

## CHAPTER 13

# Brinkmanship: The Cuban Missile Crisis

### TEACHING SUGGESTIONS

As mentioned in the teaching suggestions for Chapter 9, you can screen and discuss the movie *Dr. Strangelove* for this chapter instead.

If you want to develop the idea of brinkmanship in an economic application, an obvious one is when a labor union presses a wage claim without knowing whether the company is sufficiently profitable (and of course the company's assertions in this matter cannot be believed). We suggested this at the end of the chapter text, and here we offer a more detailed treatment that closely follows the model of the Cuban missile crisis in the chapter.

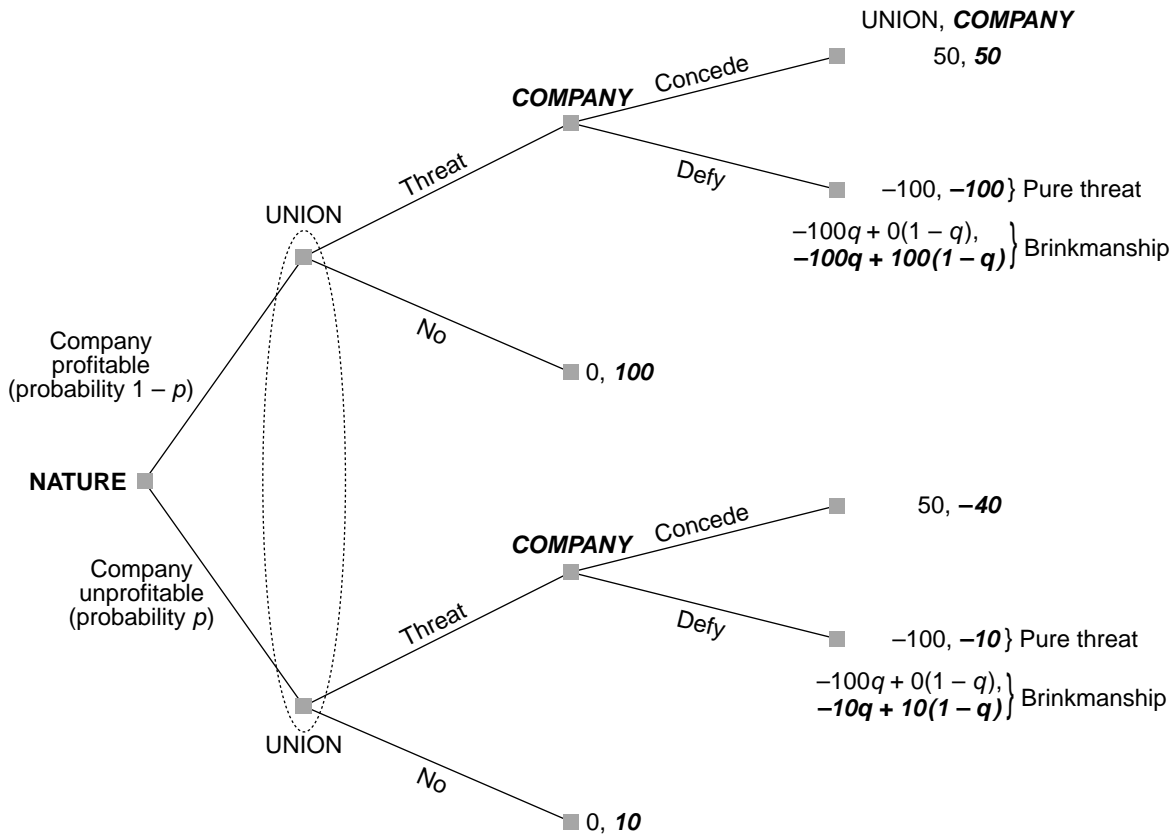
The idea in this example is that, in a game between a union and the company that employs the union membership, the union can threaten to strike (or not) in order to get the company to meet its wage or benefits demands. The company, when faced with a threatened strike, can choose to concede to the demands 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; nature plays a role in determining the company's profitability, and the company is unprofitable with probability  $p$  (and profitable with probability  $(1 - p)$ ).

