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*Controlling
Conventional
Arms Transfers*

*A New Approach
with Application
to the Persian Gulf*

*Kenneth Watman, Marcy Agmon,
Charles Wolf, Jr.*

94-23332



**National Defense
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PREFACE

The Iraqi invasion of Kuwait renewed attention to the potentially destabilizing impact of the accumulation of conventional weapons systems in regions such as the Middle East. At the same time, the end of the Cold War and the reduction in domestic procurement of sophisticated military hardware have highlighted to the major arms suppliers the importance of the continued growth of their arms exports. Reporting on Phase 1 of the research, this report offers an approach for controlling transfers of conventional weapons systems to the Persian Gulf with an appreciation of these competing interests. Subsequent phases will broaden the focus to other regions. This report should be of interest to policymakers concerned with arms export policies, Persian Gulf security arrangements, and the U.S. industrial base.

The research was conducted under the International Economic Policy Program of RAND's National Defense Research Institute (NDRI) for the Undersecretary of Defense for Policy. NDRI is a federally funded research and development center sponsored by the Office of the Secretary of Defense and the Joint Staff.

CONTENTS

Preface	iii
Figures	vii
Summary	ix
Acknowledgments	xiii
Chapter One	
INTRODUCTION	1
Why is Control of Conventional Arms Transfers Now Possible?	1
Benefits from Conventional Arms Transfer Controls ...	4
What Should Be the Objectives of a Control Regime? ...	6
Chapter Two	
WHAT SHOULD BE THE CHARACTERISTICS OF AN INTERNATIONAL REGIME FOR CONTROLLING CONVENTIONAL ARMS TRANSFERS?	9
A Methodology for Determining Which Weapon Systems Should Be Controlled	9
Applying the Criteria	11
Should an International Control Regime Focus on Suppliers, Users, or Both?	17
Should an International Regime Seek to Regulate or Prohibit the Sales of the Weapons Subject to the Controls?	18
Should an International Control Regime Be Applied to Some States in the Region or to All?	18

Chapter Three

DEVELOPING MECHANISMS FOR STABILIZING THE ARMS MARKETS	21
Market-Stabilizing Mechanisms and Interregional Military Balances	22
Market-Stabilizing Mechanisms and Intra-regional Military Balances	23

Chapter Four

SUMMARY AND CONCLUSION	25
Outstanding Issues for Future Examination	26

FIGURES

1. Arms Transfer Agreements with the Middle East, 1988-1991	2
2. Foreign Exchange Earnings from the Supply of Conventional Weapons Worldwide, 1987-1991	3
3. When Should the United States Be Interested in Controlling Arms Transfers?	5
4. Categories of Arms Sales to the Middle East, 1984-1991	15
5. Anticipated Sales of Advanced Weapons and Submarines to the Persian Gulf States, 1994-2001	16

SUMMARY

This project has two objectives. The first is to develop a methodology and a practical approach to the control of conventional arms transfers that would link U.S. policy on such transfers to U.S. national and regional interests and strategy. Conventional arms transfer policy is a component of U.S. national security strategy. Decisions on arms transfers should be consistent with larger U.S. goals, and the intent of this report is to identify ways to make this connection explicit.

The second objective is to apply this methodology to specific regions of the world. The research documented in this report has focused on the Persian Gulf. That focus carries with it important implications for military balances that are discussed below. Follow-on research will focus on other regions, perhaps the Greater Middle East, East Asia, and Eastern Europe.

The primary impact of limiting the transfer of conventional arms is on the military forces that otherwise would be incorporating them. The objective of a control regime should be to limit weapons that, if sold, would affect regional military balances in ways inconsistent with U.S. strategic interests. There are two types of balances that could be affected: interregional and intraregional. The relative importance of each for regional stability varies according to the region studied. For the Persian Gulf, the interregional balance dominates, since the foundation for deterrence of Iraq or Iran is the threat of U.S. intervention. Therefore, the primary objective for a control regime applied in the Persian Gulf is to affect the interregional balance—the balance between the U.S. and potential regional adver-

saries—favorably. In other regions, the intraregional balance may be more relevant.

Proceeding from this objective, what should be the broad characteristics of an international regime for controlling conventional arms transfers to the Persian Gulf? Three criteria were devised for guiding analysis of what weapon systems should be included in the regime.

The first is “high leverage”: The systems included should exert an especially powerful influence on battlefield outcomes. The second is “low substitutability”: The systems included should have no substitutes such that users can replace them by buying from a supplier outside the regime. The third is “low opportunity cost”: The opportunity cost for the forgone sales incurred by states adhering to the control regime should be low.

The following categories of weapons meet all three criteria:

- Submarines.
- Stealth aircraft.
- Advanced sea and land mines.
- Advanced air-to-air, air-to-ground, ground-to-air, antishipping, antitank, and other ground-to-ground munitions and the associated devices (e.g., sensors) needed for their effective operation.
- Tactical ballistic missiles and cruise missiles with advanced conventional warheads.
- Tactical air defense systems and some strategic air defense systems.
- Advanced reconnaissance, surveillance, and target acquisition systems, and, possibly, some battle management and electronic warfare systems.

Note that not on the list are major end items such as armored fighting vehicles, advanced combat aircraft, and naval surface combatants. These weapons meet none of the three criteria when applied to the interregional balance in the Persian Gulf. The same may not be true for other regions.

Analysis suggests that a regime to control the transfer of these weapons should be applied to all states in the Persian Gulf, not just to some, and should seek to prohibit rather than simply regulate their sale. These conclusions were reached on the basis of the analytical and political infeasibility of establishing mutually agreed-upon sales quotas and verifying them.

Finally, the control regime will require some mechanism for dealing with disputed sales, as well as with occasions when a supplier feels a particular need to make a sale of a controlled item. This mechanism is called the market-stabilizing mechanism, or MSM. The MSM needed to implement this international regime is a system of measures that can be taken, depending on the judgment of the other suppliers, either to help defray the losses incurred as a result of forgone sales to a hard-hit supplier or to penalize a supplier for regime violation. These measures could include compensation of a supplier by the other suppliers by cash or by advantageous terms of trade in another commodity. User states that would be affected adversely by the prospective sale would be allowed to contribute to this compensation or even bid competitively for the disputed sale in order to preempt it. As to sanctions for violating the regime, the MSM would permit the other suppliers to retaliate in some other trade area, so that the violator could receive no net benefit for the prohibited sale.

