus seem similar to those in the United States.

Moreover, China's weapons are generally less technically advanced than those produced by the other major exporters, meaning that unit costs are not as great and economies of scale thus not particularly difficult to achieve for a given level of investment in a program.[17] China's exports of major arms averaged about $1.7 billion a year in the 1987-1991 period. Although exact figures on domestic production are not available, estimates suggest that exports may amount to 20 percent to 30 percent of total military production.[18]

17. Richard A. Bitzinger, *Chinese Arms Production and Sales to the Third World* (Santa Monica, Calif: RAND Corporation, 1991), p. vi.

18. For a discussion of the magnitude of China's military spending, see Stockholm International Peace Research Institute, *SIPRI Yearbook 1991*, pp. 156-159; and Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers, 1990*, p. 58.

Chapter Eight

Political and Military Implications of Supplier-Imposed Limits on the Arms Trade

Limits on the arms trade, if successfully implemented, should curtail growth in military power in the Middle East and prevent large buildups there by any single country. It therefore seems likely that limits would reduce the security threats facing Mideast friends of the United States--particularly compared with what might transpire in the absence of limits. In addition, limits should reduce the scale of any future Mideast war that might again involve the United States. For that reason, they might eventually make possible deeper reductions in U.S. military force structure and spending than will otherwise occur.

Imposing limits on the arms trade could, however, come at a price. Apart from the short-term adverse effects on some firms and locales, discussed in Chapter 7, there could also be political costs associated with forming a cartel. Although those costs seem unlikely to be onerous, they should be borne in mind as the United States weighs the pros and cons of attempting to limit the arms trade.

Direct Military Implications

Limits could directly affect security and military force levels in the Middle East in a number of ways. The following discussion of those effects is based largely on the TASCFORM scoring system for weapon systems, which accounts for the quality and quantity of a country's military hardware. This approach to calculating military force balances cannot necessarily predict the outcomes of wars. The unclassified TASCFORM scores, as used by CBO, ignore such factors as training, communications, intelligence, and logistics that tend to favor military forces such as those of Israel and the United States. The scores do, however, suggest the combat potential of the weapons in various forces. (Appendix B discusses the TASCFORM results in more detail.)

Current Balances of Forces in the Region

From the perspective of key friends of the United States in the Middle East, regional weapons balances appear relatively favorable at present. That is particularly true when compared with what worst-case planning might have demanded several years ago--when Iraq was strong and countries such as Syria and Iran could turn to the Soviet Union to purchase major weapons.

The current balances of forces seems to favor Israel. It retains advantages over both Egypt and Syria in weapons potential, and significant superiority over any other country in the region. Factoring in Israel's military tradition, excellent training, early warning systems, and intelligence assets leads to the conclusion that the country is capable of defeating a conventional attack by at least one of its principal potential adversaries with strict-

ly conventional means. One noted military analyst estimates that Israeli forces should be considered roughly twice as good as their Arab counterparts per unit of hardware.[1] With that factor included, Israel is without question the strongest country militarily in the region. Indeed, it may be strong enough to fend off attack by plausible coalitions that might be formed to attack it.

Saudi Arabia's military position is considerably weaker. Its current orders for new equipment, which include 465 modern U.S. tanks and other systems, will improve its ground capability fairly soon. Even with these additions, its forces will remain weaker than those of Iraq and certain other Mideast countries, meaning that the United States' guarantee to protect Saudi Arabia's security will remain critically important.

As far as TASCFORM scores and other open sources permit one to infer, Mideast weapons balances contain few major disparities among neighboring countries. Thus, although those countries retain substantial military forces, none can be sure that its attack on another would be successful. Among Iran, Iraq, and Syria, Iran--the weakest of the three--is currently increasing its stocks of military equipment by the largest amounts. The current arms competition therefore probably poses little risk to regional stability--at least in the short term.

Effects of Illustrative Limit

How will those military balances look 10 years from now? Would the outlook differ if the illustrative limit discussed in this study--an annual limit on major weapons imports from the key suppliers of $700 million per country--were put in place?

No one can be certain because the effects depend on the exact nature of the limit, how well countries would comply with it, and such other factors as possible changes in domestic production. Nevertheless, the potential effects of the illustrative limit can be projected and compared with possible trends in the absence of any limit.

In analyzing the illustrative option, it is assumed that existing agreements to sell arms will be honored. Three particular assumptions are made (see Table B-2): that Saudi ground forces increase in capability by the rough equivalent of a modern U.S. armored division (hereafter referred to as a "normalized division"); Iranian forces grow by approximately half a normalized division and half a normalized air wing (that is, half a modern U.S. tactical fighter wing); and Syrian forces grow by one-third of a normalized division. Available information does not suggest that many noteworthy sales to other countries are in the works. Domestic production of major weapons by Mideast countries, together with transfers from suppliers that might not become part of the cartel, are assumed to be roughly $500 million a year for Israel and $250 million a year each for Iran, Iraq, and Egypt.[2] Amounts for other Mideast countries are assumed to be insignificant.

Although some growth in military capability could occur under the illustrative limit, it should prevent large buildups of the sort that have occurred in the Middle East in the past. Consider, for example, what happened between 1981 and 1991. The weapons potential of Iraq's tank forces more than doubled according to the TASCFORM system, and the capability of air forces doubled. Iraq managed to make these large, *net* additions while fighting a major war with Iran throughout most of the decade.

Under the import ceiling of $700 million a year, such an increase could not occur. Iraq's

1. Trevor N. Dupuy, *Attrition: Forecasting Battle Casualties and Equipment Losses in Modern War* (Fairfax, Va.: HERO Books, 1990), pp. 46, 121.

2. This analysis assumes that the cartel will be composed of the five permanent members of the U.N. Security Council, as well as other large European arms producers--Germany, Spain, Italy, Turkey, Czechoslovakia, Poland, Sweden, and Switzerland.

imports of major weapons would be held to around one-fifth of the level associated with its major arms buildups of the 1980s. Over a period of years, such constraints clearly would have a significant impact.

The illustrative limit should benefit U.S. friends in the Middle East. An import limit might help Israel by preserving its current military position in the region. Saudi Arabia's relative position might improve because restrictions on the increase in capability of countries such as Iran and Iraq could minimize the importance of Saudi Arabia's inherent limitations--most notably, a small population that provides insufficient manpower for large ground forces.

An import limit also might leave roughly unchanged the balance of military forces among a number of other Mideast countries; for example, the balance between Iraq and Iran probably would not shift substantially. And an import limit would probably minimize the chance of marked shifts in relative military capability that might give a country the hubris--and the offensive capability--to start an armed conflict.

