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DO MULTINATIONAL CORPORATIONS BENEFIT FROM GOVERNMENT CARTEL FORMATION? A STUDY OF THE ALUMINUM MULTINATIONALS AND THE BAUXITE CARTEL

The Ohio State University Ph.D. 1979

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DO MULTINATIONAL CORPORATIONS BENEFIT FROM GOVERNMENT CARTEL FORMATION? A STUDY OF THE ALUMINUM MULTINATIONALS AND THE BAUXITE CARTEL

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Steven Kendall Holloway, B.A., M.A.

* * * * *

The Ohio State University

1979

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Chapter One: Introduction

In brief, this dissertation poses the question, do Multinational Corporations (MNCs) benefit from cartels formed by the governments of commodity producing countries. In particular the quarterly profits of two sets of MNCs in comparable industries have been examined to see what impact the formation of a cartel in one of them had on the profitability of that industry. The general interest of this question lies in its implications for MNC behavior toward the cartel. It is argued here that the question (is there a benefit) forms a necessary (but not sufficient) condition for MNC cooperative behavior toward the cartel. This assessment of the role of the MNC in cartel formation and maintenance should have implications for policy makers of many types. For policy makers in the United States government, this study represents an important first step in predicting MNC behaviors in future "OPECs," in particular where those company behaviors are seen as potentially incongruent with United States foreign policy. For policy makers in commodity producer states which seek to emulate the success of the oil cartel, it lays the foundation for explaining why some such attempts (e.g., the bauxite cartel) have been relatively successful whereas others (e.g., the banana cartel) have failed. Indeed it is the formation of the oil cartel which provided the initial impetus for this study.
The oil embargo of 1973-74, more than any event since WWII, created a flurry of interest in world raw materials. Two major lines of scholarly activity have been the focus of this interest. The first takes the part of the developed states and attempts to assess just how vulnerable the developed West and in particular the United States is on "outside" sources of strategic goods. The emphasis here is on a simple inventory of who has how much of what commodity and what US foreign policy should be doing about it. The second line has examined the problem of cartel formation from the producer country perspective, and where the producers are developing countries, the prospects for a new international order. The emphasis here is on where, when, and how cartel power is likely to be attained.

The astounding blindspot of nearly all this political literature is that it focuses on national government to government interaction and ignores the role of the institution which is actually extracting, processing, and distributing the goods—the multinational corporation. The implicit assumption of the first line is to view the MNC as a passive, apolitical conduit. The assumption of the second perspective is to view the MNC as an agent of the parent national government, or the link point in a chain of dependency. Sampson (1975) stood alone for sometime as an attempt to bring the MNCs into the picture if only in a journalistic, historical manner, Pindyck (1977) is one of the few writers studying cartels who admits that the companies may have some impact on cartel formation. While excluding them from his study,
he admits that his model's "main shortcoming is that it ignores the important regional characteristics of the bauxite, as well as the monopsony power of some of the multinational companies that purchase bauxite." 4

In the years immediately following the embargo, various investigations of the US Congress began to suggest that the oil companies may have violated what they considered to be aspects of the national interest. Since then the attack on the oil companies has covered a wide range of allegations. At a minimum is the sentiment that the companies gave in too quickly, that they have not had the incentives to challenge OPEC. The following quotation typifies this view:

By going along with OPEC the companies are guaranteed access to OPEC oil at preferred prices. Guaranteed access means that the major companies will have at least some oil to distribute when other companies do not.... Under these conditions the companies have no incentive to bargain down or challenge OPEC prices and power.5

The extreme position has been to allege that OPEC would not have been possible without the collusion of the oil companies. This is due to the alleged role of the companies in acting as distributors and rationers. Consider this quote from Wyant (1977):

As the Senate Antitrust and Monopoly Subcommittee majority staff puts it, "OPEC, like any cartel, must perform two basic functions. First, it must agree on the price level it wants. Second, and far more difficult, it must agree on how the members will apportion the necessary production cutback among themselves." However, OPEC has never been able to agree on a formula for prorationing production. Instead,
OPEC relies on the companies to decide how much should be produced in each member country. Without the companies to prorate production, the cartel could not hold together.6

The most commonly cited evidence that the oil companies have benefited from this "cooperative" arrangement is the profits that the firms made during the early years of the price increases. As vertically integrated firms, the majors were supposedly able to raise the final price well above their increased costs by acting in concert following each crude increase, given an inelastic market of short supply. Graphs such as Figure 1 appears in popular news journals to emphasize this allegation.

Two major problems with this analysis are obvious. First, there has been an absence of controls for intervening variables that might explain the increased profits. Second, there has been an absence of generalizations beyond the oil example of when the extracting firms are likely to benefit from a cartel. These two failings are nearly always charged to the purported exceptional nature of oil, a proposition that will not be debated here. Consequently, this study focuses on the bauxite cartel (the International Bauxite Association) and the question of benefits that might have accrued to the aluminum MNCs involved in the production of bauxite. Bauxite is a mineral which more closely resembles other metal minerals, and hence avoids the problem of the exceptional nature of oil.
FIGURE 1

Oil Profits

Source: Time, October 24, 1977
The Specific Query of the Dissertation

The basic premise behind the allegations of oil company support for OPEC is that the companies have in some way benefited from the formation of the cartel. This benefit is most often stated in terms of increased profits or lessened competition for the existing firms. The benefit has been operationalized in this study as profits, with the cartel under consideration being the bauxite cartel (IBA). The specific query of this dissertation, therefore, is: what impact did the bauxite price increases of the IBA have on the profits of the aluminum firms, the main buyers and processors of that bauxite.

A secondary benefit of lessening competition in the aluminum industry has not been tested, although the author will briefly address this aspect in Chapter Six.

The specific method adopted to answer this query is a quasi-experimental design. The quasi-experimental design allows the adoption of experimental techniques in dealing with ex-post-facto observations of a given phenomenon. One particular subvariant of this design calls for the selection of a control group of observations in parallel with the observations of the experimental group. Consequently, two groups of MNCs were selected in the form of two comparable industries. The two industries were selected by employing several criteria to create profiles of several primary commodity industries. This process is detailed in Chapter Three. The one important difference between the two industries was the intervention of a price raising cartel in one of them. The bauxite/aluminum industry was
chosen as the experimental group for the design, and the copper industry was chosen as the control group. Next a relative percentage time-series was created based on adjusted quarterly profits for the firms in each industry. This resulted in two time-series of 29 data points each, divided in the middle by an intervention point (the first price hike by an IBA member). Regression analysis was then used to measure the level and directionality of the change from the before to after segments of the time-series. A more detailed account of the methodology is provided in Chapters Three and Five.

The Contributions of the Study

There are four major contributions made by this dissertation for the study of the MNC. First, in order to link the specific query about the behavior of the MNC during producer state cartel formation to the broader issue of the nature of the political behaviors of the MNC generally, the author has reviewed in Chapter Two a large portion of the literature on the politics of the MNC. Furthermore, a taxonomy of the major arguments in this literature was developed. The appropriateness of each argument as the frame of reference for the specific query is examined. This is not to say that the arguments are tested in any systematic, empirical way. On the basis of well founded assumptions and overall flexibility, the author has chosen the third argument, the "MNC as independent actor" approach as the intellectual context in which he will carry out this inquiry. Thus, the author is hopefully making explicit his particular scholastic
bias. By doing so, he is also denying any assumption that the MNC is a powerful emissary of the US political system or that it is only a weak, apolitical subject of national governments.

Second, a case study of the aluminum industry provides a descriptive and historical context for analysis of the bauxite cartel and its impact on the MNCs. This account has been rendered from the perspective of argument three which emphasizes the political independence of the MNC. This account is given in Chapter Four.

Third, there is the reporting of the findings of the basic query: does cartel formation benefit the MNCs in the industry. Were profits for the aluminum firms higher than expected after the intervention of the IBA? The findings have policy implications for the US government and other governments of aluminum consuming nations, as well as for other MNC policy makers and national governments involved in attempts to form commodity cartels. The findings are reported in Chapter Five.

Fourth, having found in Chapter Five some evidence of strong profits in the cartelized industry, the author attempts in Chapter Six to lay out the rudiments of a design to explain the political behaviors of the MNC in the process of cartel formation. In particular he has centered on the conditions where the firms are likely to cooperate with the cartel members. This examination is carried out by means of a case study of the bauxite cartel. However, the speculations of this section are limited by his lack of familiarity with psychological and coalition behavior approaches. Ultimately the author can only hope to have laid the groundwork for future research in this area.
Footnotes to Chapter One

1 The author is aware that many writers on the subject today prefer the label TNC (transnational corporation) as they feel the term MNC disguises the real absence of multinational staffing and control of these organizations. However, he doubts that this descriptive point has been missed by anyone seriously studying the field regardless of their preference for abbreviation. He has chosen to continue the popular predilection in the US of using the label "MNC."

2 International Economic Studies Institute, Raw Materials and Foreign Policy, 1976, serves as an example of this line.

3 An example of this line is Mikdashi (1976).


6 Ibid., p. 2.
Chapter Two: Literature Review

ASSESSING THE ARGUMENTS ABOUT THE POLITICAL BEHAVIORS OF THE MNC

One of the first tasks of any dissertation is to locate the author's research within a certain body of literature and assess the contributions to be made. Turning to the MNC literature appropriate to the dissertation, this author discovered seemingly endless chaos. It appears that writers of diffuse abilities and vastly differing backgrounds have rushed to cover the MNC phenomena. From journalists to economists, Marxists to members of Congress—everyone has an opinion about the controversial MNC. Political scientists are only the most recent scholastic wave to focus on this subject. One begins to wonder whether it is possible to organize the volumes written, to develop any method to assess what can be learned from them.

A caveat is in order. This review will not examine the internal economic workings of the MNC or other areas of the economic or oligopolistic motivations of the MNC. The question of what leads a firm to go abroad has been reviewed rather thoroughly elsewhere. Furthermore, the controversy surrounding the economic issue of "development versus distortion" of the local economy will be included only in so far as it affects political consequences (such as, general government attitudes toward MNC investment). The intent of this review is to summarize the literature dealing with the political
behaviors of the MNC.

A meaningful way to organize the literature might be to reduce it into sets of contending theory. The term "theory," however, is misleading, if one uses a strict definition of the term, since the literature as a whole lacks the necessary rigor for such a characterization. For a similar reason the author has ruled out the enterprise of "hypothesis listing." To some scholars the use of the word "hypothesis" suggests that the assertions under study have been carefully derived from a comprehensive theory.

On the contrary, allegation, counter-allegation, expose, and defense characterize the literature as it stands today. Eschewing the somewhat vague terms "pre-theory," "paradigm," and "tacit theory," and the more rigorous, theoretic use now implied to some by the word "model," the contending viewpoints expressed in the writings are better organized under the lexicon of "arguments." Most of the writings share a desire to persuade (often to prescribe for) some target audience (usually policy makers). The arguments have developed often through mutual stimulation via rather heated debates (interfaces). Nonetheless, the author believes there is a valuable enterprise in simply presenting the arguments in a systematic way, spelling them out so that their component parts may be compared, checking them for obvious inconsistancies in logic and weak assumptions, and showing the types of evidence marshalled.

The literature collapses into three major arguments. Argument I and its variants link the political behavior of the MNC to the foreign
policy interests of the parent national government. Argument II asserts that MNCs are apolitical actors, motivated purely by economic considerations. This line stresses the political naivete and vulnerability of MNCs to national government demands. Argument III suggests that in many regards large MNCs are independent international actors; as with any political actor, they are in many ways constrained by the behaviors of other actors (particularly national governments) but that significant independent decision-making powers exist. As will be seen, Argument III is quite applicable to the thrust of this dissertation and has been chosen as the perspective from which this author chooses to write.

In order to expedite systematic comparisons among the arguments, the same outline structure will be used for the presentation of each. The outline structure will begin by listing the assumptions of the argument, and proceed to the political behaviors that flow from those assumptions. Next the sources section will attempt to identify the main proponents of the given argument, while the evidence section will show what types of data the proponents usually cite in support of their positions. Finally, each section will end with the author's critique of the argument.

Through the use of this outline form, the author hopes to facilitate component-to-component comparisons, such as those given in Table 1. The first item reveals how the arguments align on one of the crucial assumptions, the separability of economic and political behaviors. In a similar fashion the arguments may be compared on issues such as the power of the MNC or the future of the MNC.
TABLE 1
Comparison of Arguments Across Issues

<table>
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<th>ARGUMENT II</th>
<th>ARGUMENT III</th>
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<td>Reformist</td>
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<td>Derives from the means of production</td>
<td>Economic decisions leading to disutilities for state</td>
<td>Extremely limited, incentives only</td>
</tr>
<tr>
<td>Amount of independence from N-S</td>
<td>From control of the means of production</td>
<td>Extremely limited, incentives only</td>
<td>Lies in future</td>
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<td>N-Ss N-Ss regulate unable to regulate</td>
<td>Growing role for trans-national actors like MNC</td>
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<td>Declining</td>
<td>Great at present</td>
<td>Growing in future</td>
</tr>
<tr>
<td>Future</td>
<td>Great at present</td>
<td>Very little</td>
<td>Growing in future</td>
</tr>
<tr>
<td>Future</td>
<td>More regulation</td>
<td>At best, more regulation</td>
<td>Displacement of MNC</td>
</tr>
<tr>
<td>Future</td>
<td>Greater regulation</td>
<td>Displacement of MNC</td>
<td>Growing role for trans-national actors like MNC</td>
</tr>
</tbody>
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H *
Finally, the reader is reminded that the goal of this enterprise is not to test the arguments. Rather the purpose is to locate the particular intellectual context within which this research on cartels will be carried out, and to show how that context or bias differs from alternative contexts.

ARGUMENT I: MNCs AS TOOLS OF PARENT (US) FOREIGN POLICY

Lush flora has sprung from the perennial arguments of imperialism, neo-imperialism, nationalism (self-determination) and Marxist intellectuals over the role US MNCs play as supports to the Pax Americana of today's world. No argument has produced as colorful a growth of variants and cross-pollinations. But under careful taxonomic analysis, this forbidding jungle appears to collapse into three broad phylums. The first variant is the....

ARGUMENT Ia: THE POLITICAL IMPERIALISM LINE

Assumptions

There are three basic assumptions of this argument.

1) There exists a broad underlying congruence of interests between US foreign policy and national security elites and US international business elites.4

2) Economic and political factors are not easily separated, Economic power is often the basis for political power, (While
there is often a lack of specificity in defining the domains of these two factors, nonetheless this assumption seems implicit and stands in clear distinction with Argument II. It lies at the root of the assertion:

2a) A state can not be politically independent, if it is economically dependent.

3) The existence of this congruency of foreign policy and MNC interests has resulted in similar goals, realization of shared interests between both sets of actors, and mutual support (often covert) for each others aims.

Political Behaviors

PB1) Joint political behaviors flow from the following shared goals (Gilpin, 1975):

a) Maintaining the United States' share of world markets.
b) Securing a strong position in foreign economies.
c) Spreading US economic and political values.
d) Controlling access to vital raw materials.

PB1a & b. The importance of these goals is that they are the basis upon which US hegemony rests. Take as an example balance-of-payments. It is asserted that the United States' ability to finance overseas military and diplomatic commitments, which have a negative impact on balance-of-payments, is sustained by overseas earnings which have a positive impact,
US policy-makers purportedly view MNCs as creating a liberal international economic and political order. "Through the transfer of American technology and the free enterprise tradition, they are helping to create the democratic and pluralistic world of the American liberal vision."5

Access to petroleum and other vital raw materials is important not only for strategic reasons but for the long term health of the nation. Furthermore, this control gives US policy-makers an important tactical weapon in maintaining the cohesion of its western allies (as for example, the 1956 Suez crisis in which the US threatened to cut off oil to Britain and France).

MNCs are creating a system of dependence with the support of US foreign policy elites in which Third World areas are consigned to supply raw materials and labor in exchange for First and Second World manufactured and high technology goods. Since the demand for primary products is extremely elastic and since, as Raul Prebisch (1964) has asserted, Third World nations' terms of trade are declining, this relationship has created a long term disadvantageous dependency for less developed nations on the developed economies. This process is supported by US foreign policy elites because it furthers the political dependency of Third World allies on the US and strengthens US Hegemony. From this it is asserted;
a) Technology transfers to less developed countries (LDCs) and minimal. Indeed, LDCs serve as dumping grounds for secondhand, "50s" technology.

b) Capital transfer to LDCs is minimal. LDCs are exploited for their primary products which are declining in relative value.

c) MNCs pay an unjust price of LDC goods through transfer pricing and exorbitant rates of return.

PB3) The Third World has begun to struggle against this dependency. LDCs are becoming increasingly aware of their political and economic subservience to the US. The system is a direct challenge to national prestige and self-determination of the LDC. As highly visible agents in the process, MNCs become the obvious targets of nationalistic and progressive forces. Nationalization of foreign interests is seen as the most direct way to break the dependency.

PB4) To meet this threat, business and foreign policy elites in the US again converge in a familiar pattern of direct and covert support for the more reactionary elements of LDC societies (the landed gentry, the military) as can be seen with United Fruit in Guatemala, Firestone in Liberia, ITT in Chile, and various companies in Cuba, the Dominican Republic, South Africa, and Vietnam,
PB5) Reaction against US MNCs as tools of US foreign policy interests is not just limited to LDCs. Goals b and c under PB1 are particularly threatening to European states.

a) Large US MNCs are flooding European markets with cheap, tasteless goods, which drive out the products of small traditional producers.

b) The US has shown a constant lack of sensitivity to European cultural and political values, and the desires of other developed states to assert their political independence. US MNCs are thus labeled instruments of cultural imperialism.

Sources

Robert Gilpin's *US Power and the Multinational Corporation* takes as its central thesis that US MNCs support US Hegemony much as British firms and bankers supported the *Pax Britannica* of the 19th century.

Barnett and Muller (1974) also provide many statements in support of this argument although others fit well under Argument Ic, 6

There is a large body of popular literature which examines the MNC's role in Neo-imperialism and exploitation. Louis Turner's, *MNCs and the Third World*, deals with United Fruit in Guatemala (p. 21), Firestone in Liberia (p. 25), and Union Miniere in Zaire (p. 27). Kepner and Soothill's, *The Banana Republic* traces United Fruits' activities in Central American countries up to the thirties. *Corporations and the Cold War*, edited by David Horowitz, provides
many articles that follow this approach. For example, Domhoff argues for corporate impacts on foreign policy making, while Williams advances the idea that US foreign policy since 1890 has consistently followed the "frontier thesis" of Brooks Adams and Fredrick Jackson Turner.

Some books have also been penned concerning the US threat to developed economies. For example, Servan-Schreiber, The American Challenge, and Karl Levitt, Silent Surrender: The American Economic Empire in Canada, deal respectively with French and Canadian reactions.

Evidence

Evidence gathering has concentrated on the crucial assumptions of the argument. Concerning the assumption of a congruency between US foreign policy elites and MNC manager interests, most studies have attempted to demonstrate implicitly shared interests through shared background. Such efforts go back to C. Wright Mills, The Power Elite, and more recently include Dye and Zeigler, The Irony of Democracy, Richard Barnetts, Intervention and Revolution, and other elitist writers. Evidence is cited in all of these sources of linkages between business, political, and military elites such as common socialization, attendance at the same schools, same clubs, and common job connections. In examining the organizational setting of US foreign policy, Domhoff (in Horowitz, 1969) argues that the Council on Foreign Relations, the Committee for Economic Development, the RAND Corporation, the National Security Council and special government committees are dominated by business interests (in terms of personnel)
and that the only inputs which are not tainted, Congress and public opinion, have little clout.  

The next step is to show examples of actual collaboration between business and foreign policy elites in various Third World interventions. The case study is the chief research design employed. Narrative documentation is given for such interventions as Guatemala, Iran, the Dominican Republic, Chile, Cuba, Vietnam, and so on.

Evidence gathered to support the mechanism of exploitation tends to be testimonial with little statistical analysis. One of the shortcomings of this argument is the paucity of hypothesis testing, as is carried on by its more "scientific" Argument II opponents. Nonetheless, analysis of declining terms of trade is provided by Stephen Krasner (1973), Hans Singer (1968), Raul Prebisch (1964). Econometric tests find either inconsistent and/or negative impacts, such as Muller (1970). Evidence of MNCs withholding advanced technology come from studies of patent laws, and leasing contracts. Vaitsos (1972a) shows how these agreements favor the MNCs. Overpricing of imports and unfair rates of return have been studied by various UN groups (see UNCTAD, 1972) and Vaitsos (1972b).

Critique

Perhaps the most problematic area of the whole argument lies in its very first assumption, the congruency of interests. The issue of individual beliefs and values and their impact of foreign policy has long generated controversy among international relations
scholars. Consider this quote from Sullivan:

...though there exists much ad hoc theorizing and volumes of individual case studies that can be read as illustrating an individual's effect on foreign policy, we still lack much systematic evidence confirming this hypothesis or illustrating its domain.

Furthermore, we have no proof nor explanatory mechanism for why two persons with similar socialization, when placed in disparate roles (State Department vs. corporate executive), should continue to share similar interests or manifest cooperative behaviors. As many have argued, do not the roles themselves provide their own sets of interests. Allison (1971) goes far in dispelling the monolithic elite interest model of national security policy-makers.

Nor does citing examples where business and foreign policy elites have cooperated in the past offer much proof of an underlying congruence, because there is an equally large body of examples where MNC and US foreign policy interests have diverged. Gilpin himself points out:

The available evidence does not, however, add up to the radical thesis that there is a systematic relationship between American policy and the multinationals. It is simply not the case that the imperative of corporate growth and expansion explains the foreign policy of the United States.\(^9\)

He further cites the examples of business opposition to trading with the enemy provisions, the Vietnam War, US policy toward Japan, the Middle East, and the Oil Crisis. The widening discrepancy has in fact generated the Reformist Argument (Ic) that US MNCs are hurting US interests and need to be brought in line with Congressional legislation.
There are some studies which call into doubt the very cohesiveness of business community attitudes. Bauer (1972) while looking for attempts by business leaders to effect the Reciprocal Trade Act found widely differing views on the basic issue of free trade.

