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MULTIPLE POINT COMPETITION

Abstract

Situations where firms compete against each other simultaneously in several markets abound in real life. However, there is very little conceptual or theoretical literature on multiple point competition. This paper offers a first cut at developing a conceptual framework for analyzing and understanding situations involving multiple point competition. Several examples are discussed to provide insights into the options available to the competitors and the equilibrium outcomes of such competition.

Introduction

Business portfolio theory (for example, Hofer and Schendel 1978, Chapter 2) recommends that a firm should take cash out of high-market-share, low-growth business units (called "cash cows") and invest cash in low-market-share, high-growth business units (called "question marks"). Suppose firm A follows this recommendation. Then, an interesting question arises: how should firm B, which is trying to gain/maintain a competitive advantage in the same high-growth market as firm A, compete against firm A? One answer is that firm B should attack the cash cow business of firm A. This forces firm A to defend its strong position in the low-growth market, with the result that firm A will have less cash available to invest in the high-growth market. The underlying principle is: attack your competitor's profit producer with your loser. By forcing your competitor to overinvest in his profit producer and underinvest in his high potential "question mark," you are able to gain a major advantage in a high-growth market (Hofer and Schendel 1978, Chapter 4, and Watson 1982.)

The situation discussed above is an instance of multiple point competition, which can be defined as a situation where firms compete against each other simultaneously in several markets. A common example of multiple point competition is firms competing against each other in different geographical markets for the same product.

Since situations involving multiple point competition abound in real life, it is not surprising that several case studies and articles in the business press allude to this phenomenon. However, there is very little conceptual or theoretical literature on this topic. Shakun's (1965, 1966) research on advertising in coupled markets is relevant to multiple point competition among firms. His mathematical results, however, though based on a very simplified model of competitive interaction, are very difficult to

interpret and thus offer no insights on a conceptual level into competitive strategy. Porter (1980, Chapter 4), in the context of market signals, briefly analyzes "cross-parry" situations, where a firm initiates a move in one area and a competitor responds in a different area. Partial analogies to multiple point competition might be drawn from research in international politics on "limited war" (see, for example, Schelling 1960, 1966). On the whole, we have a very limited understanding of multiple point competition, in spite of its prevalence in practice. The objective of this paper is to offer a first cut at developing a conceptual framework for analyzing and understanding situations involving multiple point competition. No attempt is made to provide a mechanical way of determining the optimal competitive strategy.

The next section discusses some examples of multiple point competition, and the final section draws some conceptual insights from this discussion into the alternatives available to competitors and the equilibrium outcomes of multiple point competition. A simple model will be presented in the appendix.

CASES OF MULTIPLE POINT COMPETITION

Domestic Airline Industry

The deregulation of the airline industry has engendered a greater degree of competition and a shift in emphasis from nonprice competition to price competition in the industry (Taneja 1981, Chapter 5). In this context, there have been several instances of the following scenario: An airline, say A, competes directly with another airline, B, on several routes. Airline A initiates an attack with a drastic price cut on one or more routes. How should airline B respond to this move?

Airline B has, broadly speaking, four options: (1) do nothing, (2) cut prices on those routes on which airline A has cut prices, (3) cut prices on

some other routes on which it competes with airline A, or (4) cut prices on all routes on which it competes with airline A. In other words, the options are, respectively: do nothing, defend, counterattack, and declare a total war.

If firm B desires peace, it might, as a gesture of friendliness, do nothing. However, such a gesture is very likely to be misunderstood as a sign of weakness and is unlikely to result in peace. Thus, doing nothing is tantamount to losing competitive position and is probably not a good option, unless there is reason to believe that airline B will outcompete A regardless of whatever actions are taken by airline A.

Declaring a total war can be dangerous. A total war would be very costly to both airlines, perhaps to the point of leaving them vulnerable to attacks by other firms. Moreover, once a total war is started, it can be very difficult to end it, since the only legal way to signal a desire for ceasefire is a unilateral laying down of arms. Therefore, given the drawbacks of the two extreme options--no action and total war--it is essential to explore whether the other two alternatives are less costly and yet effective in defending airline B's competitive position.