Limits may not be necessary in order to bestow these benefits. Not all historical indicators are as ominous as the recent record of Iraq. Take two other Mideast examples from the 1980s. Iran, after importing a good deal of modern military equipment during the preceding decade, faced a cutoff by the United States of spare parts and major weapons. As a consequence, its capability did not grow significantly during the 1980s. Syria added significant numbers of tank and air forces, but ran into cash flow problems and was unable to match the rate of Iraq.

Historical lessons on either side of the argument should not be overemphasized. A number of features not likely to recur in the current decade characterized the Middle East in the 1980s. The three most notable of those were the war between Iran and Iraq; the role of the Soviet Union in arming Libya, Iraq, and Syria (in the latter case, largely through concessionary arms transfers); and the relatively favorable fiscal conditions prevailing in many of the large arms-importing countries in the region. In the 1990s, the region may not have as much cause to arm itself--nor such ready means of doing so. Moreover, the Gulf War was a watershed event that left several important legacies. In that war, Iraq lost about 30 percent of its air combat potential and about 60 percent of its ground force potential, as well as--at least temporarily--its access to the international arms market. Therefore, other countries will not have to arm so vigorously in the next few years just to keep pace with Saddam Hussein. Iraq also suffered heavy blows to its civilian economy; although much damage may already have been repaired, Iraq may need to devote much of its future national investment to civil reconstruction.

As noted in Chapters 1 and 2, however, many underlying factors that spurred arms imports in the 1980s remain largely unchanged: ongoing Arab-Israeli tension; volatility caused by extreme forms of both pan-Arabism and Islamic fundamentalism; and disputes over oil wealth, water resources, and national borders. On the supplier side, pressures to sell are at least as strong in the 1990s as they were 10 years earlier. Therefore, without direct limits on the arms trade or further erosion in the price of oil, conditions exist that could re-ignite an arms race.

Comparison with Other Types of Limits

The illustrative example of arms limits in this study would restrict the dollar value of imports into each Mideast country. Other types of limits on arms transfers are of course possible. Chapter 5 discussed their basic pros and cons; this section focuses on differences in their military effects.

Generally, the other types of import limits discussed previously would have effects similar to those of the illustrative example. Limits

on exports, however, would not guarantee the same results.

In Chapter 5, several different types of import limits were discussed. Apart from the $700 million annual ceiling on each country's imports of major weapon systems, the three most important were direct limits on units of equipment rather than on their value; limits that apply only to tanks, attack helicopters, and combat aircraft rather than to all categories of equipment in the Conventional Forces in Europe Treaty plus ships, large radar systems, and large missiles; and limits on the imports of only one or two countries, on the assumption that the financial or political constraints of several others will restrict their imports. How would these other types of import limits compare with that of the illustration?

For U.S. interests, direct limits on units of equipment might be marginally preferable to a dollar restriction. The nations of greatest concern to the United States in the region--Iran, Iraq, Syria, and Libya--probably will buy weapons that are not quite as good or quite as expensive as those sold by the United States; that is especially true of Chinese and older Soviet models of military hardware. But most or all Mideast countries probably could find some supplier willing to sell them near state-of-the-art equipment. So limits on numbers of units probably would not have a military effect much different from that imposed by similarly restrictive dollar limits.

Restrictions on particular categories of equipment--such as combat aircraft, tanks, submarines, and attack helicopters--would not be quite as constrictive as broader limits but might yield similar effects. Category restrictions would not inhibit transfers of missiles, radars, and surface ships; and they would leave artillery and various types of infantry fighting vehicles unfettered. Still, TASCFORM scores suggest that combat aircraft and tanks together now account for about half of the combat potential of Mideast countries such as Iraq and Syria, so limits on those weapons could be quite useful if broader limits did not appear feasible. Without a major buildup of tank forces in particular, it is unlikely that any Mideast country would have enough confidence in its offensive capabilities to initiate a large-scale war.

Compared with limits that applied to all Mideast countries, restrictions on the imports of only one or two countries might have similar military effects. As long as fiscal pressures (or, as in the cases of Iraq and Libya, a U.N. embargo) acted as constraints, the imports of most of the countries would be modest with or without formal limits. Capping the imports of the one or two large countries not constrained in that manner might thus accomplish the same goal--for as long as fundamental international circumstances remained unchanged.

Import limits seem to offer an inherent advantage over most types of proposed export limits: they would restrict the flow of arms to recipient countries individually. If successfully enforced, therefore, import limits would directly prevent the sort of major buildup that Iraq accomplished during the 1980s. Yet even if a regionwide limit on each supplier's exports were imposed, disproportionate buildups still could occur if one country gathered the majority of weapons that were shipped to the Middle East.

A limit on imports rather than exports also has the advantage of being broadly consistent with what might be a reasonable, long-term goal for arms control in the region. A treaty covering conventional forces in the Middle East probably remains a distant prospect. But its chances might be improved by supplier limits generally consistent with force levels that could be instituted under such a treaty. Although difficult to envision, the idea of rough equality among the region's main powers does not seem unreasonable; the accord might include special provisions addressing the security concerns of Israel--the only Mideast country in recent times that hostile coalitions have repeatedly attacked. The import ceiling approach effectively follows the treaty model; it envisions an equal ceiling on imports for all major regional countries but al-

lows Israel a modest advantage by virtue of its greater domestic production.

Other Military Implications

Arms control, it has been observed, can have all sorts of unintended consequences. The SALT I Interim Agreement on Offensive Arms, for example, froze superpower arsenals of missiles but left warhead inventories unconstrained. That loophole made it feasible for both the United States and the Soviet Union to add multiple independently targetable reentry vehicles to their missiles, vastly expanding the power of the weapons and possibly worsening military stability in the process.

Would limiting Mideast imports of major weapons also bring unintended and harmful consequences? It is important to investigate that question before leaving the subject of military implications. There are three topics of particular concern: military stability and vulnerability to attack; acquisition of nonconventional weapons by Mideast countries; and domestic production of conventional weapons in the Middle East.

Military Stability

The vulnerability of countries to attack and, by extension, the military stability of the region depend on many things besides inventories of offensive weapons. Stability hinges on such factors as the way in which forces are deployed and how surveillance is conducted. How would the limits discussed in this study affect these dimensions of military stability?

To begin with, this study's limits would not prevent countries in the Middle East from improving their nonoffensive military capabilities: communications systems, diversified and blast-resistant military bases, physical obstacles to attack, reconnaissance of potential adversaries, training of personnel, and the like.