The argument contains one final shortcoming—its lack of specificity on the issue of MNC power. Nearly all proponents seem to argue that MNCs are powerful, but the exact dimensions and sources of that power, except for implicit links to the power of the US, are largely undefined. The issue will arise again in later arguments.

ARGUMENT Ib: THE MARXIST ARGUMENTS

The Marxist or Neo-marxist argument is in many regards quite similar to the imperialism arguments of Ia; indeed, the differences are mainly in the use of Marxist terminology. However, the essential difference is the role of nationalism and the nation-state. Argument Ia seems targeted more toward an LDC audience stressing the need to politically combat US Hegemony. It is consequently interwoven with anti-colonialism, self-determination and nationalistic sentiments, and does not necessarily predict any transformation of the Third World into a Socialist Camp. But Marxist writers appear to split on the issue of nationalism between those who see a strengthening of the nation-state through capitalistic rivalry and those who see a consolidation of the nation system into two mega Capitalist and Socialist Camps.
Assumptions

There are four assumptions all Marxists will accept.

1) Economics is the ultimate independent variable for explaining all political behaviors and relationships. The world today is divided into two great classes and all political institutions, ideologies, and legal orders reflect a class interest. (Thus, this assumption is similar to but goes further than Assumption 1 of Argument Ia.)

2) To say that there is a congruency of interests between US foreign policy interests and US MNCs is merely to reflect upon the fact that the United States is a capitalist state and as such all its dominant political institutions reflect the interests of the capitalist class. (Indeed, one can go so far as to invert the previous heading, the US government is the tool of the corporate executives.)

3) "Owing to the international requirements of the American (Western Europe and Japan also) capitalist system, the large corporations are forced to expand outward in search of new markets, investment opportunities and sources of raw materials."¹⁰

4) "The foreign policy of the United States reflects the expansionist interests of the dominant capitalistic class."¹¹
Political Behaviors, Sources and Evidence

There is a grand debate occurring between Marxist writers over the political behaviors expected of the MNCs and the nation-state, and the roles that nationalism and internationalism will play in the process of the development of the international economy. This debate can be traced back to the 1915 controversy between Kautsky and Lenin over the outbreak of WWI and ultra-imperialism. While Lenin saw the war as the natural outcome of intense and chronic capitalist rivalry, Kautsky foresaw the coming of a new phase of consolidation of the capitalist nation-states into a super-national state.

Kautsky suggested "a new ultra-imperialist policy, which will introduce the joint exploitation of the world by internationally united financial capital in the place of mutual rivalries of national capital." In his reply, Lenin argued that the international alliances which Kautsky observed were no more than truces between wars, for these alliances were based upon the economic, financial and military strength of the parties at the time of the formation of the alliance, and since these strengths develop unequally between nations, the alliances would inevitably become anachronistic. The necessary rivalry between capitalist states would remain.12

The debate also differs in the level of analysis chosen. Lenin focuses on the nation level.

The tendency is to take the national economy... and then analyze the forces projecting out from this system into the outside world. In this view, "capitalism" is the system operating within the national economy and other national economies. Bukharin on the other hand argues for an international perspective, "there is a general trend of internationization inherent in the expansive nature of capitalism which tends to create a specifically capitalist world order.13
Bukharin however does not go so far as to support Kautsky's view of "ultra-imperialism."

Several modern writers follow the "Kautsky line"; for example, Stephen Hymer writes—

Due to the internationalization of capital, competition between national capitalists is becoming less and less a source of rivalry between nations. Using the instrument of direct investment, large corporations are able to penetrate foreign markets and detach their interests from their home markets....Given these tendencies an international capitalist class is emerging whose interests lie in the world economy as a whole and a system of international private property which allows free movement of capital between countries.14

In a similar vein Robin Murray (in Radice, 1975) suggests the internationalization of capital is slowly weakening the capitalist nation-state. His argument runs---

PB1) There is an increasing "territorial divergence" between activities of nation-states and their respective MNCs.

PB2) In the past the large national firm was dependent on its parent capitalist nation-state for a variety of public economic functions (such as guarantee of property rights, control of money supply, control of interest rates) but now as the firms have gone overseas, they find that these functions can be fulfilled by:

a) International Organizations

b) Other capitalist states

c) Themselves
PB3) As a result, expansion overseas has weakened the nation-state's economic regulation of the firms while the firms themselves engage in activities which further subvert the capitalist state's control over its national economy.

As evidence of this, he cites the examples:

a) The Euro-dollar market provides in effect, an interest rate outside the control of any capitalist government, while at the same time it has increased the exposure of national monetary systems.

b) MNC financial moves destabilize foreign exchange markets and often thwart corrective actions taken by governments.

c) The capitalist governments have lost their powers of information, regulation, and taxation of international financial flows due to MNC use of transfer pricing.

d) With access to international capital markets and internal sources of funds, MNCs are financially independent and can in effect eviscerate any attempts at regulating the money supply by national governments.

Bill Warren (in Radice, 1975) is a fine example of the contrary "Leninist line." Basically he rejects the notion of MNCs gaining the upper hand and cites evidence to refute each of the points made by Murray.
Counter Evidence: While admitting that MNCs have moved in large numbers overseas, he notes "compared with total domestic sales or investment, that of subsidiaries located abroad remains an extremely modest proportion." (In 1964, 3.5% for US, 4.7% for UK, 0.7% for France.)

Counter Evidence: The provisal of public functions is marked by a history of "steadily increasing intervention of the State in economic life generally." Indeed he suggests the opposite of Murray's thesis:

the power of the nation-state vis-a-vis the large firms is greater now than ever before (and increasing)...the relationship between large firms and the State is a two-way one involving a degree of mutual accommodation, the upper hand will generally be that of the State since it must of necessity look to the interests of the system as a whole, and will therefore be able to act with authority vis-a-vis individual industries or firms, provided it is felt to be in fact looking to the general (capitalist) interest.

Counter Evidence: "...insofar as international economic liberalization has given some extra room to manoeuvre to large firms, State authorities have rapidly been evolving counter measures." In particular, he attacks the evidence given by Murray:

a) "it is clearly not going to be long before the central bankers, international organizations State policy-making bodies chain down the Euro-dollar monster so that it is no longer available to do the bidding of large firms."
b) "Tax authorities are rapidly getting control of the internal transfer price problem."\textsuperscript{18}

He then reaffirms the two central assertions of the Leninist line:

PB1) There has been a strengthening of the capitalist state in relation to the firms in its national economy.

PB2) There is a "developing pattern of increasing acute economic rivalry and related government conflict between the USA, Japan, and Europe."\textsuperscript{19}

And finally, he casts a great evil upon the Kautskyites:

The danger of the thesis that the nation-state is weakening \textit{vis-a-vis} international firms is that it may lend credence to the reformist belief that the capitalist State could have interests different from the national capitalist economy and society as a whole and may thus have to be defended against the cosmopolitan monopolies.\textsuperscript{20}

\textbf{Critique}

The critique here will be somewhat limited due to the author's limited knowledge of Marxist works and because of the mutual critiquing performed by the debate itself. Nonetheless, an essential problem is just where exactly do the true interests of the capitalist class reside. While Lenin discusses conflict and competition between capitalist states, how can contradictions occur between capitalists within a state? Warren weakly states,

This is not to say that there are no contradictions between capitalist states and private firms...there are and always
29

have been such contradictions throughout the history of capitalism for obvious reasons related to the difference between the whole and the sum of its parts. (Author's emphasis.)

Hymer and Murray seem to have the same problem in explaining how the firm is superseding the state. Has the state failed to be capitalistic enough? Is it evolutionarily unfit? Some sort of evolutionary mechanism must then be presented to explain this withering away of the state.

ARGUMENT Ic: THE REFORMIST POSITION

Finally, it would seem that Marxist Bill Warren's fears about Kautskyism are well founded, at least, insofar as there are now groups which make the "reformist" argument that the state must be defended against its own companies. While it is the analysis of this position that MNCs are no longer serving as effective tools of the parent government's foreign policy, the argument has been listed here because the reformist believes that MNCs ought to serve the government's interests.

Assumptions

1) While MNCs are basically economic organizations motivated primarily by the search for profits, they nonetheless may be responsible collectively for behaviors which are deleterious to the parent national government.
2) There is no necessary congruence of interests between the parent national government and its MNCs. While some activities of business help the government, others may be quite harmful.

3) The state has the right and the duty to protect its citizens and the "national interest" from the disutilities of the MNC. Therefore, the government must be expected to actively intervene and regulate its MNCs and assure that their activities are in line with state policy. In other words, while US MNC interests is not always in agreement with US foreign policy and domestic economic goals, they ought to be.

Political Behaviors

There are many areas where the MNC's activities may run afoul of US policy and the necessity of regulation becomes apparent. These areas include:

PB1) MNCs (as a group or in particular) may have a negative impact on balance-of-payments.

PB2) MNCs may export US jobs.

PB3) MNCs' investment patterns may hurt US growth and development.

PB4) MNCs may sell sophisticated technology to US enemies which weakens the security of the nation.
PB5) MNCs financial activities may harm the international monetary system and in particular the dollar.

PB6) MNCs may eviscerate government domestic economic programs, such as control of money supply and inflation.

PB7) MNCs may violate fair business practices in operations overseas, such as uncompetitive behavior and the giving of bribes.

PB8) In specific instances, recent MNC activities have harmed US foreign policy and security interests:

a) Oil MNCs release information on US military requirements to Arab members of OPEC.

b) Gulf pays taxes to the MPLA in Angola at a time when the US does not recognize that government.

PB9) The US government must develop greater regulatory control over its MNCs to prevent any of the harmful situations listed above. The focus of this activity should be the Congress, the Justice Department and other specific relevant bureaus.

Sources and Evidence

The evidence for the above argument comes primarily from books like Global Reach and from the investigations of various committees; such as, Senator Church's foreign affairs committee and Senator Long's finance committee, and various interest groups; such as, labor
unions. In specific cases, this argument has attracted wide bi-
partisan support, where it is asserted that "America" is being harmed.

Critique

The most vigorous argument interface has developed between this
and Argument 2. Most of the disagreement centers on the purported
harmful economic effects. Data are cited on both sides concerning the
effects on trade and jobs. In particular, *Implications of Multi-
national Firms for World Trade and Investment and for US Trade and
Labor*, the report of Russell Long's committee is very useful in laying
out the various views. Business arguments often run afoul of this or
Argument 1a particularly on trade consequences. After all, balance-
of-payments are a zero-sum game. In cases of dyadic trade, if the MNC
is helping the host country, it has to be hurting the parent's
balance.

What concerns the author more are the political aspects of the
argument. If one accepts that MNCs are political actors, and can find
no satisfactory mechanism for wedding them to the interests and
control of the nation-state (as through a power elite or class) then
one must be prepared to accept the explanation that they may be
politically independent actors. The interesting aspect of this
argument is that it takes the *normative* position that the world is
better off organized under nation-state control. This involves a
value judgment on the part of the arguer, not an analytic mechanism
which one can easily test.
Summary of Argument I

All the variants of Argument I, "The MNC as a Tool of the Parent Government's Foreign Policy," have in common an attempt to link the policies of the MNC to the policies of the parent state's national government. In the case of the Political Imperialism Line (Ia) and the Leninist Line of Argument Ib, the linkage arises in the maintenance of that state's hegemony through an upper elite or class. In the case of the Reformist Position (Ic) the linkage is seen as unfavorably weak at present, demanding tougher regulation of the MNC by the national government in the future. Only the Kautsky Line of Argument Ib is unique in predicting a weakening of that linkage in the future.

As can be seen in the coming arguments, the linkage of these two sets of actors is unique to Argument I. Argument II in particular is insistent on denying any such linkage. The author now turns to Argument II.

ARGUMENT II: THE MNC AS APOLITICAL ACTOR

In a complete investigation of the possible political impacts of the MNC, one must also consider the absence of any political motivations or behaviors, especially since a large body of businessmen are willing to assert just that. Argument Two breaks down into two parts—the straight orthodox business argument and a more "activist" internationalist variant.
ARGUMENT IIa: THE ORTHODOX BUSINESS ARGUMENT

Assumptions

1) A meaningful distinction can be made between the political and economic realms and between the public and private sectors. Actors may be identified as political and public as opposed to economic and private. The distinction may not be completely mutually exclusive, actions in the economic, private sector may well have public, political consequences, but still the distinction is useful in judging motivations.

2) MNCs are primarily private, economic concerns; that is, they are intrinsically apolitical actors. Their motivations are economic: profits, growth, and stability. While in the aggregate their economic actions may have crucial political impacts, each individual firm is merely responding to economic stimuli. As private concerns, they minimize their responsibility for public problems. MNCs are economic units which shun the political arena, often with revulsion at the purported, gross inefficiencies of the public sector.

3) A further assumption follows from this eschewing of the political: MNCs have little political clout. While the annual sales of the largest companies are often compared to national GNPs, in any real confrontation between 23rd ranked GM and 25th ranked Pakistan over control of a local affiliate, GM would be expected
to lose. This economic "power" supposedly being reported by sales or assets does not covert readily into political power. Though in the 19th Century some companies owned local militias, there is nothing to compare today with the political coercion, internal security and military forces of the modern nation-state. Through the process of incorporation, the national government legitimizes the MNC.

4) In particular the national government possesses three direct powers over the MNC which are often guaranteed in the legal code of the nation:

a) The power to tax business

b) The power to regulate business

c) The power to protect the "national endowment" (or the right of public domain)

The third power includes implicitly, the power to expropriate with or without compensation depending on which system of international law one subscribes to.

Political Behaviors

PB1) Given that the late reports of the death of the nation-state seem grossly exaggerated and that in a direct political confrontation with a national government (parent or host) the MNC is likely to lose, MNCs are well-advised to avoid all politically
controversial activities. MNCs tend to maintain a low political profile. If political activities (such as, campaign contributions) must be engaged in, they should be discharged as quietly as possible.

PB2) Due to the fact that national governments are overseers of territories and due to the nature of the investment that a MNC must make in its productive facilities, the MNC often finds itself a hostage of the state in which it locates. This condition further forces the MNC to adopt a passive political role. To some extent MNCs may relocate, but such a relocation may be quite costly, especially since the nation may forbid the move or expropriate the plant. All political factors are to be evaluated as additional costs.

PB3) While MNCs are forced to assume passive political profiles, nonetheless many business researchers encourage more active monitoring of the political risks. Yet, the evidence is that at this time such monitoring is woefully underdeveloped, pointing again to the political naivete of the MNC.

PB4) In keeping with the passive political role envisioned above, the MNC must emphasize certain economic incentives in its dealings with national governments. It is often asserted that MNCs may serve as vehicles to:
a) Transfer technology

b) Develop and stimulate growth of an economy

c) Rationalize world production

Best Possible Worlds

Vision 1: (pessimistic) At worst the MNC must find what solace it can in a system of nation-states. It must turn more to national governments in the developed Northwest as guarantors of international law. Perhaps eventually there will develop a comprehensive world legal order which in particular would guarantee the inviolability of contracts and property rights. The MNC might be given some legal status before the World Court to sue governments that expropriate their holdings. While the business realist would find such a development unlikely, still any move in this direction would help to eliminate some political risk.

Vision 2: (optimistic) Eventually nations might realize the benefits MNCs have to offer. They would realize that expropriated industry is not efficient. National governments might then remove tariff barriers (perhaps with a few exceptions), lower taxes, and remove all restrictions on the movements of capital and labor. Under such conditions, the MNCs would soon rationalize production, realize world-wide efficiencies, and bring a sustained, steady growth to all nations of the world.
ARGUMENT IIb: THE INTERNATIONALIST VARIANT

In some of the larger and more reflective MNCs, a further modification of the basic business argument has grown up which could be labeled the "internationalist" or "activist" line.

Further Assumptions

This line accepts most of the assumptions of the previous argument with a few significant additions.

5) Concerning the evils of the nation-state, this line adds a normative judgment of the malignant disutility of the present political organization of the world into nation-states. Nations have done little to help and indeed have been a positive hindrance to the advancement of human society in at least two crucial areas:

a) The nation has failed to bring about a peaceful world order. Nationalism as an agent of nation-state cohesion has in fact encouraged prejudice, racism, and aggression.

b) The nation has failed largely to fulfill the economic needs of its citizens. Instead huge government expenditures are diverted to military spending, money which could have been better spent on growth and development.

6) The nation-state is an antiquated institution tottering on the brink of collapse. In spite of growing public resentment, the
nation-state has shown itself insidiously capable of defending itself in any direct confrontation. Hence the displacement will occur as an incremental process. The mechanism for this displacement is good, old-fashioned functionalism (but not neo-functionalism).

7) At this point the argument can be enlarged with all the assumptions of functionalism:

a) Since the nation-state is still quite capable of defending itself in any direct challenge, the "withering away" will commence at the fringes of the system in very remote, non-controversial areas.

b) Contemporary life is becoming increasingly complex. The current problems Washington is having with the economy merely underscore this point. Confronted with highly technical routine operations, the state will increasingly come to rely on apolitical technicians to manage these operations.

c) Technicians are better problem-solvers than political hacks and Congressional lawyers and so will succeed at their assignments.

d) As success is realized in one area, pressure will mount to turn over other problem areas to the expert.
e) Sub-assumptions b through d describe a positive feedback loop or spillover mechanism, which once begun can only be stopped with great difficulty.

f) Transnationalism flourishes. International actors bloom everywhere. Nations bask in the new prosperity, blissfully unaware of the fact that their old responsibilities and perogatives are quietly, yet ineluctably being stripped from them.

g) Eventually nation-states are reduced to honorary, titular status not unlike the British monarchy. The world is transformed into one vast marketplace where production rationalization may proceed without the hindrance of national boundaries.

**Political Behaviors**

The behaviors suggested in the original argument are viewed as too passive given this revised world situation. Hence, an entirely new set of behaviors is called for.

PB1) MNCs are transnational actors must recognize that they are in the vanguard of world transforming agents.

PB2) While the functionalist process is largely deterministic, MNCs are seen as having an activist, catalytic role. In particular the MNC must prepare world opinion for the coming global
transformation. MNCs should take the offensive in pointing out the ills of the present system. Government regulation is a particularly fruitful area for raising public indignation against the nation-state.26

PB3) In a positive vein, the MNC must stress the benefits of the new system. In addition to those benefits listed under PB4 in the Orthodox Argument, the following are proposed:

d) MNCs can bring "world peace through world trade" (as the IBM logos reads). In other words, through fostering international dependency, the MNC can rule out the option of aggressive warfare due to the terrible costs accruing to the aggressor of the disruption of its own transnational links in the war.

e) MNCs can bring an end to nationalism and prejudice through its truly cosmopolitan organization. The MNC, owing allegiance to no country, can offer advancement to high managerial positions to all people regardless of race, nationality or creed.

Sources and Evidence

The Orthodox Argument

So many papers have been written to show the benefits of the MNC that it would be impossible to report them all here. Therefore, merely
a small sample will be presented to illustrate the key points of the argument. Much of the literature has been stimulated by the argument interface between this and the various arguments listed under category one.

Contrary to Argument Ic, many studies attempted to show positive balance-of-payment impacts, such as Martyn, Elrod, and Vernon (1971). A counter to the job export argument is given by Business International (1972) and Stobaugh (1972).

Contrary to Argument Ia, one finds MNCs still being called the engines of development in Crookell (1975) and Vernon (1971). Diffusion of technology evidence is found in Mowlana (1975) and Ginsburg (1973). The assertion that MNCs rationalize world production is supported by various studies: that MNCs raise world employment (Elrod, 1975), that world production would decline with further restrictions on MNCs (Perlmutter, 1973) and through building economic models of direct investment benefits (Brems, 1970).

Numerous studies have attempted to demonstrate MNC powerlessness (in support of Assumption 3): by simply listing MNC nationalizations around the world (Said & Simmons, 1975), by advocacy of joint ventures (Robinson, 1964), through studies of conflict between the MNC and nationalism (Fayerweather, 1969, 1975) and the propensity to expropriate (Knudsen, 1974), through studies of the political exposure problem (Cahn, 1972), and the lack of political risk monitoring by MNCs (Root, 1968), and finally, studies of OPIC (Haendel & West, 1975).
The legalist Vision 1 is presented in Lillich (1975). The "hostage" model has been thoroughly elaborated by Moron (1974). Moron in fact argues that MNCs are most powerful just prior to investment, as site choaser, most vulnerable after selection and investment, as hostage. Naturally, MNC investors dwell on the latter condition.

The Internationalist Variant

In a survey of 166 senior international executives, Duerr and Greene (1968) found problems—Nationalism 68%, US government restrictions 66%—listed first. MNCs are pictured as the pioneers of internationalism by Turner (1971) and Fayerweather (1975). The nationality mix of MNC staffing is studied by Franks (1973) and Guvenc (1973). The MNC as integrationalist is presented by Couloumbis and Georgiades (1975), and the MNC as bringing convergence between the superpowers by Irving Horowitz (1975). Attempts by business to affect public opinion are studied in an antagonistic way in Global Reach, Chapter 5. In addition, there are the various statements of managers in support of Globalism reported in that book.29

Critique

The most questionable assumption of the argument is that of the separability of political and economic factors (which makes this argument unique). For a more complete discussion of this problem see Spero (1977). If this assumption is flawed then all of the volumes of
statistical material that have been gathered in support may be wide of the mark. All the purported benefits must then be weighted against Argument I's political costs, such as dependency and neo-colonialism.

As with Argument Ia the term "power" is used very sloppily in determinations of whether the firm or the state has the upper hand. This argument emphasizes the expropriative (possession) power of the state, while Argument I emphasizes the capacity of the firm to affect the environment of the state (milieu power). Argument III will suggest that the truth lies somewhere in the middle.

