14

Brinkmanship

The Cuban Missile Crisis

In Chapter 1, we explained that our basic approach was neither pure theory nor pure case study, but a combination in which theoretical ideas were developed by using features of particular cases or examples. Thus, we ignored those aspects of each case that were incidental to the concept being developed. However, after you have learned the theoretical ideas, a richer mode of analysis becomes available to you in which factual details of a particular case are more closely integrated with game-theoretic analysis to achieve a fuller understanding of what has happened and why. Such *theory-based case studies* have begun to appear in diverse fields—business, political science, and economic history.[1]

Here we offer an example from political and military history—namely, nuclear brinkmanship in the Cuban missile crisis of 1962. Our choice is motivated by the sheer drama of the episode, the wealth of factual information that has become available, and the applicability of an important concept from game theory.

The crisis, when the world came as close to an unaccidental nuclear war as it ever has, is indeed often offered as the classic example of brinkmanship. You may think that the risk of nuclear war died with the dissolution of the

[1] Two excellent examples of theory-based studies are Pankaj Ghemawat, *Games Businesses Play: Cases and Models* (Cambridge, Mass.: MIT Press, 1997), and Robert H. Bates, Avner Greif, Margaret Levi, Jean-Laurent Rosenthal, and Barry Weingast, *Analytic Narratives* (Princeton: Princeton University Press, 1998). A broader analysis of the approach can be found in Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, Mass.: MIT Press, 2005).

Soviet Union and that therefore our case is a historical curiosity. But nuclear arms races continue in many parts of the world, and such rivals as India and Pakistan or Iran and Israel may find use for the lessons taken from the Cuban crisis. More important for many of you, brinkmanship must be practiced in many more common situations, from political negotiations to business-labor relations to marital disputes. Although the stakes in such games are lower than those in a nuclear confrontation between superpowers, the same principles of strategy apply.

In Chapter 9, we introduced the concept of brinkmanship as a strategic move; here is a quick reminder of that analysis. A *threat* is a response rule, and the threatened action inflicts a cost on both the player making the threat and the player whose action the threat is intended to influence. However, if the threat succeeds in its purpose, this action is not actually carried out. Therefore, there is no apparent upper limit to the cost of the threatened action. But the risk of *errors*—that is, the risk that the threat may fail to achieve its purpose or that the threatened action may occur by accident—forces the strategist to use the minimal threat that achieves its purpose. If a smaller threat is not naturally available, a large threat can be scaled down by making its fulfillment probabilistic. You do something in advance that creates a probability, but not certainty, that the mutually harmful outcome will happen if the opponent defies you. If the need actually arose, you would not take that bad action if you had the full freedom to choose. Therefore, you must arrange in advance to let things get out of your control to some extent. *Brinkmanship* is the creation and deployment of such a probabilistic threat; it consists of a deliberate loss of control.

In our extended case study of the Cuban missile crisis, we will explain the concept of brinkmanship in detail. In the process, we will find that many popular interpretations and analyses of the crisis are simplistic. A deeper analysis reveals brinkmanship to be a subtle and dangerous strategy. It also shows that many detrimental outcomes in business and personal interactions—such as strikes and breakups of relationships—are examples of brinkmanship gone wrong. Therefore, a clear understanding of the strategy, as well as its limitations and risks, is very important to all game players, which includes just about everyone.

1 A BRIEF NARRATIVE OF EVENTS

We begin with a brief story of the unfolding of the crisis. Our account draws on several books, including some that were written with the benefit of documents

and statements released since the collapse of the Soviet Union.[2] We cannot hope to do justice to the detail, let alone the drama, of the events. President Kennedy said at the time of the crisis: "This is the week when I earn my salary." Much more than a president's salary stood in the balance. We urge you to read the books that tell the story in vivid detail and to talk to any relatives who lived through it to get their firsthand memories.[3]

In late summer and early fall of 1962, the Soviet Union (USSR) started to place medium- and intermediate-range ballistic missiles (MRBMs and IRBMs) in Cuba. The MRBMs had a range of 1,100 miles and could hit Washington, D.C.; the IRBMs, with a range of 2,200 miles, could hit most of the major U.S. cities and military installations. The missile sites were guarded by the latest Soviet SA-2–type surface-to-air missiles (SAMs), which could shoot down U.S. high-altitude U-2 reconnaissance planes. There were also IL-28 bombers and tactical nuclear weapons called Luna by the Soviets and FROG (free rocket over ground) by the United States, which could be used against invading troops.

This was the first time that the Soviets had ever attempted to place their missiles and nuclear weapons outside Soviet territory. Had they been successful, it would have increased their offensive capability against the United States manyfold. It is now believed that the Soviets had fewer than 20, and perhaps as few as "two or three," operational intercontinental ballistic missiles (ICBMs) in their own country capable of reaching the United States (*War*, 464, 509–510). Their initial placement in Cuba had about 40 MRBMs and IRBMs, which was a substantial increase. But the United States would still have retained vast

[2] Our sources include Robert Smith Thompson, *The Missiles of October* (New York: Simon & Schuster, 1992); James G. Blight and David A. Welch, *On the Brink: Americans and Soviets Reexamine the Cuban Missile Crisis* (New York: Hill and Wang, 1989); Richard Reeves, *President Kennedy: Profile of Power* (New York: Simon & Schuster, 1993); Donald Kagan, *On the Origins of War and the Preservation of Peace* (New York: Doubleday, 1995); Aleksandr Fursenko and Timothy Naftali, *One Hell of a Gamble: The Secret History of the Cuban Missile Crisis* (New York: W. W. Norton & Company, 1997); and last, latest, and most direct, *The Kennedy Tapes: Inside the White House During the Cuban Missile Crisis*, ed. Ernest R. May and Philip D. Zelikow (Cambridge, Mass.: Harvard University Press, 1997). Graham T. Allison's *Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little Brown, 1971) remains important not only for its narrative, but also for its analysis and interpretation. Our view differs from his in some important respects, but we remain in debt to his insights. We follow and extend the ideas in Avinash Dixit and Barry Nalebuff, *Thinking Strategically* (New York: W. W. Norton & Company, 1991), ch. 8.

When we cite these sources to document particular points, we do so in parentheses in the text, in each case using a key word from the title of the book followed by the appropriate page number or page range. The key words have been underlined in the sources given here.

[3] For those of you with no access to firsthand information or those who seek a beginner's introduction to both the details and the drama of the missile crisis, we recommend the film *Thirteen Days* (2000, New Line Cinema). A new, relatively short book by Sheldon Stern uses the evidence from the Kennedy administration tapes to present as accurate a view of the crisis and its later analysis as possible. His book is perhaps the best short read for interested parties. See Sheldon Stern, *The Cuban Missile Crisis in American Memory: Myths versus Reality* (Stanford, Calif.: Stanford University Press, 2012).

superiority in the nuclear balance between the superpowers. Also, as the Soviets built up their submarine fleet, the relative importance of land-based missiles near the United States would have decreased. But the missiles had more than mere direct military value to the Soviets. Successful placement of missiles so close to the United States would have been an immense boost to Soviet prestige throughout the world, especially in Asia and Africa, where the superpowers were competing for political and military influence. Finally, the Soviets had come to think of Cuba as a "poster child" for socialism. The opportunity to deter a feared U.S. invasion of Cuba and to counter Chinese influence in Cuba weighed importantly in the calculations of the Soviet leader and Premier, Nikita Khrushchev. (See *Gamble*, 182–183, for an analysis of Soviet motives.)

U.S. surveillance of Cuba and of shipping lanes during the late summer and early fall of 1962 had indicated some suspicious activity. When questioned about it by U.S. diplomats, the Soviets denied any intentions to place missiles in Cuba. Later, faced with irrefutable evidence, they said that their intention was defensive, to deter the United States from invading Cuba. It is hard to believe this, although we know that an offensive weapon *can* serve as a defensive deterrent threat.

An American U-2 "spy plane" took photographs over western Cuba on Sunday and Monday, October 14 and 15. When developed and interpreted, they showed unmistakable signs of construction on MRBM launching sites. (Evidence of IRBMs was found later, on October 17.) These photographs were shown to President Kennedy the following day (October 16). He immediately convened an ad hoc group of advisers, which later came to be called the Executive Committee of the National Security Council (ExComm), to discuss the alternatives. At the first meeting (on the morning of October 16), he decided to keep the matter totally secret until he was ready to act, mainly because if the Soviets knew that the Americans knew, they might speed up the installation and deployment of the missiles before the Americans were ready to act, but also because spreading the news without announcing a clear response would create panic in the United States.

Members of ExComm who figured most prominently in the discussions were the Secretary of Defense, Robert McNamara; the National Security Adviser, McGeorge Bundy; the Chairman of the Joint Chiefs of Staff, General Maxwell Taylor; the Secretary of State, Dean Rusk, and Undersecretary George Ball; the Attorney General, Robert Kennedy (who was also the President's brother); the Secretary of the Treasury, Douglas Dillon (also the only Republican in the Cabinet); and Llewellyn Thompson, who had recently returned from being U.S. Ambassador in Moscow. During the two weeks that followed, they would be joined by or would consult with several others, including the U.S. Ambassador to the United Nations, Adlai Stevenson; the former Secretary of State and a senior statesman of U.S. foreign policy, Dean Acheson; and the Chief of the U.S. Air Force, General Curtis LeMay.