Before analyzing the two options having to do with cutting prices on selected routes, it is necessary to examine the economic structure of this industry. Fruhan (1972, Chapter 5) argues that the airline industry exhibits route-specific economies of scale. That is, an airline's profitability depends more on its market shares of the routes it competes on than on its market share of the airline industry as a whole. This implies that a price cut which is not directly countered is likely to lead to loss of market share and profitability on the route in question. It thus appears that the best alternative for airline B is to respond in the very same routes where airline

A first attacked. By doing so, airline B can hope to contain the conflict at that level, since the defense signals a willingness to respond to more massive attacks, thereby discouraging additional attacks by airline A. In fact, many "airlines maintain a policy of competition-oriented pricing. They will match prices charged by competitors..." (Taneja 1981, p. 160).

Probably the best option for airline B is to directly defend its competitive position on the routes attacked by airline A. If airline B chooses this option, the competitive situation between the two airlines is likely to stabilize in what might be called a "limited war" equilibrium. In such an equilibrium, attacks are defended locally and fighting is "contained" within small isolated regions.[1] Formally, we define such a situation as one in which the firms compete actively in only some of the markets in which they both participate. A limited war equilibrium permits each firm to signal its determination to fight while avoiding both the costs of total war and the risks of misunderstood friendliness.

Global Tire Industry

In July 1969, Michelin, the largest tire manufacturer in Europe and the third largest worldwide, announced plans to establish a plant in Canada which would give it a foothold in the North American market.[2] At that time Goodyear was the largest manufacturer not only in North America but also worldwide, although it had only a small presence in Europe. How should Goodyear respond to this move by Michelin?

One line of strategic reasoning suggests that a firm should build on its strengths and defend its strong positions. By that logic, Goodyear should defend its position locally in North America. (For purposes of analysis, we will look at North America as one market.) However, this would entail

fighting a price war from a very large sales base against an opponent who can support losses on a much smaller base with funds from Europe. If the tire industry were characterized by significant brand loyalties, Goodyear could fight such a price war with relatively lower costs. However, tires are bought primarily on the basis of price, and brand loyalties are quite low. If there were significant local economies of scale (that is, economies of scale with respect to volume produced in North America as opposed to worldwide volume), the costs in North America for Goodyear would be significantly lower than for Michelin, thus making a price war relatively less expensive for Goodyear. However, the tire industry is characterized by limited economies of scale in production. In 1969, a plant size corresponding to only 1 percent of the North American market was considered cost-competitive (see Pneumatiques Michelin Ib, 1980). Therefore, in the relative absence of brand loyalties and local economies of scale, it would be very expensive for Goodyear to respond to Michelin's move by directly defending its position in North America. Thus, limited war is not an attractive equilibrium in this situation. Other options have to be considered.

Doing nothing is obviously not a desirable option since it would lead to Goodyear's loss of its strong competitive position. Another option is to declare worldwide war against Michelin by lowering prices on a global scale. However, such a war is likely to be at least as costly for Goodyear as a limited war in North America, although it would also be very costly for Michelin. It could, in fact, badly hurt both firms, thereby leaving the market open to other firms. Thus, although total war is an unattractive alternative, a threat of total war might be an attractive option.

Such a threat can be credible only if Goodyear gets a foothold in Europe which is large enough to cause a cash drain on short notice for Michelin,

should Goodyear decide to use it for that purpose. In fact, that is exactly what Goodyear actually did. By 1980, Michelin had captured about 8 percent of the U.S. tire market. In response to this move, Goodyear increased its market share in Europe from less than 8 percent to more than 12 percent by the same year.

What can Michelin do in response to Goodyear's countermove? One option is to withdraw from Canada, hoping that Goodyear will then scale down in Europe, thereby returning to the original (that is, 1969) state of market sharing. However, as evidenced by Michelin's attack, such an equilibrium is not stable because it offers significant advantages to the firm which attacks first. In the time it takes for the second firm to respond, the attacker could have gained a significant competitive advantage. Thus, to be sustainable in a situation where the first mover advantages of an attack are significant, implicit market sharing demands a lot of trust and is therefore usually unstable.