Finally, to the extent that the Globalist variant ties itself to the functionalist process, it suffers from the numerous flaws in that doctrine cited by the neo-functionalists and other reviewers. Functionalism in the international organization was to involve the transfer of loyalty from the nation to that body. Similarly, Globalism transfers loyalty to the corporation. This simple process overlooks the possibility of multiple loyalties. The loyalty one feels for a job may not affect the loyalty one feels for country. Furthermore, is there reason to believe loyalty formation is a rational process, to be awarded to the most efficient organization? There are problems with the determinism of the feedback or spillover loop. The neo-functionalists argue that learning is not automatic or transferable from one context to another, but rather based upon the perception of self-interest. Finally again there is the power as separate from welfare issue, the politician versus expert. It is
very difficult to imagine what a totally apolitical person or organization would look like.

Summary

Both parts of Argument II specifically deny any linkage of the MNC to national government of either parent or host countries. The Orthodox Business line would attempt to place the MNC in a special realm out of the reach of the political concerns of national governments. Such issues as loyalty to the nation are simply inappropriate in this context. The Globalist starts from the same premise but sees the MNC eventually superseding the nation-state in all its capacities. And what becomes of the state's political powers? Evidently it is to be a world without politics.

The chapter turns now to Argument III which denies any deterministic link of the MNC to national governmental policies, yet maintains that the MNC operates in the same realm as the national governments.

ARGUMENT III: MNCs AS INDEPENDENT INTERNATIONAL ACTORS

Consider for a moment the interface between Arguments Ia and Ic. The former pictures the MNC as the "running dog" of US foreign policy interests and cites the examples of Iran, Guatemala, Liberia, and Chile. The latter pictures the MNC as the nemesis of US foreign policy interests and cites Saudi Arabia, Nazi Germany, China, and
Angola. Taken together the contrary examples serve as evidence of the MNC's political independence. The examples in sum imply no necessary congruence or anti-congruence of MNC and parent national government interests. MNCs appear to have an independent set of political interests, at times causing them to align with the parent government, at times with the foreign host government. MNCs seek to influence political outcomes that effect their interests whether the governmental decision-making process is at home or abroad. These influence-seeking interactions constitute MNC diplomacy and the foreign policy of the firm, as the term is now used in speaking of the "foreign policies of publics" (Alger, 1977). These MNC foreign policies may not be articulated to the public, but in that regard would they be very different from the example of most national governments.

While the consideration of this sort of argument is hinted at by the Kautsky Line, the Reformist Position, and the Internationalist Business Variant, it is expressed directly only by recent transnational interaction writers. In Keohane and Nye one finds numerous references to this position:

In addition multinational firms and banks affect both domestic and interstate relations. The limits on private firms, or the closeness of ties between government and business, vary considerably from one society to another; but the participation of large and dynamic organizations, not controlled entirely by governments, has become a normal part of foreign as well as domestic relations.

and further

(The) condition of complex interdependence, multiple channels of contact among societies, further blurs the distinction between domestic and international
politics. The availability of partners in political coalitions is not necessarily limited by national boundaries as traditional analysis assumes. The nearer a situation is to complex interdependence, the more we expect the outcomes of political bargaining to be affected by transnational relations. Multinational corporations may be significant both as independent actors and as instruments manipulated by governments.31

The transnational interaction approach to the study of international relations is a relatively new field and as yet the view of MNCs as "independent actors" has not been developed very completely. (Notice the way Keohane and Nye hedge on many of their assertions—"may be," "likely.") One of the primary questions facing this approach is that of the significance of many of the new actors studied. One sees evidence of growth in the number of many transnational actors, increases in MNC and INGO activity. Yet the question remains, what impact are these actors having? Can one weigh the political influence they peddle? Keohane and Nye make reference to "projections that in the year 2000 a handful of multinational corporations will control most of world production, and wield greater power than governments."32

To what extent is that control of production monitored or shared with governments—how is it translated into political influence or power? While there are many such questions to be evaluated, the promise of this field is great and should attract the concern of political scientists now studying the MNC with the hope of making a research contribution to the discipline. While this argument has not yet been articulated very systematically, the author will attempt to sketch an incomplete skeletal framework, suggesting possible options
for development. Complete fleshing out would be a dissertation in itself.

Assumptions

1) Again one must confront the question of the intermingling of the political and economic realm. There is too much evidence of corporate activity at influencing political outcomes at the federal level of this country to deny that corporations have a lively interest in political decisions. Some will argue that this is only the result of growing governmental involvement in the economic sector. But whatever the reason, business firms have entered the political arena.

2) MNCs act upon their interests and seek political influence, as revealed by the existence of the campaign slush fund, the business lobbyist, and overseas bribes. This is not to say that attempts at influence are always successful or preponderant. One first must assert some process for describing the scope and limits of MNC political influence.

A novel analogy is presented by economist W. Mark Crain (1978) who suggests that one conceive of political influence as a commodity and bargaining between interest groups and politicians as a market transaction between demanders (business interests) and suppliers (friendly politicians and corruptible bureaucrats). Crain then asks how competitive is the market. The analogy suggests the applicability
of the market concentration lexicon: are there markets that can be labeled "monopsonistic"—only one buyer? Crain concludes that for the US government, the market is fairly competitive with the rival influence of labor and consumer groups (recalling the countervailing power concept of Galbraith (1952)). But as with assessing market concentration, it is not enough to show that rivals exist but to determine their relative "market shares." Furthermore, are there not smaller "markets," say in the interaction between MNC and some LDCs, where the countervailing power of labor and consumers is small or absent, and one corporation may exercise near hegemony over public policy influence?

While the market analogy is far from perfect, it does give some guidelines to this description. Whether one refers to them as "markets," bargaining interfaces, or policy inputs, the diagram (Figure 2) demonstrates the influence interaction points for a typical MNC.

The box representing the MNC itself could be further broken down to reflect intra-company bargaining between various subsidiaries or divisions of a given firm. Interaction "a" describes the domestic relationship of the firm to the state. Reflecting on Keohyne and Nye—"the closeness of ties between government and business var considerably from one society to another"—one would look here to explain the differences between the US and Japanese governments and their firms. Interaction "b" reflects the policy of the firm toward host nations or the "foreign policy" of the MNC. Interaction "c" reflects the
FIGURE 2

MNC Interactions
international "diplomacy" between firms of various countries. This linkage ties the figure into a system of similar interactions of other firms with their respective parent and host nations.

One brief example will demonstrate the usefulness of this conceptualization. Consider the synthetic rubber cartel of the '30s. Standard of New Jersey (concerned about German synthetic gasoline research) and IG Farbenindustrie (concerned about the spread of synthetic rubber technology) concluded a series of agreements on November 9, 1929 to limit research in each others fields, to divide world markets, and to exploit jointly synthetic rubber processes (Standard's butyl process and IG's electric arc and buna process) through Jasco, a jointly held company. IG was also concerned about the spread of Du Pont's own neoprene process. Prior to the Standard agreement, IG had followed a policy of playing the two US companies off against each other, but afterwards Standard agreed to consult with Du Pont on IG's behalf and in 1938 a Du Pont-IG agreement was reached (respecting each others synthetic rubber markets, and dividing interests in synthetic nitrogen and acetic acid).

The Nazi government of course objected to IG sharing its "secrets" with the US companies and attempted to block release of the buna process. Standard responded by condemning the German government's interference in IG Farben's policies. As the war approached, Goodrich and Goodyear were clammering for release of the patents Standard held. Standard continued to temporize pending further agreements with IG. Even as the war broke out, on September 25, 1939 Standard and IG
worked out a **modus vivendi** for relations during the war regardless of US entry and beyond!

After Pearl Harbor, the US Justice Department stepped in and sued the Standard-IG cartel. Through a consent decree both buna and butyl were made available to the US rubber companies without royalties. The US government charged that through its efforts to dominate the synthetic rubber industry, Standard had retarded development of the synthetic technology (made vital after the loss of SE Asian natural rubber), and seriously threatened the war effort. This example diagramed in Figure 3 shows the complex working of all three interfaces:

a) Court battle between US Justice Department and Standard,

b) Standard's condemnation of German government restrictions on IG.

c) Standard's cartel agreements with IG and Du Pont and conflicts including a court fight with Goodyear and Goodrich.

This example also presents evidence of the third and last assumption of this argument--

3) There is no necessary congruence of interests between MNCs. The interest of various MNCs are largely independent of each other though coalitions may be formed as in this case, the chemical versus the rubber firms.
FIGURE 3

Standard Oil, NJ, Interations
Political Behaviors

If one accepts this conceptualization of the MNC to national government interaction, one is still left with many questions about the processes behind those interactions. Keohyne and Nye's statement, "Multinational corporations may be significant both as independent actors and as instruments manipulated by governments," implies a broad spectrum of interaction from independence to control. IG's working relationship with the German government was different from that of Standard's to the US government. To what extent is the influence of the MNC on the "b" (host nation) interaction felt, particularly when the host is an LDC? To what extent does the MNC have control of the "market" for "political influence"? Can one stipulate the variables which might explain the amount of influence an MNC is likely to have? Very likely these variables are not the same on each of the three interactions, but the author will concentrate on the "b" host to MNC relationship.

PB1) The amount of influence an MNC can exert on a given policy process can be formulated:

\[ I = x_1 + x_2 + x_3 + \ldots + x_n \]

where the following are possible candidates for independent variable, x:
Ideology of the government in regard to economic relations.

How do government officials perceive the role of government in business? Do they believe in strong regulation or laissez-faire? Do they perceive MNC's as engines of development or instruments of US imperialism? (Do they subscribe to one of the arguments given here?) For example, Moran suggests that for Chile, periods of resurgence of government belief in liberalism resulted in the relaxing of restrictions on MNC investment and increased incentives for investment.

Amount of governmental discipline and effectiveness.

In part the author is borrowing Myrdal's "soft state" concept to ask how open are governmental workers to persuasion and bribery, and how rigorously are policy directives carried out. To what extent to officials place loyalty to the government, to their bureau, ahead of personal gain? While Myrdal developed this term for application to LDCs, it is quite applicable to many developed states, as bribes in Italy, Belgium, and campaign fund irregularities in this country indicate.

Relative size and amount of penetration.

How big and important is the MNC investment in the local economy? Consider the title of a recent article: "Do Corporations Capture Local Communities?" (Leibowitz, 1978) This article raises the popular question of whether giant corporations might not come to dominate smaller political units by their very size. Studies have been done of Du Pont influence in the state of Delaware (Bauer, et al., 1972, Phelan and Pozen, 1973). While a nation the size of the US has yet to meet its match in terms of wealth of a single corporation, what about United Brands in Honduras? A related issue is the extent to which the MNC has penetrated the economy. United Fruit owned railroads, stores, port facilities, radio stations, schools, hospitals, and considerable real estate in several Central American countries at one time. Even on a less extreme scale, one expects MNCs that are seen as vital to the health and growth of the economy to have more inputs to a local policy process and possess more bargaining chips in negotiations over economic issues.
The number of rival interests.

If nothing else there seems to be a perception that a good cure to the previous condition is to invite in more investments. Middle Eastern oil countries pushed hard for this arrangement in days past, demanding that consortia expand their memberships wherever possible. The most frequently given reasons for this phenomena is to prevent dependency on a single firm (as in \( x_3 \)) and to be able to play rival firms off against one another.

There are many other variables that could be considered as candidates: the location of a given MNC in terms of industry (strategic, extractive, vital resources), the past history of relations with a given MNC, how long the MNC has been there, the relations of the host government with the MNCs parent government and so on.

This discussion has raised many unanswered questions and could raise many more, such as the relative weights of the variables, what the equations might be for interactions "a" and "c", what issues are MNCs most likely to lobby and so forth. The author's hope is not to construct an entire argument, but merely to suggest directions and stimulate thought. The broad outlines for considering MNCs as independent actors already exist here in the field of transnational interaction.

More of the explanatory work as that which has been attempted here must be done. The flaw with much of the work done under the transnational interaction label, is that while it has been quite descriptive, it lacks attempts at explanation or "theorizing." This flaw can be seen in a recent book (Mansbach, et al., 1976) which uses an events data approach to describe the interactions of non-state
actors. In this case the authors find that non-state actors account for more violent-conflictual interactions than nation-states, a seemingly astounding statement which nonetheless has no meaning outside some theoretic perspective. Hence, several alternative conclusions are possible. Defenders of the status quo will use such a finding to argue that since these groups are more violent, they should rightly be denied status in the nation-state system. Others will argue that the news media sources are biased in the direction of reporting non-state actor violence rather than cooperation. Others will argue with the definition of violence—nation-states are perhaps more adept at using structural violence. Mere description does not aid one in making these choices of interpretation.

Summary

Table 2 again lays out the arguments for comparison. Strikingly evident from this table is that arguments that begin from very different premises conclude with similar predictions for the future. Arguments Ia, Ib (Leninist), and IIa see a subservient or declining role for the MNC. Arguments Ib (Kautsky), Ic, IIb and III foresee an independent and sometimes growing impact for the MNC.

From this table, one can see how the basic question of the dissertation would be examined differently if a different context had been chosen. For example, a study of cartel formation from the perspective of Argument Ia or Ib (Leninist) would emphasize the role of the MNC as emissary of the hegemonic, imperialist power. Cartel
### Table 2
Comparison of Arguments Across Issues

<table>
<thead>
<tr>
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<th>ARGUMENT I</th>
<th>ARGUMENT II</th>
<th>ARGUMENT III</th>
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<td>Marxist</td>
<td>Reformist</td>
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<td>Assumption: economic</td>
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<td>Kautsky</td>
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formation by Third World producing states is seen as a form of uniting against the oppressor. Hence, such a study would emphasize the confrontation between MNC and national government. The story of OPEC becomes the story of a successful challenge to the US oil companies' domination of world oil. The question, do MNCs benefit, would have no meaning under this perspective. The possibility of cooperative behavior between the MNCs and the cartel forming governments would be unimaginable given the contradictory interests of the two groups. An unexpected finding of MNC increased profitability after the intervention of cartel formation would be interpreted as showing that the cartel governments had in some way been co-opted by the companies.

From the context of the business arguments (IIa & b) the question could be posed, but its answer would not have much in the way of political implications. The question of the firm being "seduced" away from the parent government's interest (the major concern of Argument Ic) would not concern the proponent of this line. In the orthodox position business firms do not have political loyalties and concern themselves only with the question of risk and return. An account of cartel formation by this line would picture the MNC as a hapless victim caught in the crossfire of conflicting parent and cartel government demands.

Neither of these two sets of arguments (Ia, b or IIa, b) would see the MNCs as having much independent maneuvering ability. This is not the case with the context chosen here. Taking Argument III as
the referent, cartel negotiation is seen as a complex bargaining process in which each MNC maneuvers to maximize its own self-interest.
Footnotes for Chapter Two

1 See Buckley (1977).

2 Biersteker (1978) deals specifically and thoroughly with this subject, employing much the same argument terminology used here.

3 Some recent articles by political scientists have taken this approach (Miller and Kilpatrick, 1976).

4 The same congruency would be found in other nations as well. Attention focuses on the US as the pre-eminent power.


6 Concerning PB2, references are made to an international system of dependence (p. 29). Concerning PB1, chapter four deals with the various ways US MNCs strengthen US political power abroad. Concerning PB2, chapters six and seven deal with the MNC's role in retarding development in Third World countries, PB2c transfer pricing is discussed in chapter eleven. Concerning PB5b and related charges of cultural imperialism, see pp. 30-33. European counter-attack, see p. 39.

7 He cites Rosenau (1973).


10 Gilpin (1975) outlining the Marxist position, p. 140.

11 Ibid., p. 140.


16 Ibid., p. 138.

17 Ibid., p. 140.

18 Ibid., p. 140.
Concerning the export of jobs, PB2, see Chapter eleven "The Obsolescence of American Labor," which cites plant relocations and multiple sourcing to neutralize the strike. "...the power of corporations to neutralize the strike weapon is not merely theoretical," p. 308. Concerning government control of the domestic economy, PB6, there is Chapter 10, "The Managerial Dilemma of the Nation-State," where examples are given (Euro-dollar market) to prove this point. "These experiences illustrate the loss of a crucial aspect of national sovereignty, the control of the domestic money supply," p. 283.


Weinberg (in Said and Simmons, 1975) which while it presents that former labor leader's personal views and not the official policy of the UAW; nonetheless, is typical.

This strategy is clear in Mobil Oil's latest advertisements in the New York Times.

In Said and Simmons (1971), p. 41.


Ibid., p. 34.

Ibid., p. 40.

The information in the following account is from Chapter 3 of Stocking and Watkins (1946).
Chapter Three: The Research Design

The purpose of this chapter is to spell out the research design of the dissertation. Primary emphasis is placed both on the selection of the research technique, the quasi-experimental design, and the selection of the two industries for this design. The term "quasi-experimental design" actually refers to a set of alternative time-series designs presented by Campbell and Stanley (1966). These designs have in common the application of experimentation logic to ex-post-facto research problems, that is, to situations where the experimental intervention (e.g., the presentation of stimulus in stimulus-response experiments) has already occurred and was not administered by the researcher.

SELECTION OF THE QUASI-EXPERIMENTAL DESIGN

Campbell and Stanley (1966) have clearly stated the value of the quasi-experimental design approach:

There are many natural social settings in which the research person can introduce something like experimental design into his scheduling of data collection procedures (e.g., the when and to whom of measurement), even though he lacks full control over the scheduling of experimental stimuli (the when and to whom of exposure and the ability to randomize exposures) which makes a true experiment possible.¹
This statement of affairs is quite applicable to the query presented in this dissertation. With the possible exception of simulation, no research design would allow full experimental control for examining the impact of cartel formation on corporate profits. Nonetheless, a time series of quarterly profits could be generated for periods preceding and following the cartel's formation. A fairly discrete intervention point is provided by the cartel's first price increase which in effect signals the firms that their costs are rising. Thus quasi-experimental design has been selected as the research technique for this study.

The next task is to choose among the various quasi-experimental designs discussed by Campbell and Stanley and others. The previously mentioned example of yearly oil company profits, such as the one presented in Time, represents a crude form of time series experiment. In this case the viewer is invited to compare visually the profit levels before and after the intervention (the X in Campbell and Stanley's terminology) of the oil embargo of 1973.

When this design is applied in a rigorous manner (as Design #7), it can allow some meaningful comparisons of the time series before and after the intervention point. But a major problem of internal validity exists for this design. In the words of Campbell and Stanley, the "failure to control history is the most definite weakness of Design 7." That is, the rival hypothesis exists that not X but some more or less simultaneous event produced the shift.

Of the other possible design, number 14, the multiple time series design seems most applicable to the research here. Represented:
FIGURE 4

Oil Profits

Source: Time, October 24, 1977
this design involves multiple observations (0) of the experimental group (in this case the company profits of the cartelized industry) before and after the intervention (X, the cartel price increases) as well as concurrent observations of a similar industry which experienced no such intervention. This design benefits from the fact that it allows two sets of comparisons, the experimental industry to itself before and after the intervention and that industry to the second or "control" industry.

Concerning issues of validity, Campbell and Stanley argue that Design 14 is relatively free of the internal validity problems (history, maturation, etc.) that plague other designs, but is troubled by issues of external validity or generalizability. Since the testing involves after the fact examination of financial reports, the author would expect the test itself to be nonreactive (have little impact on the phenomena under study). Nonetheless, the generalizability issue remains. It will be interesting in itself to know whether the given industry did realize benefits from cartelization, but to then suggest any industry outside the two studies would likewise benefit could not be done without extreme caution.

The most difficult task in using this design is the selection of the two similar industries to serve as the experimental and control groups. The problem is a critical one; consequently the rest of this chapter is devoted to the task of selecting the two groups. After a careful examination of various raw materials, the bauxite industry
was chosen as the experimental group, and copper as the control
group.

1) Concentration and Characteristics of the Major Exporters. Both
   bauxite and copper are produced by a small number of LDCs. Iron ore,
tungsten, and nickel all have major DC exporters. Tin, however, is
produced primarily by LDCs.

2) Concentration and Characteristics of the Major MNCs Involved in
   Extraction. Both bauxite and copper are produced by a handful of
   large vertically integrated firms. Both industries are dominated
   by North American firms. Iron ore, tungsten, and tin are not so
   vertically integrated. Tungsten and tin have many non-North American
   firms involved which could lead to data gathering problems.

3) Demand Elasticity. Demand for bauxite and copper is considered
to be inelastic in the short to medium term. Demand for most of the
metals named is inelastic in all but the very long run, though tin
is considered more elastic than the other.

4) Substitution. Bauxite and copper are not near substitutes for
each other. Under some limited conditions, aluminum (the final
product of bauxite) and copper can be intersubstituted, but as will
be shown those conditions do not apply in the 1970-78 time frame of
this study.

As has been stated in Chapter One, the main benefit which MNCs
are alleged to receive from cartel formation are increased profits.
Having chosen bauxite as the experimental group and copper as the control group, the next step was to operationalize the term "profits" as being quarterly earnings for the firms in each group. A relative percentage index of earnings adjusted for inflation was calculated from these quarterly earnings to serve as a time series, one for each group. Through regression analysis, comparisons were made for the means and slopes for each industry before and after the intervention point. The details of this latter research process are elaborated in Chapter Five.

SELECTION OF THE INDUSTRIES FOR COMPARISON

As suggested earlier, the first task in realizing this research design is to locate two industries, one in which a producer nation cartel has been formed and one of similar characteristics in which no cartel has been formed. The selection of the bauxite and copper industry was the result of a long search. The details of that search follow.

To begin with, the author has limited the set of primary commodities to be considered to metals alone. The author assumes that differences between agricultural and mineral production are great, particularly on the supply side. The supply of most agricultural products comes from a mix of small independent producers and large plantations or farms. The opening of a mine on the other hand is a large, long term investment normally undertaken only by a large firm.
or consortium. Whereas agricultural producers may shift the amounts
and mixes of crops at each planting, metal producers are loath to
close a mine at any time (due to the high restarting costs of a mine
that has gone unmaintained), particularly when the grade of ore from
that mine feeds a long, vertically integrated processing chain. Thus
the elasticity of supply for most agricultural products is slightly
higher than that of mineral products.