In the rest of that week (October 16 through 21), the ExComm met numerous times. To preserve secrecy, the President continued his normal schedule, including travel to speak for Democratic candidates in the midterm congressional elections that were to be held in November 1962. He kept in constant touch with ExComm. He dodged press questions abut Cuba and persuaded one or two trusted media owners or editors to preserve the facade of business as usual. ExComm's own attempts to preserve secrecy in Washington sometimes verged on the comic, as when almost a dozen of them had to pile into one limo, because the sight of several government cars going from the White House to the State Department in a convoy could cause speculation in the media.

Different members of ExComm had widely differing assessments of the situation and supported different actions. The military Chiefs of Staff thought that the missile placement changed the balance of military power substantially; Defense Secretary McNamara thought it changed "not at all" but regarded the problem as politically important nonetheless (*Tapes*, 89). President Kennedy pointed out that the first placement, if ignored by the United States, could grow into something much bigger and that the Soviets could use the threat of missiles so close to the United States to try to force the withdrawal of the U.S., British, and French presence in West Berlin. Kennedy was also aware that it was a part of the *geopolitical* struggle between the United States and the Soviet Union (*Tapes*, 92).

It now appears that he was very much on the mark in this assessment. The Soviets planned to expand their presence in Cuba into a major military base (*Tapes*, 677). They expected to complete the missile placement by mid-November. Khrushchev had planned to sign a treaty with Castro in late November, then travel to New York to address the United Nations and issue an ultimatum for a settlement of the Berlin issue (*Tapes*, 679; *Gamble*, 182), using the missiles in Cuba as a threat for this purpose. Khrushchev thought Kennedy would accept the missile placement as a *fait accompli*. Khrushchev appears to have made these plans on his own. Some of his top advisers privately thought them too adventurous, but the top governmental decision-making body of the Soviet Union, the Presidium, supported him, although its response was largely a rubber stamp (*Gamble*, 180). Castro was at first reluctant to accept the missiles, fearing that they would trigger a U.S. invasion (*Tapes*, 676–678), but in the end he, too, accepted them. The prospect gave him great confidence and lent some swagger to his statements about the United States (*Gamble*, 186–187, 229–230).

In all ExComm meetings up to and including the one on the morning of Thursday, October 18, everyone appears to have assumed that the U.S. response would be purely military. The only options that they discussed seriously during this time were (1) an air strike directed exclusively at the missile sites and (probably) the SAM sites nearby, (2) a wider air strike including Soviet and Cuban

aircraft parked at airfields, and (3) a full-scale invasion of Cuba. If anything, attitudes hardened when the evidence of the presence of the longer-range IRBMs arrived. In fact, at the Thursday meeting, Kennedy discussed a timetable for air strikes to commence that weekend (*Tapes*, 148).

McNamara had first mentioned a blockade toward the end of the meeting on Tuesday, October 16, and developed the idea (in a form uncannily close to the course of action actually taken) in a small group after the formal meeting had ended (*Tapes*, 86, 113). Ball argued that an air strike without warning would be a "Pearl Harbor" and that the United States should not do it (*Tapes*, 115); he was most importantly supported by Robert Kennedy (*Tapes*, 149). The civilian members of ExComm further shifted toward the blockade option when they found that what the military Joint Chiefs of Staff wanted was a massive air strike; the military regarded a limited strike aimed at only the missile sites so dangerous and ineffective that "they would prefer taking no military action than to take that limited strike" (*Tapes*, 97).

Between October 18 and Saturday, October 20, the majority opinion within ExComm gradually coalesced around the idea of starting with a blockade, simultaneously issuing an ultimatum with a short deadline (from 48 to 72 hours was mentioned), and proceeding to military action if necessary after this deadline expired. International law required a declaration of war to set up a blockade, but this problem was ingeniously resolved by proposing to call it a "naval quarantine" of Cuba (*Tapes*, 190–196).

Some people held the same positions throughout these discussions (from October 16 through 21)—for example, the military Chiefs of Staff constantly favored a major air strike—but others shifted their views, at times dramatically. Bundy initially favored doing nothing (*Tapes*, 172) and then switched toward a preemptive surprise air attack (*Tapes*, 189). President Kennedy's own positions also shifted away from an air strike toward a blockade. He wanted the U.S. response to be firm. Although his reasons undoubtedly were mainly military and geopolitical, as a good domestic politician he was also fully aware that a weak response would hurt the Democratic party in the imminent congressional elections. In contrast, the responsibility of starting an action that might lead to nuclear war weighed very heavily on him. He was impressed by the CIA's assessment that some of the missiles were already operational, which increased the risk that any air strike or invasion could lead to the Soviets' firing these missiles and to large U.S. civilian casualties (*Gamble*, 235). In the second week of the crisis (October 22 through 28), his decisions seemed constantly to favor the lowest-key options discussed by ExComm.

By the end of the first week's discussions, the choice lay between a blockade and an air strike, two position papers were prepared, and in a straw vote on October 20 the blockade won 11 to 6 (*War*, 516). Kennedy made the decision to start by imposing a blockade and announced it in a television address to the na-

tion on Monday, October 22. He demanded a halt to the shipment of Soviet missiles to Cuba and a prompt withdrawal of those already there.

Kennedy's speech brought the whole drama and tension into the public arena. The United Nations held several dramatic but unproductive debates. Other world leaders and the usual busybodies of international affairs offered advice and mediation.

Between October 23 and October 25, the Soviets at first tried bluster and denial; Khrushchev called the blockade "banditry, a folly of international imperialism" and said that his ships would ignore it. The Soviets, in the United Nations and elsewhere, claimed that their intentions were purely defensive and issued statements of defiance. In secret, they explored ways to end the crisis. This exploration included some direct messages from Khrushchev to Kennedy. It also included some very indirect and lower-level approaches by the Soviets. In fact, as early as Monday, October 22—before Kennedy's TV address—the Soviet Presidium had decided not to let this crisis lead to war. By Thursday, October 25, they had decided that they were willing to withdraw from Cuba in exchange for a promise by the United States not to invade Cuba, but they had also agreed to "look around" for better deals (*Gamble*, 241, 259). The United States did not know any of the Soviet thinking about this.

In public as well as in private communications, the USSR broached the possibility of a deal concerning the withdrawal of U.S. missiles from Turkey and of Soviet ones from Cuba. This possibility had already been discussed by ExComm. The missiles in Turkey were obsolete; so the United States wanted to remove them anyway and replace them with a Polaris submarine stationed in the Mediterranean Sea. But it was thought that the Turks would regard the presence of U.S. missiles as a matter of prestige and so it might be difficult to persuade them to accept the change. (The Turks might also correctly regard missiles, fixed on Turkish soil, as a firmer signal of the U.S. commitment to Turkey's defense than an offshore submarine, which could move away on short notice; see *Tapes*, 568.)

The blockade went into effect on Wednesday, October 24. Despite their public bluster, the Soviets were cautious in testing it. Apparently, they were surprised that the United States had discovered the missiles in Cuba before the whole installation program was completed; Soviet personnel in Cuba had observed the U-2 overflights but had not reported them to Moscow (*Tapes*, 681). The Soviet Presidium ordered the ships carrying the most sensitive materials (actually the IRBM missiles) to stop or turn around. But it also ordered General Issa Pliyev, the commander of the Soviet troops in Cuba, to get his troops combat-ready and to use all means except nuclear weapons to meet any attack (*Tapes*, 682). In fact, the Presidium twice prepared (then canceled without sending) orders authorizing him to use tactical nuclear weapons in the event of a U.S. invasion (*Gamble*, 242–243, 272, 276). The U.S. side saw only that several

Soviet ships (which were actually carrying oil and other nonmilitary cargo) continued to sail toward the blockade zone. The U.S. Navy showed some moderation in its enforcement of the blockade. A tanker was allowed to pass without being boarded; another tramp steamer carrying industrial cargo was boarded but allowed to proceed after only a cursory inspection. But tension was mounting, and neither side's actions were as cautious as the top-level politicians on both sides would have liked.

On the morning of Friday, October 26, Khrushchev sent Kennedy a conciliatory private letter offering to withdraw the missiles in exchange for a U.S. promise not to invade Cuba. But later that day he toughened his stance. It seems that he was emboldened by two items of evidence. First, the U.S. Navy was not being excessively aggressive in enforcing the blockade. It had let through some obviously civilian freighters; they boarded only one ship, the *Marucla*, and let it pass after a cursory inspection. Second, some dovish statements had appeared in U.S. newspapers. Most notable among them was an article by the influential and well-connected syndicated columnist Walter Lippman, who suggested the swap whereby the United States would withdraw its missiles in Turkey in exchange for the USSR's withdrawing its missiles in Cuba (*Gamble*, 275). Khrushchev sent another letter to Kennedy on Saturday, October 26, offering this swap, and this time he made the letter public. The new letter was presumably a part of the Presidium's strategy of "looking around" for the best deal. Members of ExComm concluded that the first letter was Khrushchev's own thoughts but that the second was written under pressure from hard-liners in the Presidium—or was even evidence that Khrushchev was no longer in control (*Tapes*, 498, 512–513). In fact, both of Khrushchev's letters were discussed and approved by the Presidium (*Gamble*, 263, 275).