Nor would limits on arms transfers make a country's forces so small that they would become highly vulnerable to decisive attack. Although it is theoretically possible that severe limits could result in armed forces that were simply too small to defend the amount of land involved, such concerns do not seem pressing in the well-armed Middle East.

The fact that Mideast balances now appear relatively good from the perspective of friends of the United States--and that limits on arms transfers would tend to preserve the balances--does not guarantee peace in the region. Political tensions could remain high, and countries could purchase smaller arms without constraint, even if limits on the arms trade were imposed. Limits would not preclude low-technology infantry battles, which have been deadly and widespread in the Middle East in recent years--for example, in the Iran-Iraq War and the internal conflicts in Lebanon and Iraq.

But by capping growth in offensive military technologies, limits could have significant benefits. They could make less likely the types of major and rapid wars of conquest that are most likely to threaten both the friends of the United States and U.S. oil interests in the region.

Proliferation of Nonconventional Weapons

Perhaps of greatest concern is whether limits on conventional arms transfers to the Middle East would affect the spread of nonconventional weapons there. The question is difficult to answer. Persuasive reasoning argues both yes and no. On the negative side, an Iran or Iraq antagonized by what might be perceived as heavy-handed Western policies on arms transfers might accelerate efforts to develop nuclear capabilities--perhaps using money that might otherwise have purchased conven-

tional arms from abroad. On the positive side, it is possible that Israel, reassured by limits on the conventional arms imports of its chief potential adversaries, might prove more willing to negotiate a durable Mideast peace and eventually to participate in regionwide monitored bans on nuclear, chemical, biological, and missile technologies. Also, if Iran or Iraq launched a massive effort to expand domestic production capability in order to compensate for supplier-imposed limits on conventional arms transfers, it might actually have fewer resources to devote to nonconventional weapon programs than would otherwise have been the case.

Perhaps none of the above effects would turn out to be particularly important. Iran and Iraq, as well as other regional states, have been trying to develop weapons of mass destruction for a long time and seem likely to continue doing so. Outside policy initiatives on conventional arms probably will not change matters much, at least not in the short term. The Western world seems to recognize as much and is therefore focusing its nonproliferation efforts where they can make a difference--in trying to buttress the Nuclear Non-Proliferation Treaty and to tighten controls on the flows of certain technologies relevant to missiles as well as to nuclear and chemical weapons.[3]

Domestic Production

Would increases in the domestic production of conventional arms diminish the effectiveness of limits on the conventional arms trade? Mideast countries may be capable of significantly expanding the production of relatively low-technology weapon systems, such as simple armored personnel carriers and artillery. Because of their political goals and the state of their current defense industries, Iran and Iraq may be of greatest concern in this regard.

Still, those concerns must be weighed against the fact that virtually all of the countries in the region are, as a consequence of the 1991 Gulf War, aware of the importance of modern weaponry for achieving military superiority. Stealth aircraft, guided munitions, electronic warfare systems, sophisticated command and control networks, target acquisition sensors, and the like have been established as the real ingredients of military success in modern, high-intensity warfare. Ambitious efforts to produce weapons platforms of older vintage may seem insufficiently promising to merit large-scale efforts at import substitution.

Efforts to upgrade existing equipment and to coproduce new systems might be of greater concern. Outside countries might not monitor such efforts precisely, permitting increases that escape limits on arms trading. If one of the major suppliers helped a regional country avoid limits in that way--perhaps only in small increments at first--it would be up to the other suppliers to make the determination and take appropriate steps (discussed in Chapter 5) that would halt the violation or compensate for it in some way. Otherwise, domestic upgrades and coproduction in the region might indeed increase.

That concern is legitimate, but it should not be overplayed. It is hard to disguise major factories carrying out upgrades and production. Although their true production rates may not be easily discerned from overhead reconnaissance, their existence and their maximum output potential are quite difficult to keep secret. Moreover, if persuaded that limits were a good idea, the major exporters presumably would not flagrantly violate them.

Implications for U.S. Force Planning

Power is intrinsically relative. Since the possibility of war in the Middle East now helps

3. For another discussion of this issue that draws similar conclusions, see Andrew J. Pierre, *The Global Politics of Arms Sales* (Princeton, N.J.: Princeton University Press, 1982), pp. 29-31.

determine the size of the U.S. military, a lower level of armaments in that region eventually could permit the United States to reduce its military forces and budget more than it will otherwise.

Substantial Savings Are Possible

According to the U.S. Joint Chiefs of Staff, the Administration's proposed "base force" probably has enough combat units to deal with two major regional wars simultaneously.[4] General Colin Powell, Chairman of the Joint Chiefs of Staff, has stated that the United States must retain the capability to wage war in North Korea and in the Middle East at the same time because conflicts in those regions are "demanding, plausible, and representative of U.S. vital interests and alliance commitments."[5] In the Pentagon's view, simultaneous wars in each of those theaters probably would constitute the most challenging mission for U.S. military forces in the post-Cold War era.

Although other analysts sometimes make different assumptions when calculating requirements for the U.S. military, most consider the Middle East to be a very important concern in force planning. If the countries there become less threatening militarily than is currently expected, and if the European security environment further stabilizes through an ongoing process of arms control and economic and political cooperation, a strong case for further reductions in U.S. military forces could be made.

Size of Reductions in Forces. How big might the additional reductions in the U.S. military be? Consider first Mideast force levels. As noted in Chapter 3, the Central Intelligence Agency has stated that if the arms trade continues unchecked during the 1990s, Iraq might be able to regain its prewar force levels. Stated in terms of TASCFORM scores, that shift would imply future Iraqi force levels of five to six normalized ground divisions and about three normalized tactical fighter wings. Under the illustrative limit on the arms trade considered here, this key potential U.S. adversary would have ground and air forces with about 50 percent less weapons potential than it otherwise might have (see Appendix B)--on the order of two to three normalized divisions and two normalized air wings.

Reductions in U.S. forces might be larger still. Reflecting its belief that prudent military planning should be based on reasonable worst-case assumptions, the United States probably does its military planning on the assumption that it might have to fight several Mideast countries at once. Modest curbs on the forces of each country making up such coalitions would have a significant effect on the combined capability of the members and thus reduce the threat that U.S. force planners had to deal with.