Joint Supply and Intersubstitution In Consumption: The Minor Metals

A distinction is made by tradition and the industry between major
and minor metals. The main difference is in levels of production.1
Whereas the major metals—iron, copper, lead, zinc, gold, silver,
aluminum, nickel, tin, uranium—have nearly all been produced and
consumed in large amounts for over the last 50 years, the production
levels of minor metals are significantly lower and of more recent
vintage. A list of minor metals would include:

<table>
<thead>
<tr>
<th>Antimony</th>
<th>Cesium</th>
<th>Indium</th>
<th>Rare-earths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>Cobalt</td>
<td>Lithium</td>
<td>Rhenium</td>
</tr>
<tr>
<td>Beryllium</td>
<td>Columbiun</td>
<td>Mercury</td>
<td>Rubidium</td>
</tr>
<tr>
<td>Bismuth</td>
<td>Gallium</td>
<td>Molybdenum</td>
<td>Scandium</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Germanium</td>
<td>Platinum-group</td>
<td>Selenium</td>
</tr>
<tr>
<td>Calcium</td>
<td>Hafnium</td>
<td>Radium</td>
<td>Sodium</td>
</tr>
<tr>
<td>Tantalum</td>
<td>Tungsten</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tellurium</td>
<td>Vanadium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thallium</td>
<td>Yttrium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium</td>
<td>Zirconium</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The minor metals have another common characteristic, something
quite confounding to their use here: joint supply and intersubstitu-
tion. Many of them are byproducts of major metals: cadmium,
germanium, indium and thallium from zinc ores, bismuth and antimony from lead ore (the problem is compounded by the fact that lead and zinc are often mined together). Many of the rest are byproducts or co-products of other minor metals: thorium, columbium, tantalum, titanium, zirconium, platinum-group metals from heavy sand deposits; beryllium, cesium, lithium, scandium from pegmatite deposits. Indeed there are only three minor metals mined individually on a large scale: mercury, molybdenum, and tungsten (though tungsten and molybdenum are often found associated).

In meeting the requirements of the proposed quasi-experimental design, it is necessary that the two industries, while similar in their characteristics, be nevertheless independent of each other. If the production of the two metals is interdependent, if the same group of firms produces the two metals, then the experimental change is liable to affect the control metal as well. Same firm production is no problem if the metals are produced by independent subsidiaries of the firms with separate accounting of prices and profits, but this independence is impossible where the metals are mined or processed together. Thus, for the minor metals one finds conglomerates like AMAX which is a major producer of lithium, tungsten, cesium-rubidium, and molybdenum, and also a producer of major metals, iron ore, copper, lead, zinc, and nickel. If for such firms independent accounting for subsidiaries is not maintained, the firm will be excluded from the group.

With the possible exception of mercury and tungsten, the problems of limited production, joint supply and intersubstitution have led
the author to rule out the minor metals as a group.

Joint Supply: The Major Metals

The same problems mentioned above have caused the author to question the use of lead and zinc in the study. As can be seen from the table below, the same US firms have the lion's share of lead and zinc production. This merely reflects the fact that lead and zinc deposits are often found in association.

Main firms producing:

<table>
<thead>
<tr>
<th>Lead</th>
<th>Cadmium</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMAX</td>
<td>AMAX</td>
</tr>
<tr>
<td>ASARCO</td>
<td>ASARCO</td>
</tr>
<tr>
<td>Bunker Hill</td>
<td>Bunker Hill</td>
</tr>
<tr>
<td>St. Joe Minerals</td>
<td>G &amp; M Natural Resources</td>
</tr>
<tr>
<td></td>
<td>National Zinc</td>
</tr>
<tr>
<td></td>
<td>St. Joe Minerals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zinc</th>
<th>Molybdenum</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMAX</td>
<td>AMAX</td>
</tr>
<tr>
<td>ASARCO</td>
<td>ASARCO</td>
</tr>
<tr>
<td>National Zinc</td>
<td>Climax Molybdenum</td>
</tr>
<tr>
<td>New Jersey Zinc</td>
<td>Duval Corporation</td>
</tr>
<tr>
<td>St. Joe Minerals</td>
<td>Kennecott Copper</td>
</tr>
<tr>
<td></td>
<td>Union Oil</td>
</tr>
</tbody>
</table>

There is one other type of dependence which must be considered, demand for major alloys such as brass (copper and zinc) and stainless steel (iron and nickel). Since this dependence occurs in the consumer market of the metal (i.e., INCO sells nickel to U.S. Steel, which makes the stainless steel), it does not rule out using either, just their conjunction.
Ideally the author is hunting for firms where the clear major share of production is in one metal (i.e., ALCO in aluminum, INCO in nickel).

The Experimental Group: The Bauxite Cartel

The author is sufficiently intimidated by the wide opinion that oil is an exceptional case to attempt to compare any other primary commodity with it. Outside of OPEC, the greatest producer cartel success story at this time is probably the IBA, the International Bauxite Association. Between 1974 and 1976 the bauxite nations imposed tax levies which more than doubled the price from $8-12 to $20-30 a ton. The IBA formed in 1974, consists of Jamaica, Surinam, Guinea, Guyana, Australia, Sierra Leone, Yugoslavia, and later the Dominican Republic, Haiti, Ghana, and Indonesia. This group by 1975 accounted for 85% of total non-communist world bauxite production. Furthermore the aluminum industry is quite vertically and horizontally concentrated consisting of firms like Alcoa, Kaiser, Reynolds, and Alcan, all of which deal almost exclusively in aluminum. Robert S. Pindyck has created a model of the cartel (1977) and concludes that at present the cartel is operating at near optimal pricing. This means that the IBA is operating on the inelastic section of the bauxite demand curve, and though they have raised the price, it is not sufficiently high to lead to substitution by the aluminum companies of alternative ores. Alumina can also be taken from dawsonite, alunite, anorthosite, and high alumina clays, but these
processes are at present costlier. Furthermore, they are energy-intensive and as the price of natural gas rises so the optimum price of bauxite can be expected to rise even further. Pindyck states he has not considered the effect on the cartel of the monopsony power of the larger firms, nor has he considered how the cartel might be strengthened if the firms have adopted a cooperative attitude.

Bauxite is ideally suited to the needs of this dissertation, but let us consider briefly the possible alternative cartel candidates. In April 1975 the Association of Iron Ore Exporting Countries (AIOEC) was formed, but with no price fixing power. It is thus too early to judge whether AIOEC may yet develop into a cartel. By 1972 the main uranium exporters (Canada, Australia) were coordinating prices for that good. In April 1975 sixteen state and private uranium enterprises participated in the formation of the Uranium Institute as a permanent organization for price fixing. The US government has tacitly supported the cartel as a means of retarding nuclear proliferation. Thus the Uranium Institute has more resembled an MNC-developed nation condominium than a unilateral third world cartel. Mercury producers (Spain, Italy, Mexico, Algeria, Yugoslavia, Turkey, and Canada) have formed a producers' association, but here the concern is how to stope the decline in uses for the product rather than higher prices. There have been numerous other third world metal producer associations, but none have yet demonstrated the price fixing abilities of IBA.
Selection of the Control Group

Once the experimental group was determined the next step was to ascertain a group of firms comparable to the aluminum industry but at the same time independent of it. The next several pages present reports for several commodities which compare those criteria listed in the beginning of this chapter. The reasons for including some of the criteria are explored after the presentation of these tables.

Why Vertical Integration and Concentration are Important

In choosing two commodities for comparison the author assumes that industrial structure is of great relevance. In bargaining with producer nations, the amount of vertical and horizontal concentration directly effects the power of the MNC in negotiations over investments. The amount of monopsonist (buyer's control over price) and monopolistic (seller's control in final marketplace) power both affect the profit margin of the firms. Vertical integration in oil and bauxite has been an important factor in the success of the OPEC and IBA cartels. "Indeed, a large measure of vertical integration, a comparatively short transit time, and fewer independent decision-making centers between producer and consumer would lead to more effective coordination. Consequently, the accumulation of stocks would likely be smaller." The same point, "fewer independent decision-making centers," would apply to horizontal concentration since this would allow the firm greater accuracy in predicting the future
TABLE 3
Aluminum Report

<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Bauxite (Aluminum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Exporters:</td>
<td>Australia, Jamaica, Guinea, Surinam, Guyana, Yugoslavia, Sierra Leone</td>
</tr>
<tr>
<td>(producers*)</td>
<td></td>
</tr>
<tr>
<td>Concentration:</td>
<td>63% (production)</td>
</tr>
<tr>
<td>Profile:</td>
<td>Mainly LDC</td>
</tr>
<tr>
<td>Largest MNCs:</td>
<td>US—Primary Capacity—Alcoa 32.1%, Reynolds 19.8%, Kaiser 4.7%, CONALCO (Swiss Aluminum) 7.0%, Anaconda 6.1% Outside US—Alcan (Canadian), Pechiney (French), Vereinigte Aluminum (German), Swiss Aluminum.</td>
</tr>
<tr>
<td>Concentration:</td>
<td>US—above five firms have 79.7% capacity.</td>
</tr>
<tr>
<td>Vertically</td>
<td>Yes</td>
</tr>
<tr>
<td>Integrated?:</td>
<td></td>
</tr>
<tr>
<td>Demand elasticity:</td>
<td>Highly inelastic in short term (-0.2 short run, -1.0 long term)</td>
</tr>
<tr>
<td>Substitutes:</td>
<td>Clay, anorthosite (but energy intensive) Copper as substitute for Aluminum (?)</td>
</tr>
<tr>
<td>Producers' cartel:</td>
<td>January 1974</td>
</tr>
</tbody>
</table>

*Trade statistics for bauxite are unavailable. Much of the exports are internal company shipments and some of the bauxite is processed by the producer into alumina before export. Furthermore since nearly all the IBA members are LDCs, most of their production goes to export, whereas developed country production is used internally, the actual control of these countries of world trade is probably higher than 63%. Jamaica alone supplies 40% of US aluminum production,
### TABLE 4

**Copper Report**

<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Exporters:</strong></td>
<td>Chile, Zambia, Zaire, Peru</td>
</tr>
<tr>
<td><strong>Concentration:</strong></td>
<td>53% of world exports</td>
</tr>
<tr>
<td><strong>Profile:</strong></td>
<td>LDC</td>
</tr>
<tr>
<td><strong>Largest MNCs:</strong></td>
<td>Anaconda, Kennecott, Phelps Dodge, Roan-AMC group, Anglo-American, Union Miniere, INCO</td>
</tr>
<tr>
<td><strong>Concentration:</strong></td>
<td>54% world production (1969)</td>
</tr>
<tr>
<td><strong>Vertically Integrated?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Demand elasticity:</strong></td>
<td>Inelastic in short run</td>
</tr>
<tr>
<td><strong>Substitutes:</strong></td>
<td>Aluminum</td>
</tr>
<tr>
<td><strong>Producers' cartel:</strong></td>
<td>No effective cartel; Nov. 1974, April 1975 CIPEC attempted to restrict exports, but failed.</td>
</tr>
<tr>
<td><strong>Sources:</strong></td>
<td>Moran (1974)</td>
</tr>
</tbody>
</table>
### TABLE 5

**Iron Ore Report**

<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Iron Ore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Exporters:</td>
<td>Brazil, Chile, India, Liberia, Peru, Venezuela</td>
</tr>
<tr>
<td>Concentration:</td>
<td>34% (1967)</td>
</tr>
<tr>
<td>Profile:</td>
<td>LDC</td>
</tr>
<tr>
<td>Concentration:</td>
<td>In US—eight companies have 75% of domestic steel production and ore purchases. In Japan—four companies produce 80% of steel.</td>
</tr>
<tr>
<td>Vertically Integrated?:</td>
<td>Many firms are, others &quot;tied&quot; by long term contracts.</td>
</tr>
<tr>
<td>Producers' cartel:</td>
<td>AIOEC formed April 1975, but no price-fixing power.</td>
</tr>
<tr>
<td>Demand Elasticity:</td>
<td>Inelastic</td>
</tr>
<tr>
<td>Sources:</td>
<td>Mikdashi (1976).</td>
</tr>
</tbody>
</table>
### TABLE 6

Nickel Report

<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Nickel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Exporters:</strong> (World Mine Prod.)</td>
<td>Canada (35%), New Caledonia (18%), Dominican Rep. (4%), Indonesia (3%), Cuba (5%), Greece (4%), Botswana (2%). First four above have 60%.</td>
</tr>
<tr>
<td><strong>Profile:</strong></td>
<td>Mixed</td>
</tr>
<tr>
<td><strong>Largest MNCs:</strong></td>
<td>INCO, Falconbridge, Le Nickel, Patino N.V., AMAX Big three above have 74% of &quot;free world&quot; capacity</td>
</tr>
<tr>
<td><strong>Vertically Integrated?:</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Demand elasticity:</strong></td>
<td>Inelastic in short run</td>
</tr>
<tr>
<td><strong>Substitutes:</strong></td>
<td>Chromium for a few uses, none for all.</td>
</tr>
<tr>
<td><strong>Producers' cartel:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Sources:</strong></td>
<td>ABMS (1977), Metal Statistics (1974), Devereil (1975).</td>
</tr>
</tbody>
</table>
TABLE 7

Tungsten Report

<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Tungsten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Exporters:*</td>
<td>PRC (23%), US (18%), South Korea (10%), Canada (7%), Portugal (7%), Australia (6%)</td>
</tr>
<tr>
<td>(%) world supply</td>
<td>71%</td>
</tr>
<tr>
<td>Profile:</td>
<td>Mixed</td>
</tr>
<tr>
<td>Largest MNCs:</td>
<td>Union Carbide (15%), Sangdong Mine (S. Kor.) (7%), Canada Tungsten Mining Corp. (8%), Beralt Mines (Portugal) (8%), King Island Mine Australia (7%)</td>
</tr>
<tr>
<td>Concentration:</td>
<td>Above 5 have 45%</td>
</tr>
<tr>
<td>Vertically Integrated?:</td>
<td>Various degrees in integration, overall not very integrated. Many firms produce intermediate product.</td>
</tr>
<tr>
<td>Joint production:</td>
<td>Tungsten is sometimes found with molybdenum and tin.</td>
</tr>
<tr>
<td>Demand elasticity:</td>
<td>Very inelastic in short run</td>
</tr>
<tr>
<td>Substitutes:</td>
<td>No overall substitute, some substitutes for particular uses.</td>
</tr>
<tr>
<td>Producers' cartel:</td>
<td>None</td>
</tr>
<tr>
<td>Source:</td>
<td>James C. Burrows (1971)</td>
</tr>
</tbody>
</table>

*Though PRC has 75% of world reserves little has been done to develop or export large amounts. Even much less trickles into "Western" markets from various sources.


<table>
<thead>
<tr>
<th>PRIMARY COMMODITY</th>
<th>Tin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Exporters:</td>
<td>Malaysia (53.2%), Thailand (14.1%), Indonesia (6.6%), Nigeria (5.1%), Brazil (0.9%)</td>
</tr>
<tr>
<td>Concentration:</td>
<td>Above 5 have 79% world exports</td>
</tr>
<tr>
<td>Profile:</td>
<td>LDC</td>
</tr>
<tr>
<td>Largest MNCs:</td>
<td>Private—London Tin Corp., Patino Mining Corp., Anglo-American Corp. (S. Africa), Billiton (Shell) State—Pernas (Malaysia), Comibol (Bolivia)</td>
</tr>
<tr>
<td>Concentration:</td>
<td>Not available.*</td>
</tr>
<tr>
<td>Vertical Integration?:</td>
<td>Much less than oil or aluminum, many operators supply ore only.</td>
</tr>
<tr>
<td>Demand elasticity:</td>
<td>Inelastic in short run, but much more elastic in long run.</td>
</tr>
<tr>
<td>Substitutes:</td>
<td>Aluminum is technological superior for many container uses. Same with plastics.</td>
</tr>
<tr>
<td>Political agreements:</td>
<td>International Tin Council is a joint producer-consumer state attempt to stabilize and support prices through use of a buffer stock.</td>
</tr>
<tr>
<td>Sources:</td>
<td>UNCTAD 1972 trade data, Mikdashi (1976).</td>
</tr>
</tbody>
</table>

*The author suspects that any information in this group of firms will be extremely hard to obtain.
production of its rivals. Supply elasticity for the primary commodity would be reduced through the greater coordination and lessened stock accumulation within the firm.

Vertical and horizontal integration would also have an impact on demand elasticity and substitutes. Large vertically integrated firms have made huge investments in mining particular varieties of ores at particular locations. The entire processing line has been geared to handle the particular grade of ore used. Hence, the firm cannot switch ores without considerable expenses throughout the combine. Hence, an aluminum firm cannot change its grade of bauxite ore in response to higher prices demanded by producer nations without huge losses in the short to medium run. Furthermore, the existence of concentration may well signal barriers to new entrants in the industry. An investor building a bauxite to alumina convertor might have to rely on the beneficence of an existing aluminum firm as the seller of refined bauxite and buyer of its alumina. Since the competition of the newcomer might well mean excess capacity in the bauxite convertor of the existing firm, this beneficence might well be minimal. Even if the investor was grandiose enough to conceive of building an entire vertically integrated combine, the horizontal concentration of the industry which may well be the result of large economies to scale, name brand recognition, and existing long term customers, would intervene to saddle the newcomer with astronomical start up costs in the short to medium run.

As mentioned earlier, the aluminum industry is vertically and horizontally integrated to a large extent. Nickel is perhaps even
more concentrated, whereas copper is not quite as concentrated, and tin has a large fringe of independent suppliers. Tungsten lacks a standard pattern of vertical integration, with firms specializing if given markets for its use. Both tin and tungsten present research problems in that there are few North American firms involved, leading to difficulty in gathering the financial data required.

The Sources of the Commodity

The profile of supplying countries has been suggested as an important criterion to use in the selection of the industries; if one commodity comes from LDCs, it is argued that the other commodity should also be supplied mainly by LDCs. The author is not exactly convinced that supply conditions will be radically different in the developed vs. the developing world. In the 19th century, business cycles varied regionally a good bit (when US slumped, Europe boomed) but the interdependence of today's world economy has done much to eliminate the regional variations. The author is not sure that worker productivity or capital intensity is necessarily biased around a developed-developing continuum when the firms investing in LDCs are developed nation enterprises. From the author's point of view the inclusion of this aspect is a matter of preference. The author is interested in the phenomenon of third world producer state cartel formation and, as mentioned in Chapter 2, the inter-action between the MNC and the third world states. On this criterion, aluminum and copper match very well, but not nickel due to importance of Canada.
Iron ore is mined in many developed states; US, Sweden, and France to name a few.

The Issue of Substitution

It has just been shown that in terms of industry characteristics and the LDC sources, aluminum and copper match pretty well. Both commodities are dominated by a handful of large MNCs though copper is slightly less concentrated. There are one or two firms such as AMAX which produce both commodities, but after examining the volumes involved, AMAX seems clearly to be a major copper producer with only a minor interest in aluminum. For both commodities a majority of the raw material is mined in developing countries. Furthermore the products are roughly comparable in total volumes produced. Aluminum is the most widely used non-ferrous metal with copper a close second.

There remains just one final problem, to what extent are aluminum and copper substitutes for each other? If the two are near perfect substitutes, then one would expect higher prices and returns in the cartelized industry to lead to higher prices and rates of return in the control industry. The evidence of recent years have not borne out this prediction. Why are the two considered then as substitutes?

First, it must be pointed out that aluminum and copper are mainly exchangeable for only certain electronic applications. The copper beer can is not a likely possibility. Second, much of the long term replacement of copper by aluminum through the 50s and 60s
was the result of technological development in the aluminum industry to show the superiority of aluminum for many uses. While the electrical conductivity of aluminum is less than copper, aluminum weighs significantly less, making it ideal for lightweight uses.

Third and most importantly, it is bauxite and not aluminum which has been cartelized. At a price of $10 per ton, bauxite represents only 8% of the costs of producing aluminum, so that even if the price of bauxite doubles, the price rise in aluminum would be only 12%.

Finally, the issue of substitution may only be resolved in the very long term. At present the bauxite cartel is operating on the inelastic portion of its demand curve. If the price were to increase significantly above this point, one might expect to see a gradual shift of resources away from aluminum, but given the high industrial investments involved, this shift would be very long term. Given that the time frame of this dissertation is eight years including 1971 to 1978 with the cartel occurring in 1974, the author assumes that substitution will have an insignificant effect.

Summary

In this chapter, the quasi-experimental design was chosen and explained. The design #14 requires two groups, an experimental group and a control group. After a long search of potential primary commodity industries, one pair was selected which matched on a list of important criteria. Bauxite was selected as the experimental group and copper as the control group. To provide a firm contextual
background on this industry, an historical case study is undertaken of the aluminum MNCs in the next chapter.
Footnotes for Chapter Three

1 Campbell and Stanley (1966), p. 34.


4 The cut off production level is 75,000 tons according to Brooks (1965), p. 14.

5 Lead and zinc have been previously excluded. Gold and silver are excluded due to their monetary functions.


Chapter Four: The Aluminum Industry

With the selection of the aluminum industry as the experimental group, we turn now to a detailed analysis of the structure and development of that industry.

In this chapter, the author will trace the historical and technological development of the major aluminum companies. The author will employ the "MNC as independent actor" approach of Chapter Two to discuss the political interaction of the companies on three levels:

1) MNC to developed nation
2) MNC to MNC
3) MNC to less developed nation

At the end of the chapter the author will consider the materials from the perspective of each of the other arguments dealing with MNC political behaviors and discuss the relative merits of each in this particular case.