ACKNOWLEDGMENTS

The authors wish to express their particular gratitude to Mr. Ralph Novak and Captain Larry Seaquist for their support and enthusiasm. There would have been no project without them. We thank Brian Chow, a key member of our research team, for his numerous creative analytical contributions. We are very appreciative of the excellent critiques done by RAND colleagues Dean Wilkening and Richard Darilek, and of the research assistance ably performed by Peter Cannon, Gwen Farnsworth, and Brett Lewis.

Finally, two of the authors would like to tell the third: "Charles, it has been a pleasure working with you."

INTRODUCTION

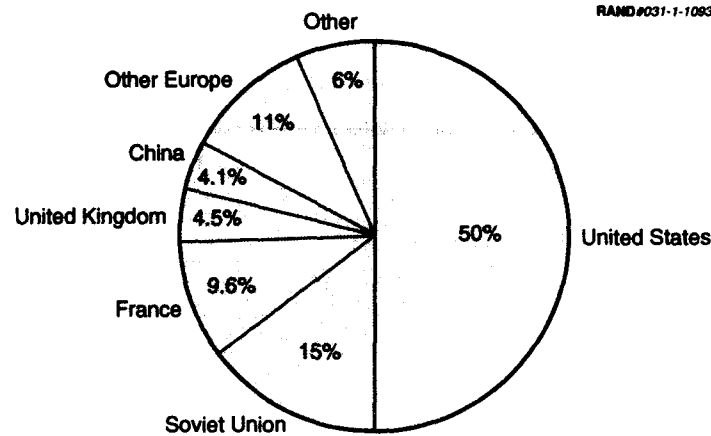
This project has two objectives. The first is to develop a methodology and a practical approach to the control of conventional arms transfers that would link U.S. policy on such transfers to U.S. national and regional interests and strategy. Conventional arms transfer policy is a component of U.S. national security strategy. Decisions on arms transfers should be consistent with larger U.S. goals, and this report's intent is to identify ways to make this connection explicit.

The second objective is to apply this approach to specific regions of the world. Phase 1 of the project, the phase documented in this report, has focused on the Persian Gulf. That focus carries with it important implications for military balances that are discussed below. Phase 2 of the project will focus on another region, perhaps the Greater Middle East, East Asia, or East Europe.

WHY IS CONTROL OF CONVENTIONAL ARMS TRANSFERS NOW POSSIBLE?

With the exception of Israel, no state in the Middle East has the indigenous capability to produce sophisticated, major conventional weapon systems. These have come almost exclusively from five external suppliers: the United States, the former Soviet Union, Great Britain, France, and China. Since 1987, these states have provided about 85 percent of the arms delivered to this region, with the United States supplying about 50 percent of this amount (see Figure 1). This market structure means that if the flow of conventional arms is to be controlled effectively, these five supplier states must cooperate.

2 Controlling Conventional Arms Transfers



SOURCE: Richard F. Grimmett, *Conventional Arms Transfers to the Third World, 1984-1991*, Congressional Research Service, July 20, 1992.

Figure 1—Arms Transfer Agreements with the Middle East, 1988-1991

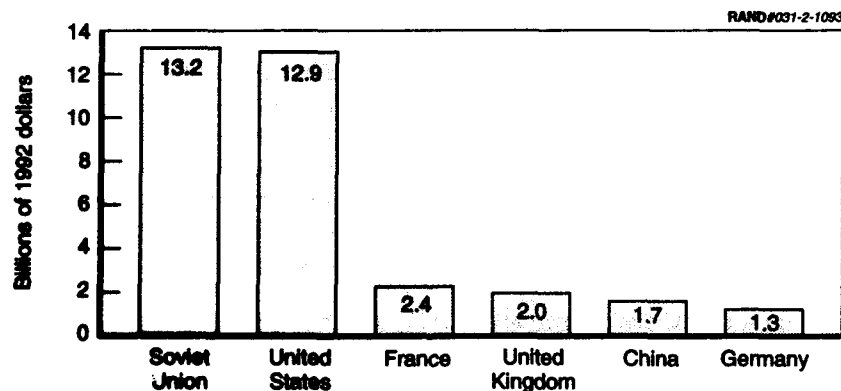
During the Cold War, such cooperation proved impossible despite two serious attempts to achieve it. The explanation is straightforward. Conventional arms transfer decisions by the United States and the Soviet Union were driven by the conflicting strategic and ideological objectives of the two sides.¹ Since those objectives tended to conflict in the Middle East, there was little chance for finding the overlap of interests that would make control of conventional arms sales possible. Indeed, the most well-developed conventional arms transfer initiatives foundered on this obstacle: the embargo on sales to Middle Eastern states begun in 1949, and the efforts of the Carter administration in the late 1970s.

The end of the Cold War has fundamentally altered this situation. East-West strategic and ideological conflicts have been reduced or eliminated. Because of the political flux in the states of the former Soviet Union and, to a much lesser extent, in U.S. relations with

¹Note that superpower cooperation on preventing nuclear proliferation is the "exception that proves the rule." It was much more effective owing to the harmony of strategic objectives in this area.

Europe and Japan, one cannot be sure that the current absence of competition among strategic interests will endure. However, the five major suppliers of conventional weapons are not now pursuing sharply conflicting objectives in the Middle East generally and the Persian Gulf specifically. Members of this group either benefit from stability in their access to oil at a reasonable price or are at least not deeply hostile to other nations' access. While the five principal arms suppliers may differ in the degree of urgency they feel about discouraging conflict in the Middle East, none has an interest in actively fomenting it.