In addition, the U.S. military believes that it should wage war with overwhelming superiority so as to win quickly and decisively. Although the concept of overwhelming superiority has not been precisely defined, it may well entail an advantage in military capability on the Gulf War scale--perhaps 2 to 1 in ground forces and 4 to 1 in air forces. For those reasons, it is conceivable that, if limits on arms sales to the Middle East were effectively instituted, the United States could reduce its forces by several normalized divisions and several normalized air wings.[6]

Reductions in naval forces might also be possible. The United States determines their size largely by the numbers of carrier battle groups needed to maintain traditional levels of "forward presence" in peacetime and during

4. Department of Defense, U.S. Joint Chiefs of Staff, *Joint Military Net Assessment 1991* (1990), pp. 9-5, 9-9.

5. Statement of General Colin L. Powell, Chairman, Joint Chiefs of Staff, before the Senate Committee on Armed Services, March 20, 1992, p. 10.

6. See, for example, Michael E. O'Hanlon, *The Art of War in the Age of Peace: U.S. Military Posture for the Post-Cold War World* (New York: Praeger Publishers, forthcoming).

crises. Those numbers in turn derive partly from unchanging geographic realities. But the numbers also depend on the size and nature of potential threats to key U.S. interests and the number of units needed to fight wars in which land bases might not initially be available. By the latter criteria, limits on weapons in the Middle East might permit the United States to reduce the size of the Navy.

Magnitude of U.S. Savings. How large might savings be? It is virtually impossible to be precise since the question raises methodological complexities that produce endless debate among planners. However, the cost of individual military units can be estimated. Including all costs associated with units, as well as a prorated fraction of overhead expenditures of the Department of Defense, annual operation and support costs for an aircraft carrier battle group plus its air wing are about $1.5 billion, for an armored division about $2.4 billion, and for a tactical fighter wing about $400 million. Reducing some or all of those types of military systems by several units each could save around $10 billion a year.

Over the longer term, annual savings could be even greater because procurement accounts used to purchase new weapons could be cut as well. Many analysts feel that, in order to preserve overwhelming military superiority, the United States needs to possess not only numerical advantages but also the most modern and capable equipment available on world markets. Following that philosophy, it may soon develop new and expensive weapon systems such as the F-22 fighter and the AX attack aircraft. It is not clear that the country needs all, or any, of those systems--even if the arms trade remains unabated. But limits on the growth in the size and sophistication of Mideast forces could reduce pressures to modernize U.S. forces with systems such as those. And that, in turn, could save additional billions of dollars a year in defense budgets.

Timing of Savings. All military forces, and particularly those of the Navy, take a long time to build. In addition, military manpower requires many years of training and practice in order to gain maximum proficiency with the complexities of modern military operations. Therefore, force reductions might not be possible until after limits on arms exports had shown some real signs of staying power and produced a notable slowdown in the Mideast arms race.

Moreover, efforts to impose further cuts in U.S. defense spending may not await limits on arms in the Middle East. Much remains to be decided about the appropriateness of the Administration's current proposal for maintaining and modernizing U.S. military forces. There are questions about the need to be able to fight two wars on the tactical offensive simultaneously and about proposed levels of overseas deployments. Uncertainty also remains over the latent risks Russia poses. Other debates continue over the future size and shape of the Navy, the balance between active and reserve forces, and future directions for the Strategic Defense Initiative. Depending on the outcome of these debates, additional cuts in defense spending may be made regardless of decisions about limiting Mideast arms. Indeed, further cuts that do not depend on Mideast arms limits have been proposed by the chairmen of the House and Senate Committees on Armed Services. It is also clear, however, that the Pentagon now considers the Middle East a critically important region of concern for the purposes of U.S. force planning--and that future developments in that region eventually may significantly affect the size and shape of the U.S. military.

Savings Are Not Guaranteed

Restrictions on arms sales do not guarantee reductions in the U.S. defense budget. There are ways to structure one's assumptions about U.S. force planning that largely decouple the level of U.S. forces from the levels of armaments in the Middle East. Worst-case assumptions about the future course of the former Soviet republics could have that effect. The scenario of two regional wars, with a Middle East conflict the more demanding of the

two, appears at present to be "the long pole in the tent"--that is, the most demanding plausible mission that the U.S. military plans for when evaluating future force needs.[7] Yet limiting the Mideast threat might have only modest implications if another threat looms almost as large.

In addition, some strategists argue in more historical terms that other military powers not now threatening to the United States might become so in the future. If one believes that a large U.S. military force can influence the military and strategic behavior of such countries, there might be advantages to retaining the Administration's proposed base force--or at least something close to it--regardless of armament levels in the Middle East and other immediate threats. But it should be noted that, with the exception of the United States, its close allies, and Russia, no country in the world has forces as capable as those that potential coalitions of several Mideast countries would possess.

A reduction in Mideast armaments also might have only modest implications for the ways in which the United States deploys troops overseas in peacetime. Most defense analysts agree that some overseas forces are necessary to deter conflict and to retain U.S. influence around the world. Although the majority of U.S. combat forces are not involved in maintaining such continuous overseas presence, that mission does impose certain demands on U.S. force planners.

Political Costs

Even successful arrangements to control arms are not cost-free. What would be the probable political effects of applying and enforcing supplier-imposed limits on the arms trade with the Middle East?

U.S. Foreign Policy Considerations

To persuade other supplier countries--allies and nonallies alike--to cooperate, the United States would need to ask them to take positions that in some cases would be unpopular at home. Although the majority of important supplier countries ultimately might prove amenable to imposing limits and forgoing some overseas arms sales, rifts among them certainly would be possible. The disagreements could be especially troublesome if they came on top of discord over other ongoing issues--such as how to resolve the Uruguay Round of trade talks, help the Russian economy, structure policy toward China, and address global environmental problems. Introducing yet another prickly issue into an already acrimonious policy environment could be a recipe for failure.

Possible benefits must be weighed against those political costs. Most notably, successful cooperation in improving the international security environment could breed trust and a sense of positive momentum among the great powers. Those are critically important ingredients of any workable approach to international security policy in the post-Cold War world.

Political problems with the Mideast countries themselves also could be expected, and they might be hard to smooth over. Although countries currently friendly to the United States might be persuaded to accept a properly structured set of limits on arms transfers to the region, Iran, Iraq, and perhaps others can be expected to reject them summarily. Those likely negative reactions must be weighed against the potential benefits of the limits. Although it is undoubtedly not in the long-term U.S. interest to provoke unnecessary bitterness in relations with the Mideast powers, the United States may need to continue to

7. See, for example, Barton Gellman, "Pentagon War Scenario Spotlights Russia," *The Washington Post*, February 20, 1992, p. A1.

take pragmatic steps to oppose countries when its policies seem to be at odds with theirs.

Some political strains could endure even after the initial period of negotiations and implementation of the arms limits. The United States and other chief suppliers might need to bring leverage to bear on countries that proved unwilling to cooperate. Any supplying or receiving countries that repeatedly or flagrantly exceeded limits might be subjected to trade sanctions or other punitive measures.