The major contribution of this chapter lies in providing a descriptive and historical context for analysis of the bauxite cartel and its impact on the MNCs. The importance of this context can not be underestimated. Too often political research becomes a sterile manipulation of data without a firm substantive comprehension of the context which generated the data. In later chapters where statistics are presented concerning Alcoa's profits or Alcoa's cartel behavior, it
is important to view this information in the context of Alcoa's long history of overseas policy making and prior attempts at aluminum agreements. Similarly IBA (International Bauxite Association) policies on tax levies must be viewed from the descriptive context of where the bauxite is located and how the industry has been organized and developed. The creation of just such a descriptive and historical context is the goal of this chapter.

THE USES OF ALUMINUM

A 1939 issue of Life magazine described aluminum as "the theme metal of the 20th Century." The dramatic increase in aluminum production since then has fulfilled that prophecy. Aluminum was then ranked fourth in total metal production: it is now ranked second, behind only iron production. Whereas steel production expanded at roughly the rate of GNP increase, aluminum grew three times as fast in the decade following WWII. Much of this expanded consumption can be explained in terms of the unique properties of the metal:

**Light weight**—aluminum has one-third the weight of copper, brass or steel. Due to this characteristic aluminum is ideal for aviation and other transportation uses. Aircraft alone explains much of the dramatic increase in production.

**Corrosion resistance**—unlike iron and steel, aluminum is not afflicted by rust, thus opening up nautical and architectural uses. These first two properties lead to uses in light-boats, aluminum ladders, outdoor equipment and aluminum oxide coatings
for buildings. The military has long been a major consumer which explains major production escalations during the wars of the century.

Electrical conductivity—aluminum has twice the conductivity on a pound by pound basis (but not volume) of copper. This property results in aluminum long distance transmission lines. However, the two metals cannot be mixed, and as most household wiring has traditionally been copper, aluminum cannot replace copper here.

Nontoxicity—aluminum gives off no toxic chemicals leading to its numerous cooking and packaging applications, aluminum cans, pots and pans, bottle caps, and foil.

In addition aluminum finds its way into paints and pharmaceuticals and even fibers in gowns. Aluminum has a low neutron cross section, does not interfere with nuclear chain-reactions, and hence has nuclear applications.

The Processing of Aluminum

Aluminum has one of the most complex processing chains of all the metals. Vernon (1971) suggests the huge economies to scale in the refining process have been the "trump card" of the aluminum industry explaining the persistence of vertical and horizontal integration. This process involved five major stages: mining, refining, power production, smelting, and fabricating.
Aluminum is the third most abundant element on the face of the earth, but freeing it from its numerous mineral combinations, has been no mean feat. Most aluminum is found in a hydrated oxide form with numerous impurities; that is, the oxide, alumina ($\text{Al}_2\text{O}_3$) and water are intermeshed with other minerals such as silica and iron oxide. Historically the low cost source of alumina has been an ore called bauxite. Bauxite ore can be classified as to the amount of water bonded to the aluminum: monohydrates ($\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$) such as Boehmite and trihydrates ($\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) such as Gibbsite. Due to technical specifications of the refining process, Gibbsite is the preferrable ore. In addition types of impurities and the amount of silica are lower in Gibbsite. Whereas Boehmite is the common bauxite of Europe, Gibbsite is found primarily in the tropics. Surinam, for example, is principally a gibbsite source. As a result there has been a steady movement of the mining stage away from Europe and the US toward the tropics.

Prior to WWII most bauxite mining took place in the developed states though operations were begun in British and Dutch Guiana in the 1920's. WWII did much to boost Third World sources and by 1948 the Guianas had 49% of the total. The fifties saw the rapid development of Jamaica as a source followed by Guinea after 1960.

The next stage is the conversion of the bauxite into alumina. Through a refining operation called the Bayer process, the impurities and water are removed. The fourth stage, reduction, needs copious amounts of electrical power. Hence, as a third stage a source of cheap
electricity, either hydro or thermal must be secured. Then the reduction of the alumina into aluminum takes place. Oxygen is liberated from a molten bath of alumina with a strong electric current, leaving behind metallic aluminum which is poured into ingots.

Finally in the fabricating stage, the aluminum is rolled into sheet, extrusions, wire, foil. Many of aluminum firms also engage in the manufacture of aluminum intermediate products and even finished consumer goods.

The prevailing technology has molded the structure of the industry around a few crucial points.

1) Economies-to-scale—sound technical reasons favor large processing. Bauxite refining in particular is a large scale continuous process. The costs in reduction favor at least a 200,000 ton capacity.

2) Capital intensiveness—the process requires large capital investments, even more so than in steel making.

3) Electrical power needs—electricity is required in such large amounts that it becomes a major component. Hence, the companies must negotiate large, low-priced power contracts from utilities or else acquire their own sources of power. As a result of numerous water power projects along the St. Lawrence and Tennessee rivers, Alcoa is itself in certain localities a utility company.

4) Internationalization—the very nature of the technical demands of aluminum making has forced the internationalization
of the firm. Bauxite must be mined in the tropics, alumina reduced near cheap electrical sources, and aluminum fabricated near consumer markets. Hence a typical European firm mines in Africa, reduces in Norway, and fabricates in France or central Europe. Furthermore, since it is cheaper to transport alumina rather than bauxite, there has been a gradual shift of alumina refining to the less developed nation bauxite sources.

In total these characteristics lay the groundwork for describing the industry today. It is an industry dominated by six major integrated international firms with control of the major share of everything from bauxite to fabrication. The next step is to trace this development historically.

Comparison with Copper Processing

Whereas the theme of aluminum's story has been the long search for a way to economically produce it, copper was being mined extensively in ancient times. The Egyptians used copper pipes in their plumbing; the Romans used it in their architecture. Copper was originally mined from veins so rich in the metal that little processing other than smelting was needed. But with time the purer veins have been exhausted. Hence the search has been for technologies to process increasingly impure forms of the mineral.

Today copper production involves the major stages—mining, smelting and refining though the exact processing varies with the specific ore. The "refining" and "smelting" stages are reversed from
those of aluminum, refining here is the final removal of miniscule impurities from the smelted copper. With western US ores this refining is done with an electrolytic process.

Narvin (1978) states that whereas aluminum reduction is the dominant stage in aluminum production, mining is the dominant stage in copper production, due in part to the complexity of ore types. In general, the copper majors have not integrated as far forward (marketward) was the aluminum companies—few copper majors own fabricators for example. The energy requirements are nowhere near as intense as in aluminum, but copper mining is very capital intensive. The physical assets per worker can be $100,000.

The copper industry has already attracted the attention of many political scientists. For greater descriptive material and analysis, the reader should see Moran (1974) and Brundenius (1972).

THE HISTORY OF ALUMINUM^2

Aluminum's first great benefactor was no less august a person than Napoleon III. Attracted by tales of the elusive metal's light-weight strength, he envisioned casting his French legions in aluminum armour. But unfortunately for the Emperor, the abundant aluminum oxide refused early to release its metal component. By mid-19th century small laboratory amounts of the metal existed, but at $115 a pound, aluminum was consigned to use as jewelry. Under the patronage of his emperor, St. Claire Deville developed a chemical reduction process by 1856. But while the Deville process made
commercial production possible, at $11 a pound, Napoleon III was forced to abandon his martial vision and content himself with being the only European monarch with his own set of shiny aluminum silverware. Nonetheless the Emperor's active interest established France in the aluminum race—the firm set up to exploit the Deville process was to develop into one of the world's major aluminum MNCs, Pechiney.

It was to be a few decades before simultaneous discoveries in the US and France allowed cheap commercial reduction of alumina to aluminum. Each of the processes involved the same electrometallurgical technique used even today, but resulted in a miasma of patent agreements. The manipulation of these patents set the basic structure of the infant industry. The French Herout patent (1886) resulted in the creation of two firms, a French firm to exploit the process locally and a Swiss firm to process aluminum in the rest of the world. The Societe Electrometallurgique Francais (Froges enterprise) entered into competition with the older Pechiney firm (still using the Deville process.) German backing played an important role in the Swiss Metallurgische Gesellschaft (1887) renamed first in 1888 Aluminum Industries AG (AIAG) and then in 1963 Swiss Aluminum (Alusuisse).

In the US the Pittsburgh Reduction Company (1888) emerged from early patent battles as the sole producer of American aluminum. Credit for the American version of the electrolytic process went to Charles Martin Hall of Oberlin, Ohio. Hall with the backing of Captain Alfred E. Hunt and shortly thereafter the Mellon family, began reduction in Pittsburgh. The first patent challenge came from
the Heroult patent, but the US Patent Office found in Hall's favor in 1889. The second patent challenge was from the older Cowles Brothers Electric Smelting and Aluminum Company which held a shotgun Bradley patent on any "heated electric arc" aluminum process. In an out of court settlement (1893), Pittsburgh Reduction paid Cowles $1.4 million to stop producing aluminum.

The Growth of Alcoa

Its patent problems resolved, Pittsburgh Reduction renamed the Aluminum Company of America (Alcoa) in 1907, was to enjoy a 50-year monopoly on aluminum production in the US. Alcoa could not long claim to be in an "infant" or "distressed" industry. Aluminum demand grew vigorously with decline in costs. From $5 a lb. in 1887, the price was cut to 75¢ in 1893, and Alcoa grew with the market. At a very early stage the management decided to expand not only horizontally with the market, but vertically with the processing chain. Ore refining had grown more appetizing with the 1888 Bayer process for extracting pure alumina from bauxite. Starting in 1896 the firm began acquiring bauxite deposits in Georgia. By 1903 they had an ore refining plant in East St. Louis. In 1906 the fledgling absorbed the General Bauxite Co. of Arkansas, the owner of most of the known high grade domestic deposits.

As the smelting production levels grew, so grew the need for electric power. In 1895 a plant was built near Niagara Falls, and in 1903 another at Massena by the St. Lawrence rapids. At the same time
the company developed a major Canadian project at Shawinigan Falls, Quebec and in 1906 purchased the St. Lawrence River Power Co. By 1910 Alcoa was selecting hydroelectric sites on the Tennessee River and soon owned utilities like Tapoco Power, and Nantahala Power and Light Company. Alcoa built a network of dams through the Smokies, all to feed a reduction site at what was to become Alcoa, Tennessee.

The incredible speed and scope of the young company's expansion is laid in the official company's history to the necessary consequences of the economies-of-scale and the desire to lower costs. "In the aluminum industry's infancy, there were no electric utilities large enough to supply Alcoa's requirements at a reasonable cost."² Similarly the company history explains its move into fabricating as the natural result of the need to expand consumption by creating new uses for the metal. By this scenario Alcoa had no eagerness to integrate marketward, but was forced to do so by the reluctance of traditional manufactures. In any case the firm soon owned sheet-rolling mills and was producing its own cooking utensils, cables, and castings. In 1901 it organized the U.S. Aluminum Company to produce its numerous kitchenware items, and the Aluminum Cooking Utensil Co. to distribute them.

It is not surprising that this flurry of activity soon attracted the attention of the Department of Justice. Antitrust proceedings began in 1912 with allegations that Alcoa was engaged in making restrictive covenants. In particular Alcoa had contracts with suppliers to make purchases so long as the supplier agreed not to enter
the aluminum business. Other contracts kept alum-makers out of aluminum. In the Consent Decree of 1912 the company promised to refrain from such activities. But one area which was to continue to distress the Department of Justice was Alcoa's foreign dealings.

Alcoa's "Foreign" Policy

Having successfully pre-empted domestic competition, Alcoa's main business threats came from overseas. The Swiss AIAG and French Froges grew at the same pace as Alcoa and in 1895 the British Aluminum Company was likewise licensed under the Heroult patents. The ever-growing large American market attracted them all in spite of an eight cents per pound tariff. Alcoa moved immediately to deal with the foreign threat, first by leasing its own process to Froges's rival Pechiney (1895) and secondly by reaching agreements (1896) with AIAG not to export to each other's markets.

This agreement was just the first in a series of cartel agreements which were to dominate world aluminum for the first half of the 20th Century. The second cartel, signed on Nov. 2, 1901, was more comprehensive than the 1896 pact, and included AIAG, Alcoa, British Aluminum, Froges and Pechiney. It closed the respective home markets Switzerland, the US and Canada, the UK, and France, and assigned quotas on the "open markets." (Alcoa's share was 21%.) The cartel governing body fixed prices for the open markets. The closed market price was to be kept 1¢ higher to prevent independents from buying locally and selling on the open market. The result of cartel policy
was a price advance to 36¢ a lb. in Europe. Alcoa through a prior agreement kept the US price at 33¢ until 1906 when it conformed to the cartel price. By doing so it doubled its productive capacity from 1901 to 1906. Its rates of return also rose with the price increase. (See Table 9.)

The third cartel formed in 1906 was to have been a renewal of the previous agreement with tough enforcement and regular reports from members on sales, but a combination of deleterious events blighted the pact. First the Heroult patents expired in 1906 to 1908 opening the European field to competitors attracted by the high profits. Secondly there was a general business downturn in 1907. Finally the "high price" policy of the cartel disenchanted some of the original members who believed lower prices were needed to create markets for the still relatively new product. The members dissolved the cartel in 1908.

A similar short-lived fourth cartel agreement between Alcoa and AIAG failed to curtail a burgeoning aluminum invasion of the US. Even with a 7¢ tariff, Alcoa's overseas competitors exported 7.6 million pounds to the US in 1910. The American price dropped 22¢ a lb, but a dramatic rise in domestic consumption more than compensated the American firm.

The Fifth Cartel proposed by Alcoa President A. V. Davis on a trip to Europe in 1911 was founded upon the realization that Alcoa dell'Alumino Italiano and a large portion of AIAG's Alumino Espanol SA. After vainly pursuing a block of VAW stock, it settled for an
agreement with the German firm not to export to the US. Another phase of their strategy involved buying up sources of European bauxite. In France, the Societe des Bauxite Francaises held their bauxite properties. Yugoslavia was the main new source of bauxite for Europe and in rapid succession Alcoa acquired Jadranski Bauxit (1922), Primorski Bauxit (1925), and SA Mineraria Triestina (1926). Finally Alcoa sought leverage over its rivals by purchasing their hydro-electric sources: in 1924 55% of Det Norske Aktieselskab Electrochemisk and AS Kinservik (Norway).

The European companies sued for an armistice in the informal sixth cartel (1923) which contained a gentleman's agreement on price and individual agreements to limit exports to the US. Table 10 dramatizes the impact on aluminum prices. Meanwhile demand for aluminum expanded dramatically through the 20s in the automotive and aviation industries. Profits again began to climb and Alcoa again increased its capacity.

The Seventh Cartel (1926) formally cemented the peace along the old pre-WWI lines. It re-established quotas on all sales domestic and export with penalties for oversales and compensations for undersales, and made standard delivery prices uniform for all world markets. Members submitted quarterly accounts on sales volumes, prices, output and inventories to the governing body. Alcoa again participated through its Canadian subsidiary. Furthermore it followed a strict policy of refusing sales to non-cartel member firms. The cartel was to have lasted two years, but at the end of 1928 was
### TABLE 9
Alcoa's Net Profits on Stockholder Equity

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1899</td>
<td>11%</td>
</tr>
<tr>
<td>1900</td>
<td>15%</td>
</tr>
<tr>
<td>1905</td>
<td>26%</td>
</tr>
<tr>
<td>1906</td>
<td>35%</td>
</tr>
</tbody>
</table>

### TABLE 10
Aluminum Price Per Pound Before and After Sixth Cartel

<table>
<thead>
<tr>
<th></th>
<th>1922</th>
<th>1924</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>18¢</td>
<td>24¢</td>
</tr>
<tr>
<td>US</td>
<td>19¢</td>
<td>27¢</td>
</tr>
</tbody>
</table>

Data from Stocking & Watkins (1946).
extended three more years. The Zurich Agreement (1930) divided the new Japanese market among the members (Alcoa received 52% through its Canadian branch), the later agreements similarly divided India and Russia.

As the cartel agreements became more intricate, Alcoa needed a more direct way to participate without violating the 1912 Consent Decree. On May 31, 1928 it obtained a Canadian charter for its reorganized Canadian subsidiary (renamed Alted) and transferred to it nearly all its foreign holdings (critical bauxite holdings in Surinam for one were kept with the parent). In effect, Alted became a holding company for Alcoa, but to maintain the image of independence, Alted's stock was distributed to Alcoa's shareholders on a pro rata basis. Over the years a few names changed, but not enough to threaten Alcoa's control and certainly not enough to justify the claim that Alted had "no connection at all with the American company." In reality the same interests (Mellons, Davises, Hunts) dominated the stock of Alted. Indeed the President of the new firm, E. K. Davis, was a brother to A. V. Davis, President of Alcoa. Alcoa continued to operate in tandem with Alted and through it the cartel. Ultimately, in 1950, the courts were to trap Alcoa in its own fiction and force separation of the two.

The Aluminum Alliance

On the eve of the depression the Alcoa-Alted combine had around 50% of world production. But the onset of the depression could no
longer preserve the US market as its private domain. The 1912 anti-trust case complicated the agreement: Alcoa promised not to involve itself directly in any further European cartels. At this point Alcoa established the expedient of participating in cartels through its Canadian subsidiary, North Aluminum. Alcoa signed the Consent Decree on June 7, 1912 and five days later signed the cartel agreement. The Democratic administration of 1912 lowered the aluminum tariff to 2¢ a lb. and imports rose to 20 million lbs. in 1913. But Alcoa proposed to create a new American firm, Southern Aluminum, under joint Alcoa and European control. It hoped to use this ploy as a safety valve for European desires on the US market. The outbreak of war intervened to end the project and the cartel.

World War I dramatically raised demand for aluminum products, such as, helmets, canteens, aluminum shells, explosives (a dust with ammonium nitrate), mess containers, and most importantly airplanes and engines of all types. Consequently all firms doubled their productive capacities and new plants sprung up in Norway and in Germany (the German state monopoly, VAW). After the war ended, the aluminum price war began in earnest as European firms dumped their stockpiles on the American market.

The Post-war Alcoa Offensive

Alcoa responded with a tough offensive. On the domestic front it lobbied for the 1922 Fordney-McCumber tariff which raised the duty to 5¢. Alcoa then attacked its European rivals directly with an
aggressive acquisition program aimed at forcing a new cartel. The new Norwegian firms were the main source of cheap aluminum imports. In 1922 Alcoa purchased 50% and control of Norsk Aluminum, and in 1923 purchased a third of Det Norske Nitrid. In 1925 it acquired half of Societa threatening all aluminum firms. In 1930 A. V. Davis again traveled to Europe and again a new cartel agreement emerged. The business downturn called for drastic measures and the new pact represented one of the greatest innovations in cartel history. In effect, it incorporated the cartel; every major aluminum firm signed the Foundation Agreement in Montreal in 1931 to form a super-firm, Aluminum Alliance. Officially incorporated in Switzerland, the Aluminum Alliance issued 1400 shares of stock to members only on the basis of one share for every hundred metric tons of capacity. Alted received 400 shares or 28.6%, the French firm 21%, the German 20%, the Swiss 15.5%, and the British 15% (see Figure 5). Thus voting power and directorship allotments reflected the already established market quotas. The Alliance directors set policy, fixed minimum prices, and bought and sold aluminum to bolster the administered price. Once again Alcoa acted as the "silent partner" operating in accord with Alliance policies. When the Alliance refused to give technical assistance to the Japanese Government which sought to create an independent Japanese aluminum industry, Alcoa likewise shunned the overtures.

The greatest measure of the Alliance's success was that aluminum prices were maintained through the depression at stable levels until
Alliance Aluminum Compagnie

Source: Stockings & Watkins, p. 263.
the various national re-armament programs made the need for price coordination superfluous. Alliance policy also collided with the German Nazi government which wanted to force VAW out of the cartel. Alliance agreed to remove restrictions on VAW's production so long as that firm agreed not to export its aluminum. With the advent of war collaboration became unnecessary if not impolitic. Alliance and the war prospered Alcoa and Alted greatly as they were to emerge from hostilities with 64% of world production.

Alcoa's Domestic Policy

Little has been said up to now of Alcoa's domestic situation and in particular how Alcoa was able to maintain its monopoly on domestic aluminum production for 50 years. The failure of competition in the industry was not based on a lack of attempted entrants. The company history (Carr, 1952) attempts to explain the failure in terms of the efficiencies of vertical integration and economies of scale. While these factors undoubtedly played a very important part, nonetheless, skillful manuvers on the part of the company did much to block the efforts of any would-be rivals.

One important source of competition was direct investment in the US by established foreign firms. But as we have seen in the case of Southern Aluminum (1912), Alcoa deftly placed itself in an active, participant role and thus was able to pick up the pieces when the project was abandoned due to World War I.
Several domestic producers attempted to develop aluminum reduction facilities. One such challenge came from the Uihleins, Milwaukee's wealthy brewer family (makers of Schlitz beer). The Uihleins owned the Republic Carbon Company at Niagara Falls, New York and with possession of carbon electrodes and a nearby electric power source were interested in the possibility of entering the aluminum industry. Bauxite was the missing ingredient and in late 1918 they hired Lloyd T. Emory, a bauxite engineer, to travel to British Guiana to find suitable properties. No sooner had Emory located a promising site, Demerara Bauxite (the local Alcoa subsidiary) immediately contested his claims leading to litigation in the local courts and eventually the Privy Council of London. In 1924 the Uihleins told Emory to give up and in 1925 sold Republic Carbon to Alcoa.

In 1921 Henry Ford flirted with entry by offering to buy and complete a government hydro-electric site at Muscle Shoals on the Tennessee River. This time Congress baulked at giving Ford control over so important a project. (Congress had its own plans for the Tennessee River which were eventually developed into the TVA.) With the frustrations of the ensuing delays, Ford rethought the high costs of the move and in 1924 withdrew his offer.

Around the same time the entrepreneur, J. B. Duke, who owned a Canadian hydro-electric site, considered developing an aluminum plant to use the cheap electricity. After negotiating with several potential partners, he sold out to Alcoa in 1925 for a chunk of the latter's stock. Thus Alcoa maintained its monopoly position to the end
of World War I. It was to take strong governmental intervention to create rivals for Alcoa in the domestic industry.