However, in a period of contracting defense budgets, the major suppliers remain in *economic* competition for the export of conventional weapons, and this competition is the greatest remaining obstacle to developing a cooperative control regime among suppliers. The magnitude of this hurdle should not be underestimated. As indicated in Figure 2, weapons sales are a major source of foreign exchange earnings for the principal suppliers, and especially for Russia and the other states of the former Soviet Union. Conventional arms are one of the few commodities they have, other than raw materials



SOURCE: Congressional Budget Office, *Limiting Conventional Arms Exports to the Middle East*, Washington, D.C., September 1992, p. 12.

Figure 2—Foreign Exchange Earnings from the Supply of Conventional Weapons Worldwide, 1987-1991

and energy, to sell to foreign buyers. Indeed, though precise figures are difficult to obtain, arms sales have produced over 20 percent of Russia's foreign-exchange earnings, compared with only 2 or 3 percent for the United States and 3 or 4 percent for France. Yet in principle, this problem seems more tractable than the previous Cold War divisions over strategic and ideological objectives. Economic interests can be negotiated; compromises may be possible given the proper economic "sticks" and "carrots." Vital strategic and ideological objectives are much less tractable.

BENEFITS FROM CONVENTIONAL ARMS TRANSFER CONTROLS

The view that the economic obstacles to controlling conventional arms transfers can be ameliorated flows from the strategic benefits to be gained from doing so. As Operation Desert Shield/Storm demonstrated, the United States, Great Britain, and France, and to a lesser extent Russia, have a strong interest in preserving the status quo in the Persian Gulf—in particular, in preventing the emergence of a hostile military or economic hegemon that could dominate the principal oil-producing states and thereby dominate the international oil market. Control of conventional arms transfers may have an important, albeit limited, positive impact on regional stability by moving military balances in the Gulf in directions consistent with Western regional security strategy and interests. Specifically, this can mean making military balances among the regional states more stable by reducing military incentives to undertake offensive action against states favorably disposed toward the United States or its interests. It can also make U.S. military intervention into the region less costly, if the need for such intervention recurs.

The benefits of such controls should not be overestimated. At best, the international regime we envision would probably exercise effective control over only a small fraction of the total conventional arms trade. It is no panacea for regional instability, nor can it assure that the United States and its allies will not need to intervene again in the region.

If controlling conventional arms transfers is more feasible today, is it important or desirable? Indeed, as Figure 3 illustrates, it is possible

to imagine situations in which it might not be in the U.S. interest to pursue such a regime. The horizontal axis represents the degree of availability of conventional weapons to potential adversaries; the vertical axis represents the degree of availability to friendly countries. Controlling conventional arms transfers might not be desirable in a scenario in which potential U.S. adversaries were having difficulties obtaining weapons while U.S. friends were not, as portrayed in cell 3.

The problem with such scenarios is that they are impermanent, and the United States is likely to find itself in cells 1 or 2 within a short time. There are two reasons for this. First, such asymmetries breed countervailing pressures to increase sales to potential adversaries. This is especially true at a time of contracting defense sectors in almost all the major suppliers. Second, even current friends may not remain friends. The current situation in the Persian Gulf illustrates this point. Iraq, a U.S. adversary, has great difficulty obtaining weapons, and Iran, a former friend and now a potential adversary, may still face some constraints in its efforts to acquire conventional

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		Transfers to potential U.S. adversaries	
		Unlimited	Limited
Transfers to U.S. allies	Unlimited	1 Controls	3 No controls
	Limited	2 Controls	4 Depends

Figure 3—When Should the United States Be Interested in Controlling Arms Transfers?

arms. However, this situation cannot be counted on to continue. Iraq will be able to reenter the arms market, and Iran is already moving rapidly to acquire large quantities of advanced weapons—the recent Russian sale of two KILO-class submarines is a salient example.

The larger point is that, without formal restraints, the structure of the arms market conduces to imperfectly controlled sales to all users. Generally, in such conditions it is to the advantage of the United States that arms sales be controlled to restrain the behavior of potential adversaries.

WHAT SHOULD BE THE OBJECTIVES OF A CONTROL REGIME?

Limiting the transfer of conventional arms has its primary impact on the military forces that otherwise would incorporate them. To the extent that there are no substitutes for the weapons affected by the limits, the regional users lose military capability. The specific capabilities thereby limited or lost depend on the weapons that are restricted. Therefore, the objective of a control regime should be to limit those weapons whose sales would affect regional military balances in ways inconsistent with U.S. strategic interests.

There are two types of balances to be affected: the first type is “interregional” balances between regional states on the one hand, and the United States or a U.S.-led coalition on the other; the second type is “intraregional” balances among regional states. The interregional balance of a region is important to the extent that U.S. intervention is necessary to protect its interests. The intraregional military balance is important to the extent the United States can depend on regional states for the protection of its interests rather than on intervention from outside the area. For example, in the Persian Gulf² the interregional balance is the more important and, therefore, the appropriate focus of a control regime applied to that region. This is because the intraregional balance between the Gulf Cooperation

²“Persian Gulf” here denotes only the GCC states, Iraq, and Iran. It should be distinguished from the Greater Middle East, which includes the Mediterranean Middle East as well as the Persian Gulf states.

Council (GCC) states and potential adversaries cannot be improved sufficiently to enable U.S. friends in the region to defend themselves for more than a brief period. Consequently, U.S. policy toward the Persian Gulf is based on deterring aggression against the GCC states by posing a credible threat of U.S. intervention, either as part of a coalition or unilaterally. This point should not be construed to mean that the intraregional balance in the Persian Gulf is of *no* importance to U.S. interests. Rather, it should be interpreted as *relatively* less important in this particular region. The capability of the United States to prevail militarily over potential adversaries in the Gulf is virtually certain. However, the credibility of this threat depends critically on the inability of potential enemies to inflict losses in casualties and matériel on U.S. forces that would be politically difficult to accept, even if the United States is ultimately successful. Therefore, success of this regional strategy requires not simply that the United States be able to secure its objectives, but that it be able to do so at a low cost in terms of losses. It follows that the goal of a regime to control the transfer of conventional arms to this region is to affect interregional balances in ways that reduce the costs to the United States of intervening.