Another option for Michelin is to keep its foothold but to adopt a nonaggressive posture in North America, signalling a desire to stabilize the game in this state. This would result in what may be called a "mutual foothold" equilibrium. In such an equilibrium each firm maintains a foothold in the other firm's market and thus has a stick with which to discipline the other firm. Formally, we define such a situation as one in which each firm has a small share of the market dominated by the other firm. This equilibrium offers little advantage to a firm which decides to attack first, because the other firm can counterattack quickly. Thus, the mutual foothold equilibrium requires less trust to sustain and is therefore more stable than the implicit market-sharing equilibrium. Of course, this stability is bought at a price--both firms would be better off if they could find and sustain an

arrangement to share markets instead of having to maintain a foothold in each other's market.

Yet another option for Michelin is to go to a total war. As discussed earlier, total war is probably unattractive to both firms; however, it will probably occur if communication (implicit or explicit) between the firms breaks down or if one firm believes that it can win an outright victory.

On the basis of the above analysis, one would expect the outcome of the competition between Goodyear and Michelin to be somewhere between a mutual foothold equilibrium and total war, probably closer to the former. In fact, in response to Goodyear's increase in market share in Europe, Michelin continued to attempt to increase market share in North America. Michelin also attacked another Goodyear stronghold by building a plant in Brazil. As one industry executive put it, "Unless one or the other gets intelligent, they are going to tear each other apart" (Business Week, Dec. 1, 1980, p. 124). It is interesting that while Michelin and Goodyear have been battling it out, Japan's Bridgestone has emerged as a strong competitor. Goodyear believes that it is entering a new era of world competition, with Michelin and Bridgestone as its prime competitors in every market (Business Week, Dec. 1, 1980, p. 124). It could be argued that the current state of the tire industry is closer to total war than to a mutual foothold equilibrium. Where it will stabilize is, of course, an open question.

Other Examples of Counterattack

Cases where one firm attacks in one geographical area and the other firm counterattacks in a different area are quite common in practice. Such a situation occurred in the roasted coffee industry. Maxwell House was dominant in the East Coast market while Folger was strong in the West Coast market.

After Folger was acquired by Procter and Gamble, it pushed into Cleveland in an attempt to increase its penetration in the eastern markets. Maxwell countered by cutting prices and raising marketing expenditures in Folger's stronghold in Kansas City. Maxwell also brought out a fighting brand called Horizon, which had characteristics and package design similar to Folger's. Folger then escalated the war by entering Pittsburgh, whereupon Maxwell entered Dallas with drastic price reductions (Porter 1980, pp. 84-85).[3]

The competition between BIC and Gillette can be interpreted as an example of counterattack in another product market. After BIC had revolutionized the ball-point pen industry with its mass merchandising techniques, Gillette, which also had considerable skills in mass merchandising, entered the market for disposable pens. Since BIC's primary strength was in disposable pens, it could not afford not to respond to Gillette's move. Also, just as Gillette's skills from the razor market could be transferred to the disposable pen market, BIC's skills could be transferred from the disposable pen market to the razor market. In fact, BIC counterattacked by entering the disposable razor market.

CONCEPTUAL FRAMEWORK

We now pull together the insights derived from the above examples and attempt to provide some concepts useful for understanding multiple point competition.

If doing nothing is ruled out, a firm has, broadly speaking, three other possible responses to an attack: defense, counterattack, and total war. While it is useful for conceptual reasons to distinguish among these alternatives, they are not mutually exclusive, discrete options. Even as a firm counterattacks, for example, it can take some actions to defend its position

directly. Moreover, to some extent, the distinctions simply reflect differences of degree. For example, counterattacking on several vital fronts is fairly close to declaring a total war. Nonetheless, the distinctions are useful.

It has been argued above that defending leads to a limited war equilibrium, whereas counterattacking could lead to a mutual foothold equilibrium. Two other possible outcomes are the extremes of total war and total peace (that is, market sharing). Market sharing is often an unstable equilibrium. Total war, since it cannot last forever, is of course also unstable. If the firms do not find a way to end the war, it will result in either an outright victory for one firm or a mutual destruction of both firms. Once again, while it is useful to distinguish among these outcomes, the differences are, to some extent, a question of degree. The dividing line between the outcomes can be quite fuzzy. For example, how much market share constitutes a "foothold" is a question of judgment which depends on the specific case under analysis. A situation where each firm maintains a 3 percent market share in each other's turf is probably somewhere in between market sharing and a mutual foothold equilibrium, whereas maintaining a 30 percent market share in each other's turf is probably close to, if not actually, total war.