The Government-Created Rivals

In the late '30s under the New Deal the country saw a second wave of anti-trust activity. Alcoa was an obvious target and in 1937 the Department of Justice filed a broad complaint of monopolization. In 1940 District Judge Caffery acquitted Alcoa, but in 1945 Circuit Court Judge Hand found Alcoa guilty of a price squeeze on independent sheet fabricators. Alcoa was charged with raising the price of ingots to the independents while at the same time lowering its own sheet metal price. However Judge Hand postponed any remedy of the situation till the end of the war.

The main reason for the postponement was due to the tremendous contribution of aluminum to the war effort. It became clear to the US government upon America's entrance into the war that Alcoa could not expand its capacity enough to meet war aviation needs without government assistance. In 1942 the Government's Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation, began subsidizing the construction of aluminum plants. By 1944 government production accounted for nearly half of the country's aluminum capacity and Alcoa operated four-fifths of those plants through management contracts and leases. At the end of the war the Defense Plant Corp. turned over its properties to the Surplus Property Board.
The fate of these plants now became a hotly contested issue. Alcoa stood in a good position to claim the lion's share; it had leases on the plants till 1947-1948 and had seen to it that the plants were constructed with Alcoa patented processes. Also in Alcoa's favor was the fact that Congress wanted the plants sold as quickly as possible with little interruption in operation. Finally there was a scarcity of applicants for the plants indicating the trepidation of any would be buyer at the prospect of competing with the Alcoa combine. Reynolds Metals which had begun producing aluminum during the war wanted subsidies and guarantees of Government purchases before it would acquire any of the plants.

In July of 1945 President Truman appointed W. Stuart Symington as the Surplue Porperty Administrator. Symington immediatly appointed two economic advisers, Gordon Reed and Sam Moment. The two economists immediately drew up conflicting plans for disposing of the properties. Reed recognized Alcoa's strong interests and proposed that the firm be allowed to purchase plants up to the point that it would hold 60% of US capacity. The rest would be sold to competitors. Sam Moment's plan emphasized the creation of effective competition in the aluminum industry. He pointed out that only large vertically integrated firms would be capable of competing with Alcoa. Therefore, he suggested that all the properties be used to set up two integrated firms with the government's two alumina refiners serving as the backbone of each.
Symington vacillated between the two plans before leaning toward the Reed proposals though he did allow Alcoa to acquire the St. Lawrence Reduction works and an extrusion plant at Cressona, Pennsylvania. He solved the leasing problem by cancelling the contracts under a clause that the plants had to be operating above 40% of capacity. Alcoa resolved the patents problem by granting royalty-free licenses. The subsidy plan failed to pass Congress, but a government stockpile program beginning in 1945, increased civilian uses, and the Korean war stimulated demand and took up the slack production. Under these conditions Reynolds Metals agreed to purchase the Urricane Creek alumina plant and the Jones Mills, Arkansas and Troutdale, Oregon aluminum plants. Kaiser Aluminum and Chemical Corp. acquired the Baton Rouge alumina plant and the Spokane and Tacoma, Washington aluminum plants. The plan resulted in three US primary producers with capacity divided: Alcoa 51%, Reynolds 29%, Kaiser 20%.

In 1947 Alcoa petitioned the courts that it no longer was a monopolist. The Department of Justice counter-petitioned that true competition would not exist unless Alcoa was split up creating four competitors of equivalent size. In 1950 Judge Knox ruled against the Government but turned his attention on Alted, Alcoa's Canadian partner. Here he found that nine individuals in the Mellon and Davis families owned 46.3% of Alcoa and 44.7% of Alted and ruled that these individuals must sell their stock in one or the other of the firms.

If according to Alcoa's past statements the two were acting independently, the change of stock should not represent any change in
operating practices. Caught in its own rhetoric, Alcoa agreed. He
also put Alcoa on a five year probation period. In 1957 the courts
ended the case.

New Entrants Since World War II: The Perils of Harvey

As I mentioned earlier in this chapter, aluminum production since
World War II has boomed as the metal found its way into an increasing
array of products. Given this prosperity and the dissolution of the
Alcoa monopoly, it was natural that other firms would enter the
aluminum business. But as the case of Harvey suggests this entry was
not accomplished without a good deal of struggle and Government
assistance.

The first challenger was Harvey Aluminum. Harvey had manufactured
aluminum parts in its Los Angeles plant even before the war, and with
the creation of the Surplus Properties Board toyed with purchasing
an aluminum reduction plant at Riverside, California. However, the
plant was not an economical producer and hence was closed by the
government.

In its second attempt Harvey first secured a five year government
stockpile purchase contract for 50,000 tons of aluminum. It then
negotiated a long term power contract with the new Hungry Horse Dam
in Montana and a contract to buy alumina from Reynolds. But even as
the Montana reduction plant was being built the capital requirements
of the project proved too much for Harvey's limited financial sources.
In 1953 it sold its Montana interests to the mining giant Anaconda,
In late 1953 Harvey tried again. It secured another government contract and began work on a 54,000 ton reduction plant in Oregon. A power failure plagued the project when the Bonneville Power Authority tried to back out of its power contract for the plant. Harvey sued and in an out of court settlement Bonneville agreed to supply the power if Harvey built its own power lines. Once again financing grew short but General Services agreed to advance Harvey payments on the stockpile contract. With the plant built, a new calamity arose; Alcoa, Limited (Alted), Reynolds, and Kaiser all refused to sell alumina to the new firm. Not to be undone at the eleventh hour, Harvey negotiated an alumina contract with a newly formed Japanese firm.

Anaconda Aluminum was the second entrant after inheriting Harvey's Montana project. The parent copper firm Anaconda had the advantage of its large size to provide financing, the power and alumina contracts that Harvey had already negotiated and the fact that one-third of its production could be used internally by its own metal fabricators. Nonetheless, the high price of alumina supplied by Reynolds was a problem until Anaconda negotiated a contract with Kaiser in 1960 at a much lower price, but only after Anaconda agreed to lend Kaiser the funds to expand its alumina refiners.

The third entrant in the fifties was a joint venture, Ormet, owned by Olin Mathieson and Revere Copper and Brass. The project was capitalized at $231 million, $200 million of which was loaned by insurance companies. Ormet built an alumina refiner at Burnside, Louisiana and an aluminum plant at Hannibal, Ohio. Olin also owned a
53% interest in the Fria consortium which constructed an alumina plant alongside the bauxite mines of Guinea.

Many other firms, including St. Joseph's Lead, Wheeland, and Apex Smelting attempted entry and failed, chiefly due to inability to get financing. Sources of alumina which the majors guard jealously is another problem and also the low profits in the aluminum reduction stage. Peck (1961) even suggests that the majors have kept profits low on this stage, purposely to limit entry (instead they take their profits further upstream).

PROFILES OF THE PRESENT ALUMINUM FIRMS

Our list of MNC actors is now essentially complete. Before turning to the recent events of the bauxite cartel, let us review each firm through a summary profile. Today's "big six" is made up of three American firms, one Canadian, one French, and one Swiss.

Alcoa

Though its market share has declined slowly since World War II, Alcoa is still the world's largest aluminum producer with 1,575,000 tons per year capacity in 1974 in its American plants alone (Aluminum Association, 1974, p. 32). In 1975 (which was not a banner year for metal sales) Alcoa ranked only 85th by sales of American corporations (it was 64th in 1974) but with over $3 billion in assets, it ranked 36th on the Fortune list, putting it in the same league with Proctor & Gamble and International Harvester. Alcoa has had to rebuild its
overseas operations after the loss of Alted in 1950. At present it has major bauxite mining operations in the US, Surinam, Jamaica, the Dominican Republic, and Australia; refining plants in the US, Australia, and Surinam; and reduction plants in the US, Norway, Australia, Mexico and Surinam. The Surinam metal gives it duty free access to the EEC countries. It has a strong position in the US fabrication industry and others around the globe. Though originally built on hydro-electric power, Alcoa's new plants on the Gulf Coast use thermal energy. The companies' greatest asset is its strong domestic position in sales and production, though through subsidiaries in Norway, Surinam and Japan, it has grown into all the major developed markets. Alcoa is also a leader in new industry sales and technology.

Reynolds

Reynolds is the world's second largest aluminum firm and a major marketer outside the US. The most important step in the internationalization of the company was the acquisition of a 51% share of the older British Aluminum Company (46% directly, 5% through another affiliate). This move gave it a strong position in the UK, Canada, and Norway. The firm has bauxite sources in the US, Jamaica, Guyana, Haiti, and is a minor participant in both the Fria Consortium (Guinea) and the Ghana Consortium. It owns fabricators in US, Canada, UK, Belgium, Japan, Germany, and the Philippines. Reynolds is acknowledged as the leader in packaging uses of aluminum.
Kaiser

Kaiser is the most diversified of the majors with 79% of its sales in aluminum. It also has interests in refractories, chemicals, fertilizers, and nickel. Kaiser has no domestic sources of bauxite, and hence has a very bold location policy. It has often been called the most sensitive to Third World host nation situations, and is the only American firm with a major African interest (Ghana). In the late 1960's Kaiser began heavy investments in Australia.

Alcan

The Canadian firm has had a long history of association with the American giant Alcoa through its many incarnations. Its first "life" was begun in 1900 as Alcoa's directly owned Canadian subsidiary, Northern limited set up to control the former's Canadian smelters and its access to Canada's cheap hydro-electric power. Then as we have seen it was reborn in 1928 as Alted, a "holding company" for Alcoa's foreign interests. In 1950 it began its third life with Judge Knox's decision that removed most of the Mellon interests, though it did not adopt its present name until 1966. It is called a Canadian firm, but in reality as Brubaker (1967) points out 70% of its stock is owned by Americans.

Given that the firm's structure was historically set by the needs of Alcoa's international strategy, Alcan finds itself in the tenuous position of being a huge far-flung international business with a weak domestic position. Its share of the Canadian market is simply not
enought to absorb much of its Canadian capacity of 950,000 tons per year. Hence in contrast to Alcoa, it does not have a strong domestic base to fall back on in periods of international aluminum slump. At first it supplied much aluminum to independent US fabricators, but in the late 1950's the big American firms began acquiring these independents and weakened Alcan's position. Alcan retaliated by acquiring American fabricators of its own and further diversifying its international markets.

Alcan is a fully integrated firm with bauxite sources in Jamaica, France, Malaysia, Sarawak, and until recently Guyana. It has alumina plants in Quebec, Jamaica, Norway, Australia, Brazil, India, and Japan. It has smelting and fabricating operations in 30 countries including most of the European countries, Argentina, Brazil, India, Japan, and Australia. Thus the firm is the most international aluminum MNC, which at times contradicts its pledge to Canadian production. Its strengths include its position as low cost producer (due to intensive Canadian Norwegian hydro-electric properties), its high technology base, and its international expertise.

Pechiney

Pechiney is the oldest aluminum firm tracing its ancestry back to the 1859 St. Clair Deville process. The firm has had a strong domestic base in France and now in the EEC. It obtains bauxite from affiliates in South France, Guinea, Australia, and Greece, and owns alumina refineries in the same nation. Its smelters are located in
France, Cameroon, Spain, and the US (through its 1975 acquisition of Howmet).

Much of Pechiney's past history has been recounted in the history of Alcoa. It should be remembered that France with the US was a birthplace of the aluminum industry. By the time of the Aluminum Alliance (see Figure 5) there were three major Aluminum firms in France: Pechiney, Froges, and Societe d'Ugines. At some point since, Pechiney (based on the lists of present affiliates) absorbed Froges, then in December 1971 in one of the major European mergers of the century, Pechiney absorbed its remaining domestic rival, Societe Ugine-Kuhlmann to become Pechiney Ugine Kuhlmann, the world's fourth largest producers and one of the largest industrial combines in Europe. The new firm is highly diversified with business in copper, steel, rare metals, dyes, chemicals, pharmaceuticals, and nuclear technology.

Alusuisse (Swiss Aluminum A.G.)

Alusuisse is now the sixth largest firm and the only firm without a domestic market of its own. Its long history is in part retold in the previous Alcoa history. Alusuisse owns bauxite facilities in France, Italy, Greece, Sierra Leone, and, with a monor interest in the Fria Consortium, Guinea. Most of its refining, smelting, and fabricating operations are located in Italy, France, Germany, and Switzerland. Swiss Aluminum entered the US market with an American affiliate, Conalco in 1948. In 1963 it constructed a reduction line at New Johnsonville, Tennessee.
The Other American Producers

Since the 1950's other firms have entered the aluminum business in the US, but as Figure 6 indicates the big three own two-thirds of the nation's primary capacity. Most of the minors are not fully integrated and must rely on the majors for purchases of bauxite or alumina as Figure 7 indicates. Nearly all of the minors have had complex changes in ownership and are hence difficult to trace.

Harvey-Martin Marietta

The story of the intrepid Harvey Aluminum Corporation has already been told. In 1968 Harvey fell under the acquisitive sight of Martin Marietta, a chemical-aerospace conglomerate, which bought up 41% of its stock. In a few years time, Martin Marietta purchased more blocks of stock, changing Harvey's name to Martin Marietta Aluminum in 1972, and absorbing the firm completely in 1974.

Anaconda Aluminum

Due to the troubles of its parent, this firm has never completed its plans for vertical integration. On January 12, 1977 it disappeared with its parent into the Atlantic Richfield Company.

Phelps Dodge Aluminum

Other copper companies have attempted to diversify into aluminum like Anaconda, on the whole with unsatisfactory results. The Phelps Dodge Copper company made such an attempt but in 1971 sold its subsidiary to CONALCO (Swiss Aluminum) for a 40% interest in that firm.
FIGURE 6

Distribution of US Primary Aluminum Capacity 1974

(Based on data from Aluminum Statistical Review, 1974, p. 32.)
Bauxite Transfers of US Producers

(Data for figure taken from Farin & Reibsamen, 1969, p. 25.)
Ormet

We have already met this joint—Olin, Revere Copper and Brass—venture. This partnership was sundered by Olin's January 1974 decision to get out of aluminum. Olin sold its share to CONALCO (Swiss Aluminum) and Revere retained its 34% share.

INTALCO

This consortium was formed in 19-6 by Pechiney, Howmet, and AMAX. It apparently was rather short-lived. In 1974 AMAX sold 50% of its meager aluminum interests to Mitsui & Co. Ltd. of Japan. In 1975 Pechiney acquired Howmet and absorbed the remaining aluminum interests directly into Pechiney Ugine Kuhlmann.

Minor Foreign Producers

The complex web of international associations has been traced out in Figures 8, 9, and 10 with 1969 information. It should be remembered these charts represent only major aluminum smelters; the inclusion of fabricators would complicate the picture extremely.

VAW, mentioned earlier, remains the large German state-owned firm (218,000 ton capacity in 1969), but since the war has shied away from international business. The Italian Montecatini-Edison splits its domestic market with Alusuisse.

Japan has produced two important independent firms, Showa Denko K.K (SDK) and Sumitomo Chemical Company. Both firms draw their bauxite from Malaysia, Indonesia, and Australia.
CANADA

Alcan 970

United States

Alcoa

Reynolds

BRAZIL

Aluminio Mina Gerais 25

100%

Companhia Brasileira de Aluminio 34

G.O.

Companhia Mineira de Aluminio P27 26% Local

MEXICO

Aluminio S.A. de C.V. 33

46% 54% Local

SURINAM

Suralco 77

100%

VENEZUELA

Alcasa 11

50% 50% Gov't

FIGURE 8
Aluminum Capacity Ownership - America

Numbers after name indicate annual aluminum capacity in thousands of short tons. "P" prefix indicates planned, "G.O." means government owned.

FIGURE 9

Europe and Africa
FIGURE 10

Asia and Pacific
THE IMPACT OF THE ALUMINUM MNC ON THIRD WORLD BAUOXITE SOURCES

The discussions to this point have dealt primarily with MNC to MNC and MNC to developed nation interaction. It is now time to consider the interactions between the large firms and their LDC bauxite sources. As has been mentioned, the first sources of the raw material were within the developed states which spawned the industry, the US and France, but with time and rapid expansion, these sources became insignificant compared with the higher grade LDC sources. By the 1920's Alcoa was sourcing bauxite from the Guianas and the European firms were importing from Yugoslavia.

In the history and profiles, the author named most of the nations presently serving as bauxite sources for the firms. Time and informational resources do not permit a detailed account of the firms' activities in each country. However, a detailed examination to Jamaica, the major exporter today and leader in the formation of the bauxite cartel, will serve to elucidate the general pattern of this interaction.

The MNCs in Jamaica

Jamaica can be described historically as a modified plantation-type developing economy. From the 17th to early 19th century sugar grown on plantation with African slave labor was the dominant export followed later by bananas. The abolition of slavery in 1834 established a pattern of surplus labor supply which has plagued the economy down to the present. Unemployment problems have generated social
frustration leading to periodic strikes and riots such as those of the 1930s. The agricultural sector is still characterized by dualism between large plantations and small plots. In 1943, 1.4% of the nation's farms owned 66% of the land and 92% had only 21% of the land. Hence, Jamaica fits the Latin American pattern of skewed land distribution with land reform as a main national priority.

Jamaica's foreign investment policy has followed the lines of an open, capitalist developing economy. The aluminum MNC invasion beginning in the 1950's represented the single largest inflow of capital, 145 million in the years 1950 to 1966. This inflow has had a dramatic impact on the gross measures of development: %GDP grew from 0% in 1950 to 10% in 1967\(^{15}\) and to 12% by 1972.\(^{16}\) The investments contributed the single largest tax revenue source, 15% of government expenditures in 1967. On paper, the rapid expansion of the bauxite sector has made Jamaica one of the fastest growing LDCs.

Nearly all of Jamaica's bauxite goes to the US and intra-company transfers by the three major US firms. The only exception is Alcan's alumina refiner which supplies that firm's smelters in Canada and Scandinavia. In 1969 a consortium of Alcoa, Reynolds and Kaiser built an alumina refinery, Alpart, to export alumina to the US, but the major export is still raw bauxite.

Kaiser, Reynolds, and Alcan entered Jamaica in the early 1950s. In part this move was directly sponsored by the US Government. The first source of US involvement grew out of the government's desire to create fully integrated rivals to Alcoa. While the Surplus Properties
Administrator provided Kaiser and Reynolds with alumina refiners and aluminum smelters, it could do little at first in supplying bauxite sources. Reynolds had a few Arkansas properties of low quality, but Alcoa and Alcan dominated the well-known foreign sources in the Guianas. Hence, the discovery of cheap Jamaican Bauxite was a godsend for Reynolds and Kaiser. Secondly the US Government favored Jamaican bauxite for national security reasons. Given the Korean war and the general cold war context, the government regarded Jamaica as an easily defensible source of the strategic material. Hence the government extended Reynolds and Alcan aid credits to establish mining operations there.

Many additional factors have contributed to make Jamaica attractive to the North American MNCs. First there is the low cost of Jamaican bauxite compared with other sources. The mining overburden, the rubble which must be cleared to extract the ore, is very light in Jamaica and the bauxite sites are more accessible than the already heavily worked Guianan deposits. The cost of transporting bauxite from Jamaica to the US is less than from South America. This factor lead Kaiser and Reynolds to convert their nearby Gulf Coast facilities specifically to the processing of Jamaican ores. Bauxite from Surinam which is "rich" in alumina is also "rich" in noxious impurities such as silica. A second attraction is the huge size of the Jamaican reserves allowing for longterm commitment of investments. Finally there was the relative "political safety" of Jamaican investment. After independence, both political parties, the Jamaican Labor Party and the Peoples National
Party, were anxious to assure the companies. The alternatives in 1957-1964 were none too appetizing for the firms. The Marxist government of Dr. Cheddi Jagan was in power in Guyana. While Alcan expanded its operations there, the more suspicious Reynolds waited until the anti-Communist coalition came to power in 1964 before agreeing to any further investments. Although Alcoa had a strong base in Surinam, it used the newly discovered source in the Dominican Republic for its incremental expansion. But the withdrawal of US support for Trujillo in the late 1950's, left Alcoa in a tenuous position, and soon thereafter that firm entered Jamaica also.

Decisions to expand mining capacity in Jamaica have been dependent on corporate strategies and the expansion of aluminum capacity by the North American industry. Both factors lie in the hands of the aluminum MNCs; the Jamaican government could only offer incentives. In particular the government has encouraged alumina refining to increase value added on the island. Alcan build alumina processors "Kirkville" with Marshall plan funds in 1959 and Ewarton in 1960. Alpart represents a similar move on the part of the Americans. In the late 1960's Revere entered and discussed alumina facilities. But as we have seen, the firms already had technical incentives to locate alumina processors in Jamaica given the relative costs of shipping alumina as opposed to bauxite.

The map on Figure 11 summerizes the positions of the firms by the early 1970's. All firms lease extensive tracts of land and invest in agriculture to a small extent due to government land restoration and
FIGURE 11

Map of Jamaica Showing Bauxite Lands

(Taken from Girvan, 1971, p. 16.)
idle farm land legislation. Given the persistent land inequalities and agricultural needs of the island's large population, the government's past policies of liberal land leases have drawn increasing attack from many quarters. In addition each of the MNCs have established their own ports and storage facilities (notice "Kaiser" and "Port Kaiser") and all but Alcan have their own transportation facilities.

Figure 12 shows the location of bauxite output for each of the US firms. Notice the total dependence of Kaiser on Jamaica at this time (1965). Kaiser has recently diversified its position with investments in Australia and Africa.