This study's initial focus on the interregional balance is a consequence of choosing the Gulf as the region for examination in Phase 1 of this project. There are many other regions in which the intraregional balance is as or more important than the interregional. For example, unlike the GCC versus Iraq or Iran, the military balances between Israel and its Arab opponents have considerable influence on the stability of that region, and the likelihood that U.S. intervention will be needed to support Israel in a crisis is small. Therefore, in such regions where the United States seeks to preserve the status quo against aggressive action, a control regime would seek to limit weapons that confer disproportionate advantages to the offensive over the defensive side.

This objective raises the vexing question of whether it is possible to categorize weapons according to their "offensive" and "defensive" content, so as to be able to control the former and not the latter. Many argue that this question is driven so much by situational factors as to be useless. Others arrive at the same conclusion by pointing out that in modern, mechanized combat, forces on both sides are constantly transitioning from offense to defense at all levels.

Therefore, the capabilities needed to carry out offensive and defensive operations are identical, according to this view. At this point, our project must take an agnostic position on this question. This type of assessment must be done using the tools of force-on-force analysis, which is intended for the study's second phase.

**WHAT SHOULD BE THE CHARACTERISTICS OF AN
INTERNATIONAL REGIME FOR CONTROLLING
CONVENTIONAL ARMS TRANSFERS?**

**A METHODOLOGY FOR DETERMINING WHICH WEAPON
SYSTEMS SHOULD BE CONTROLLED**

Both prior studies and disappointing experience have confirmed the premise that establishing a regime for controlling conventional arms transfers will be difficult, and that it will become increasingly difficult as the number of states involved grows. Therefore, designing a practicable regime should strive for efficiency: That is, it should seek to exercise as great an effect as possible while restricting as small a number of weapons as possible and requiring the adherence of as small a number of states as possible. This approach is crystallized by three criteria for choosing which weapons systems should and should not be included: high leverage, low substitutability, and low opportunity cost for suppliers.

First, the systems included should exert high leverage on battlefield outcomes; that is, their effects should be disproportionately high compared to their numbers. The rationale for this criterion lies in the notion of efficiency with respect to the objective. All things being equal, one would prefer to control the transfer of weapons that make a large difference even in small numbers.

Second, the systems included should have no substitutes of comparable capability that are available to users. A user should not be able to circumvent the purpose of the control regime by acquiring a comparable system from a supplier not part of the regime. Similarly, a user should not be able to substitute easily for the proscribed system by acquiring a different kind of system that nevertheless can perform the same missions with comparable effectiveness. If this criterion is

not met, users can defeat the control regime with little difficulty. Once that begins to happen, supplier-members of the control regime will defect as they observe other suppliers benefiting from the forgone sales.

Third, the systems included should not comprise a large fraction of the total dollar value of the arms transferred by the five first-tier suppliers. Put another way, the opportunity cost of forgone sales incurred by states adhering to the control regime should be low. The rationale for the "low opportunity cost" criterion is also practical. The major obstacle to successful control of conventional arms transfer is economic. Logically, if the opportunity costs for complying with an international control regime can be kept low, the likelihood is increased that the key supplier states will find it in their interests to join and abide by such a regime.¹

In sum, the methodology for devising controls on conventional arms transfers that are both helpful to U.S. strategic interests and feasible is to ask the following questions:

- In the region to which the regime is to apply, which military balance is more important for protecting U.S. strategic interests, the intraregional or the interregional?
- Based on the answer to the first question, what are the high-leverage systems for the region in question?
- What subset of these high-leverage systems have no substitutes and impose a low opportunity cost on suppliers for forgone sales?

The next step is to apply this methodology to a region, in this case the Persian Gulf. This region was chosen largely because most of the suppliers share a strong national interest in avoiding military instability that would endanger access to oil at a reasonable price. Specifically, the United States, France, Britain, Japan, and other

¹We recognize that the dollar value of forgone sales may not be the only way to think about opportunity costs. For example, a lost sale may affect a critical company or industry out of proportion to its dollar value, if it means that important domestic capabilities or competencies might be lost. Similarly, the political opportunity cost may be great in cases of forgone sales to an important regime. We will explore these broader constructions of opportunity cost in follow-on research.

European states would receive a strategic benefit to offset the opportunity costs they would have to absorb.

APPLYING THE CRITERIA

The question of what constitutes a "high-leverage" weapon depends upon whether the interregional or the intraregional balance is being considered. As noted earlier, the United States is the primary source of countervailing military power to conventional threats to the GCC states from Iraq or Iran. This means that the interregional military balance between the United States and its potential adversaries is of dominant importance. The objective of controlling conventional arms sales to the Persian Gulf is to influence that balance to make the U.S. threat to intervene as credible as possible by making such an intervention as quick, inexpensive, and decisive as possible. In this context, a weapon with high leverage over the interregional balance is one that threatens to inflict losses on a U.S. intervention force or coalition partner that might carry with it serious domestic or international political consequences. Such a loss might be the loss of a capital ship or even serious damage to one; the loss of more than a trivial number of aircraft, especially high-profile aircraft like the B-2 or F-117; or the loss of a major ground unit, a division or perhaps a brigade. The political cost of such losses would be heightened greatly if inflicted suddenly in a short period, rather than incrementally over the entire period of the conflict.

A major obstacle in the way of a regional military power inflicting such a high political cost on the United States is organizational. With few exceptions, the Arab militaries are deficient in the demanding tasks loosely denoted as command, control, and communications. This complex function requires integrating the operations of many disparate units and systems to produce combat power that can be directed in a timely fashion at the proper place. Without these requisite organizational skills, the regional forces tend to function as collections of relatively uncoordinated units and individuals unable to provide one another the essential protections of combined arms. Such forces are both much less effective than their equipment might allow them to be, and highly vulnerable to the attack of a true combined arms force. These weaknesses afflict some regional forces more than others. The GCC militaries are probably quite poor in this

regard. The Iraqis rate somewhat better, as do the Egyptians and Syrians. However, none is remotely competitive with Western forces or Israeli forces in organizational effectiveness.

The implication of this weakness is that weapons that require the complex integration of force elements cannot be well utilized by regional militaries—or, at least, the full capabilities of such types of systems cannot be fully exploited.