From a conceptual standpoint, situations where one firm can win an outright victory over the other in a total war, and where market sharing is a stable equilibrium, are relatively straightforward. We will focus our attention on the more interesting cases where limited war or mutual foothold is the equilibrium outcome.

Below, we first analyze the situation from the point of view of the responder, that is, the firm which is attacked. Next, we analyze the situation from the point of view of the firm which decides to attack. Clearly,

the attacker's analysis of the situation must take into account how the responder is going to analyze the situation. The responder's analysis, in turn, takes into account the attacker's analysis. This circularity is, of course, at the heart of any game involving strategy, and is the main reason why formulating competitive strategy requires creativity rather than routine application of economic theory.

The Responder

We now investigate the factors which influence the attacked firm's choice between defending and counterattacking. If the responder has a low sales volume in the business in which it is attacked, it should probably directly defend against the attack. A low sales volume implies that the cost of defense is likely to be relatively low. (Goodyear in North America was in the opposite situation of having a high sales volume.) Defending is less likely than counterattacking to touch off a total war. Given the low sales volume, the responding firm probably wants to ensure that a total war does not ensue since the stakes involved are relatively low. This does not mean, however, that the firm should just concede the market to the attacker. It could be that the responder maintains a low market share as a foothold and does not want to give it up. Even aside from that, the responder may want to defend its position to signal that it will not be pushed around and would be willing to fight should the need arise.

If the market in which the firm is attacked has high entry barriers, then the firm should probably defend its position directly. The entry barriers could be due to various factors, such as brand loyalties and economies of scale with respect to volume in that market. For example, the airline industry is characterized by local (that is, route-specific) economies of scale,

whereas Goodyear was in the opposite situation of being in a market with low technological and production barriers to entry. There are two reasons why high entry barriers favor the defense alternative. First, if the responding firm is already entrenched in a market with high entry barriers it is likely to have a significant advantage relative to the attacker. Therefore, it is probably less expensive for the responder to defend in this market than it is for the attacker to attack. Second, if the attacker is successful at dislodging the responder from a market with high entry barriers, the responder will find it very difficult to make a comeback. In other words, loss of competitive position is likely to be permanent.

A firm should probably defend its position in the market if this position is particularly salient for the firm, that is, if the market has high economies of scope with the other activities of the firm.[4] For example, if this business is part of a vertically integrated chain for the firm, then losing competitive position in the business could disrupt the chain and have severe consequences for the firm.

The above three factors--low sales volume, high entry barriers, and high saliency--favor the option of defending rather than counterattacking. The converse of these factors, of course, favor the option of counterattacking. The three factors characterize the business/market in which the attacker makes the first move. In addition, the responder must consider two other factors which characterize the other markets in which the firms compete and their overall competitive positions. The first of these is the firm's capacity relative to that of the attacker to fight an all-out war. A counterattack is a more aggressive move than defending, and is likely to be perceived as such by the attacker. Thus, a counterattack is more likely to touch off an all-out war. If the responder is much weaker than the attacker, it probably wants to

minimize the risk of a total war and should probably defend its position directly. On the other hand, if the responder is much stronger than the attacker, a counterattack may be an effective way to discipline the attacker, who may then decide to back off.

The attractiveness of the option of counterattacking also depends on the characteristics of the markets in which the responder can counterattack. In the extreme case where the attacker is a single-business firm, of course, the responder does not even have the option of counterattacking. Clearly, if an attractive opportunity for counterattack is available, the option becomes more appealing. Conversely, if there is no attractive opportunity for counterattack, the responder should probably defend its position. The factors which determine the attractiveness of a market as an opportunity for the responder to counterattack are the same as those which determine its attractiveness as an opportunity for an initial attack by the attacking firm, which is the topic of the next section.