The payoff structure is as follows: No threat leaves the union with 0 in either case (profitable or unprofitable company), but the company gets a payoff of 100 if it is profitable and there is no threat while it gets only 10 if it is not profitable and there is no threat; a passive union leaves more

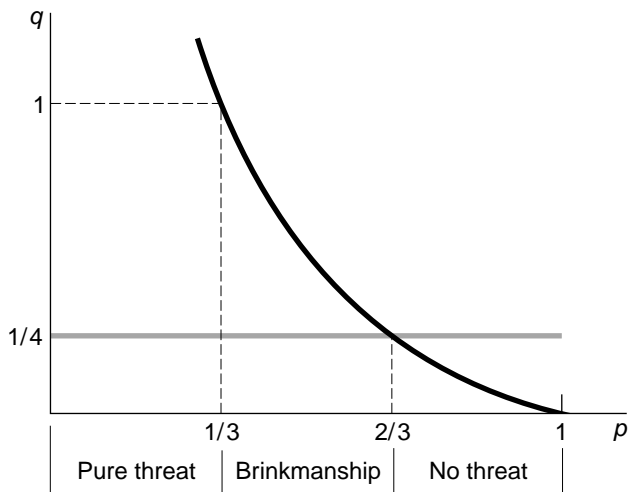
profit for the company if there is any profit made. When the union threatens to strike, it gets 50 if either type of company concedes. A profitable company gets 50 from concession to a strike, but an unprofitable one gets  $-40$ . Finally, when the company defies the union's threat, the union must strike and gets  $-100$  against either type of company. The company gets  $-100$  in this case 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. Brinkmanship arises if there is only some probability  $q$  that there is a strike when the company defies a threat by the union. The tree for this game is illustrated at the top of the next page.

To analyze this version of the game, consider what happens when the union uses the pure threat to strike unless the company concedes to the union's demands. Then the union gets  $50(1 - p) - 100p = 50 - 150p$  on average. The union's expected payoff goes to zero for  $p = 1/3$  and is negative for  $p > 1/3$ . Thus the pure threat is too big from the union's perspective if  $p > 1/3$ . In such a case, it may be in the union's interest to use brinkmanship.

With brinkmanship, the union sets up a situation in which there is some risk, with probability  $q$ , that the company's defiance will lead to a damaging strike. This risk may arise from the union leadership's imperfect ability to keep the membership in line. Then a profitable company is better off conceding to the union demands if  $50 > -100q + 100(1 - q)$ , or  $q > 1/4$ ; this is the effectiveness condition. Further, under brinkmanship the union gets  $50(1 - p) - 100qp$ . This payoff is positive (and brinkmanship is acceptable to the union) if



$q < 1/2(1 - p)/p$ ; this is the acceptability condition. The diagram below shows the values of  $p$  and  $q$  for which the union can use pure threat, brinkmanship, or no threat at all.



### ANSWERS TO EXERCISES FOR CHAPTER 13

These questions do not have unique mathematically correct answers; their purpose is to get students thinking about real-world issues using game-theoretic perspectives. Each is so complex and rich in factual detail that setting the stage com-

pletely would take several pages. Therefore we offer only the basic facts of each, with some suggestions for getting discussions started. Each topic can develop in many different directions and can benefit from factual information or experience that teachers and students may be able to contribute.

### 1. The Uruguay Round of Trade Negotiations

General trade liberalization brings overall economic benefits to all countries. But within each country there are gainers and losers; people whose incomes are tied to the export sectors gain as more and bigger markets open up for them, and those whose incomes are tied to the import sectors lose as they must face stiffer competition from other countries' products. Thus almost no country can present a clear and unified front for trade liberalization; each must resolve its internal conflict over the gains and losses.

In the Uruguay Round, one can identify three main parties or groups of nations. (1) The United States's main interest was to achieve liberalization of the markets for its traditional (agriculture) and emerging (especially high technology, including high-tech services like banking and insurance) export sectors, to obtain more open and liberal treatment of direct investment by multinationals, and to ensure that other countries protect intellectual property rights (patents and copyrights). But the United States also wanted to protect its politically sensitive sectors such as autos, steel, and textiles.

(2) Japan and Europe wanted to protect their farmers and traditional manufacturing industries but had some interests in common with the United States in liberalizing high-tech trade. (3) The developing countries wanted to protect and promote their own fledgling high-tech and service sectors but to get access to the developed countries' markets in textiles, traditional manufacturing sectors, and so on. There was also the general view that the General Agreement on Tariffs and Trade (GATT) was ineffective in enforcing its agreements. The procedure to investigate a complaint that one country was restricting its imports in violation of its GATT obligations was slow; the guilty country could veto the findings of the investigating panel and could stall and delay the imposition of any sanctions almost indefinitely.