By the same token, weapons that do not require this organizational correlate for their effective employment—or require it to a lesser degree—are more likely to be used effectively by regional military establishments. Weapons that fall into this category embody technology which can compensate for the organizational deficiencies of the forces using them, and which may be difficult for the United States to counter. In essence, these weapons are able to “do all the work” themselves, or they require the interaction of only a few carefully selected individuals rather than many large organizations. Weapons in this category are generally able to engage targets within a very large envelope—“all-aspect” capabilities are the furthest extension of this feature. The longer the range of the weapon, the less difficult and complex force maneuver is needed. Finally, such weapons have “fire-and-forget” capability that minimizes the need of the operating organization to take an active and demanding role in directing weapons to their targets. Thus, these weapons derive their capabilities from the individual system’s physical characteristics rather than the skill of the organizations that employ them. The result is that they permit a regional adversary, deficient in organizational effectiveness, to compensate with technical effectiveness. They permit those adversaries to function like a more sophisticated military. In a word, they can be thought of as “equalizers.”

Examples of such weapons include the following:

- Submarines.
- Stealth aircraft.
- Advanced sea and land mines.
- Advanced air-to-air, air-to-ground, ground-to-air, antishipping, antitank, and other ground-to-ground munitions and the associated devices (e.g., sensors) needed for their effective operation.

- Tactical ballistic missiles and cruise missiles with advanced conventional warheads.
- Some tactical air defense systems.²
- Advanced reconnaissance, surveillance, and target acquisition systems, and, possibly, some battle management and electronic warfare systems.

Two platforms are on this list because both are difficult for the United States to counter, can inflict costly losses, and do not require large, highly complex organizations to make possible their effectiveness. The Argentinian submarine in the war for the Falkland Islands is a perfect example. The armed forces of Argentina were not successful in those areas requiring organizational effectiveness. Yet they were able to keep at sea a relatively crude submarine, a menace to the Royal Navy in the area, in the face of sophisticated antisubmarine warfare (ASW) for the duration of the conflict. The Persian Gulf is probably a more difficult ASW environment because of its shallowness—and hence the alarm at the sale of Russian diesel electric submarines to Iran.

Stealth aircraft are similar. A Third World air force, not capable of large-scale operations against the United States, can circumvent some of its organizational difficulties by means of stealth technology. This would greatly increase an adversary's ability to penetrate to reach lucrative targets, and it would need only a relatively small number of highly skilled personnel. Again, the Falklands conflict supplies a good illustration. The RAF and the British air forces were far superior to the Argentine. Yet that air force was capable of mustering pilots and aircraft that could have inflicted considerable costs to the British, had they been more difficult to detect and intercept.³

²Specifically, we refer here to modern, shoulder-fired infrared missiles that do not depend on a radar and communications net.

³These two platforms, submarines and stealth aircraft, do not depend upon the skills of their crews, and so are not so autonomous as some of the advanced weapons discussed here. Nevertheless, though most Third World nations cannot field large, organizationally effective forces, they can develop effective and skilled individuals and small groups. Hence, they can operate a submarine or a few aircraft effectively.

Advanced air-to-air, air-to-ground, antiarmor, antishipping, and other ground-to-ground weapons (especially tactical missiles) embody all the characteristics discussed. They can strike from long range, making suppression very difficult. Once launched, they function autonomously, obviating the need for maneuver and guidance. For these reasons, they function nearly as effectively for a Third World military as for a First World in terms of being able to strike valuable targets.

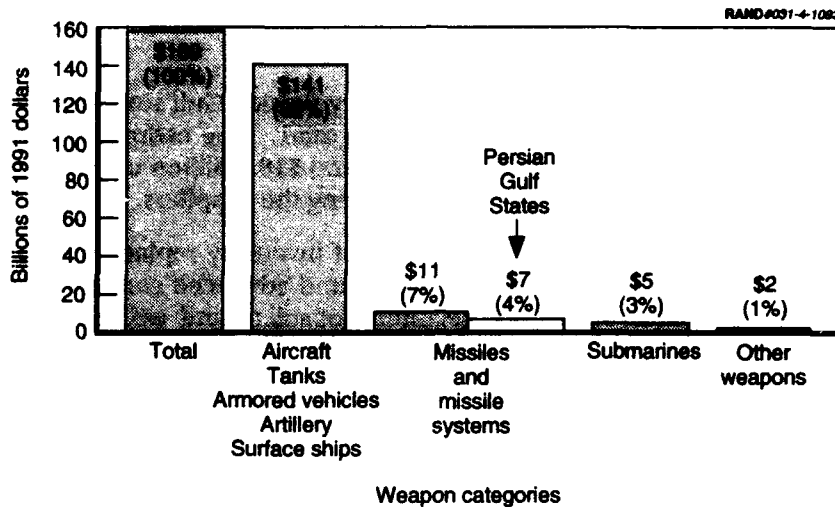
Land and sea mines present the same problems. An advanced sea mine deployed by Iraq is as difficult for the United States to detect and avoid as the same mine laid by a more advanced adversary. The same is generally true for ballistic and cruise missiles, which is why they are so attractive to regional users.

The advanced reconnaissance, surveillance, and target acquisition systems, electronic warfare systems, and battle management systems can be thought of as enabling advanced weapons to function effectively. Hence their inclusion here.

It is significant that the list excludes such major end items as sophisticated armored fighting vehicles, advanced combat aircraft, and naval surface combatants. These weapon systems require exactly the degree of organizational competence that virtually all the regional military forces lack. Hence, these weapon systems can seldom be used to their full capability by these militaries, and they pose a relatively smaller threat to U.S. forces than do the weapons on the preceding list that do not require organizational competence to be used effectively.

The weapons on the "high-leverage" list are also those with low substitutability, and the weapons not on the high-leverage list—armored fighting vehicles, modern aircraft, and naval vessels—are those with higher substitutability. Although conventional weapons technologies are spreading, the first-tier suppliers remain virtually the exclusive sources for high-leverage weapons.