It is also possible that several regional states, sufficiently upset by supplier cartels in weapons, might retaliate by raising the price of oil. Such a reaction seems improbable, however, since many large oil producers in the region are more likely to cooperate with industrialized countries than with Iran or Iraq. Moreover, as was noted earlier, such GCC states as Saudi Arabia stand to benefit militarily from supplier-imposed limits on the arms trade and thus would probably not object.

All that said, however, much would depend on the diplomatic care with which the United States and other countries proposed and negotiated the supplier limits. By making arms limits a critical element of overall policy toward the Middle East, the United States and other suppliers may be able to help the region become more peaceful and prosperous in a manner that should appeal to most Mideast countries.

U.S. Government Resources and Efforts

Another set of concerns involves the use of scarce resources at the State Department and in other parts of the U.S. government. Achieving limits on arms sales would require the concerted and sustained attention of the Secretary of State as well as important officials in the Department of Defense and quite possibly the President. If arms accords in the nuclear, chemical, or biological realm suffered as a consequence--or if U.S. analytic and diplomatic support for the Mideast peace conference was shortchanged--this diversion of policy expertise might prove costly to U.S. interests. But that may be a slight concern: with the end of the Cold War, many more political resources should now be available for application to the Middle East.

One also can argue that negotiations with only slight prospects for success are not worth a large investment of effort. The United States may, however, be able to gauge the prospects for achieving multilateral limits before making a major public announcement. The Administration already has created an informal forum, the ongoing Perm-5 talks, for discussing arms sales to the Middle East. It might be able to sound out proposals such as those discussed here without undue commitment of political capital. By doing so, it could introduce standards for restraint in arms dealing that might prove influential at a later date, even if they were not immediately adopted.

Indeed, the United States might even obtain political dividends by proposing supplier limits. With options on the table that would require restraint by the United States as well as other countries, the United States could partially deflect China's criticisms that it is heavy-handed and one-sided in the Perm-5 talks. In addition, addressing Mideast arms control from the perspective of the arms supplier could complement, and push along, regional efforts. If that outcome is even remotely possible, a discussion of limits on the arms trade justifies serious attention.

Appendixes

Appendix A

Measuring the Global Arms Trade

Fundamental to any multilateral agreement to control arms exports would be a system for tracking, recording, and estimating the value of the transfers. Two sources, the U.S. Arms Control and Disarmament Agency (ACDA) and the Stockholm International Peace Research Institute (SIPRI), collect and make public comprehensive, annual, worldwide data on arms transfers.[1] SIPRI uses only publicly available sources, such as journal articles and newspaper accounts, to compile its data base. ACDA relies on the estimates that U.S. intelligence officials prepare.[2]

There are other sources, more limited in scope but helpful in terms of timeliness or added detail. For example, the Congressional Research Service publishes an annual report on arms transfers to developing countries.[3] The CRS report also draws on the intelligence community and is therefore based on the same data as ACDA's publication. The Defense Security Assistance Agency publishes a yearly report offering summary statistics on U.S. exports of arms, including the Foreign Military Sales (FMS) program.[4]

The FMS program accounts for the majority of the exports of U. S. military products, but it omits those that are made as direct commercial transactions. The State Department, which regulates the flow of commercial arms sales, decides whether to approve or disapprove licenses and contract requests but does not maintain records as detailed as DoD's accounting of the FMS program. Other organizations track sales on a regional or national level through official trade statistics, foreign government reports, and the like; most of those have already been incorporated into the SIPRI register.

Reliability of Methods

The clandestine nature of arms sales makes data collection difficult. Presumably the CRS and ACDA sources employ intelligence assets superior to those of SIPRI. The two U.S. agencies have a far more ambitious task than does SIPRI because they publish data that define

1. Arms Control and Disarmament Agency, *World Military Expenditure and Arms Transfers* (annual publication); Stockholm International Peace Research Institute, *World Armaments and Disarmament* (New York: Oxford University Press, annual publication).

2. Further discussion of the compilation of arms trade statistics can be found in two of the Defense Budget Project publications: Natalie Goldring, "The International Arms Industry: A Framework for Analysis" (paper presented at the International Security Section of the International Studies Association, Annapolis, Md., 1991); and Gordon Adams, *Arms Exports and the International Arms Industry: Data and Methodological Problems* (Washington, D.C.: Defense Budget Project, 1991).

3. Richard Grimmett, *Conventional Arms Transfers to the Third World* (Washington, D.C.: Congressional Research Service, annual publication).

4. Department of Defense, Defense Security Assistance Agency, *Foreign Military Sales, Foreign Military Construction Sales and Military Assistance Facts* (annual publication). This publication, referred to as "The Factbook," also contains data on the Military Assistance, Excess Defense Articles, and International Military Education and Training programs.

"arms" more broadly. Their estimates of certain arms shipments and arms agreements--especially those involving smaller arms--are imprecise and subject to frequent revision. SIPRI encounters challenges of its own because it relies exclusively on public sources for its information on the arms trade (see Figure A-1 for SIPRI and ACDA estimates of the arms trade with the developing world in the 1980s).