ExComm continued to meet, and opinions within it hardened. One reason was the growing feeling that the blockade by itself would not work. Kennedy's television speech had imposed no firm deadline, and as we know, in the absence of a deadline a compellent threat is vulnerable to the opponent's procrastination. Kennedy had seen this quite clearly and as early as Monday, October 22, in the morning ExComm meeting preceding his speech, he commented, "I don't think we're gonna be better off if they're just sitting there" (*Tapes*, 216). But a hard, short deadline was presumably thought to be too rigid. By Thursday, others in ExComm were realizing the problem; for example, Bundy said, "A plateau here is the most dangerous thing" (*Tapes*, 423). The hardening of the Soviet position, as shown by the public "Saturday letter" that followed the conciliatory private "Friday letter," was another concern. More ominously, that Friday, U.S. surveillance had discovered that there were tactical nuclear weapons (FROGs) in Cuba (*Tapes*, 475). This discovery showed the Soviet presence there to be vastly greater than thought before, but it also made invasion more dangerous to U.S. troops. Also on Saturday, a U.S. U-2 plane was shot down over Cuba.

(It now appears that this was done by the local commander, who interpreted his orders more broadly than Moscow had intended [*War*, 537; *Tapes*, 682].) In addition, Cuban antiaircraft defenses fired at low-level U.S. reconnaissance planes. The grim mood in ExComm throughout that Saturday was well encapsulated by Dillon: "We haven't got but one more day" (*Tapes*, 534).

On Saturday, plans leading to escalation were being put in place. An air strike was planned for the following Monday, or Tuesday at the latest, and Air Force reserves were called up (*Tapes*, 612–613). Invasion was seen as the inevitable culmination of events (*Tapes*, 537–538). A tough private letter to Khrushchev from President Kennedy was drafted and was handed over by Robert Kennedy to the Soviet Ambassador in Washington, Anatoly Dobrynin. In it, Kennedy made the following offer: (1) The Soviet Union withdraws its missiles and IL-28 bombers from Cuba with adequate verification (and ships no new ones). (2) The United States promises not to invade Cuba. (3) The U.S. missiles in Turkey will be removed after a few months, but this offer is void if the Soviets mention it in public or link it to the Cuban deal. An answer was required within 12 to 24 hours; otherwise "there would be drastic consequences" (*Tapes*, 605–607).

On the morning of Sunday, October 28, just as prayers and sermons for peace were being offered in many churches in the United States, Soviet radio broadcast the text of a letter that Khrushchev was sending to Kennedy, in which he announced that construction of the missile sites was being halted immediately and that the missiles already installed would be dismantled and shipped back to the Soviet Union. Kennedy immediately sent a reply welcoming this decision, which was broadcast to Moscow by the Voice of America radio. It now appears that Khrushchev's decision to back down was made before he received Kennedy's letter through Dobrynin but that the letter only reinforced it (*Tapes*, 689).

That did not quite end the crisis. The U.S. Joint Chiefs of Staff remained skeptical of the Soviets and wanted to go ahead with their air strike (*Tapes*, 635). In fact, the construction activity at the Cuban missile sites continued for a few days. Verification by the United Nations proved problematic. The Soviets tried to make the Turkey part of the deal semipublic. They also tried to keep the IL-28 bombers in Cuba out of the withdrawal. Not until November 20 was the deal finally clinched and the withdrawal begun (*Tapes*, 663–665; *Gamble*, 298–310).

2 A SIMPLE GAME-THEORETIC EXPLANATION

At first sight, the game-theoretic aspect of the crisis looks very simple. The United States wanted the Soviet Union to withdraw its missiles from Cuba; thus the U.S. objective was to achieve compellence. For this purpose, the United States deployed a threat: Soviet failure to comply would eventually lead to a

nuclear war between the superpowers. The blockade was a starting point of this inevitable process and an action that demonstrated the credibility of U.S. resolve. In other words, Kennedy took Khrushchev to the brink of disaster. This was sufficiently frightening to Khrushchev that he complied. The prospect of nuclear annihilation was equally frightening to Kennedy, but that is in the nature of a threat. All that is needed is that the threat be sufficiently costly to the other side to induce it to act in accordance with our wishes; then we don't have to carry out the bad action anyway.

A somewhat more formal statement of this argument proceeds by drawing a game tree like that shown in Figure 14.1. The Soviets have installed the missiles, and now the United States has the first move. It chooses between doing nothing and issuing a threat. If the United States does nothing, this is a major military and political achievement for the Soviets; so we score the payoffs as −2 for the United States and 2 for the Soviets. If the United States issues its threat, the Soviets get to move, and they can either withdraw or defy. Withdrawal is a humiliation (a substantial minus) for the Soviets and a reaffirmation of U.S. military superiority (a small plus); so we score it 1 for the United States and −4 for the Soviets. If the Soviets defy the U.S. threat, there will be a nuclear war. This outcome is terrible for both, but particularly bad for the United States, which as a democracy cares more for its citizens; so we score this −10 for the United States and −8 for the Soviets. This quantification is very rough guesswork, but the conclusions do not depend on the precise numbers that we have chosen. If you disagree with our choice, you can substitute other numbers you think to be a more accurate representation; as long as the *relative* ranking of the outcomes is the same, you will get the same subgame-perfect equilibrium.

Now we can easily find the subgame-perfect equilibrium. If faced with the U.S. threat, the Soviets get −4 from withdrawal and −8 by defiance; so they prefer to withdraw. Looking ahead to this outcome, the United States reckons on

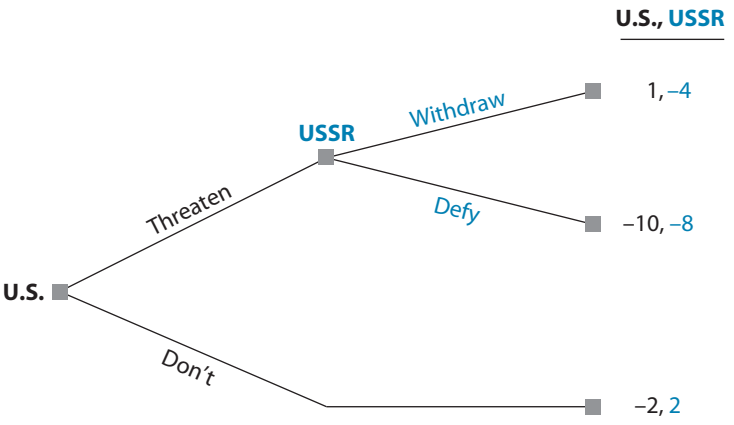

FIGURE 14.1 The Simple-Threat Model of the Crisis

getting 1 if it issues the threat and −2 if it does not; therefore it is optimal for the United States to make the threat. The outcome gives payoffs of 1 to the United States and −4 to the Soviets.

But a moment's further thought shows this interpretation to be unsatisfactory. One might start by asking why the Soviets would deploy the missiles in Cuba at all, when they could look ahead to this unfolding of the subsequent game in which they would come out the losers. But more important, several facts about the situation and several events in the course of its unfolding do not fit into this picture of a simple threat.

Before explaining the shortcomings of this analysis and developing a better explanation, however, we digress to an interesting episode in the crisis that sheds light on the requirements of successful compellence. As pointed out in Chapter 9, a compellent threat must have a deadline; otherwise the opponent can nullify it by procrastination. The discussion of the crisis at the U.N. Security Council on Tuesday, October 23, featured a confrontation between U.S. Ambassador Adlai Stevenson and Soviet Ambassador Valerian Zorin. Stevenson asked Zorin point-blank whether the USSR had placed and was placing nuclear missiles in Cuba. "Yes or no—don't wait for the translation—yes or no?" he insisted. Zorin replied: "I am not in an American courtroom. . . . You will have your answer in due course," to which Stevenson retorted, "I am prepared to wait for my answer until hell freezes over." This was dramatic debating; Kennedy, watching the session on live television, remarked, "Terrific. I never knew Adlai had it in him" (*Profile*, 406). But it was terrible strategy. Nothing would have suited the Soviets better than to keep the Americans "waiting for their answer" while they went on completing the missile sites. "Until hell freezes over" is an unsuitable deadline for compellence.

3 ACCOUNTING FOR ADDITIONAL COMPLEXITIES

Let us return to developing a more satisfactory game-theoretic argument. As we pointed out before, the idea that a threat has only a lower limit on its size—namely, that it be large enough to frighten the opponent—is correct only if the threatener can be absolutely sure that everything will go as planned. But almost all games have some element of uncertainty. You cannot know your opponent's value system for sure, and you cannot be completely sure that the players' intended actions will be accurately implemented. Therefore, a threat carries a twofold risk. Your opponent may defy it, requiring you to carry out the costly threatened action; or your opponent may comply, but the threatened action may occur by mistake anyway. When such risks exist, the cost of threatened action to oneself becomes an important consideration.

The Cuban missile crisis was replete with such uncertainties. Neither side could be sure of the other's payoffs—that is, of how seriously the other regarded the relative costs of war and of losing prestige in the world. Also, the choices of "blockade" and "air strike" were much more complex than the simple phrases suggest, and there were many weak links and random effects between an order in Washington or Moscow and its implementation in the Atlantic Ocean or in Cuba.

Graham Allison's excellent book *Essence of Decision* brings out all of these complexities and uncertainties. They led him to conclude that the Cuban missile crisis cannot be explained in game-theoretic terms. He considers two alternatives: one explanation based on the fact that bureaucracies have their set rules and procedures; another based on the internal politics of U.S. and Soviet governance and military apparatuses. He concludes that the political explanation is best.

We broadly agree but interpret the Cuban missile crisis differently. It is not the case that game theory is inadequate for understanding and explaining the crisis; rather, the crisis was *not a two-person game*—United States versus USSR, or Kennedy versus Khrushchev. Each of these two "sides" was itself a complex coalition of players with differing objectives, information, actions, and means of communication. The players within each side were engaged in other games, and some members were also directly interacting with their counterparts on the other side. In other words, the crisis can be seen as a complex many-person game with alignments into two broad coalitions. Kennedy and Khrushchev can be regarded as the top-level players in this game, but each was subject to constraints of having to deal with others in his own coalition with divergent views and information, and neither had full control over the actions of these others. We argue that this more subtle game-theoretic perspective is not only a good way to look at the crisis, but also essential in understanding how to practice brinkmanship. We begin with some items of evidence that Allison emphasizes, as well as others that emerge from other writings.