The "low opportunity cost" criterion would also be satisfied by this list of restricted systems, as shown in Figure 4. Between 1984 and 1991, sales to the Middle East of such major end items as armored fighting vehicles, advanced combat aircraft, and naval surface com-



SOURCES: Richard F. Grimmett, *Conventional Arms Transfers to the Third World, 1984-1991*, Congressional Research Service, July 20, 1992, p. 64; and authors' estimates, based on ACDA and SIPRI data.

Figure 4—Categories of Arms Sales to the Middle East, 1984-1991

batants amounted to between 85 and 90 percent of the total revenues generated by the conventional arms sales of the first-tier suppliers to that region. Thus, even if all the systems on the high-leverage, low-substitutability list had been completely proscribed for transfer to the Middle East in this period, the suppliers' loss of income would have been relatively modest—about \$2 billion per year. Narrowing the focus to the Persian Gulf subregion, lost revenue would be even lower, roughly \$1 billion per year.

There are several reasons to suppose that the dollar contribution of the weapons on the high-leverage list is likely to rise in the future. First, the existing stocks of missiles and other advanced weapons in the Persian Gulf states are becoming obsolete and need replacement with more modern and expensive weapons. Second, the Gulf War gave a powerful demonstration of the effectiveness of advanced weapons, a demonstration not lost on Persian Gulf users. Third, several advanced weapons will become available from the major suppli-

ers in the next five years, including antishipping and antitank missiles and air-to-ground standoff weapons.

Figure 5 contains estimates of demand by Persian Gulf states for advanced weapons for the period 1994 to 2001. The estimated total sales for 1994 to 2001 is between \$12.1 and \$18.6 billion or between \$1.7 and \$2.7 billion per year, spread among the suppliers.

The \$10 billion figure reflects the cost of inventory replacement by users of their existing stocks of missiles and advanced conventional weapons. These stocks are becoming obsolete and will need replacement by the current versions of the systems. Cost growth means that a straightforward one-for-one replacement policy will cost Persian Gulf users significantly more than they paid to acquire their now-obsolete systems originally. Of course, in replacing their aging inventory they will acquire significantly more capability as well. The inventory replacement costing was done using data from the *Defense Marketing Service* surveys.⁴

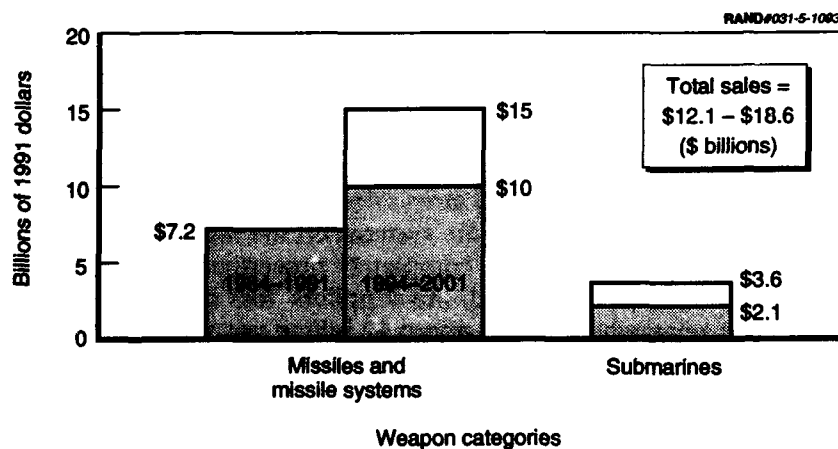


Figure 5—Anticipated Sales of Advanced Weapons and Submarines to the Persian Gulf States, 1994-2001

⁴ *Forecast International/DMS: Missiles*, 22 Commerce Road, Newton, CT, 1993.

The upper-bound figure of \$15 billion was computed by assuming that the Persian Gulf users will seek to increase their stocks of advanced conventional weapons beyond their current levels by 50 percent in dollar value. An increase of this magnitude was based on the projected production schedules contained in the *Defense Marketing Service*.⁵

The submarine calculations were made in a comparable way based on announced and anticipated submarine purchases.

Obviously these cost figures must be treated with considerable uncertainty. For example, Russian pricing policies are difficult to predict. Similarly, the resources allocated to weapons acquisition by the Persian Gulf states are dependent on a myriad of circumstances, foreign and domestic.

While the predicted opportunity costs still are a small part of total weapons sales, the possibility that sales of high-leverage weapons may rise at all if left uncontrolled increases the urgency of entering into those controls as quickly as possible before the opportunity costs of joining a regime become too great.

SHOULD AN INTERNATIONAL CONTROL REGIME FOCUS ON SUPPLIERS, USERS, OR BOTH?

The most powerful control regime would be one that included both suppliers and users. In this case, violation of the agreement would require a joint decision by both a supplier and a user. Presumably, this would be less likely than such a decision by a supplier or a user alone. However, the more members in a regime, the more difficult it is to secure agreements and the more unlikely it is that all the potential participants will share the requisite common interests. Although the supplier states have the possible basis for agreement in common strategic interests, no such basis exists for the users. Indeed, quite the opposite is true. Therefore, our initial premise is that the type of regime most likely to succeed is one that would be confined to suppliers.

⁵ibid.

SHOULD AN INTERNATIONAL REGIME SEEK TO REGULATE OR PROHIBIT THE SALES OF THE WEAPONS SUBJECT TO THE CONTROLS?

Outright prohibition of the relevant weapons seems to be preferable for two reasons. First, prohibition is more verifiable than regulation of a permissible quantity of sales. Second, it is extremely difficult if not impossible to determine analytically what quantity should be allowable and what not. For most of the weapons on the list, there probably is some operationally permissible quantity that could be sold without materially disturbing the interregional balance. However, it is extremely difficult to determine across situations what that permissible quantity should be. Equally difficult would be the task of convincing the parties to the regime that one particular level of sales was proper and another was not. Once the door is open to some sales of the designated items, the ultimate effectiveness of the control regime would be jeopardized.