Pricing System

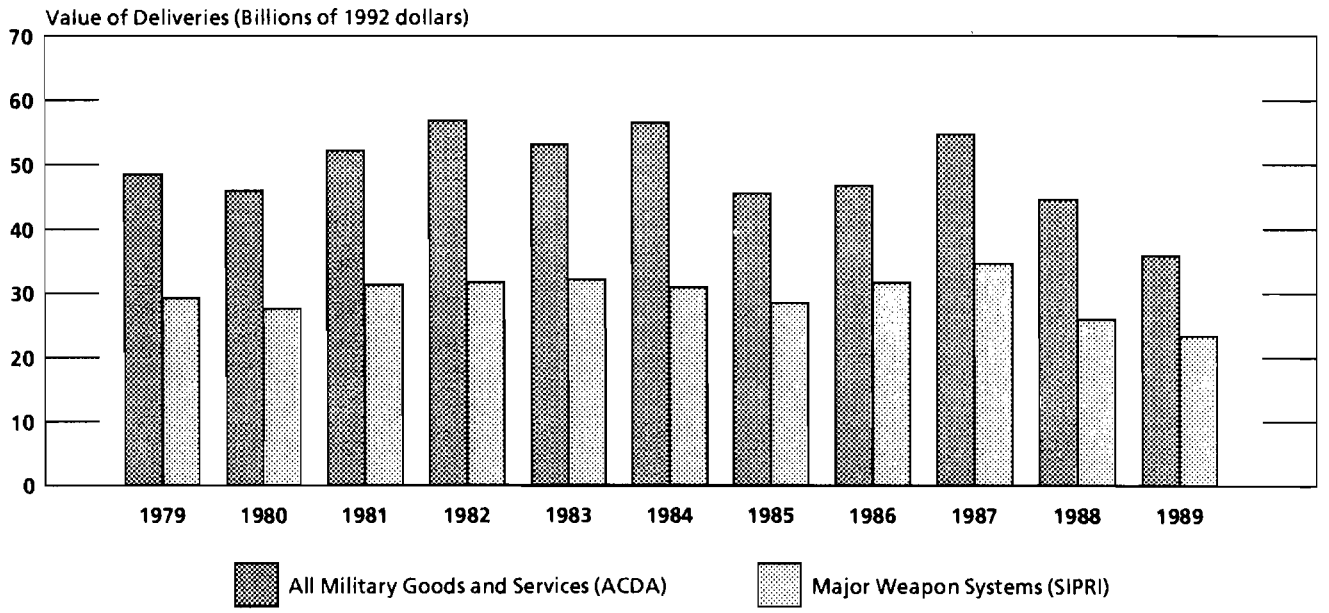
The questions of how to value equipment and what to include as an arms transfer also arise. How many T-55 tanks equal a T-72? For that matter, how many T-55s equal a multiple rocket launcher? This problem lies at the heart of measuring the arms trade. Because so many deals have complicated arrangements--third-party payments, concessionary credits, offsets (agreements to award subcontracts to the buying country), barter agreements, and outright gifts--the actual price paid for a weapon system is not so important as its value or military capability.

In dollar-value reporting, researchers have had to devise a system for assigning weights to weapons. There are numerous methods and criteria for doing that:

- o "Fair market value," the price one could get for the system in today's market (of cash-paying buyers);
- o Actual contract prices;
- o Approximate cost to the United States if a U.S. firm produced a weapon of the same specifications;
- o Estimated costs of the constituent parts of the finished system, in local currency, converted to dollars.

Each of the criteria has its drawbacks and advantages. The data published by SIPRI and ACDA ostensibly use a combination of all

Figure A-1.
Arms Shipments to Developing Countries, 1979-1989



SOURCE: Congressional Budget Office based on data from the Arms Control and Disarmament Agency (ACDA) and the Stockholm International Peace Research Institute (SIPRI).

four, with the greatest reliance given to contract prices when they are available. Dollar limits would require the parties to agree on the relative value of very different weapon systems, obliging them to share information relating to the above criteria in order to argue their case.

There are other methods for valuing equipment. They include the Defense Department's WEI/WUV scoring system (which stands for Weapon Effectiveness Indices/Weighted Unit Values) and The Analytic Sciences Corporation's TASCFORM. Both could serve as benchmarks to help suppliers construct a data base of "shadow prices." Ideally, one could compare the pricing systems of, say, SIPRI and the U.S. intelligence community to understand the range of disagreement among experts. A close match would bode well for the notion of dollar ceilings or other indicators of weapon quality. SIPRI and ACDA have not made figures public, however, making further analysis of this issue difficult.[5] But at least some of the relevant information would be available to negotiators.

Definition of the Term "Arms"

Another matter that the data leave unclear, and that has posed obstacles to past arms embargoes and transfer limitations, is the determination of what should be counted as a weapon. A tank is clearly one, but what about the rounds of ammunition that it fires? Or the trucks carrying extra ammunition? Or the communications gear for the tank's crew? Or infantry rifles? On these points, SIPRI and ACDA differ considerably.

SIPRI uses the narrowest definition, counting only hardware that falls into one of five major categories of weapon systems: aircraft, armor and artillery, guidance and radar systems, missiles, and warships. The classification is helpful where restraint options are concerned because it includes the items that can be counted and verified with greatest certainty.

ACDA defines arms transfers as "weapons of war, parts thereof, ammunition, support equipment, and other commodities designed for military use." ACDA thus includes a wide range of goods and services: military construction, royalties from technology licenses when they are part of the transfer agreement, and a host of smaller or ancillary equipment such as nonarmored military vehicles, communications and electronic equipment, small arms, ammunition, parachutes, and uniforms.

The ACDA data treat U.S. exports differently than those of the rest of the world. ACDA excludes construction and other services from the U.S. export level. It also leaves out dual-use equipment for U.S. exports unless it is included on the Munitions List, but counts such items for the rest of the world. (The value of the dual-use equipment is difficult to gauge, but the foreign military construction sales and "other services" reported by the Department of Defense averaged over $3 billion a year in the late 1980s--more than 10 percent of the figure ACDA reports for total U.S. exports.)

Which definition of arms is most appropriate? The answer depends on the issue at hand. The limits in this study use a narrow definition of weapons but are also intended to comprise dual-use and component trade that can contribute to the manufacturing of such major weapons. The economic analyses, however, are based on CBO estimates of what might happen to all military production.

For all supplier countries except the United States, statistics published by ACDA will include a dual-use item "when its primary mission is identified as military." That determination is of course complicated, and it would pose perhaps the greatest challenge of all in designing and monitoring supplier limits on the arms trade.

5. For a general explanation of how SIPRI updates its pricing system, see Michael Brzoska and Thomas Ohlson, *Arms Transfers to the Third World, 1971-85* (New York: Oxford University Press, 1987), Appendix 8.

When Does an Arms Transfer Take Place?

Most of the ACDA and SIPRI data used in this study describe the delivery of arms or services--the point at which equipment actually changes hands or services such as construction actually are rendered. Frequently, however, deliveries represent the execution of a contract or agreement made several years earlier.

A compelling reason to use delivery data in a time series is that arms agreements are erratic from year to year: a single contract can be signed to complete the modernization of a country's forces for the next decade. Future agreements to limit the spread of weapons need to distinguish between the two stages of the process and decide at what point it would be best to intervene.

As the former Eastern bloc opens up economically, it may be more willing to share information with other suppliers. U.N. efforts to promote openness in arms transfers might also bear some fruit. If those developments occur, measuring the arms trade will become an easier task.

Appendix B

Calculating Weapons Balances in the Middle East

Because of the inherent imprecision of measuring military capability, analyses of it are difficult to do rigorously. In Chapter 8, for example, the military balances in the Middle East were discussed in rather general terms. Nevertheless, quantitative techniques can highlight certain features of military balances and provide a guide to intuitive assessments. This appendix employs one such measure and offers quantitative corroboration of the conclusions reached earlier.