In trying to apply these concepts, of course, one has to make judgmental trade-offs among the different factors. It is a rare situation indeed where all the considerations point to the same answer. For example, the case where the responder has a high sales volume in a market with high entry barriers can be discussed only in terms of the specific details of the particular case. Also, recall that defense and counterattack are not mutually exclusive, discrete options. The responder may well decide to simultaneously defend and counterattack. Thus, the concepts presented here do not automatically yield the right answer; rather, they provide a framework for analyzing situations involving multiple point competition.

Finally, a counterattack can also be used purely as a signal (Porter 1980, Chapter 4). The responder may deliberately counterattack in a minor

market to signal that it desires peace but can and will fight if necessary, and that if the attacker does not back off, the responder will launch a more serious counterattack.

The Attacker

The issues of interest for a potential attacker are whether and where to attack. A firm should initiate an attack if it believes its position will be improved regardless of how the competitor responds. The ideal situation is one in which attacking is fairly inexpensive, defending will be costly for the responder, the responder does not have any attractive opportunities for counterattack, and the responder does not want to risk getting into a total war. Another reason a firm might initiate an attack is to preempt the other firm from striking first. This case occurs in the unstable situation where two firms are evenly poised and a significant advantage will accrue to the firm which attacks first.

A less well defined, although valid, reason for a firm to initiate an attack is that it expects the other firm to react incorrectly. Most mathematical game theory (e.g., Luce and Raiffa 1957) assumes that all the players are perfectly rational and that each player assumes that the other players are perfectly rational. Such an assumption is probably not warranted in real life. As anyone who has played a game involving competitive strategy (e.g., chess, bridge) knows, one plays differently against a player one believes to be highly skilled than against a player one believes to be less skilled. It is difficult, of course, to correctly assess the competence of one's opponents, and underestimation is a common mistake. However, to assume that one's opponents are perfectly rational may be a mistake in the other direction. Thus, a firm should try to take into account how its competitor

will react rather than how the competitor should react. For example, if a firm believes that the competitor's top management is emotionally involved in a particular market and that this is likely to distort the competitor's analysis, then the firm should take this into account in formulating its own strategy.

Finally, whether or not to attack depends on the attractiveness of the opportunities available for attack. If the attacker has a low sales volume and the competitor has a high sales volume in a market, then it is probably relatively inexpensive to attack and relatively expensive to defend, which makes it attractive to attack in this market. For example, if the attack consists of a price cut, the attacker has to cut prices on only a small volume, whereas the responder will have to cut prices on a much larger volume if it decides to defend its position directly. It is also cheaper to attack in a market with low entry barriers than one with high entry barriers. Finally, it is better to attack in a market which offers more significant economies of scope (i.e., synergy) to the attacker than to the responder. A special case of this, which was discussed at the beginning of this paper, occurs when there are diseconomies of scope due to a binding cash constraint. If the competitor is operating under a cash constraint, he may be vulnerable to an attack in the business which generates cash for him. Such an attack would force him to sacrifice in one market in order to compete in another market.

Equilibria

From the analysis presented above, it can be seen that the most attractive attacks--those in markets with low entry barriers and in which the attacker has lower sales volume and higher economies of scope than the

responder--are those which are most likely to lead to counterattack rather than defense. (This assumes, of course, that the responder has suitable markets available for counterattack.) So we can argue:

PROPOSITION 1: When the responder has reasonable alternatives, a mutual foothold equilibrium is a likely outcome of an attack.

A mutual foothold equilibrium is typically more costly (that is, both the firms are less profitable) and requires less trust between the two firms than a limited war equilibrium, which in turn is more costly and requires less trust than keeping total peace (i.e., market sharing). However, a limited war only rarely offers enough disciplinary leverage to produce a stable equilibrium. Thus, in situations where the firms are far from having developed mutual understanding and communication, mutual foothold equilibrium may be the only way to prevent total war, especially if an attack offers big first mover advantages. In other words, it is easier to cut the gains of a violater if one has a foothold in "his" market. So we have:

PROPOSITION 2: If an attack offers big first mover advantages, a mutual foothold, rather than total peace, is a stable equilibrium.