By the early 1970's the Jamaican government and in particular the PNP government of Prime Minister Manley, had grown increasingly sensitive to the relative benefits of the bauxite industry distributed locally, and the overall impact on the local economy. The economic policy of the 1950's and 1960's had been premised on the liberal model of development which portrays direct investment as an "engine of development" and creates a "leading sector" which through the use of local intermediate goods, pulls up production in the rest of the economy. But while gross level indicators continued to rise, by the late 1960's the "spillover" effect still seemed insignificant. Norman Girvan (1971) calculates that the local share of the value of output in the bauxite industry has fluctuated from 33-51% as depicted in the figure. Furthermore, he finds that payments for materials, wages, and salaries make up an insignificant share of local share,
FIGURE 12

Kaiser, Reynolds and Alcoa: Aluminum Production and Location of Bauxite Output, 1950, 1965
FIGURE 13

Export Value and Current Local Payments of the Bauxite Industry

(Taken from Girvan, 1971, p. 40.)
FIGURE 14

Gross Value Added in Transforming Jamaican Bauxite Production Inside and Outside of Jamaica, 1952-1967

(Taken from Girvan, 1971, p. 76.)
with tax payments compromising the greater part. In part, this is due to the absence of many intermediates in mining processes in general. But it is the MNC overseas parent which makes the crucial decisions on factor proportions and foreign inputs and outputs. As a result, the parent has chosen to use mainly foreign inputs many of which the vertical combine already produces for itself or buys in mass volumes from US domestic producers and which it can ship cheaply to Jamaica in its empty returning ore ships.

The low local share is also the result of capital intensity chosen in the bauxite operations and the fact that since that capital is foreign owned, the higher returns on capital flow into foreign hands. The bauxite industry in Jamaica is very capital intensive: Girvan calculates 12,342 of assets per person as opposed to a general manufacturing range of 400 to 2,000 per person. The companies had a wide range of latitude in determining the capital to labor ratio in its mining operations (essentially an earth moving operation). They chose capital intensive as more appropriate given the requirements of a constant flow of bauxite to alumina plant. However, a capital intensive is certainly appropriate from Jamaica's perspective given the island's overabundance of labor.

The result is the MNC's bauxite operations comprise a self-contained autonomous sector in the Jamaican economy. The Government's first response was to pressure the firms to set up alumina production on the island, thus increasing the value added and with it, stimulating intermediate goods and increasing tax revenues. Figure 14 shows the
value added at various stages to the Jamaican ore. But even the already existing alumina refineries import most of their intermediates rather than purchase locally. The companies have largely ignored attempts by local firms to develop local production of intermediates such as caustic acid and chlorine. A patented process for extracting starch needed in alumina beneficication from the Jamaican breadfruit tree, developed by a native Jamaican has attracted little interest from the firms.

Another concern of the government is that the foreign bauxite sector may be inducing distortions into the economy of the island. Aside from government tax revenue, the only other portions of local share of any consequence are payments to local transportation and construction industries. The three American companies transport most of their bauxite to port themselves, but Alcan transports its alumina to port via the Jamaican Railway Corporation. Alcan is thus a major customer of the JRC and receives a reduced shipping rate. The rest of the transportation payments fluctuate with the construction industry on the basis of investment expansion by the firms. New investments by the companies represent huge construction projects for the local industry, and a temporary, dominant share of their business. Given the cyclical nature of investment patterns on Figure 14, Girvan shows that there is a very volatile impact on the lives of construction workers, periodically throwing thousands out of work and thus exacerbating the unemployment problem. Again this distortion is due to a relative size problem, the small size of the construction industry
contrasted with the huge size of the firm's projects, and the lack of alternative big projects in the developing country to take up the slack.

The firms wage payments, while small in total value, have a dramatic impact on the labor situation in the small developing economy. As Sir Mitchell (1968) points out, the firms operate on the basis of American labor practices and wages. In 1951 the United Steelworkers of America helped the local National Workers Union to organize the bauxite workers. In this they were assisted by the firms, who preferred the American shop-steward system of processing grievances. With time, the bauxite workers have become the core of the National Workers Union.

...the bauxite companies established wages which were often beyond the capacity of other employers to match, with the result that they recruited heavily from other industries. Due to the high degree of mechanization, the numbers they employed were relatively low. A highly paid elite group of workers emerged which may have been a mixed blessing for the island.17

These labor policies and the general insularity of the MNC's has ironically eroded the support of a group that could have potentially supported its interests—the local business elite. Kuper (1976) reports little support from local leaders for the bauxite firms:

Jamaican businessmen are particularly well-organized to press their demands, but their interests are not always congruent with those of the most powerful economic bodies, the multinational corporations. They, with their monopolistic positions, are most concerned with predictability, with maintaining control of the long-term development of their operations....The
bauxite companies have created new and formerly undreamt-of aspirations for the workers. They have also worked closely with the unions, and greatly strengthened them in consequence....The distinctness of these economic interests is reflected in the generally contented attitude adopted by Jamaican Capitalists when, recently, the PNP government turned the screws on the bauxite companies.18

This "turning of the screws" can be seen as the direct result of the failure of past government policies to raise the local share of total output and affect corporate decisions perceived as having a distorting effect on the local economy. The government's response and the formation of the cartel will be analyzed in depth in Chapter 6.

Summary and Analysis

What interpretations and conclusions can one draw from the extensive accounts of this chapter? The author has presented materials illustrative of the three tier approach laid out in the "MNC as independent actor" argument of Chapter Two. The aluminum MNC's political actions can thus be summarized:

<table>
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<tr>
<th>Interaction level</th>
<th>Example</th>
<th>Issue</th>
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<tr>
<td>1) MNC to Developed Parent</td>
<td>US Justice Dept. vs. Alcoa</td>
<td>Competition in US market</td>
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<tr>
<td>2) MNC to MNC</td>
<td>Alcoa and the cartels</td>
<td>Control and stability of world markets</td>
</tr>
<tr>
<td>3) MNC to LDC</td>
<td>Alcoa in Jamaica</td>
<td>Distribution of benefits</td>
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However, each of the other arguments of Chapter Two could be used as a
perspective to view the information of this chapter. Therefore, the author will conclude the chapter with a brief summary of each argument's analysis.

It will be remembered that Argument I and its variants A, B, and C, flows from the premise that MNCs are the tools of the parent nation or ought to serve in that capacity. The elitist approach of Argument IA would have a field day with the Mellon control of Alcoa. In addition to the American aluminum giant the Mellons own a major interest in Gulf Oil, Koppers Products Ltd., Carborundum, and the Mellon National Bank & Trust. In Andrew Mellon, they have a corporate-government elitist first class. In 1920 he accepted the position of Secretary of the Treasury under President Harding, a post he was to hold throughout the following Republican administrations of Coolidge and Hoover. Mellon's policies had a fiscal conservative, pro-business bent and he actively lobbied for and got the reduction of taxes on the rich and the giving of tax rebates to corporation for "over taxes" collected during World War I. William Hoffman (1974) claims to see the hand of Mellon behind the Ford-McCumber tariff on aluminum imports. Mellon sought the presidency in 1928 a battle which Hoffman sees as a gentleman's struggle between Mellon and Morgan (Hoover). money.

Mellon's policies were blamed for the onset and continuation of the great depression. These accusations led Rep. Wright Patman to initiate impeachment proceedings against Mellon in January 1932 on the grounds of conflict of interest. Among the specific counts listed
by Patman were:

1) in his role of chief of the Coast Guard, he oversaw the collection of import duties on goods his businesses imported.

2) he gave his own businesses large tax rebates.

3) as ex officio chairman of the Federal Reserve Board, it was illegal for him to own bank stock.

4) his distilleries sold liquor during Prohibition.

5) he advised the construction of public buildings with aluminum.

Before the hearings had reached the impeachment stage, Hoover rescued Mellon by appointing him Ambassador to England.

It is interesting to note that during the three Republican administrations, no legal action was taken against the Alcoa monopoly. Attorney General Harlan F. Stone was preparing an anti-trust case against Alcoa when Collidge suddenly appointed him to the Supreme Court. "Many Washington observers thought they detected the long arm of the Secretary of the Treasury in the convenient removal of Attorney General Stone, especially since his successor never followed up on the charge." 19

Andrew's son, Paul Mellon, and his wife, Bunny, continued the many business and governmental ties of the family. Their daughter, Catherine, married John William Warner, Jr. in 1957 and he went on to become Assistant Secretary of the Navy in 1972. Again there was the possibility of conflict of interest, since the US Navy is one of the world's largest oil purchasers. Paul and Bunny had close ties with
Prince Phillip and Queen Elizabeth, and Bunny was a personal friend of Jackie Kennedy and Mrs. Johnson, and once remarked to a reporter concerning the various advise she had given to past president's wives, "Of course I would be happy to help Mrs. Nixon, but she hasn't asked me. I am a Democrat. My husband teases me about it all the time. But gardens aren't political. I tell my husband, 'Trees have to be watered whether the Administration is Republican or Democratic.'"20

The elitist analyst would be quick to read a subtext into this statement.

Reynolds Metals has the same dynastic ties with 17% of the present stock still held by the Reynolds family. Richard Reynolds, Sr., the founder, was a cousin of R. J. Reynolds of tobacco fame. He worked for his uncle for many years before branching out to the US Foil Company where he began fabricating aluminum foil wrappers for his uncle's cigarettes. Richard, Jr. explained his father's reasons for creating Reynolds Metals: "My father, like his grandfather before him, wanted a business for his own sons."21

The congruence of business and national security interests would be pointed out in US involvement in Surinam during World War II. As Wilkins (1974) recounts it, in the Fall of 1941 Cordell Hall got permission from the Dutch government in exile to station US troops in Surinam to safeguard Alcoa's bauxite source. In November, 1,000 US troops moved for the duration of the war. Operating on the basis of similar strategic thinking the US government encouraged the firms to set mining in Jamaica by extending credits. Purchases for US stockpile was another source of collaboration and certainly aluminum production
was vital for the Vietnam war. One radical writer (Hoffman) goes so far as to imply an Alcoa connection in the overthrow of Indonesian President Sukarno.

From the Marxist or labor perspective, Alcoa has certainly had its share of confrontations with the working class. Again quoting Hoffman:

In 1913 at a strike at the Alcoa plant in New Kensington, Pennsylvania, state police waded into picket lines and clubbed down workers.

In 1915 at Massena, New York, the state militia was called out to physically smash another Alcoa strike. One strike leader, Joseph Solunski, was bayoneted to death. Hundreds of workers were jailed, dozens beaten unmercifully. Charles Moritz, general manager of Alcoa's Massena mills, said that cheap labor could be imported from Canada. When the strike was finally beaten each state militiaman was given a set of aluminum cooking utensils by a grateful General Manager Moritz.

The company played Divide and Conquer again in 1917 when a strike broke out at the East St. Louis plant, and this time the results were truly tragic. Management refused to listen to employee demands and instead went to Mississippi to urge blacks to come north. Ten thousand flocked to East St. Louis, where there were not nearly enough jobs. Angry white workers attacked the black strikebreakers and murdered at least twenty-five. Blacks were shot, hung from telephone poles, and beaten to death. Company property was kept safe from the rampaging whites by guards armed by E. M. Sorrels, who later was placed on Alcoa's payroll.22

Kautsky and Hymer predicted the steady concentration or merging together of capitalist classes around the world. Here the evidence is not clear. While the aluminum industry is very concentrated both
vertically and horizontally it is difficult to find a trend over time. We can see that all of the firms from their formation, moved quickly to forward and backward integration. All have engaged in restrictive and monopolistic practices in the past. In France we have a steady trend of three firms to two firms to one—Pechiney Ugine Kuhlmann. But in this country thanks to government intervention, there were three after World War II with three more entrants in the 1950's. This is not to say that there is genuine competition in the industry today. The businessman uses the term "competition" to mean "rivals" whereas the economist uses it in the sense of firms in a market are price takers and have no control over price. While Alcoa has rivals it is not at all clear that Alcoa has no power whatsoever over price. Furthermore it is interesting to look at the recent fate of the "minors" in aluminum. As we have seen most of the independents have gradually been taken over by large firms and conglomerates in other industries. This may be an indication that they could not compete successfully against the big three without the kind of financial backing available to the majors.

From the standpoint of argument IC there are numerous accounts of clash between American government and public interest and Alcoa's business interests. Drew Pearson accused Alcoa of collaborating with the Nazis. "The monopoly between Aluminum Company of America and I.G. Farben kept magneuxium away from the American aircraft industry and retarded our production of planes." In the 1950's Alcoa as a public service to improve its image sponsored Edward R. Murrow's
See It Now. When Murrow attacked McCarthy, the latter countered against Alcoa. In Murrow biographer Kendrick's works--

The Senator himself sent a telegram attacking Alcoa directors if they intended to continue using "tax money" to sustain Murrow, meaning money spent on institutional advertising instead of going for taxes. Implied, as usual, was an investigation of some sort. Alcoa wavered but finally stood firm. A year later, however, it would drop its sponsorship of See It Now in another controversial situation, though the ostensible reason would be to sell "pots and pans" instead of mere good will."

"Sometimes," Edward R. Murrow remarked in thundering understatement, "there is a clash between the public interest and the corporate interest." 24

Finally from a Third World dependence perspective we have Girvan's analysis of the failures of the "engines of development" model in Jamaica. In particular he points out that underdevelopment and inequality have been fostered because:

1) income benefits have accrued to only a small percentage of the population.

2) the investment has had little impact on employment.

3) the high wages paid bauxite workers inflate the price of labor and have an adverse effect on farm output.

4) there is a little direct technological transfer.

5) balance of payments effects are limited due to the outflow of profits and the overspecialization in the primary product bauxite which experiences declining terms of trade.

6) the modern sector has done little to absorb the traditional sector.
Furthermore Girvan states that Jamaica did not "recourse" to foreign capital; that is, seek foreign capital only after local sources had been used up. Comparing the use of direct investment to a loan—

the use of foreign loan capital is far less costly to the national income than the use of direct foreign investment. With direct investment, depreciation and net profits accrue abroad, and do so, moreover in perpetuity. The foreign indebtedness is never liquidated. Rather, in so far as profits are reinvested, the foreign indebtedness increases.25

In contrast, the business viewpoint argued in the official statements and histories of the firms themselves, explain specific actions of the companies in terms of technological or economic necessity. Kaiser answers those who criticize the size and integration of the aluminum firms by the following statement:

If, as has been consistently proven, a major firm in today's manufacturing economy must integrate backwards, in order to obtain the lowest costs through the efficiency of the sources and the processing of raw materials, then it is equally true forward integration, making use of by-products and technologies, will also opportunities to enhance the firm's competitive position.26

Moreover, the companies' accounts tend to glance over or avoid discussion of "controversial" or "political" situations. Hence Aluminum by Alcoa makes little reference to the monopoly and cartel periods of the firm's past. In the earlier part of the chapter the author often contrasted the company accounts of such things as Alcoa's decision to acquire utilities, the creation of Alted, and the antitrust cases with other writers. In the company accounts misdeeds are always in the distant past.
While the business arguments appear to be weak in this case (perhaps because the companies have most often chosen not to respond to their critics), the arguments in group one have many of the flaws that were pointed out in Chapter Two. The recital of Mellons family holdings and friends does little to explain a linkage mechanism for transmitting company goals into government policy goals. Indeed many of the situations described reflect more the potential for conflict-of-interest rather than proven wrong-doing. There is also little support for the thesis of government and business congruency of goals outside of the few examples cited. There seem to be many more cases of conflict. The elaborate lengths that Alcoa went to in the early twentieth century to circumvent US Government anti-trust policy in pursuing its own FP goals stands as clear contrary testimony. As Wilkins points out (1974), Alcoa was not alone in the 1920's in using Canadian subsidiaries as holding companies. Nor is there much evidence of a congruency of business interests. We have already seen the failure of the aluminum MNCs to find much support from the national bourgoise of Jamaica. Indeed the author is struck during the cartel period, by the ways the MNCs resemble independent nation-state, warring at times, forming truces at others, and collaborating at other times.
Footnotes for Chapter Four


4 The term "foreign policy" is used in the manner adopted by Alger (1977) in speaking of non-governmental actors.

5 The company history written by Alcoa Public Relations man Carr is particularly amusing on this point. "Alcoa's management decided that it was not equipped to develop foreign markets, and that this could be done adequately only by a foreign corporation devoting its major activities to the task...This voluntary decision on the part of Alcoa to devote itself to the United States market was, as we have already said, inspired to some extent by the amazing acceptance aluminum received in this country in the twenties." (Carr, 1952, p. 191.) No mention is made of the cartel or the Consent Decree. It strains credibility that Alcoa spun off a good share of its business for no other reward than to create another competitor.

6 Including the Uihleins (Stockings..., 1946, p. 259) and George Haskell (Carr, 1952, p. 172).

7 In his conviction of Alcoa as a monopolist, Judge Hand ruled that 90% of the ingot market represented a monopoly. Dealing then with the slippery notion of what monopoly power is, the judge suggested, "it is doubtful whether sixty percent (of the market) would be enough." (Quoted in Peck (1958), p. 12.) Hence the reification of "60%".

8 The company's account of these events again attributes Alcoa with the loftiest of intentions...

...the Company's fight against subsidies and other socialistic suggestions, plus its liberal attitude toward competitors who acquired the plants, did much to bring about the present competitive conditions in the industry. (Carr, 1952, p. 264).
The Company has a reason to take pride in the co-operative role it played in bringing about a solution of the disposal of the government-owned aluminum facilities suitable for peacetime operations. The Company can feel some satisfaction in this despite the fact that it received scant consideration in the disposal of these properties which it had built for the government and operated so efficiently during the war. (Carr, 1952, p. 275).


11 Information for this section is taken from Moody's Industrials and company annual reports.


14 Further information see Mitchell (1968), Kuper (1976), Girvan (1971).


23 Ibid., p. 148.

24 Ibid., p. 150.


26 Hoffman (1974)
In March of 1974, Jamaica, in response to the many grievances outlined in the last chapter, announced the imposition of a substantial new "production levy" to boost the share of total output which Jamaican bauxite captured. In the past the bauxite nations had been stimulated in seeking higher returns for the raw material by the absence of an open bauxite market and bauxite price information. Jamaica, for example, had to rely on the companies' estimates of the value of the bauxite for tax purposes. But in setting its new production levy, Jamaica solved this problem by linking the tax to the ingot price of aluminum and demanding participation (but not nationalization) in the local mining operations, so as to acquire the needed internal financial information.

At first glance this move might well be seen as a telling blow to the traditionally dominant positions of the MNCs, particularly since most of the other bauxite sources followed suit in the months following the Jamaican move. But as was pointed out in Chapter One, may authors have argued that based on the experience of the OPEC cartel, the aluminum multinationals may not have suffered all that much and may indeed have had reasons to respond in a cooperative manner. In Chapter Six the author will attempt to assess the company
response to the cartel, but in this chapter the author turns his attention to the prime indicator of corporate health—the company profits.

OPERATIONALIZATION OF PROFITS

In assessing the impact of the cartel increases on the firms, many alternative measures of profit exist which might be employed. The author considered four potential indicators: return on book value, earnings per share, the price to earnings ratio, and change in earnings alone. The latter was selected as the operational measure for the reasons given below.

In his recent book on the copper industry, Narvin (1978) makes use of the indicator, return on book value. However, this indicator is seriously flawed for a number of reasons. First, there is the fairly arbitrary nature of book value, a measure easily manipulated for corporate fiscal needs. Book value may be inflated for some financial needs such as expropriation negotiations and devalued for others such as tax assessments. Also book value depends heavily on the particular depreciation method employed by the firm.

Earnings per share and price to earnings ratio are both good comparative investment measures, but tend more to reflect the stock market view of the firm. Earnings per share may depend on the amount of stock outstanding. The two components of the price/earnings ratio (P/E ratio) cause similar problems. A drop in the P/E might indicate a decline in the price of a share of stock or an increase in earnings.
Furthermore, financial theory states that if profits rise, the price of the stock is likely to rise in an offsetting manner.

The most commonly accepted measure in business research is the change in earning alone. For this reason, the author has chosen to construct an index of relative percentage of a given base period. In order to generate a sufficient data base, the author decided to use after-tax earnings reported on a quarterly basis.

SELECTION OF THE FIRMS

The availability of quarterly information raised a problem for the inclusion of certain firms. The author could not find quarterly information for the two large European firms, Pechiney and Alusisse. A further complication arose for the Pechiney Ugine Kuhlman conglomerate. Its annual report gave a breakdown of 1973 sales:

<table>
<thead>
<tr>
<th>Division</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>35.3%</td>
</tr>
<tr>
<td>Copper fabrication</td>
<td>22.1%</td>
</tr>
<tr>
<td>Mining-Electrometallurgy</td>
<td>7.9%</td>
</tr>
<tr>
<td>Steel and Titanium</td>
<td>7.4%</td>
</tr>
<tr>
<td>Nuclear and Special Proj.</td>
<td>7.8%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>19.5%</td>
</tr>
</tbody>
</table>

A sense of the overall size of this firm can be gained by considering that with only 35.3% of its activity in aluminum, Pechiney ranks as the fourth largest aluminum firm in the world.

A somewhat similar problem exists for Martin Marietta (Harvey). After April 18, 1972, Harvey's profits are reported as Martin Marietta Aluminum though separate from Martin Marietta. But in 1974 the
aluminum firm disappeared into the parent's earnings. The firm's 1978 annual report shows that aluminum contributed only 33% to earnings before interest and taxes. Similar changes in corporate identification generated problems for the other minor independents. Therefore, the author has selected four of the six majors for consideration in this study: Alcoa, Alcan, Reynolds, and Kaiser.

Narvin (1978) lists the six major US copper firm by asset size as Kennecott, Anaconda, AMAX, Phelps Dodge, ASARCO, and Newmont. Anaconda has been removed for several reasons. As has already been seen, Anaconda has a moderate interest in aluminum through its subsidiary, Anaconda Aluminum. More importantly, in 1977 it was absorbed by Atlantic Richfield; hence profit data in recent years is unavailable.

Both Anaconda and Kennecott lost assets in Chile, but, as Narvin reports,² Anaconda was deriving three-fourths of its profits there, whereas Kennecott earned only 11% from Chile. Furthermore, the takeover occurred in two stages, the first 51% in 1967, well before the beginning of the time-series. The second expropriation in 1971 ironically catapulted Kennecott into the lead as the world's largest copper firm. After carefully comparing Kennecott's earnings to the industry aggregate, the author concluded that the impact on Kennecott appears to be minimal due in part to the small proportion involved, the receipt of US governmental agency insurance, the use of tax losses, and the eventual payment of compensation by the Pinochet regime. The Kennecott nationalization may be viewed as roughly
equivalent to Guyana's nationalization of Alcan's properties in the same year, 1971.