The TASCFORM Method and Its Limitations

As noted in Chapter 8, in order to assess the balance of forces in the Middle East, the Congressional Budget Office (CBO) used unclassified estimates of force structures ("orders of battle") and the weapons inventories of Mideast countries. It also used a scoring system based on expert judgments and the technical characteristics of weapons that takes account of quality. The system was developed for the Department of Defense by The Analytic Sciences Corporation. TASCFORM, as it is known, is used to assess the capability of ground forces by assigning scores to unit equipment: tanks, other armored combat vehicles, artillery, attack helicopters, antitank weapons, and so forth. TASCFORM also serves to assess the capabilities of tactical air forces that conduct air-to-air operations and ground-attack missions, as well as aircraft that are multipurpose in design and operation.[1] The scoring system gives greater weight to high technology than do older methods like the U.S. Army's Weapon Effectiveness Indices/Weighted Unit Values (WEI/WUV) system, generally rating the best modern systems as having between two and five times the combat potential of weapons of older vintage.

In making the estimates presented in this appendix, CBO assumed that each Mideast country has the number of weapons indicated in *The Military Balance, 1991-1992*, published in 1991 by the International Institute for Strategic Studies in London. For ground units, CBO did not score all weapons but only those that could be associated with an established unit that is part of the country's order of battle. To estimate force structures or orders of battle, it used various unofficial and publicly available sources. For aircraft, however, CBO scored each country's total inventory.

The TASCFORM methodology that CBO used has important limitations. The scores are static measures; they do not account for the dynamics of a conflict and the associated losses of weapons. The scores also make no allowance for variations in factors important to fighting capability: training, command and

1. In calculating the capability of a multipurpose aircraft, the Congressional Budget Office averaged the scores of that aircraft for the different missions it is considered capable of conducting.

control, and logistical support and repair facilities. Nor does TASCFORM reflect the wartime importance of such factors as leadership and morale. Moreover, the scores view ground and air forces not as an integrated whole but as separate categories. For all those reasons, the scores are better suited to assessing how military leaders might appraise their forces relative to those of potential adversaries than to predicting the outcome of any particular battle.

The scores do, however, suggest the combat potential of weapons in various forces. That capability makes TASCFORM a useful tool for assessing the effects of arms limits on Mideast security, especially when--as in this study--weapons are the focus of discussion. Another advantage to this method is that the scores of military forces for countries that might be expected to fight together can simply be totaled. For example, the TASCFORM scores of U.S. and Saudi Arabian forces can be combined to determine coalition strength for a scenario in which they both are assumed to fight a rearmed Iraq.

Table B-1.
Estimated Force Levels, 1991
(In units of normalized divisions and wings)

Country	Ground Forces	Air Forces
Algeria	1.0	1.0
Egypt	2.5	2.0
GCC, non-Saudi	0.3	1.0
Iran	1.3	1.3
Iraq, post-Gulf War[a]	2.1	2.0
Israel	4.5	3.7
Jordan	1.2	0.4
Lebanon	0.1	0.0
Libya	1.9	2.5
Morocco	0.6	0.2
Saudi Arabia	0.2	1.6
Syria	3.3	2.9
Tunisia	0.1	0.1
Turkey	2.7	1.8
Yemen	0.5	0.3
U.S. Forces		
1991 forces	24.8	41.0[b]
1997 base force[c]	20.9	33.1[d]

SOURCE: Congressional Budget Office using the Technique for Assessing Comparative Force Modernization (TASCFORM) scoring system, developed by The Analytic Sciences Corporation, and forces reported in International Institute for Strategic Studies, *The Military Balance, 1991-1992* (Riverside, N.J.: Macmillan Publishing Co., 1991).

NOTES: A normalized division is the equivalent of a U.S. armored division containing 350 M1A1 tanks and associated equipment; a normalized wing is the equivalent of a U.S. wing containing 100 F-16C/D aircraft.

GCC = Gulf Cooperation Council.

a. Before the Gulf War, Iraq had 5.7 normalized divisions and 2.9 normalized wings.

b. An additional 20.2 normalized wings are in naval forces (Mideast countries have no naval air forces not already included in their air force potentials).

c. To ensure consistency, the same weapons scores as for the 1991 results were used to evaluate the 1997 base force.

d. Naval aircraft account for an additional 20.6 normalized wings, including aircraft normally in storage; strategic bombers account for additional capability as well.

Measuring Today's Mideast Force Levels

Of those countries that would be subject to the illustrative limit, Israel has the greatest weapons potential in both ground and air categories. Syria, Egypt, Libya, Iraq (even after the 1991 Gulf War), and Iran also have appreciable weapons potentials (see Table B-1).[2]

For reference, Table B-1 also includes the weapons potential of U.S. forces. Even leaving out U.S. naval aviation forces, U.S. ground

2. The potential of ground and air weapons can be measured in terms of normalized units, when those are suitably defined.

A normalized division has the capability, as TASCFORM scores measure it, of a full-sized U.S. armored division that is equipped with 350 M1A1 tanks and other types of modern equipment. (Extra equipment and spares are not scored, however.) Thus, if the ground forces of a particular nation have TASCFORM scores totaling twice that of a U.S. division equipped with M1A1 tanks, that nation would be credited with two normalized divisions--even if its forces were organized into four or five actual divisions.

A normalized wing has the capability, in terms of TASCFORM, of a U.S. wing with an inventory of 100 F-16C/D aircraft.

and air capability under the Administration's currently proposed force structure (which it terms the base force) would greatly exceed those of any individual Mideast country--or even of any two or three of them together. Indeed, U.S. air scores will continue to exceed by a considerable margin the sum of those of all Mideast countries, and U.S. ground potential will more than match the region's total ground combat potential.

Future Mideast Force Levels

How will those military balances look 10 years from now? Would the results differ if arms limits of the sort discussed in this study were put in place? No one can answer those questions with complete certainty because the effects depend on the exact nature of the arms limits, how well countries would comply with them, and such other factors as possible changes in domestic arms production. Nevertheless, the potential effects of one type of restriction on the arms trade can be assessed and compared with likely trends in the absence of any limits.

Assumptions Behind CBO Calculations

In making its estimates, CBO assumed an annual limit of $700 million on each country's imports of major weapons. The limit is assumed to be phased in over time, becoming fully binding in 1995 and thus allowing equipment currently on order to be delivered.