Successful conclusion of the negotiations in such a forum needs near-unanimity; therefore each group could threaten to cause the talks to collapse. If this merely meant continuation of all the liberalizing agreements reached under the previous rounds of GATT, the threat was not too severe. However, if the failure of the Uruguay Round could worsen matters to a point where countries fell into blocks which raised their trade barriers against one another, a harmful trade war could break out.

The Uruguay Round was launched in 1986 with an extremely ambitious agenda that included all the items listed above—services, intellectual property rights, investment, agriculture, and so on—and plans to tighten GATT's procedures for settling disputes among member countries. The negotiations stalled at several points, most critically on the issue of agriculture. The whole effort seemed doomed to failure, especially in 1993 when the fast-track legislation, which enabled the U.S. administration to enter into the negotiations and make a credible deal, was about to expire. Under this deadline, a compromise settlement was reached. It included many of the very ambitious items of the initial agenda, and the formation of a new international organization, the World Trade Organization. A key provision was the single-package idea, whereby countries had to sign on to the whole package of rules and procedures; they were not allowed selectively to accept those provisions that suited them and opt out of the others. The hope was that each country would find the package as a whole sufficiently in its interest to join when the only alternative was to stay outside, but the risk was that if one large country chose to stay outside (as the United States did in the case of the League of Nations after the First World War and of the International Trade Organization after the Second), then the effectiveness of the whole organization would be greatly reduced.

## The Camp David Accords

By the mid-1970s, the prospects for peace in the Middle East looked bleak. Israel had captured a large amount of territory in the Six-Day War of 1967: Sinai from Egypt, the West Bank and East Jerusalem from Jordan, and the Golan

Heights from Syria. The defeat in this war humiliated the Arab countries and made them even more unwilling to negotiate with Israel or accept its existence. Also, the Six-Day War greatly enlarged the population of Palestinians living in exile in various Arab countries. These exiles grew increasingly militant and even violent in their opposition to any deal with Israel and in their insistence on the establishment of a Palestinian state in some or even all of the land of Israel. In the Yom Kippur War of 1973 the Arab countries acquitted themselves better and won back some confidence and self-respect. This raised the prospects of moves toward peace, but little progress was being made.

The best prospect was that of a deal between Israel and Egypt. Indeed the two had negotiated some very limited disengagements in the Sinai in 1973 and 1975. In the longer run, Israel's main objective was to achieve a durable peace combined with recognition from one or more Arab states. It was willing to give up in exchange some of the land it had captured in the Six-Day War of 1967. But there were large political divisions within Israel on this issue. The Golan Heights had military importance, the West Bank was regarded as an integral part of the historic land of Israel by a large proportion of the population, and almost no Israeli was willing to give up East Jerusalem. Sinai was the most promising candidate for a land-peace trade. Egypt attached considerable importance to getting the Sinai back. But it also wanted to maintain a leadership role in the Arab world. A separate peace, especially one involving any formal diplomatic recognition of the Israel, would cost Egypt and its leadership dear in the Arab world and within Egypt itself. (Indeed, Anwar Sadat was assassinated a few years later.) If Egypt could secure a settlement of the Palestinians' claims that was acceptable to them and their leaders, that might be quite a coup. However, this was difficult to attempt, since the Arab states had designated the Palestine Liberation Organization (PLO) as "the sole legitimate representative" of the Palestinian people. It was also a very long shot.

This was the background in the summer of 1977, when President Jimmy Carter initiated a direct involvement of the United States as an intermediary between Israel and Egypt, and possibly also other Arab countries and the PLO. He and his diplomats held separate meetings with the various parties in Washington and various other venues. The aim was to set up direct negotiations in Geneva. But this stalled because of some unresolvable opposition in the United States and the Arab countries and of some mishandling that lost control of the diplomatic process. Then in November 1977 Egyptian President Anwar Sadat attempted a dramatic breakthrough with a trip to Jerusalem; in December Israeli Prime Minister Menachem Begin made a reciprocal trip to Ismailiya. Begin offered some ideas on home rule for the Palestinians in the West Bank but no withdrawal or territorial concessions.

In early 1978 Carter began another round of discussions in an attempt to bring the two sides together. Little progress was made; in particular Begin proved totally inflexible on

the land question and adamant on other matters as well. In July 1978, with the process near collapse, Carter decided to attempt a breakthrough summit meeting with Sadat and Begin at the official presidential retreat Camp David, isolated in the Maryland mountains. These were held on September 5 to 17, 1978.