First, there are several indications of divisions of opinion on each side. On the U.S. side, as already noted, there were wide differences within ExComm. In addition, Kennedy found it necessary to consult others such as former President Eisenhower and leading members of Congress. Some of them had very different views; for example, Senator William Fulbright said in a private meeting that the blockade "seems to me the worst alternative" (*Tapes*, 271). The media and the political opposition would not give the President unquestioning support for too long either. Kennedy could not have continued on a moderate course if the opinion among his advisers and the public became decisively hawkish.

Individual people also *shifted* positions in the course of the two weeks. For example, McNamara was at first quite dovish, arguing that the missiles in Cuba were not a significant increase in the Soviet threat (*Tapes*, 89) and favoring blockade

and negotiations (*Tapes*, 191), but ended up more hawkish, claiming that Khrushchev's conciliatory letter of Friday, October 26, was "full of holes" (*Tapes*, 495, 585) and urging an invasion (*Tapes*, 537). Most important, the U.S. military chiefs always advocated a far more aggressive response. Even after the crisis was over and everyone thought the United States had won a major round in the cold war, Air Force General Curtis LeMay remained dissatisfied and wanted action: "We lost! We ought to just go in there today and knock 'em off," he said (*Essence*, 206; *Profile*, 425).

Even though Khrushchev was the dictator of the Soviet Union, he was not in full control of the situation. Differences of opinion on the Soviet side are less well documented, but, for what it is worth, later memoirists have claimed that Khrushchev made the decision to install the missiles in Cuba almost unilaterally, and, when he informed the members of the Presidium, they thought it a reckless gamble (*Tapes*, 674; *Gamble*, 180). There were limits to how far he could count on the Presidium to rubber-stamp his decisions. Indeed, two years later, the disastrous Cuban adventure was one of the main charges leveled against Khrushchev when the Presidium dismissed him (*Gamble*, 353–355). It has also been claimed that Khrushchev wanted to defy the U.S. blockade, and only the insistence of First Deputy Premier Anastas Mikoyan led to the cautious response (*War*, 521). Finally, on Saturday, October 27, Castro ordered his antiaircraft forces to fire on all U.S. planes overflying Cuba and refused the Soviet ambassador's request to rescind the order (*War*, 544).

Various parties on the U.S. side had very different information and a very different understanding of the situation, and at times this led to actions that were inconsistent with the intentions of the leadership or even against their explicit orders. The concept of an "air strike" to destroy the missiles is a good example. The nonmilitary people in ExComm thought this would be very narrowly targeted and would not cause significant Cuban or Soviet casualties, but the Air Force intended a much broader attack. Luckily, this difference came out in the open early, leading ExComm to decide against an air strike and the President to turn down an appeal by the Air Force (*Essence*, 123, 209). As for the blockade, the U.S. Navy had set procedures for this action. The political leadership wanted a different and softer process: form the ring closer to Cuba to give the Soviets more time to reconsider, allow the obviously nonmilitary cargo ships to pass unchallenged, and cripple but not sink the ships that defy challenge. Despite McNamara's explicit instructions, however, the Navy mostly followed its standard procedures (*Essence*, 130–132). The U.S. Air Force created even greater dangers. A U-2 plane drifted "accidentally" into Soviet air space and almost caused a serious setback. General Curtis LeMay, acting without the President's knowledge or authorization, ordered the Strategic Air Command's nuclear bombers to fly past their "turnaround" points and some distance toward Soviet air space to positions where they would be detected by Soviet

radar. Fortunately, the Soviets responded calmly; Khrushchev merely protested to Kennedy.[4]

There was similar lack of information and communication, as well as weakness of the chain of command and control, on the Soviet side. For example, the construction of the missiles was left to the standard bureaucratic procedures. The Soviets, used to construction of ICBM sites in their own country where they did not face significant risk of air attack, laid out the sites in Cuba in a similar way, where they would have been much more vulnerable. At the height of the crisis, when the Soviet SA-2 troops saw an overflying U.S. U-2 plane on Friday, October 26, Pliyev was temporarily away from his desk and his deputy gave the order to shoot it down; this incident created far more risk than Moscow would have wished (*Gamble*, 277–288). And at numerous other points—for example, when the U.S. Navy was trying to get the freighter *Marucla* to stop and be boarded—the people involved might have set off an incident with alarming consequences by taking some action in fear of the immediate situation. Even more dramatically, it was revealed that a Soviet submarine crew, warned to surface when approaching the quarantine line on October 27, did consider firing a nuclear-tipped torpedo that it carried onboard (unknown to the U.S. Navy). The firing-authorization rule required the approval of three officers, only two of whom agreed; the third officer himself may have prevented all-out nuclear war.[5]

All these factors made the outcome of any decision by the top-level commander on each side somewhat *unpredictable*. This gave rise to a substantial risk of the "threat going wrong." In fact, Kennedy thought that the chances of the blockade leading to war were "between one out of three and even" (*Essence*, 1).

As we pointed out, such uncertainty can make a simple threat too large to be acceptable to the threatener. We will take one particular form of the uncertainty—namely, U.S. lack of knowledge of the Soviets' true motives—and analyze its effect formally, but similar conclusions hold for all other forms of uncertainty.

Reconsider the game shown in Figure 14.1. Suppose the Soviet payoffs from withdrawal and defiance are the opposite of what they were before: −8 for withdrawal and −4 for defiance. In this alternative scenario, the Soviets are hard-liners. They prefer nuclear annihilation to the prospect of a humiliating withdrawal and

[4] Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (New York: Simon & Schuster, 1995), pp. 573–75. LeMay, renowned for his extreme views and his constant chewing of large unlit cigars, is supposed to be the original inspiration, in the 1963 movie *Dr. Strangelove*, for General Jack D. Ripper, who orders his bomber wing to launch an unprovoked attack on the Soviet Union.

[5] This story became public in a conference held in Havana, Cuba, in October 2002, to mark the 40th anniversary of the missile crisis. See Kevin Sullivan, "40 Years After Missile Crisis, Players Swap Stories in Cuba," *Washington Post*, October 13, 2002, p. A28. Vadim Orlov, who was a member of the Soviet submarine crew, identified the officer who refused to fire the torpedo as Vasili Arkhipov, who died in 1999.

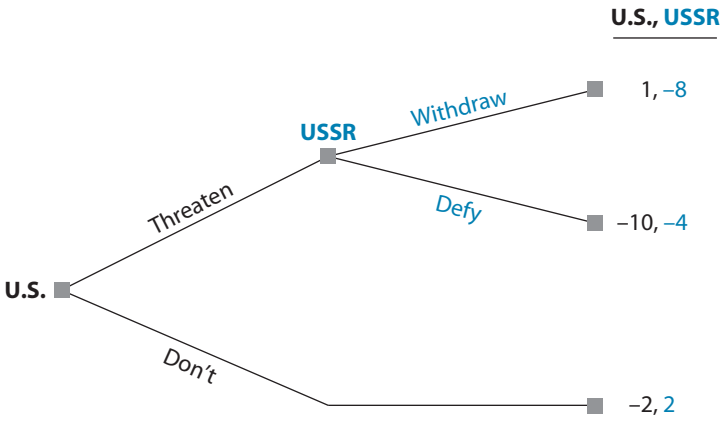

FIGURE 14.2 The Game with Hard-Line Soviets

the prospect of living in a world dominated by the capitalist United States; their slogan is "Better dead than red-white-and-blue." We show the game tree for this case in Figure 14.2. Now, if the United States makes the threat, the Soviets defy it. So the United States stands to get −10 from the threat but only −2 if it makes no threat and accepts the presence of the missiles in Cuba. It takes the lesser of the two evils. In the subgame-perfect equilibrium of this version of the game, the Soviets "win" and the U.S. threat does not work.

In reality, when the United States makes its move, it does not know whether the Soviets are hard-liners, as in Figure 14.2, or softer, as in Figure 14.1. The United States can try to estimate the probabilities of the two scenarios, for example, by studying past Soviet actions and reactions in different situations. We can regard Kennedy's statement that the probability of the blockade leading to war was between one-third and one-half as his estimate of the probability that the Soviets are hard-line. Because the estimate is imprecise over a range, we work with a general symbol, *p*, for the probability, and examine the consequences of different values of *p*.