(These two propositions, plus one dealing with limited war, are derived in a somewhat more formal and stylized way in the appendix.)

One should finally note (although detailed discussion is outside the scope of this paper) that all other firms participating in a market used as a foothold or as a stage for limited war will be affected by the strategic interactions between the two warring firms. In some cases they are penalized by price cutting and in others (such as is the case for Bridgestone in tires) they benefit from the casualties of the two combatants. If more than two firms take part in the multiple point competition, the number of feasible equilibria would probably be quite large and detailed analysis difficult.

CONCLUSIONS

While situations involving multiple point competition are commonplace in practice, there has been very little conceptual or theoretical discussion of this phenomenon in the strategy literature. This paper offered a first cut at developing a conceptual framework for analyzing and understanding situations involving multiple point competition. The discussion of several examples yielded insights into the alternative moves available to competitors and the equilibrium outcomes possible in such competition. Our main prediction is that so-called mutual foothold equilibria should be the most frequently observed outcome. However, given the importance of this topic for competitive strategy, much more research is needed in this area.

APPENDIX

We will here try to formalize the above reasoning in a stylized dynamic game theoretic model.

First, we will analyze the scenario illustrated in Figure 1. Initially, two firms, A and B, dominate one market each, called 1 and 2, respectively. 1 and 2 are of approximately equal size. If firm B attacks market 1, what should A do?

FIGURE 1

Assuming that the payoffs from either a mutual foothold (c) or a limited war (d) are smaller than 10, the best A can hope for is to move towards total war and hope that B withdraws, so that the original peace is restored. (The numbers on the figures are chosen arbitrarily, simply to illustrate relative orders of magnitude.) Assuming that A decides not to take this chance, the preferred action will depend on the relative magnitudes of c and d. The value of d will be smaller if market 1 has the following properties:

1. It is expensive for A to fight in 1 (e.g., A has a high sales volume in 1)
2. It is likely that B will fight hard in 1 (e.g., B has sunk costs in 1)
3. A's competitive advantage is small (e.g., 1 has low entry barriers, A has long response time)
4. 1 is not too salient for A (e.g., 1 has low economies of scope with A's other activities)

Conversely, c will be higher if market 2 has the following properties:

5. It is cheaper for A to fight in 2
6. B's competitive advantage in 2 is small

Under these circumstances, one would expect that $c > d$ and A is likely to counterattack, leading to a mutual foothold equilibrium.

The next question we will look at is the following: If B wants to attack and can choose between two markets, one of which will lead to a limited war and the other to a counterattack in 2, which market should B attack in? Here we are interested in the relative magnitudes of e and f, corresponding to B attacking in two different markets. Ceteris paribus, B will find it cheaper to attack a market with the properties 1 through 4 listed above, even though this most likely will cause A to respond in 2, thereby inflicting some losses on B. The alternative, to go for a limited war in an easily defended market, is likely to be much more costly. So if B attacks, it will most often be in a market which leads to a mutual foothold equilibrium. Therefore, although there are several exceptions:

THEOREM 1: If markets are of equal size and an attack occurs, a mutual foothold equilibrium is a likely outcome.

Next, we need to investigate the circumstances under which an attack will take place. So we ask about the conditions under which e (or f) is bigger than 10. This depends critically on the first mover advantages awarded to the attacker. If the response time is long and the attacker can commit itself with high sunk costs and the responder has not done the same, it is likely that $e > 10 > c$ (or $f > 10 > d$). What prevents these situations from escalating to total war is the fact that response times from a mutual foothold are much faster than from peace. So once we have a mutual foothold, it is much less tempting to try a second round of attacks. Therefore:

THEOREM 2: If an attack offers big first mover advantages, a mutual foothold rather than peace is a stable equilibrium.

Note that a mutual foothold, which often yields lower payoffs to both firms compared to peace, nevertheless may be upheld, since it deprives both firms of any incentive to upset the equilibrium. This is illustrated in Figure 2, where the original situation is stable if $9 > g$ (or $9 > h$).