Neither side knew for sure how much weight the other placed on achieving a compromise. Each could explore the other's willingness to compromise, while trying to get a better deal for itself, using brinkmanship. The threat was the risk of collapse of the negotiations, which could in turn have worsened the relationship between the two and even led to another war. Each side could use its internal divisions to make this risk more credible. The situation met all the conditions for use of brinkmanship that we have studied in this chapter. An additional complication was that Sadat and Begin did not get along at all on a personal level.

But there was also a game involving Carter, who by his active involvement and by convening such a high-level and high-visibility meeting, had put a lot of U.S. prestige on the line. Failure of the meeting would have been seen as a failure of U.S. diplomacy and would have caused significant damage to future U.S. involvements in international affairs. Therefore the United States was willing to contribute something from the outside, mainly economic aid, to achieve agreement. The Israeli and Egyptian governments both knew this; so they could also tacitly collude to practice brinkmanship against the United States to obtain more aid, again using the risk of collapse as a brinkmanship threat.

After 10 days of exchanges of proposals, embodying largely entrenched positions, and offers of compromise only on issues that mattered relatively less to the other side, an impasse seemed to have been reached. Both Sadat and Begin at different points threatened to walk out. Carter told Sadat that if he left, "it would mean an end to the relationship between Egypt and the United States." There were no similar direct threats to Begin, presumably for reasons of internal U.S. politics, but Carter was preparing a joint statement with Sadat blaming Begin for the collapse should this occur.

Finally, on September 17, an agreement was reached on several issues, and the parties agreed to declare the summit a success, leaving other issues to be resolved later. It transpired that Sadat valued the return of Sinai more than the settlement of the Palestinian question, and Begin did not regard a collapse of the talks as such a bad outcome. According to William B. Quandt, Begin "knew how to play the game of brinkmanship, holding back on his final concessions until everyone else had put his cards face up on the table" [*Peace-making and Politics* (Washington, D.C.: Brookings, 1986)]. Therefore Israel got the best deal out of Camp David. It agreed to give up all of Sinai but did not make any concessions on the West Bank or Gaza. In return Israel got normalization of relations with Egypt (and in 1979 a full peace treaty and establishment of diplomatic relations). And although this was not an explicit written part of the agreement, both Egypt and Israel got substantially increased U.S. aid.

### 3. The End of Apartheid in South Africa

By the end of the 1980s it was clear to almost all interested parties that the days of apartheid and of white minority rule in South Africa were numbered. The only questions were whether the end would come sooner or later and whether it would come peacefully through negotiations or violently at very high cost to all. Racial unrest was growing, the black townships were getting ever closer to exploding, and international pressures were hurting the country politically and economically.

The ruling National Party represented the Afrikaners (whites of Dutch and Huguenot origin); its membership ranged from extreme hard-liners, who opposed any move toward black majority rule and would be willing to fight for their cause, to more pragmatic people, who were willing to negotiate a deal that would preserve as much of the economic and political power and influence of the whites as they could and for as long as possible. To this end they would try to split the other groups by offering token power-sharing to some parties and groups. The African National Congress (ANC) had the support of a large majority of the black population. Its *de facto* leader Nelson Mandela had been imprisoned by the apartheid regime for almost thirty years, but he was the one with whom the government had to negotiate. The ANC also had its internal divisions, with factions ranging from extreme militants to magnanimous pragmatists (including Mandela), who merely wanted to achieve majority rule quickly and peacefully without seeking revenge against the whites for years (or even centuries) of oppression.

If the negotiations failed, especially if they failed visibly, then the situation would be much worse than if no negotiations had taken place at all, and armed conflict would probably occur, about whose outcome the only thing that could be said with certainty was that both sides would pay a very heavy price. Thus the risk of such conflict was the threat that both sides' brinkmanship could invoke. There were also other minor players, including white liberals, mainly of British extraction, who were politically relatively powerless but economically more significant, the Inkatha Freedom Party with support mainly from Zulus, and representatives of other ethnic and racial groups such as Indians and "Colored." The white liberals had contacts with both the ANC and the government and could facilitate negotiations. Inkatha engaged in a feud, sometimes violent, with the ANC and had complicated relations with the white minority government.