The tree for this more complex game is shown in Figure 14.3. The game starts with an outside force (here labeled "Nature") determining the Soviets' type. Along the upper branch of Nature's choice, the Soviets are hard-line. This leads to the upper node, where the United States makes its decision whether to issue its threat, and the rest of the tree is exactly like the game in Figure 14.2. Along the lower branch of Nature's choice, the Soviets are soft. This leads to the lower node, where the United States makes its decision whether to issue its threat, and the rest of the tree is exactly like the game in Figure 14.1. But the United States does not know from which node it is making its choice. Therefore, the two U.S. nodes are enclosed in an "information set." Its significance is that the United States cannot take different actions at the nodes within the set, such as issuing the threat only if the Soviets are soft. It must take the same action at

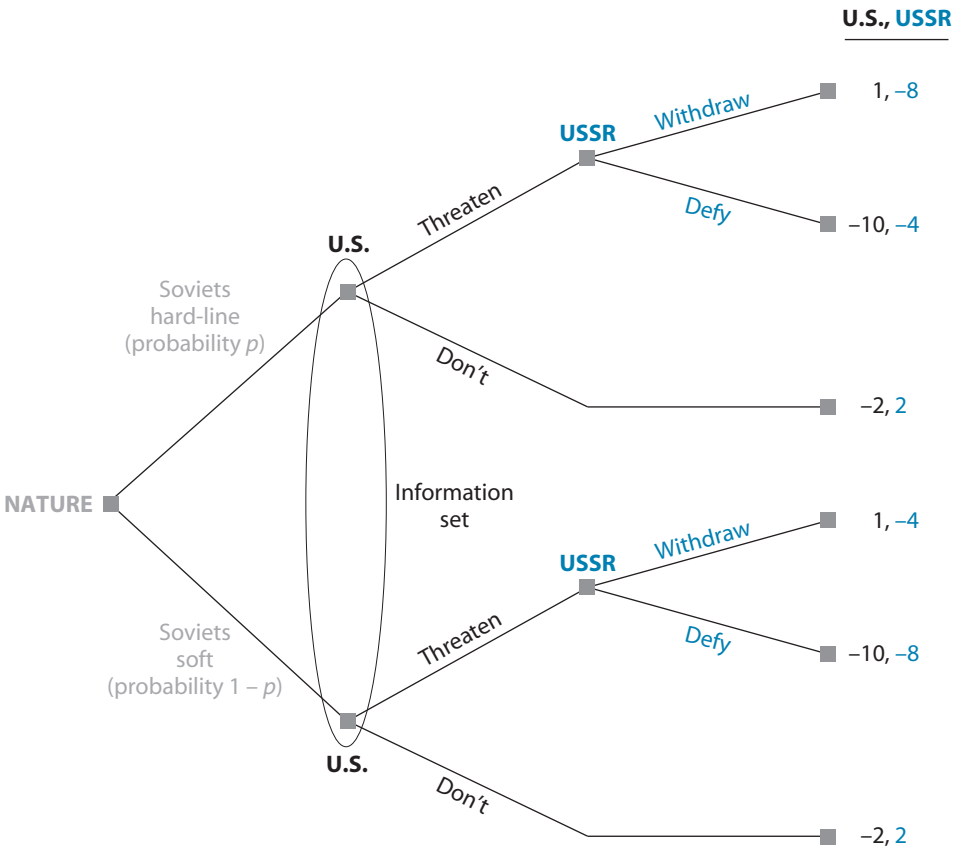

FIGURE 14.3 The Threat with Unknown Soviet Payoffs

both nodes, either threatening at both nodes or not threatening at both. It must make this decision in the light of the probabilities that the game might in truth be "located" at the one node or the other—that is, by calculating the *expected* payoffs of the two actions.

The Soviets themselves know what type they are. So we can do some rollback near the end of the game. Along the upper path, the hard-line Soviets will defy a U.S. threat, and along the lower path, the soft Soviets will withdraw in the face of the threat. Therefore, the United States can look ahead and calculate that a threat will yield a -10 if the game is actually moving along the upper path (a probability of p) and a 1 if it is moving along the lower path (a probability of $1 - p$). The expected U.S. payoff from making the threat is therefore $-10p + (1 - p) = 1 - 11p$.

If the United States does not make the threat, it gets a -2 along either path; so its expected payoff is also -2. Comparing the expected payoffs of the two actions, we see that the United States should make the threat if $1 - 11p > -2$, or $11p < 3$, or $p < 3/11 = 0.27$.

If the threat were sure to work, the United States would not care how bad its payoff could be if the Soviets defied it, whether −10 or even far more negative. But the risk that the Soviets might be hard-liners and thus defy a threat makes the −10 relevant in the U.S. calculations. Only if the probability, p, of the Soviets' being hard-line is small enough will the United States find it acceptable to make the threat. Thus, the upper limit of 3/11 on p is also the upper limit of this U.S. tolerance, given the specific numbers that we have chosen. If we choose different numbers, we will get a different upper limit; for example, if we rate a nuclear war as −100 for the United States, then the upper limit on p will be only 3/101. But the idea of a large threat being "too large to make" if the probability of its going wrong is above a critical limit holds in general.

In this instance, Kennedy's estimate was that p lay somewhere in the range from 1/3 to 1/2. The lower end of this range, 0.33, is unfortunately just above our upper limit 0.27 for the risk that the United States is willing to tolerate. Therefore, the simple bald threat "if you defy us, there will be nuclear war" is too large, too risky, and too costly for the United States to make.

4 A PROBABILISTIC THREAT

If an outright threat of war is too large to be tolerable and if you cannot find another, naturally smaller threat, then you can reduce the threat by creating merely a probability rather than a certainty that the dire consequences for the other side will occur if it does not comply. However, this does not mean that you decide after the fact whether to take the drastic action. If you had that freedom, you would choose to avoid the terrible consequences, and your opponents would know or assume this, so the threat would not be credible in the first place. You must relinquish some freedom of action and make a credible commitment. In this case, you must commit to a probabilistic device.

When making a *simple threat*, one player says to the other player: "If you don't comply, something will *surely* happen that will be very bad for you. By the way, it will also be bad for me, but my threat is credible because of my reputation [or through delegation or other reasons]." With a **probabilistic threat**, one player says to the other, "If you don't comply, there is a *risk* that something very bad for you will happen. By the way, it will also be very bad for me, but later I will be powerless to reduce that risk."

Metaphorically, a probabilistic threat of war is a kind of Russian roulette (an appropriate name in this context). You load a bullet into one chamber of a revolver and spin the barrel. The bullet acts as a "detonator" of the mutually costly war. When you pull the trigger, you do not know whether the chamber in the firing path is loaded. If it is, you may wish you had not pulled the trigger, but by

then it will be too late. Before the fact, you would not pull the trigger if you knew that the bullet was in that chamber (that is, if the certainty of the dire action was too costly), but you are willing to pull the trigger knowing that there is only a 1 in 6 chance—in which the threat has been reduced by a factor of 6, to a point where it is now tolerable.

Brinkmanship is the creation and control of a suitable risk of this kind. It requires two apparently inconsistent things. On the one hand, you must let matters get enough out of your control that you will not have full freedom after the fact to refrain from taking the dire action, and so your threat will remain credible. On the other hand, you must retain sufficient control to keep the risk of the action from becoming too large and your threat too costly. Such "controlled lack of control" looks difficult to achieve, and it is. We will consider in Section 5 how the trick can be performed. Just one hint: all the complex differences of judgment, the dispersal of information, and the difficulties of enforcing orders, which made a simple threat too risky, are exactly the forces that make it possible to create a risk of war and therefore make brinkmanship credible. The real difficulty is not how to lose control, but how to do so in a controlled way.

We first focus on the mechanics of brinkmanship. For this purpose, we slightly alter the game of Figure 14.3 to get Figure 14.4. Here, we introduce a different kind of U.S. threat. It consists of choosing and fixing a probability, q, such that if the Soviets defy the United States, war will occur with that probability. With the remaining probability, $(1 - q)$, the United States will give up and agree to accept the Soviet missiles in Cuba. Remember that if the game gets to the point where the Soviets defy the United States, the latter does not have a choice in the matter. The Russian-roulette revolver has been set for the probability, q, and chance determines whether the firing pin hits a loaded chamber (that is, whether nuclear war actually happens).

Thus, nobody knows the precise outcome and payoffs that will result if the Soviets defy this brinkmanship threat, but they know the probability, q, and can calculate expected values. For the United States, the outcome is -10 with the probability q and -2 with the probability $(1 - q)$, so the expected value is

$$-10q - 2(1 - q) = -2 - 8q.$$

For the Soviets, the expected payoff depends on whether they are hard-line or soft (and only they know their own type). If hard-line, they get a -4 from war, which happens with probability q, and a 2 if the United States gives up, which happens with the probability $(1 - q)$. The Soviets' expected payoff is $-4q + 2(1 - q) = 2 - 6q$. If they were to withdraw, they would get a -8, which is clearly worse no matter what value q takes between 0 and 1. Thus, the hard-line Soviets will defy the brinkmanship threat.