FIGURE 2

Secondly, we will look at the situation where one market, 1, is bigger than the other and where the firms initially share both markets. Looking again at the situation after an attack in market 2 by B, we will analyze A's options. The game is illustrated in Figure 3.

FIGURE 3

If we again assume that an attack is ruled out because of the risk of total war, we can concentrate on a defense of 2 or a counterattack in 1. Given the relative sizes of the markets, however, a counterattack is almost identical to total war, that is, k is most likely negative and it becomes rational for B to go to total war. This leaves A with the limited war option. So:

THEOREM 3: If markets are of different size and an attack occurs, a limited war is the most likely outcome.

Since one must expect that m is smaller than 10, it is hardly rational, from a narrow perspective, for B to attack. An attack might nevertheless occur anyway, either to signal a determination to counter a possible attack by A in 1 or in the hope that A will fail to react.

FIGURE 1

PEACE DISRUPTED

Efforts per Market and Payoffs per Firm

Original Situation

Peace

	A	B
1	XX	-
2	-	XX
Payoff:	10	10

- Weak Presence

X Low Effort

XX Normal Effort

XXX Strong Effort

After B's Attack

	A	B
1	XX	X
2	-	XX
Payoff:		

After A's Response

Mutual Foothold

	A	B
1	XX	X
2	X	XX
Payoff:	c	e

Attack

	A	B
1	XXX	X
2	XXX	XX
Payoff:		

Limited War

	A	B
1	XXX	X
2	-	XX
Payoff:	d	f

Final Outcome after A's Attack

Peace

	A	B
1	XX	-
2	-	XX
Payoff:	10	10

Total War

	A	B
1	XXX	XXX
2	XXX	XXX
Payoff:	0	0

FIGURE 2

MUTUAL FOOTHOLD DISRUPTED

Efforts per Market and Payoffs per Firm

Original Situation

Mutual Foothold

	A	B
1	XX	X
2	X	XX
Payoff:	9	9

- Weak Presence
X Low Effort
XX Normal Effort
XXX Strong Effort

After B's Attack

	A	B
1	XX	XX
2	X	XX
Payoff:		

After A's Response

Counterattack

	A	B
1	XX	XX
2	XX	XX
Payoff:		g

Attack

	A	B
1	XXX	XX
2	XXX	XX
Payoff:		

Defense

	A	B
1	XXX	XX
2	X	XX
Payoff:		h

Final Outcome after A's Attack

Mutual Foothold

	A	B
1	XX	X
2	X	XX
Payoff:	9	9

Total War

	A	B
1	XXX	XXX
2	XXX	XXX
Payoff:	0	0

FIGURE 3

MARKET SHARING DISRUPTED

Efforts per Market and Payoffs per Firm

Original Situation

Market Sharing

	A	B
1	XX	XX
2	X	X
Payoff:	10	10

- Weak Presence
X Low Effort
XX Normal Effort
XXX Strong Effort

After B's Attack

	A	B
1	XX	XX
2	X	XXX
Payoff:		

After A's Response

Mutual Foothold

	A	B
1	XXX	XX
2	X	XXX
Payoff:	i	k

Attack

	A	B
1	XXX	XX
2	XXX	XXX
Payoff:		

Limited War

	A	B
1	XX	XX
2	XXX	XXX
Payoff:	j	m

Final Outcome after A's Attack

Market Sharing

	A	B
1	XX	XX
2	X	X
Payoff:	10	10

Total War

	A	B
1	XXX	XXX
2	XXX	XXX
Payoff:	0	0

FOOTNOTES

1. For a detailed discussion of limited war, especially in the context of international politics, see Schelling (1960).

2. The description of the tire industry presented here is based on the cases "Pneumatiques Michelin" (1A), (1B), and (II), 1980, INSEAD, The European Institute of Business Administration. The analysis of the competitive situation between Goodyear and Michelin, however, is our own.

3. In a recent paper based on Kreps and Wilson (1982), Milgrom and Roberts (1982) interpret the events as prediction on the part of Maxwell in the eastern markets. In our view, the simultaneous developments in the western markets are a necessary part of the total picture.

4. There are economies of scope when a single firm can produce a given level of output of each product line more cheaply than a combination of separate firms, each producing a single product at the given output level.

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