However, application of a control regime to a region in which the intraregional balance, rather than the interregional one, is of predominant concern may nonetheless require setting numerical limits on the sales of certain weapons; specifically, those that would benefit potential aggressors more than defenders. Therefore, we anticipate that future work will involve an analytic assessment of how the sales of some items can be regulated instead of absolutely prohibited.

SHOULD AN INTERNATIONAL CONTROL REGIME BE APPLIED TO SOME STATES IN THE REGION OR TO ALL?

Ideally, the flow of conventional weapons would be restricted only to those states threatening U.S. interests and not at all to U.S. friends and allies. If this were possible, a control regime would not be necessary in the first place. However, it seems unlikely that the first-tier suppliers share the same strategic views with sufficient intensity to sustain arms-trade policies consistently preferential to U.S. strategic interests. Economic incentives are too strong—hence the need for a control regime. By the same logic, the control regime cannot be applied selectively to some regional states and not to others. Even if

it were possible to induce the Perm-5⁶ states to agree to such a regime, it seems very unlikely that they would adhere to it for any length of time.

A second reason for uniform application of the control regime to all states arises from questions of international support and legitimacy. It is important for the durability of any international agreement that it be viewed by most other states as legitimate and not simply a disguised form of hegemony. A suppliers' regime already runs the risk of appearing to be patronizing and unilateral. To add to that burden the application of restrictions on some states and not on others likely would be more weight than the control regime could bear.

Prohibition of Perm-5 sales of high-leverage weapons applied to all regional states provides powerful incentives for other second-tier suppliers and indigenous producers to try to occupy the now-empty market niche. How much danger these incentives pose to the purposes of the control regime is to be evaluated in subsequent project work. Detailed technical and economic analysis is necessary to address this question in depth, but at least two initial points can be made here. First, to occupy this niche, a supplier would need know-how, cash, and access to the requisite technologies. Many of the user states have the cash to support such an effort either by another state or by themselves. The know-how may also exist in some abundance with the large-scale unemployment of ex-Soviet weapons scientists. The availability of the proper technology is unclear. It may be that with the increased importance of microelectronics and computer technology to the civilian sector, the extent to which civilian technologies can be "weaponized" is increasing. Put another way, perhaps more technologies have become truly "dual-use." In this case, one might expect many future, sophisticated suppliers of civilian technology (for example, Singapore) to become involved in the arms market, as well as the traditional second-tier suppliers. This "worst-case" scenario may mean that the best the Perm-5 suppliers can hope for in controlling high-leverage weapons is to buy themselves time to develop the next generation of weapons, or to develop more effective counters to the currently advanced weapons, as the second-

⁶The five permanent members of the United Nations Security Council.

tier suppliers, new and old, move to occupy the niche vacated by the Perm-5.

In a less pessimistic vein, it may be that certain critical elements of sophisticated weapons, like systems integration, will continue to exceed the capabilities of all but the first-tier suppliers. In any case, the diversion of resources to exploit the market opportunities provided by the Perm-5 suppliers' regime would be a perverse result.

**DEVELOPING MECHANISMS FOR STABILIZING
THE ARMS MARKETS**

Formidable obstacles confront the design and implementation of an effective mechanism for stabilizing the arms market in ways that will maintain or enhance regional military balances. Precedents and precursors for such a mechanism exist—for example, the Missile Technology Control Regime (MTCR) and the Perm-5 Protocol of October 1991, in which the signatories agreed to establish a registry of arms sales and to refrain from arms exports that would seriously impair regional military stability. Although these efforts have had some value, they have been insufficient and unsuccessful.

The obstacles result from the strong economic incentives of arms sellers, and the strong political-military incentives of arms buyers, to breach any stabilizing mechanism that may be established. On the supply side of the market, the Perm-5 sellers as well as second-tier arms suppliers are motivated to expand exports as a means of stretching military production lines and thereby lowering unit costs, a worthwhile goal in the face of decreasing domestic defense R&D and procurement budgets. Economic incentives to export arms are even stronger for Russia and Ukraine because of their pressing need to earn foreign exchange and their relatively limited options—aside from arms exports—for doing so. The sellers are further motivated by the familiar “free rider” incentive: if a seller refrains from a sale, the result may simply be that another supplier’s sales are equivalently increased.

On the buyers’ side of the market, incentives to breach a control regime arise from fundamental political and security concerns, abetted by a version of the “prisoner’s dilemma”: namely, if one buyer

forgoes the purchase of advanced equipment and technology, the threat posed by a neighbor may be intensified because of the risk that the neighbor would not symmetrically forgo such acquisitions.

Thus, development of a reasonably effective market-stabilizing mechanism (MSM) depends upon creating countervailing incentives to those that previously, currently, and prospectively impel both sellers and buyers to expand sales and purchases. Such countervailing incentives can be provided by a variety of instruments: for example, a fund to compensate sellers who forgo destabilizing sales, thereby encouraging their compliance; and counterbidding by threatened buyers to encourage other buyers to comply with the MSM. In addition to these "carrots," it may be possible to design various "sticks"—credible penalties—to reinforce these compensatory inducements toward compliance. In any event, both carrots and sticks would require support by appropriate political and diplomatic measures, including appropriate declaratory policy, an inclusive and transparent data registry, and careful monitoring of the MSM once in place.

MARKET-STABILIZING MECHANISMS AND INTERREGIONAL MILITARY BALANCES

To induce compliance with the complete prohibition of the "high-leverage" weapons systems described earlier, and thereby to contribute to the crucial interregional balance in the Persian Gulf, the MSM that we have been designing would include several components. One component would be a fund that the Perm-5 members would establish to compensate a stressed seller for forgone sales of high-leverage systems in special cases of compelling economic reasons for earning foreign exchange. Russia's critical needs for hard-currency earnings, and its limited ability in the short term to earn them by exports other than military ones, are a case in point.¹ To avoid or mitigate the temptation to abuse or manipulate this source of possible compensation, strict conditions would be required to link disbursement of these funds to accelerated reductions of defense industrial capacity or its conversion to civil uses. It is also possible that

¹In this connection, it is worth noting that in the 1980s, arms exports provided about 20 percent of the former Soviet Union's hard-currency earnings, compared to less than 3 percent for the corresponding U.S. figure.

other countries, such as Japan and Korea, that share with the Perm-5 members an interest in regional military stability might contribute to this compensation fund.