The calculation is different if the Soviets are soft. Reasoning as before, we see that they get the expected payoff $-8q + 2(1 - q) = 2 - 10q$ from defiance

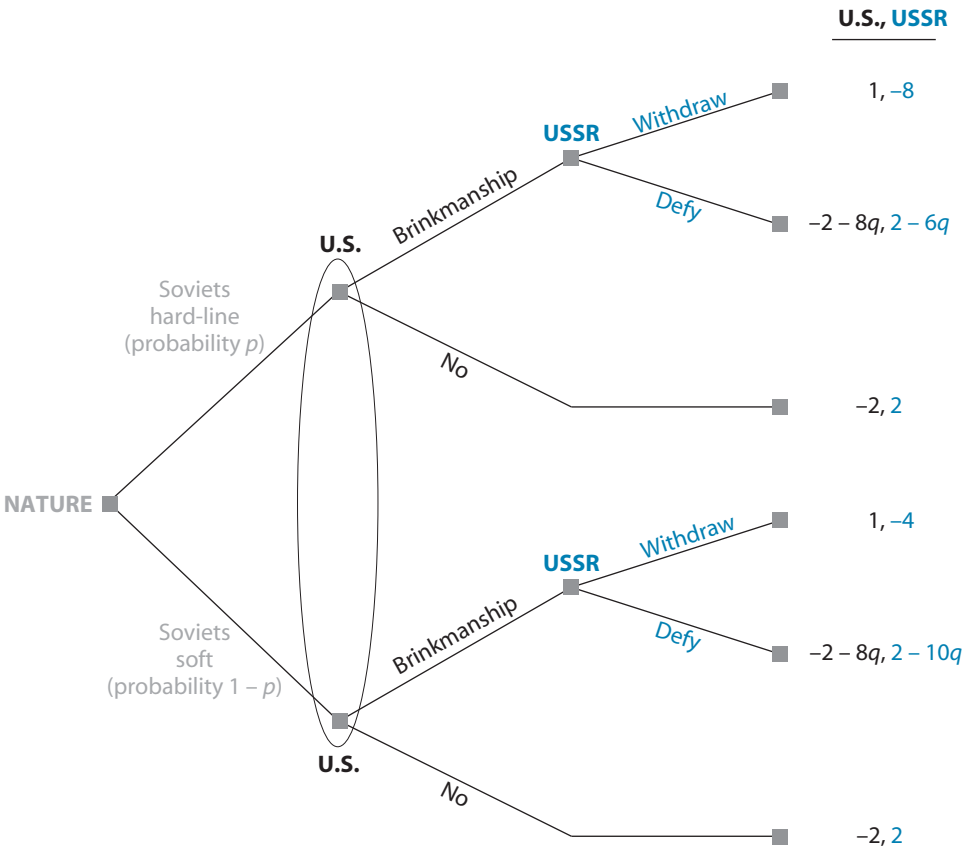

FIGURE 14.4 The Brinkmanship Model of the Crisis

and the sure payoff -4 if they withdraw. For them, withdrawal is better if $-4 > 2 - 10q$, or $10q > 6$, or $q > 0.6$. Thus, U.S. brinkmanship must contain at least a 60% probability of war; otherwise it will not deter the Soviets, even if they are the soft type. We call this lower bound on the probability q the **effectiveness condition**.

Observe how the expected payoffs for U.S. brinkmanship and Soviet defiance shown in Figure 14.4 relate to the simple-threat model of Figure 14.3; the latter can now be thought of as a special case of the general brinkmanship-threat model of Figure 14.4, corresponding to the extreme value $q = 1$.

We can solve the game shown in Figure 14.4 in the usual way. We have already seen that along the upper path the Soviets, being hard-line, will defy the United States and that along the lower path the soft Soviets will comply with U.S. demands if the effectiveness condition is satisfied. If this condition is not satisfied, then both types of Soviets will defy the United States; so the latter would do better never to make this threat at all. So let us proceed by assuming that the soft Soviets will comply; we look at the U.S. choices. Basically, how risky can the U.S. threat be and still remain tolerable to the United States?

If the United States makes the threat, it runs the risk, p, that it will encounter the hard-line Soviets, who will defy the threat. Then the expected U.S. payoff will be $(-2 - 8q)$, as calculated before. The probability is $(1 - p)$ that the United States will encounter the soft-type Soviets. We are assuming that they comply; then the United States gets a 1. Therefore, the expected payoff to the United States from the probabilistic threat, assuming that it is effective against the soft-type Soviets, is

$$(-2 - 8q) \times p + 1 \times (1 - p) = -8pq - 3p + 1.$$

If the United States refrains from making a threat, it gets a -2. Therefore, the condition for the United States to make the threat is

$$-8pq - 3p + 1 > -2 \quad \text{or}$$

$$q < \frac{3}{8}\,\frac{1-p}{p} = \frac{0.375(1-p)}{p}.$$

That is, the probability of war must be small enough to satisfy this expression or the United States will not make the threat at all. We call this upper bound on q the **acceptability condition**. Note that p enters the formula for the maximum value of q that will be acceptable to the United States; the larger the chance that the Soviets will not give in, the smaller the risk of mutual disaster that the United States finds acceptable.

If the probabilistic threat is to work, it should satisfy both the effectiveness condition and the acceptability condition. We can determine the appropriate level of the probability of war by using Figure 14.5. The horizontal axis is the probability, p, that the Soviets are hard-line, and the vertical axis is the probability, q, that war will occur if they defy the U.S. threat. The horizontal line $q = 0.6$ gives the lower limit of the effectiveness condition; the threat should be such that its associated (p, q) combination is above this line if it is to work even against the soft-type Soviets. The curve $q = 0.375(1 - p)/p$ gives the upper limit of the acceptability condition; the threat should be such that (p, q) is below this curve if it is to be tolerable to the United States even with the assumption that it works against the soft-type Soviets. Therefore, an effective and acceptable threat should fall somewhere between these two lines, above and to the left of their point of intersection, at $p = 0.38$ and $q = 0.6$ (shown as a gray "wedge" in Figure 14.5).

The curve reaches $q = 1$ when $p = 0.27$. For values of p less than this value, the dire threat (certainty of war) is acceptable to the United States and is effective against the soft-type Soviets. This just confirms our analysis in Section 3.

For values of p in the range from 0.27 to 0.38, the dire threat with $q = 1$ puts (p, q) to the right of the acceptability condition and is too large to be tolerable to the United States. But a scaled-down threat can be found. For this range of values of p, some values of q are low enough to be acceptable to the United States and yet high enough to compel the soft-type Soviets. Brinkmanship (using a

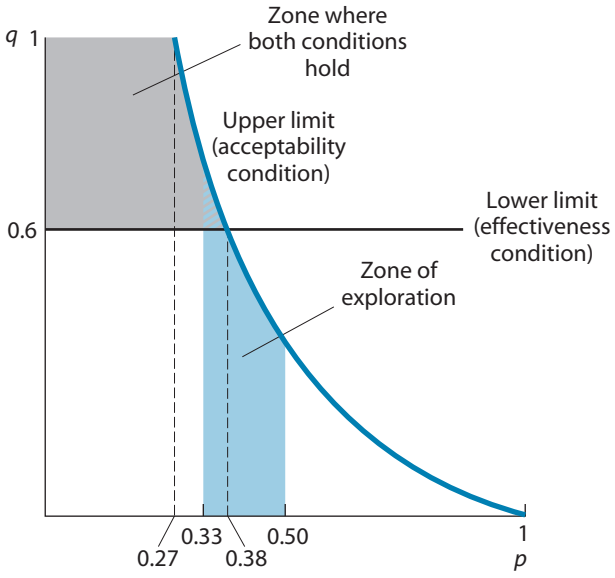

FIGURE 14.5 Conditions of Successful Brinkmanship

probabilistic threat) can do the job in this situation, whereas a simple dire threat would be too risky.

If p exceeds 0.38, then no value of q satisfies both conditions. If the probability that the Soviets will never give in is greater than 0.38, then any threat large enough to work against the soft-type Soviets ($q \geq 0.6$) creates a risk of war too large to be acceptable to the United States. If $p \geq 0.38$, therefore, the United States cannot help itself by using the brinkmanship strategy.

5 PRACTICING BRINKMANSHIP

If Kennedy has a very good estimate of the probability, p, of the Soviets being hard-liners, and is very confident about his ability to control the risk, q, that the blockade will lead to nuclear war, then he can calculate and implement his best strategy. As we saw in Section 3, if $p < 0.27$, the dire threat of a certainty of war is acceptable to Kennedy. (Even then he will prefer to use the smallest effective threat—namely, $q = 0.6$.) If p is between 0.27 and 0.38, then he has to use brinkmanship. Such a threat has to have the risk of disaster $0.6 < q < 0.375$ $(1 - p)/p$, and again Kennedy prefers the smallest of this range—namely, $q = 0.6$. If $p > 0.38$, then he should give in.

In practice, Kennedy does not know p precisely; he only estimates that it lies within the range from 1/3 to 1/2. Similarly, he cannot be confident about the exact location of the critical value of q in the acceptability condition. That

depends on the numbers used for the Soviet payoffs in various outcomes—for example, −8 (for war) versus −4 (for compliance)—and Kennedy can only estimate these values. Finally, he may not even be able to control the risk created by his brinkmanship action very precisely. All these ambiguities make it necessary to proceed cautiously.

Suppose Kennedy thinks that $p = 0.35$ and issues a threat backed by an action that carries the risk $q = 0.65$. The risk is greater than what is needed to be effective—namely, 0.6. The limit of acceptability is $0.375 \times (1 - 0.35)/0.35 = 0.7$, and the risk $q = 0.65$ is less than this limit. Thus, according to Kennedy's calculations, the risk satisfies both of the conditions—effectiveness and acceptability. However, suppose Kennedy is mistaken. For example, if he has not realized that LeMay might actually defy orders and take an excessively aggressive action, then q may in reality be higher than Kennedy thinks it is; for example, q may equal 0.8, which Kennedy would regard as too risky. Or suppose p is actually 0.4; then Kennedy would regard even $q = 0.65$ as too risky. Or Kennedy's experts may have misestimated the values of the Soviet payoffs. If they rate the humiliation of withdrawal as −5 instead of −4, then the threshold of the effectiveness condition will actually be $q = 0.7$, and Kennedy's threat with $q = 0.65$ will go wrong.

All that Kennedy knows is that the general shape of the effectiveness and acceptability conditions is like that shown in Figure 14.5. He does not know p for sure. Therefore, he does not know exactly what value of q to choose to fulfill both the effectiveness and the acceptability conditions; indeed, he does not even know if such a range exists for the unknown true value of p: it might be greater than or less than the borderline value of 0.38 that divides the two cases. And he is not able to fix q very precisely; therefore, even if he knew p, he would not be able to act confident of his willingness to tolerate the resulting risk.