Seven major Mideast countries--Libya, Egypt, Israel, Syria, Iran, Iraq, and Saudi Arabia--are assumed to import the maximum amount in major weapons each year; smaller countries whose imports have not reached that level in the past are assumed to be unaffected. Domestic production of major arms, as well as transfers of major weapons from suppliers that are not part of the cartel, are assumed to contribute a total of $500 million a year to Israel's air and ground forces, and $250 million a year each to Iran's, Iraq's and Egypt's.[3] Amounts for other countries are assumed to be insignificant.

In terms of equipment already on order, Saudi ground forces are assumed to increase by roughly a full normalized division, Iranian forces by perhaps half a normalized division and half a normalized wing, and Syrian forces by one-third of a normalized division. For other countries, unclassified information suggests that no noteworthy changes are in the works. Were supplier limits negotiated, these assumptions could be checked against intelligence information and made more precise by the suppliers.

Except where specific evidence to the contrary is available, CBO assumes that Mideast countries would spend about $200 million a year on large naval vessels and missile and radar systems and divide their remaining resources of $500 million a year so as to add equally to ground capability and air capability.[4] For purposes of valuing major equipment, CBO assumes that the costs of a normalized division or wing equal what the United States would spend to acquire that capability. CBO assumes that the cost of a normalized wing of tactical aircraft is roughly $2.5 billion and that of a normalized heavy division $4.5 billion. The normalized wing of aircraft is composed of 100 F-16C/D aircraft; the normalized division is equipped with M1A1 tanks and contains 20 percent extra equipment to cover attrition and training needs.

3. For this analysis, the cartel members are assumed to be the five permanent members of the U.N. Security Council, as well as Germany, Italy, Spain, Turkey, Czechoslovakia, Poland, Sweden, and Switzerland.

4. Large naval vessels might be defined as those displacing a total of more than 150 metric tons; large missiles as those with the mass of at least a Patriot (roughly 900 kilograms); and large radars as those with at least the surface area of a Patriot radar (roughly five square meters).

Because most weapons in the Middle East have been purchased fairly recently--and almost all since the early 1970s--CBO also assumes that purchases of new weapons can be used to add new units to orders of battle rather than to modernize weapons in existing military units. The assumption may be more accurate for the richer and less well-armed countries of the Persian Gulf region than for Egypt, Syria, and Israel--and it may cause the estimates in this appendix to overstate slightly the likely growth in capability for several countries. However, the assumption is of limited importance in the calculations. Reversing it--that is, assuming that all new equipment is used to replace older equipment--would change scores by no more than a couple of decimal points (one-tenth or two-tenths of a normalized wing or a normalized division). The small change would occur be-

Table B-2.
Estimated Levels of Weapons in Selected Mideast Countries in 1991 and 2002, Under the Illustrative System of Import Limits (In units of normalized divisions and wings)

Country	1991		Year 2002, Under Import Limits	
	Ground	Air	Ground	Air
	1991 and Projected Levels			
Israel	4.5	3.7	5.5	4.7
Syria	3.3	2.9	4.0	3.3
Iraq	2.1	2.0	2.7	2.6
Iran	1.3	1.3	2.7	2.7
Saudi Arabia	0.2	1.6	1.9	2.1
	Possible Levels Without Limits[a]			
Iraq	2.1	2.0	5 to 6	3.0
Iran	1.3	1.3	5 to 6	3.0

SOURCE: Congressional Budget Office.

NOTES: In the weapons categories covered by the Conventional Forces in Europe (CFE) Treaty, Israel's domestic production plus any imports from noncartel suppliers are assumed to total $500 million a year, and Iran's and Iraq's totals are assumed to be $250 million a year each.

Iraq is assumed to resume importing in 1995. Iran is assumed to have the equivalent of 0.5 normalized wings and 0.5 normalized divisions on order; Saudi Arabia is assumed to have one division--but no additional aircraft--on order; and Syria is assumed to have one-third of a normalized division on order. These assumptions are based on publicly available information about orders current in August 1992. If 72 F-15 aircraft were sold to Saudi Arabia before limits were negotiated, the Saudi air score for the year 2002 would be about 3.0 rather than 2.1--though it is impossible to make a precise calculation without more information about the exact type of F-15 aircraft that would be sold.

Depreciation of 10 percent in existing capability is assumed to occur from 1991 through 2002. This assumption is based on average changes during that period in scores compiled under the TASCFORM system for assessing comparative force modernization. (TASCFORM was developed by The Analytic Sciences Corporation, Arlington, Va.)

Of the $700 million in imports permitted annually under the illustrative option, each country is assumed to devote $500 million to CFE categories of equipment and its remaining $200 million to naval vessels, large missile systems, and large radars.

a. The possible levels for Iran and Iraq, in the event that no controls are put in place, are based on testimony by the Central Intelligence Agency and the U.S. military's Central Command. The testimony estimated that Iraq could return to 1990 levels by the end of this decade and that Iraq and Iran can be expected to compete for influence and hegemony in the Gulf region. Statement of Robert Gates, Director of Central Intelligence, before the Defense Policy Panel of the House Committee on Armed Services, March 27, 1992, pp. 4, 8, 11-16.

Because the capabilities that Iraq attained in 1990 remain uncertain--particularly in regard to large numbers of ill-equipped infantry divisions--a range of possible values is indicated for the ground forces of Iraq and Iran.

cause the units containing the oldest equipment have very low TASCFORM scores. Replacing one of them with a newer one has about the same effect on a country's total score as adding an additional unit.

Finally, existing weapons usually decline in relative value over time, as the introduction of new weapons makes them more vulnerable, less effective, or both; TASCFORM unit scores suggest that a decline of about 10 percent could occur during a decade. CBO's projections for the year 2002 thus assume a reduction of that magnitude in the capability of any given weapon in today's inventories.

Results

Using these assumptions, CBO projected possible changes in the weapons capabilities of five militarily important Mideast countries (see Table B-2). Generally, their capabilities would grow by only about one normalized wing and one normalized division over the next 10 years. The growth would vary from country to country because of domestic production and weapons already on order. In the view of the Central Intelligence Agency and the Pentagon, the capabilities of Iran and Iraq in particular might--in the absence of limits--increase by several normalized divisions.

○

OTHER CBO ARMS CONTROL STUDIES

The START Treaty and Beyond, October 1991.

U.S. Costs of Verification and Compliance Under Pending Arms Treaties, September 1990.

Budgetary and Military Effects of a Treaty Limiting Conventional Forces in Europe, January 1990.

Questions about these studies should be directed to CBO's National Security Division at (202) 226-2900. The Office of Intergovernmental Relations is CBO's Congressional liaison office and can be reached at 226-2600. Copies of the studies may be obtained by calling CBO's Publications Office at 226-2809.

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