Another component of the MSM might provide for increased exports of other-than-high-leverage systems—such as armored vehicles, artillery, and surface vessels—in place of exports that might otherwise be forthcoming from other Perm-5 members. A third element in the notional MSM would provide for some Perm-5 members to buy limited amounts of the high-leverage systems whose sale is forgone by another member.

A fourth element would invoke the possibility of “preventive” or “preemptive” counterbidding by an affected buyer. For example, if Russia or China was considering further sales of submarines to Iran, an opportunity might be created for the Saudis or other GCC states to exercise a counterbid that would forestall the destabilizing sale.

Clearly, these countervailing incentive measures create opportunities for abuse, if not extortion. Thus, the relevance and effectiveness of these instruments depend on the existence of a genuine disposition among the Perm-5 to cooperate in the interests of regime stability, provided that opportunities exist to support the MSM by exceptions in special, as well as legitimate, circumstances that might confront individual Perm-5 members. Such exceptions might arise, for example, in the previously cited case of Russia’s possibly compelling need for foreign exchange earnings.

To supplement these inducements or “carrots,” an MSM should also carry with it some credible instruments for inflicting penalties on foreign firms that violate the established prohibition of high-leverage systems. For example, it might be possible to restrict access to the markets of the United States and other Perm-5 members for any firms that breach the prohibition against certain weapons exports.

MARKET-STABILIZING MECHANISMS AND INTRAREGIONAL MILITARY BALANCES

We have noted earlier why, in the Persian Gulf region, the prospects are not good for creating and maintaining an intraregional military balance. Hence, military stability depends on the maintenance of a

credible *interregional* balance. However, in other regions such as Eastern Europe, the Greater Middle East region beyond the Persian Gulf, and Asia, military stability is primarily a function of the *intra*regional balance. In these regions, a properly functioning regime for controlling conventional arms sales would reduce incentives for military aggression. The question is whether, where, and when controlling the advanced conventional weapons would encourage increased *intra*regional stability. If so, then the control regime and market-stabilizing measures useful for encouraging stable *inter*regional balances will also be useful for encouraging stable *intra*regional balances. Preliminary analysis suggests that many of the systems useful to bar from the Persian Gulf region would be equally useful to withhold from the Greater Middle East. However, in other instances, efforts to affect the *intra*regional and *inter*regional balances favorably may conflict. For example, if efforts to control the introduction of advanced conventional weapons were to expand substantially sales of other weapons, the result might be to increase rather than reduce the probability of conflict within the region. Eastern and southeastern Europe may be a case in point. We expect to address this important question in our follow-on research.

In the design of MSMs to preserve or enhance *intra*regional balances, it would be highly desirable to include prospective buyers in the setting of aggregate ceilings for permissible exports of specific systems, and in the monitoring and enforcement of those ceilings. To provide incentives for compliance, some of the same mechanisms discussed earlier—including compensatory funding to restrain sellers, and counterbidding from the buyers' side of the market—would be relevant. Similarly, penalties might be imposed on firms that breach the quotas by restricting their access to the markets of Perm-5 states.

SUMMARY AND CONCLUSION

Reviewing briefly, the major points of this discussion are as follows:

1. The primary objective of controlling the transfer of conventional weapons is to influence regional military balances to further U.S. strategic interests.
2. There are two such military balances in every region: the intraregional and the interregional. In some regions, the intraregional balance is most important for U.S. interests; in other regions, the interregional balance is most important.
3. In the Persian Gulf, the interregional balance is most important because U.S. forces provide the counterweight to Iraqi and Iranian military threats to the GCC states.
4. Three criteria have been developed to help determine which items (weapons and other systems) should be controlled by an international regime: high leverage, low substitutability, and low opportunity cost to sellers.
5. When applied to the Persian Gulf's military balances, these criteria suggest strongly that some advanced conventional weapons, submarines, and stealth aircraft (manned and unmanned) should be the focus of an international control regime.
6. This regime should prohibit the sale of these systems and be applied to all Persian Gulf states, U.S. allies and adversaries alike.
7. A system for compensating uniquely injured parties and penalizing violators will be necessary for the implementation of the regime. These are called market-stabilizing measures (MSMs).

OUTSTANDING ISSUES FOR FUTURE EXAMINATION

Three broad questions need further, detailed investigation. First, to what extent (if any) is the control of advanced systems helpful to U.S. interests in regions other than the Persian Gulf? This question has particular importance in regions in which the United States does not anticipate the need to intervene to protect its interests, but seeks to rely on the intraregional balance for the furtherance of its interests. An obvious example is the Greater Middle East, in which the United States seeks to assure the security of Israel without the requirement to intervene militarily, as with the GCC states. The question is whether an international regime like the one discussed here is consistent with that security. Put another way, are there systems Israel regards as so dangerous that it would be willing to forgo them in order to keep them out of Arab hands? Similarly, are there such systems that the Arabs would be willing to forgo if it meant that Israel would as well? Do these lists have any systems in common? Two other regions for this sort of inquiry are East Asia and Eastern Europe.

Second, as was alluded to, the prohibition of important systems can be expected to create powerful incentives for new suppliers to enter the market to "fill the vacuum." Some of these will be existing suppliers of less sophisticated weapons. Some will be new suppliers. How quickly can this process produce adequate substitutes that would defeat the international control regime? The time needed must be a function of the type of system to be developed, the character of the aspiring supplier, the resources available, and the like. Some systems may require little time for new suppliers to emerge. Others may require a great deal of time. All else being equal, an international control regime would be better focused on systems in the latter group rather than the former. Therefore, it is important to carry out economic and technical investigations of various types of systems to assess the time and resources needed to enable new suppliers to breach the regime.

Third, what ought to be the detailed structure and workings of the market-stabilizing measures? What is the best way to compensate especially injured parties? Can one predict the approximate amount of compensation needed over the next five to ten years? Specifically, can the risk of extortion be eliminated or monitored?