With such hazy information, imprecise control, and large risks, what is Kennedy to do? He has to *explore* the boundaries of the Soviets' risk tolerance as well as his own. It would not do to start the exploration with a value of q that might turn out to be too high. Instead, Kennedy must explore the boundaries "from below"; he must start with something quite safe and gradually increase the level of risk to see "who blinks first." That is exactly how brinkmanship is practiced in reality.

We explain this with the aid of Figure 14.5. Observe the color-shaded area. Its left and right boundaries, $p = 1/3$ and $p = 1/2$, correspond to the limits of Kennedy's estimated range of p. The lower boundary is the horizontal axis ($q = 0$). The upper boundary is composed of two segments. For $p < 0.38$, this segment corresponds to the effectiveness condition; for $p > 0.38$, it corresponds to the acceptability condition. Remember that Kennedy does not know the precise positions of these boundaries but must grope toward them from below. Therefore, the color-shaded region is where he must start the process.

Suppose Kennedy starts with a very safe action—say, q equaling approximately 0.01 (1%). In our context of the Cuban missile crisis, we can think of this as his television speech, which announced that a quarantine would soon go into effect. At this juncture, the point with coordinates (p, q) lies somewhere near the bottom edge of the shaded region. Kennedy does not know exactly where, because he does not know p for sure. But the overwhelming likelihood is that at this point the threat is quite safe but also ineffective. Therefore, Kennedy escalates it a little bit. That is, he moves the point (p, q) in a vertically upward direction from wherever it was initially. This could be the actual start of the quarantine. If that proves to be still safe but ineffective, he jacks up the risk one more notch. This could be the leaking of information about bombing plans.

As he proceeds in this way, eventually his exploration will encounter one of the boundaries of the color-shaded area in Figure 14.5, and which boundary this is depends on the value of p. One of two things comes to pass. Either the threat becomes serious enough to deter the Soviets; this happens if the true value of p is less than its true critical value, here 0.38. On the diagram, we see this as a movement out of the color-shaded area and into the area in which the threat is both acceptable *and* effective. Then the Soviets concede and Kennedy has won. Or the threat becomes too risky for the United States; this happens if $p > 0.38$. Kennedy's exploration in this case pushes him above the acceptability condition. Then Kennedy decides to concede, and Khrushchev has won. Again we point out that because Kennedy is not sure of the true value of p, he does not know in advance which of these two outcomes will prevail. As he gradually escalates the risk, he may get some clues from Soviet behavior that enable him to make his estimate of p somewhat more precise. Eventually he will reach sufficient precision to know which part of the boundary he is headed toward and therefore whether the Soviets will concede or the United States must be the player to do so.

Actually, there are two possible outcomes only so long as the ever-present and steadily increasing mutual risk of disaster does not come to pass while Kennedy is groping through the range of ever more risky military options. Therefore, there is a third possibility—namely, that the explosion occurs before either side recognizes that it has reached its limit of tolerance of risk and climbs down. This continuing and rising risk of a very bad outcome is what makes brinkmanship such a delicate and dangerous strategy.

Thus, brinkmanship in practice is the **gradual escalation of the risk of mutual harm**. It can be visualized vividly as **chicken in real time**. In our analysis of chicken in Chapter 4, we gave each player a simple binary choice: either go straight or swerve. In reality, the choice is usually one of timing. The two cars are rushing toward each other, and either player can choose to swerve at any time. When the cars are very far apart, swerving ensures safety. As they get closer together, they face an ever-increasing risk that they will collide anyway, and even swerving will not avoid a collision. As the two players continue to drive toward

one another, each is exploring the limit of the other's willingness to take this risk and is perhaps at the same time exploring his own limit. The one who hits that limit first swerves. But there is always the risk that they have left it long enough and are close enough that, even after choosing Swerve, they can no longer avoid the collision.

Now we see why, in the Cuban missile crisis, the very features that make it inaccurate to regard it as a two-person game make it easier to practice such brinkmanship. The blockade was a relatively small action, unlikely to start a nuclear war at once. But once Kennedy set the blockade in motion, its operation, escalation, and other features were not totally under his control. So Kennedy was not saying to Khrushchev, "If you defy me (cross a sharp brink), I will coolly and deliberately launch a nuclear war that will destroy both our peoples." Rather, he was saying, "The wheels of the blockade have started to turn and are gathering their own momentum. The more or longer you defy me, the more likely it is that some operating procedure will slip up, the political pressure on me will rise to a point where I must give in, or some hawk will run amok. If this risk comes to pass, I will be unable to prevent nuclear war, no matter how much I may regret it at that point. Only you can now defuse the tension by complying with my demand to withdraw the missiles."

We believe that this perspective gives a much better and deeper understanding of the crisis than can most analyses based on simple threats. It tells us why the *risk* of war played such an important role in all discussions. It even makes Allison's compelling arguments about bureaucratic procedures and internal divisions on both sides an integral part of the picture: these features allow the top-level players on both sides credibly to lose some control—that is, to practice brinkmanship.

One important condition remains to be discussed. In Chapter 9, we saw that every threat has an associated implicit promise—namely, that the bad consequence will not take place if your opponent complies with your wishes. The same is required for brinkmanship. If, as you are increasing the level of risk, your opponent does comply, you must be able to "go into reverse"—begin reducing the risk immediately and quite quickly remove it from the picture. Otherwise, the opponent would not gain anything by compliance. This may have been a problem in the Cuban missile crisis. If the Soviets feared that Kennedy could not control hawks such as LeMay ("We ought to just go in there today and knock 'em off"), they would gain nothing by giving in.

To reemphasize and sum up, brinkmanship is the strategy of exposing your rival and yourself to a gradually increasing risk of mutual harm. The actual occurrence of the harmful outcome is not totally within the threatener's control.

Viewed in this way, brinkmanship is everywhere. In most confrontations—for example, between a company and a labor union, a husband and a wife, a parent and a child, and the President and Congress—one player cannot be sure of the other party's objectives and capabilities. Therefore, most threats carry a risk of

error, and every threat must contain an element of brinkmanship. We hope that we have given you some understanding of this strategy and that we have impressed on you the risks that it carries. Unsuccessful brinkmanship can lead to a labor strike, the dissolution of a marriage, or the down-grading of U.S. bonds as was discovered by President Obama and members of Congress following their 2011 dispute over raising the nation's debt ceiling. You will have to face up to brinkmanship or to conduct it yourself on many occasions in your personal and professional lives. Please do so carefully, with a clear understanding of its potentialities and risks.

To help you do so, we now recapitulate the important lessons learned from the handling of the Cuban missile crisis, reinterpreted as a labor union leadership contemplating a strike in pursuit of its wage demand, unsure whether this action will result in the whole firm's shutting down:

1. Start small and safe. Your first step should not be an immediate walkout; it should be to schedule a membership meeting at a date a few days or weeks hence, while negotiations continue.
2. Raise the risks gradually. Your public and private statements, as well as the stirring up of the sentiments of the membership, should induce management to believe that acceptance of its current low-wage offer is becoming less and less likely. If possible, stage small incidents—for example, a few one-day strikes or local walkouts.
3. As this process continues, read and interpret signals in management's actions to figure out whether the firm has enough profit potential to afford the union's high-wage demand.
4. Retain enough control over the situation; that is, retain the power to induce your membership to ratify the agreement that you will reach with management; otherwise management will think that the risk will not de-escalate even if it concedes to your demands.

SUMMARY

In some game situations, the risk of error in the presence of a threat may call for the use of as small a threat as possible. When a large threat cannot be reduced in other ways, it can be scaled down by making its fulfillment probabilistic. Strategic use of *probabilistic threat*, in which you expose your rival and yourself to an increasing risk of harm, is called brinkmanship.

Brinkmanship requires a player to relinquish control over the outcome of the game without completely losing control. You must create a threat with a risk level that is both large enough to be effective in compelling or deterring your rival and small enough to be acceptable to you. To do so, you must determine the levels of risk tolerance of both players through a *gradual escalation of the risk of mutual harm.*

The Cuban missile crisis of 1962 serves as a case study in the use of brinkmanship on the part of President Kennedy. Analyzing the crisis as an example of a simple threat, with the U.S. blockade of Cuba establishing credibility, is inadequate. A better analysis accounts for the many complexities and uncertainties inherent in the situation and the likelihood that a simple threat was too risky. Because the actual crisis included numerous political and military players, Kennedy was able to achieve "controlled loss of control" by ordering the blockade and gradually letting incidents and tension escalate, until Khrushchev yielded in the face of the rising risk of nuclear war.

KEY TERMS

acceptability condition (578)
chicken in real time (581)
effectiveness condition (577)
gradual escalation of the risk of mutual harm (581)
probabilistic threat (575)

SOLVED EXERCISES

S1. Consider a game between a union and the company that employs the union membership. The union can threaten to strike (or not) to get the company to meet its wage and benefits demands. When faced with a threatened strike, the company can choose to concede to the demands of the union or to defy its threat of a strike. The union, however, does not know the company's profit position when it decides whether to make its threat; it does not know whether the company is sufficiently profitable to meet its demands—and the company's assertions in this matter cannot be believed. Nature determines whether the company is profitable; the probability that the firm is unprofitable is p.

The payoff structure is as follows: (i) When the union makes no threat, the union gets a payoff of 0 (regardless of the profitability of the company). The company gets a payoff of 100 if it is profitable but a payoff of 10 if it is unprofitable. A passive union leaves more profit for the company if there is any profit to be made. (ii) When the union threatens to strike and the company concedes, the union gets 50 (regardless of the profitability of the company) and the company gets 50 if it is profitable but -40 if it is not. (iii) When the union threatens to strike and the company defies the union's threat, the union must strike and gets -100 (regardless of the profitability of the company). The company gets -100 if it is profitable and -10 if it is not. Defiance is very costly for a profitable company but not so costly for an unprofitable one.