President Willem De Klerk made a major speech "placing our country irrevocably on the road to drastic change" and released Nelson Mandela from prison, in February 1990. But it took almost two more years to overcome many suspicions within and between the various parties for the formal constitutional negotiations to start. Each side also continued to develop its contingency plans in the event the negotiations failed; this increased the suspicions. The apartheid regime proposed a scheme of permanent power sharing (which would allow them to build a coalition including Inkatha and

“Colored”—Asian groups large enough to block ANC legislation). They also asked the ANC to join them in recommending an end to international sanctions at an early stage; this would have relieved the pressure on the government to come to a quick agreement. To serve their purpose, they wanted the new constitution to be written by a convention of all existing political organizations, rather than an elected assembly.

Mandela made the breakthrough by suggesting an all-party congress to negotiate the way to an elected assembly. The first meeting of this congress led to a heated exchange between De Clerk and Mandela. The acrimony continued in detailed negotiations in small groups, and finally the congress collapsed. Violence in the townships started to rise again. The militant wing of the ANC gained power in its internal discussions. Potentially the most dangerous situation arose when Chris Hani, a Communist Party leader with close links to the ANC and large personal popular support, was assassinated by a white extremist. Mandela’s leadership and the fact that Hani’s white neighbors played a crucial part in the quick capture of the assassin averted an explosion.

In the meantime, progress was made in secret negotiations between a pair of younger leaders, Roelf Meyer for the government and Cyril Ramaphosa for the ANC. A Negotiating Council was reconvened. Various compromises were reached by these two, and De Clerk and Mandela got them past their respective hard-liners not only by persuasion but also by using some tricks. The final agreement stipulated some power sharing for five years and required that one of two deputy presidents should come from the party running second in the election. It also required the president to “consult the cabinet in a consensus-making spirit” but did not include any binding constitutional provisions.

This did not quite end the crisis. There were several violent incidents that threatened the new arrangements. But an election was held mostly peacefully in 1994, and the ANC won a large majority in seven out of the nine provinces of the country. Nelson Mandela became President, and De Clerk one of the two Deputy Presidents.

#### 4. The Beijing Massacre

After the death of Mao Zedong and the advent of Deng Xiaoping to supreme power in the late 1970s, China embarked on a remarkable program of economic liberalization, especially in agriculture. But the political dominance of the Communist Party, aided by the army, remained unchallengeable. The regime was somewhat less harsh than under Mao. Occasional voices of dissent, such as the posters on the Democracy Wall in 1978–9, were briefly tolerated, but even this movement was eventually suppressed and its leaders jailed.

As information about the rest of the world became more easily accessible, a group of students began to yearn for greater political freedom and wanted to move China toward a more open and democratic system.

The governing elites, comprising the Communist Party and the military, wanted to maintain their control and power. Therefore they saw the democracy movement as a major political challenge, even though they had given up much of the socialist economic ideology of the Marxist-Leninist-Maoist variety. The government was somewhat concerned about world opinion; it would have preferred a peaceful end to the students’ protest and probably would have made some minor concessions to achieve this. Thus a violent suppression of the student protests would be very costly to both sides. But the students did not know the relative weights the government placed on its two aims—the maintenance of power and the peaceful resolution of the situation. In fact the leadership in the government was not united. President Zhao Ziyang was somewhat sympathetic to the students, while Prime Minister Li Peng was a hard-liner. Most of the others were octogenarians of the old guard, and inclined to a hard line. Most importantly, so did Deng, who was still *de facto* dictator even though the only formal title he held was honorary chairman of the China Bridge Club.

The immediate trigger for the student protests in spring 1989 was the death on April 15 of former Prime Minister Hu Yaobang, who had liberal tendencies and had been ousted by hard-liners two years earlier, and had therefore acquired something of a hero status among the students. Posters mourning the death of Hu began to appear at Beijing University; gradually the posters became bolder in criticizing Deng and demanding reforms. On April 27 the students staged a huge march to Tiananmen Square, which is at the center of the government’s offices and the top leadership’s homes, and back. Troops tried to stop them but did not use force when the students broke through; it seems this was because the top leadership failed to give any explicit or detailed order to the commander of the troops. The students and the public that supported their aims were emboldened by this. Some students began a hunger strike for their demands. They conducted this in Tiananmen Square, and gradually it became the site of a permanent large gathering and demonstration. The students were further emboldened by the visit of Mikhail Gorbachev, whom they admired for his economic and political liberalization of the Soviet Union.