(a) What happens when the union uses the pure threat to strike unless the company concedes to the union's demands?

(b) Suppose that the union sets up a situation in which there is some risk, with probability $q < 1$, that it will strike after the company defies its threat. This risk may arise from the union leadership's imperfect ability to keep the membership in line. Draw a game tree similar to Figure 14.4. for this game.

(c) What happens when the union uses brinkmanship, threatening to strike with some probability q unless the company accedes to its demands?

(d) Derive the effectiveness and acceptability conditions for this game, and determine the values for p and q for which the union can use a pure threat, brinkmanship, or no threat at all.

S2. Scenes from many movies illustrate the concept of brinkmanship. Analyze the following descriptions from this perspective. What are the risks the two sides face? How do those risks increase during the course of the execution of the brinkmanship threat?

(a) In the 1980 film *The Gods Must Be Crazy*, the only survivor of a rebel team that tried to assassinate the president of an African country has been captured and is being interrogated. He stands blindfolded with his back to the open door of a helicopter. Above the noise of the helicopter rotors, an officer asks him, "Who is your leader? Where is your hideout?" The man does not answer, and the officer pushes him out of the door. In the next scene, we see that although its engine is running, the helicopter is actually on the ground, and the man has fallen 6 feet on his back. The officer appears at the door and says, laughing, "Next time it will be a little higher."

(b) In the 1998 film *A Simple Plan*, two brothers remove some of a $4.4 million ransom payment that they find in a crashed airplane. After many intriguing twists of fate, the remaining looter, Hank, finds himself in conference with an FBI agent. The agent, who suspects but cannot prove that Hank has some of the missing money, fills Hank in on the story of the money's origins and tells him that the FBI possesses the serial numbers of about 1 of every 10 of the bills in that original ransom payment. The agent's final words to Hank are, "Now it's simply a matter of waiting for the numbers to turn up. You can't go around passing $100 bills without eventually sticking in someone's memory."

S3. In this exercise, we provide a couple examples of the successful use of brinkmanship, where "success" is indicative of the two sides' reaching a mutually acceptable deal. For each example, (i) identify the interests of

the parties; (ii) describe the nature of the uncertainty inherent in the situation; (iii) give the strategies the parties used to escalate the risk of disaster; (iv) discuss whether the strategies were good ones; and (v) **(Optional)** if you can, set up a small mathematical model of the kind presented in this chapter. In each case, we provide a few readings to get you started; you should locate more by using the resources of your library and resources on the World Wide Web such as Lexis-Nexis.

(a) The Uruguay Round of international trade negotiations that started in 1986 and led to the formation of the World Trade Organization in 1994. *Reading*: John H. Jackson, *The World Trading System*, 2nd ed. (Cambridge, Mass.: MIT Press, 1997), pp. 44–49 and ch. 12 and 13.

(b) The Camp David Accords between Israel and Egypt in 1978. *Reading*: William B. Quandt, *Camp David: Peacemaking and Politics* (Washington, D.C.: Brookings Institution, 1986).

S4. The following examples illustrate the unsuccessful use of brinkmanship, where brinkmanship is considered "unsuccessful" when the mutually bad outcome (disaster) occurs. Answer the questions outlined in Exercise S3 for the following situations:

(a) The confrontation between the regime and the student prodemocracy demonstrators in Beijing in June 1989. *Readings*: Donald Morrison, ed., *Massacre in Beijing: China's Struggle for Democracy* (New York: Time Magazine Publications, 1989); Suzanne Ogden, Kathleen Hartford, L. Sullivan, and D. Zweig, eds., *China's Search for Democracy: The Student and Mass Movement of 1989* (Armonk, N.Y.: M.E. Sharpe, 1992).

(b) The Caterpillar strike, from 1991 to 1998. *Readings*: "The Caterpillar Strike: Not Over Till It's Over," *Economist*, February 28, 1998; "Caterpillar's Comeback," *Economist*, June 20, 1998; Aaron Bernstein, "Why Workers Still Hold a Weak Hand," *BusinessWeek*, March 2, 1998.

S5. Answer the questions listed in Exercise S3 for these potential cases for brinkmanship in the future:

(a) A Taiwanese declaration of independence from the People's Republic of China. *Reading*: Ian Williams, "Taiwan's Independence," *Foreign Policy in Focus*, December 20, 2006. Available at www.fpif.org/fpiftxt/3815.

(b) The militarization of space, for example, the positioning of weapons in space or the shooting down of satellites. *Reading*: "Disharmony in the Spheres," *Economist*, January 17, 2008. Available at www.economist.com/node/10533205.

UNSOLVED EXERCISES

U1. In the chapter, we argue that the payoff to the United States is −10 when (either type) Soviets defy the U.S. threat; these payoffs are illustrated in Figure 14.3. Suppose now that this payoff is in fact −12 rather than −10.

(a) Incorporate this change in payoff into a game tree similar to the one in Figure 14.4.

(b) Using the payoffs from your game tree in part (a), find the effectiveness condition for this version of the U.S.–USSR brinkmanship game.

(c) Using the payoffs from part (a), find the acceptability condition for this game.

(d) Draw a diagram similar to that in Figure 14.5, illustrating the effectiveness and acceptability conditions found in parts (b) and (c).

(e) For what values of p, the probability that the Soviets are hard-line, is the pure threat ($q = 1$) acceptable? For what values of p is the pure threat unacceptable but brinkmanship still possible?

(f) If Kennedy was correct in believing that p lay between 1/3 and 1/2, does your analysis of this version of the game suggest that an effective *and* acceptable probabilistic threat existed? Use this example to explain how a game theorist's assumptions about player payoffs can have a major effect on the predictions that arise from the theoretical model.

U2. Answer the questions from Exercise S2 for the following movies:

(a) In the 1941 movie classic *The Maltese Falcon*, the hero, Sam Spade (Humphrey Bogart), is the only person who knows the location of the immensely valuable gem-studded falcon figure, and the villain, Caspar Gutman (Sydney Greenstreet), is threatening to torture him for that information. Spade points out that torture is useless unless the threat of death lies behind it, and Gutman cannot afford to kill Spade, because then the information dies with him. Therefore, he may as well not bother with the threat of torture. Gutman replies, "That is an attitude, sir, that calls for the most delicate judgment on both sides, because, as you know, sir, men are likely to forget in the heat of action where their best interests lie and let their emotions carry them away."

(b) The 1925 Soviet classic *The Battleship Potemkin* (set in the summer of 1905) closes with a squadron of ships from the tsar's Black Sea fleet chasing the mutinous and rebellious crew of the *Potemkin*. The tension mounts as the ships draw ever closer. Men on each side race to their battle stations, load and aim the huge guns, and wait nervously for the order to fire on their countrymen. Neither side wants to attack the other, but neither wants to back down or to die without defending itself. The tsar's ships have orders to take the *Potemkin* by

any means necessary, and the crew knows it will be tried for treason if it surrenders.

U3. Answer the questions in Exercise S3 for these examples of successful brinkmanship:

(a) The negotiations between the South African apartheid regime and the African National Congress to establish a new constitution with majority rule, 1989 to 1994. *Reading*: Allister Sparks, *Tomorrow Is Another Country* (New York: Hill and Wang, 1995).

(b) Peace in Northern Ireland: disarmament of the IRA in July 2005, the St. Andrews Agreement of October 2006, the elections of March 2007, and the power-sharing government of Ian Paisley and Martin McGuinness. *Reading*: "The Thorny Path to Peace and Power Sharing," CBC News, March 26, 2007. Available at www.cbc.ca/news2/background/northern-ireland/timeline.html.

U4. Answer the questions in Exercise S3 for these examples of unsuccessful brinkmanship:

(a) The U.S. budget confrontation between President Clinton and the Republican-controlled Congress in 1995. *Readings*: Sheldon Wolin, "Democracy and Counterrevolution," *Nation*, April 22, 1996; David Bowermaster, "Meet the Mavericks," *U.S. News and World Report*, December 25, 1995–January 1, 1996; "A Flight that Never Seems to End," *Economist*, December 16, 1995.

(b) The television writers' strike of 2007–2008. *Readings*: "Writers Guild of America," online archive of the *New York Times* on the Writers Guild and the strike. Available at http://topics.nytimes.com/top/reference/timestopics/organizations/w/writers_guild_of_america/index.html; "Writers Strike: A Punch from the Picket Line." Available at http://writers-strike.blogspot.com.

U5. Answer the questions in Exercise S3 for these potential cases of future brinkmanship:

(a) The stationing of an American antiballistic missile launch site in Poland with an accompanying radar site in the Czech Republic, ostensibly intended to intercept missiles from Iran but angering Russia. *Reading*: "Q&A: US Missile Defence," *BBC News*, August 20, 2008. Available at http://news.bbc.co.uk/2/hi/europe/6720153.stm.

(b) Deterring Iran from obtaining nuclear weapons. *Readings*: James Fallows, "The Nuclear Power Beside Iraq," *Atlantic*, May 2006. Available at www.theatlantic.com/doc/200605/fallows-iran; James Fallows, "Will Iran Be Next?" *Atlantic*, December 2004. Available at www.theatlantic.com/magazine/archive/2006/05/the-nuclear-power-beside-iraq/304819.