The government imposed martial law on May 19, and the liberally inclined Zhao Ziyang was confined to his house. The hard-liner Li Peng made some threatening speeches, but there was no immediate attempt to drive the students from Tiananmen Square. More troops arrived on the scene, and the students disabled some army vehicles and even took some weapons. This combination of harsh noises and lack of firm action from the government further emboldened the extremists among the students; the demonstrations grew in size, intensity, and demands.

Finally, during the night of June 3–4, troops attacked the demonstrators, shooting and killing several of them. The numbers killed may have reached thousands. The demonstration was suppressed, and the leaders given harsh prison terms.

## 5. The U.S. Budget Confrontation of 1995

In the midterm elections of 1994, the Republicans won majorities in both houses of Congress. The Republican success was generally attributed to the leadership of Newt Gingrich and the “Contract with America” which promised several radical initiatives including major taxcuts and a balanced budget. In the ensuing session of Congress, the Republicans tried to implement many of these ideas into legislation but had only partial success. Many of their bills passed in the House of Representatives but failed in the Senate, where their majority was not large enough to nullify the threats of filibuster by the Democrats (for which the Republicans needed at least 60 Senators), let alone to override a presidential veto (which needed 67). The balanced-budget amendment was defeated; several other items were stalled. If the Republicans were to maintain the momentum of their early days in this Congress, their plans for tax and expenditure cuts assumed great importance.

The budget proposed by President Bill Clinton in fall 1995 differed substantially from the Republicans’ intentions, both in its total size and its allocation among items, most importantly welfare, Medicaid. The gaps were of a kind that would normally be bridged by legislative compromise. But this year both sides felt they might gain by creating an impasse leading to a shutdown of the federal government. Of course such an action was very risky for at least one side and perhaps for both; no one could be sure where the public would place the blame for the problems that a government shutdown would create.

In mid-November the Republicans secured the passage of two stopgap bills (a continuing resolution to keep the government operating at the current levels of funding for a specified time and a bill to raise the debt ceiling) through Congress and sent them to President Clinton in an attempt to resolve the immediate crisis. But he vetoed them and shut down some key branches of the government for a few days, and he was able to shift much of the blame for this onto the Republicans. Their stopgap bills would have raised Medicare premiums and cut funding for some programs in the education and environmental areas; Clinton said that this was too high a price for keeping the government open.

After a few days another stopgap measure was passed that allowed the government to operate until mid-December. But the impasse could not be broken, and another shutdown commenced. Once again the public mostly blamed the Republicans. The Contract with America stalled, and Newt Gingrich’s political fortunes took a major hit.

## 6. The Caterpillar Strike

The wages that striking workers lose for the duration of a strike generally exceed the extra gains they make at the settlement of the strike as compared to the last offer they rejected when commencing the strike. Thus it is generally not

an optimal choice for a labor union to call its members out on a strike. The company stands to lose much production and profit in a strike, too.

Thus a strike can be a valuable strategy in its role as a threat—an attempt to compel the company to increase its offer of wages, working conditions, or other contract terms. An actual strike is a failed threat—one that has failed to achieve its purpose. If this is true of strikes in general, then a strike that lasts seven years and leaves the workers in severe financial, social, and emotional troubles must count as a threat that was too large to make. But it might have been rational to attempt brinkmanship creating a risk of this drastic outcome. The strike of the United Auto Workers against Caterpillar, which went on intermittently for seven years, must belong to this category.

Caterpillar, the United States’s largest manufacturer of construction equipment, was facing increasingly stiff competition from Japan’s Komatsu and needed cost savings and productivity increases. In the contract negotiations with the UAW in fall 1991, the company tried to achieve more flexible work practices. The UAW had recently achieved a settlement with Caterpillar’s U.S. rival Deere that gave the workers significant wage increases and higher health and pension benefits. Following the custom of UAW negotiations with the big three automakers, the union expected a matching contract from Caterpillar. The company responded that it could not afford to follow the pattern of the UAW contract with Deere; whereas Deere served mostly the U.S. market, Caterpillar had a large export market with stiffer competition. The company offered smaller wage increases and wanted the workers to pay more for their health plans. It also wanted separate terms at each of its factories to suit the local needs. The union feared that this would increase the company’s bargaining power, pitting small local union branches against a large single employer. The union believed that the company could cut costs using productivity gains based on suggestions from workers. Of course neither side believed the other’s assertions.

On November 4, 1991, the UAW called a limited strike involving 2,400 workers. Three days later the company responded by locking out 6,000 other workers. The dispute dragged on. The strike lasted 5 months. Then there was a return to work without a contract. The strike resumed in 1994 and went on for another 17 months, again ending with the return of several workers without a contract. The company brought in lower-wage replacement workers from its plants in the south, and there was much bitter feeling between the union workers and those who had crossed their picket lines. Since 1994, the company has operated increasingly profitably; the U.S. economy was booming, and a higher yen reduced the competition from Komatsu. But the union workers paid a heavy price.

A tentative settlement was reached between the company and UAW negotiators on February 13, 1998, only to be voted down by the rank-and-file workers. Money was not the issue

this time; the contract gave the workers significant pay and pension increases. The problem was the company's refusal to hire back all of the 160 workers who were fired during the dispute—an example of how a dispute can generate its own costs that were no part of the initial bargain.

### ADDITIONAL EXERCISES WITH ANSWERS

1. Suppose that you are considering using some kind of a threat to try to get another person to act in a way favorable to you. There is, however, some chance that your opponent will be tough, in which case your threat will not alter his behavior.

State whether the following is true or false and explain why. In this situation, it can be desirable to use a brinkmanship strategy if the chance that your opponent will be tough is small, but as the probability of running into a tough opponent rises, you should always abandon brinkmanship and instead use a definite threat strategy (in which your threat will certainly be carried out whenever your opponent acts contrary to your wishes).

ANSWER False. Your threat will not influence the behavior of a tough opponent; carrying it out will hurt both of you. When your opponent is unlikely to be tough, you are willing to risk the small chance of a mutually harmful outcome. As the probability that your opponent is tough rises, however, this risk becomes too great, and you should abandon your attempts to influence his behavior.

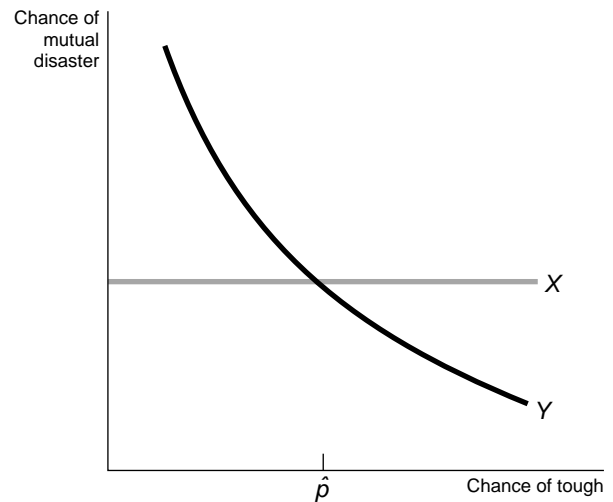
2. A player using a brinkmanship strategy is using a certain type of threat (a possibility of mutual disaster) in an attempt to influence another player's actions.

State whether the following is true or false and explain why. If a brinkmanship strategy is going to be successful (in other words, if it is going to influence the other player's action), the player who initiated the brinkmanship must have complete control over whether the mutual disaster occurs; the mutual disaster will occur *only* if the threatener explicitly decides that it should (and will) happen.

ANSWER False. The threatener does not want the mutual disaster to occur. If the disaster can occur only when

the threatener decides that it should, it will never occur. Knowing this, the threatened person will never change her behavior, and the threat will be ineffective.

3. Consider a situation in which Player A may use a brinkmanship strategy, which involves the possibility that a disaster (which would be harmful to all) could occur. This player's opponent, Player B, is either tough (he'll never give in no matter how large is the chance of disaster) or soft (he'll give in if the chance of disaster is large enough). A successful brinkmanship strategy must satisfy both the acceptability condition (the chance of mutual disaster is small enough that Player A is willing to take the risk) and the effectiveness condition (the chance of mutual disaster is large enough that the soft opponent will give in). In the accompanying graph, curve \_\_\_\_\_ illustrates an acceptability condition, while curve \_\_\_\_\_ illustrates an effectiveness condition. We can also say that a brinkmanship strategy can *not* be effective for Player A if the chance that B is tough is \_\_\_\_\_ than  $\hat{p}$ .



- (a) X; Y; greater
- (b) X; Y; less
- (c) Y; X; greater
- (d) Y; X; less

ANSWER (c)