CALCULATION OF THE INDEX

The author collected quarterly reports of after-tax for each of the nine firms from Moody's Industrial News Reports for all quarters from the Fall of 1971 to the Fall of 1978 inclusive. The next step was to adjust for the inflation rate. The OECD Main Economic Indicators provided quarterly price indices disaggregated by sector using 1970 as the base year. The years after 1976 used 1975 as the base year and therefore had to be translated onto the 1970 base year scale. The author selected the price index "Metals and Metal Products" as appropriate, and adjusted quarterly profits of all firms to reflect 1970 prices. This base year, 1970, was a time of strong profits for both industries due to the high demand for aluminum and copper products in the Vietnam War. Consequently, much of the time-series lines for both groups are below the 100% of base quarter point on Figure 21. To construct this time-series, the author summed the firms quarterly profits in each industry, and then calculated the relative percentage of the base quarter (the average of 1970's four quarters). This procedure generated two time-series, one each for the aluminum profits and copper profits, consisting of 29 data points.
THE QUASI-EXPERIMENTAL DESIGN

Following the research approach of Campbell and Stanley (1966), the author adopted the number 14 quasi-experimental design with the specifications laid out in Chapter Three. The author selected copper and aluminum as similar industries by the criteria given there. Aluminum is the experimental group and copper is the control group. In this case, the author is examining the quarterly profits of the two groups before and after the intervention of the bauxite cartel. In determining the exact time of the intervention, the author believes the first raise in price in early 1974 to be the crucial one since it in effect signalled to the aluminum firms' managements that costs were rising. Jamaica unilaterally adopted a substantial tax levy in March of 1974, and most of the other bauxite nations followed its example in the next few months. Therefore, the author chose the third quarter of 1974 as the intervention point.

In Chapter One the author stated his expectations of the effect of the intervention on the experimental group. He expects profits to rise at a higher rate in the experimental group compared with the control group. Consider a possible mechanism for this change.

The effect of the intervention on aluminum earnings depends upon the description of the aluminum industry. If one views the market for aluminum as being elastic and very competitive, one would expect earnings to decline. The aluminum firms would be as middlemen caught between rising costs and a fixed, given market price for aluminum and aluminum products. If one views the market for aluminum as inelastic
and fairly competitive, one would expect earnings to remain fairly constant, as the firms would pass on the cost increases to the price for aluminum. If one views the market as inelastic and uncompetitive, one would expect earnings to remain the same or even rise as the firms could pass on the increase and then some. On the basis of information already presented in Chapter Three, it is clear that the demand for aluminum is fairly inelastic. Hence, the most likely outcome would be that earnings will remain fairly constant. If the industry is uncompetitive the earnings might even increase.

The author can also suggest behavior patterns of company response for each of the three conditions listed above. If the first situation is the case, the author would expect the firms to have an antagonistic attitude toward the cartel and perhaps adopt a combative posture toward cartel demands. If the second is the case, he would expect the firms to adopt a fairly passive attitude toward the cartel. If the third is the case, he would expect the firms to adopt a passive, cooperative, or even protagonistic attitude. However, on the basis of the OPEC price increases, he cannot assume that the firms have perfect knowledge and hence may go through a learning process of seeing for themselves what happens to their earnings after a one or two fiscal year time lag. This lag may be shortened if the firms have already learned lessons from the OPEC experience which they apply to their own situation.

A more difficult question is the impact of the cartel on earnings stability. Given that the earnings fluctuate in a cyclical pattern,
the cartel's stabilization of the cost of bauxite might have an attenuating effect on earnings' fluctuations as Figure 15 suggests. The crucial relationship is the impact that the bauxite cartel could have on earnings from the sales of aluminum and aluminum products given that bauxite, prior to the cartel contributed only about 8% of the cost of the aluminum.

In using the quasi-experimental design the author must be particularly sensitive to the impact of other intervening variables. In particular he expects inflation, which is controlled for, and the overall business cycle to have confounding effects. Since he expects the earnings of the metal producers to be affected dramatically by demand in the manufacturing sector, metal profits should fluctuate in a roughly sinusoidal pattern mirroring the general business trend. Hence he expects to see earnings drop across the board in the 1975 recession.

If the author has effectively controlled for these intervening variables, he would expect his thesis to be confirmed by the following statements:

1) Means: $|M_{A1} - M_{A2}| > |M_{C1} - M_{C2}|

2) Slopes: $|\beta_{A1} - \beta_{A2}| > |\beta_{C1} - \beta_{C2}|

where $A1 = \text{Aluminum profits for the "before" period}$

$A2 = \text{Aluminum profits for the "after" period}$

$C1 = \text{Copper profits for the "before" period}$

$C2 = \text{Copper profits for the "after" period}$
FIGURE 15

An Attenuating Effect on Cyclical Earnings
Statement one suggests that the intervention should result in a greater mean shift in aluminum than copper. Statement two suggests that there should be a greater shift in slope for the aluminum profits. The effect of both of these equations is that if the quasi-experimental design has successfully controlled all intervening variables, the intervention should produce a greater change in the experimental group in both means and slopes than in the control group. Indeed, the control group means and slopes should remain relatively constant. Figures 16 and 17 show graphically a hypothetical case where the data confirm the propositions.

Notice that while the data in Figure 16 confirm Statement 2, it would not confirm the overall expectation of the study since it shows profits in aluminum declining after the intervention. This is because Statements 1 and 2 are concerned only with the amounts of change induced by the intervention and not the direction of that change. Concerning the directionality of change, the author expects:

3) \( M_{A2} > M_{C2} \)

4) \( \beta_{A2} > \beta_{C2} \)

5) \( r^2_{A2} > r^2_{C2} \), where \( r^2 \) is the coefficient of determination, or "variance explained"

Statement 3 suggests that after the intervention, the average relative $ profits in aluminum are expected to be higher in aluminum than copper as hypothetical Figure 18 demonstrates. Similarly,
Before X After

Means: Aluminum Copper

$|M_{A1} - M_{A2}| > |M_{C1} - M_{C2}|$

$|25 - 30| > |20 - 20|$

5 > 0
Confirmed

FIGURE 16
Hypothetical Confirmation of Means

Slopes: Aluminum Copper

$|\beta_{A1} - \beta_{A2}| > |\beta_{C1} - \beta_{C2}|$

$|0.5 - (-1)| > |0.6 - 0.6|$

1.5 > 0
Confirmed

FIGURE 17
Hypothetical Confirmation of Slopes
Statement 4 suggests that after the intervention the slope or rate of adjusted profits change should be higher (more positive) in aluminum than in copper as hypothetical Figure 17 shows.

Statement 5 focuses on the expectations concerning earnings stability. Since the cartel stabilizes the cost of bauxite, the fluctuation of relative profits around the regression line should be attenuated for aluminum as shown in Figure 15. With this attenuation, the variability of relative aluminum profits should be less than for copper, as hypothetical Figure 20 suggests.

FINDINGS

The statistics have been calculated and listed below.

\[
\begin{align*}
M_{A1} &= 77.08 \\
M_{A2} &= 85.00 \\
M_{C1} &= 74.42 \\
M_{C2} &= 36.83 \\
\beta_{A1} &= .933 \\
\beta_{A2} &= -.041 \\
\beta_{C1} &= .858 \\
\beta_{C2} &= -.639 \\
r^2_{A1} &= .87 \\
r^2_{A2} &= .00 \\
r^2_{C1} &= .74 \\
r^2_{C2} &= .41 
\end{align*}
\]

Inserting these values in equations 1 and 2 gives the following:

1) 7.92 \( \not> \) 37.39 \( \not> \) Not confirmed

2) .947 \( \not< \) 1.497 \( \not> \) Not confirmed

Recall that in order for statements 1 and 2 to be confirmed, the left sides (\( M_{A1} - M_{A2} \) and \( \beta_{A1} - \beta_{A2} \) respectively) must be greater than the
FIGURE 18

Hypothetical Confirmation of Means After

Means: Aluminum 
Copper 

\[ M_{A2} > M_{C2} \]

30 > 20

Confirmed

FIGURE 19

Hypothetical Confirmation of Slopes After

Slopes: Aluminum 
Copper 

\[ \beta_{A2} > \beta_{C2} \]

2 > .01

Confirmed
\[ r^2 = 0.85 \]
\[ r^2 = 0.45 \]

FIGURE 20

Hypothetical Confirmation of \( r^2 \)

\( r^2_A > r^2_C \)

\( 0.85 > 0.45 \)

Confirmed
right side \((M_{c1} - M_{c2} \text{ and } \beta_{c1} - \beta_{c2})\). However, one can observe that this is not the case in each instance.

The failure of Statements 1 and 2 was due to the large change in the means and betas of copper demonstrating that the design has not successfully controlled all intervening variables. Glancing at Figure 19, it appears that a likely intervening variable is the general business cycle. By late 1974 and early 1975 relative profits in both groups are sagging probably because of the business recession which began at that time.

Consider now equation 3 \((M_{a2} - M_{c2})\) and 4 \((\beta_{a2} - \beta_{c2})\). Substituting the appropriate values one obtains the following:

3) \(85.00 \geq 36.83\) Confirmed

4) \(-.04 \geq -.64\) Confirmed

The directionality expectations, Statements 3 and 4, were confirmed showing that the intervention produced a change in the direction predicted. On the average aluminum relative profits were higher than copper. After the intervention both groups experienced falling profit rates (negative slopes) but aluminum profits were declining much slower.

Turning to equation 5 and substituting the appropriate values, one obtains:

5) \(.00 \neq .41\) Not confirmed

Contrary to the expectations of Statement 5, the variability of aluminum appears to be greater at this point than that of copper. It is possible there is a lag effect; that is, it takes awhile after the
intervention for profits to stabilize.

The author also employed a one-year fiscal lag. The use of a time lag seems justified by the fact that MNC's required a few quarters to push up the price of aluminum to their customers. It seems likely that the firms would have accomplished this gradually over about four quarters. While this process was probably gradual, the author does not believe it would have been so slow as to justify multiple time lags of more than one year. In this notation $M_{A2L}$ translates as the mean for aluminum profits after the intervention lagged four quarters. The results here:

$$M_{A2L} = 93.75$$
$$\beta_{A2L} = .837$$
$$r^2_{A2L} = .70$$

$$M_{C2L} = 19.50$$
$$\beta_{C2L} = -.487$$
$$r^2_{C2L} = .237$$

1) $16.67 \neq 54.92$ Not confirmed
2) $.096 \neq 1.345$ Not confirmed
3) $93.75 > 19.50$ Confirmed
4) $.837 > -.487$ Confirmed
5) $.70 > .24$ Confirmed

The lagged results strengthen the differences between aluminum and copper means and slopes and show that deviation from the regression line is less for the aluminum profits than for copper profits after the intervention. Again, the failure of Statements 1 and 2 is due to the change in the copper control groups means and betas, demonstrating that the author has not taken into account the effects of intervening
variables, as perhaps, for example, the business cycle. This is evident from the time-series scatter plot presented in Figure 21.

On this graph the dark line running horizontally on the 100% line represents the 1970 base line. Profits for both groups start from a low in the 3rd quarter of 1971 due to the minor slowdown of late 1970 and early 1971 and the de-escalation of the Vietnam War (a major consumer of metal products) and rise at nearly identical rates until 1974. After that intervention year, the two lines steadily depart, both falling with the 1975 recession. But by 1976 the difference has become dramatically apparent as aluminum profits climb to new heights while copper profits continue downward.

IMPLICATIONS

It seems clear from these findings since mid-1975 of an upward slope ($\beta = .837$) for aluminum profits and a downward slope ($\beta = -.487$) for the copper profits that the aluminum firms have been relatively well-off since the cartel was formed, at least compared with its sister metal. Above all, it seems likely that the profits of the aluminum MNCs were not harmed by the imposition of the higher bauxite tax.

On the basis of the earlier expectations, this finding suggests that the aluminum firms have indeed been able to pass on price increases to the ultimate aluminum markets. This explanation seems to be further confirmed by Figure 22. The price chart in this figure shows the prices of a pound of copper and aluminum over roughly the same
FIGURE 21: Aluminum and Copper Earnings (Data from Appendix B.)
FIGURE 22: Aluminum and Copper Prices (Data from Appendix C.)
time period as the last figure. These prices represent quarterly averages, which have been adjusted in terms of 1970 prices. As is clear from the graph, aluminum prices have snaked steadily upward since 1974, whereas copper prices have followed a generally downward trend.

As a result of the initiatives taken by cartel members to acquire greater control over their bauxite resources, the supply of world bauxite has seen greater coordination. In contrast, the supply of copper is still characterized by anarchy and oversupply. As a result, copper prices have been more volatile and generally downward. This pattern represents but one more possible benefit to the aluminum firm of the cartel.

Finally, it should be obvious from this state of affairs that substitution between copper and aluminum is not as great as some writers have claimed (see Moran, 1974). If the two were near substitutes, one would expect the steady increase in aluminum prices to have been offset by substitution to copper with a resultant bidding up of copper's price.

SUMMARY

In this chapter the central question of the dissertation "do MNCs benefit from cartel formation," has been answered with a qualified yes. Using a quasi-experimental design to compare aluminum and copper firms, it has been shown that the intervention of the formation of the bauxite cartel (IBA) has increased the profitability of the
<table>
<thead>
<tr>
<th>Economic Condition</th>
<th>Impact of Cartel on Profits</th>
<th>Response of Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price elastic &amp; competitive</td>
<td>Decline</td>
<td>Conflictive</td>
</tr>
<tr>
<td>Price inelastic &amp; fairly competitive</td>
<td>Constant</td>
<td>Passive</td>
</tr>
<tr>
<td>Price inelastic &amp; uncompetitive</td>
<td>Constant or Increase</td>
<td>Passive or Cooperative</td>
</tr>
</tbody>
</table>
aluminum MNCs over the copper MNCs. While the design is flawed, in so much as it could not control for all the intervening variables—such as the business cycle—it does nonetheless demonstrate clearly the greater profitability of the aluminum firms. It also offers some evidence that after a one year lag, variability of aluminum profits is less than copper.

The question remains as to the generalizability of this finding. No significance test has been applied to the results since the study includes the entire population of major aluminum and copper firms. But under what conditions might other industries benefit from governmental cartels? The author's best predictor of this remains his schema presented earlier in this chapter and outlined on the summary table, Table 11. This table also presents the author's expectations of the corporate response to the given economic situations. The strengths of this analysis will be judged in the next chapter, which deals specifically with the response of aluminum firms to the bauxite cartel.
Footnotes to Chapter Five

1 At this point some reference should be made to the variable "risks." It is customary in the business literature to discuss "profits" in the context of "risks." The normal state of affairs is that the higher the risk, the higher the profits must be before an investment will be made. However, the metal industry is a mature business in which the size of the major firms and the lengthy past experiences of those firms has diminished the importance of risk, as witnessed in the traditionally low but stable profits made in the industry. Furthermore, "risk" has been excluded as a variable due to the difficulties in finding a reliable, quantitative measure of it.


3 See appendices 1 and 2 for the calculation of the index.

4 The statistics were generated from an SPSS program using the regression calculation routine.
Chapter Six: The Response of the Companies

In the last chapter it was shown that the formation of the bauxite cartel increased the profitability of the aluminum firms. This chapter will chronicle the events since the increased bauxite levels of 1974 with special emphasis on the response of the companies. Recalling the schema presented in Table 11, the expected response for the third row situation is "passive" or "cooperative." Given the necessary conditions of inelastic demand and uncompetitive markets, cartel formation can lead to increased profitability for the firms. Given this benefit, one would expect the firms to eventually respond in a cooperative manner to the cartel governments. Of course, this schema is very simple. As was pointed out before, it makes the very suspect assumption of perfect information. There is no allowance given for misperception of the benefits by the firms or a learning process which might slow the adoption of a cooperative stance. Nor is there any provision for the role of past history in this schema. Bitter past expropriation battles might render cooperation between firm and government impossible under nearly any circumstances.

The bulk of this chapter presents a case study of the firms and their interaction with the governments. The question posed here is: do the firms respond cooperatively to the cartel formation as
predicted by the schema on Table 11? In order to assess the response of the companies, Table 12 presents an inventory of actions and responses by firm and government categorized as either cooperative or conflictive. No attempt has been made to rank or weight the various responses. The list is by no means exhaustive. It is not the author's intention to generate a Creon Event Data list for MNC-LDC interaction. Rather, this table is provided to assist the reader in identifying the pattern of behaviors in the MNC to government interaction in a fairly impressionistic manner.

At the end of the case study narrative, the author will provide a brief analysis of the implications of his findings and the strength of the schema for explaining MNC behavior in cartel formation.

A CHRONICLE OF THE BAUXITE CARTEL

In February, 1971, Prime Minister Forbes Burnham announced that Guyana would nationalize Alcan's local Demerara Bauxite Co. after the breakdown of negotiations for government participation. This move was to foretell the beginning of a period of greater demands for participation in the mining and pricing of the bauxite nations' raw material. In this chapter the author will narrate that period with special attention to the formation of the cartel and the response of the companies. Due to the failure of the national news media to give much coverage to these events, this history will be taken largely from the annual reports of the firms (assumed to be biased in the firms' favor), national pamphlets' accounts (assumed biased in the
TABLE 12

Political Actions and Responses for Government and Company

<table>
<thead>
<tr>
<th>Government Actions &amp; Responses</th>
<th>Cooperative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conflicтив</strong></td>
<td><strong>Offer governmental contracts</strong> (or expand existing ones)</td>
</tr>
<tr>
<td>Nationalize assets.</td>
<td>Issue conciliatory public statements.</td>
</tr>
<tr>
<td>- with compensation</td>
<td>Reduce taxes.</td>
</tr>
<tr>
<td>- w/out compensation</td>
<td>Offer concessions in bargaining position.</td>
</tr>
<tr>
<td>Issue bellicose public statements.</td>
<td></td>
</tr>
<tr>
<td>Implement higher taxes.</td>
<td></td>
</tr>
<tr>
<td>Demand participation.</td>
<td></td>
</tr>
<tr>
<td>of contracts.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company Actions &amp; Responses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conflicтив</strong></td>
<td><strong>Expand production.</strong> (open new plants)</td>
</tr>
<tr>
<td>Cut back production.</td>
<td>Refuse to join other firms' campaigns against government.</td>
</tr>
<tr>
<td>Withdraw foreign staff.</td>
<td>Offer concessions in bargaining position.</td>
</tr>
<tr>
<td>Boycott sales of nationalized plant.</td>
<td>Voluntarily initiate programs to assist development in host state</td>
</tr>
<tr>
<td>Organize other firms to participate in boycott.</td>
<td>Issue conciliatory statements.</td>
</tr>
<tr>
<td>Begin legal proceedings against government in:</td>
<td></td>
</tr>
<tr>
<td>- local courts</td>
<td></td>
</tr>
<tr>
<td>- foreign courts</td>
<td></td>
</tr>
<tr>
<td>- ICSID</td>
<td></td>
</tr>
<tr>
<td>Withhold taxes.</td>
<td></td>
</tr>
<tr>
<td>Make bellicose public statements.</td>
<td></td>
</tr>
</tbody>
</table>
country's favor), and general business periodicals such as *Business Latin America* weekly reports (assumed biased in terms of general business values.)

By 1970 national leaders in Guyana were feeling many of the same frustrations that Jamaica faced (see Chapter 4). Guyana therefore began to sound out Jamaica and Surinam on the possibility of forming a common bauxite council to confront the aluminum firms. The then ruling Jamaican Labor Party showed no interest in the Guyanese overture, in part because it was concluding negotiations on its own for a small increase in the bauxite tax. The Guyanese leaders also attempted to pressure the firms into making greater use of local intermediates, such as local flour (starch) in the alumina process. By the end of 1970 the government had chosen majority participation as the only solution. Prime Minister Burnham was at first reluctant to go so far as nationalization, but the failure of the equity negotiations forced the move. "The prime minister may have been a victim of his own hand. The government had to pass up less drastic measures to accommodate the nationalist fervor it had whipped up since Guyana became a socialist, cooperative republic early last year."^1

The former Alcan subsidiary renamed Guybau immediately faced a series of grave problems; the flight of the entire North American management team, and the lack of a well-developed marketing system for its bauxite and alumina. In the compensation agreement, Guyana accepted a figure of $53.5 million as the price of the facilities, a
price slightly higher than the company's earlier estimates of value. "The Guyanese government is obviously trying to keep its relationship with Alcan as cordial as possible." The government still needed Alcan's marketing outlets and Alcan agreed to buy half of Guybau's output. The government report on Guybau glosses over many of the management and marketing problems which necessitated the closing of the alumina plant for a brief period, and bauxite production dropped slightly as Table 13 shows.

TABLE 13

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Guyana</td>
<td>4,306</td>
<td>4,417</td>
<td>4,234</td>
<td>3,668</td>
<td>3,621</td>
<td>3,049</td>
</tr>
<tr>
<td>Jamaica</td>
<td>10,498</td>
<td>12,106</td>
<td>12,543</td>
<td>12,989</td>
<td>13,601</td>
<td>15,328</td>
</tr>
</tbody>
</table>

\(^a\)Metal Statistics, 1976.

The increase in Jamaican production over the same years suggests that the North American firms may have made up the difference there. But by 1976 the situation seems to have taken a profitable turn, thanks perhaps in part to the cartel. "Its 1975 after-tax earnings tallied perhaps G$ 25.2 million, up from G$ 19 million in 1974 and G$ 8 million in 1973. Since nationalization, the firm has seen its total capital more than double, to G$ 227.6 million; the return on
total mean capital is 13.4%4 Guyana also has ambitious plans to tap its hydro-electric potential and build an aluminum smelter. The Alcan nationalization put Reynolds on notice that sooner or later the government would make similar demands of it.

The Bauxite Cartel

In March 1974 the major bauxite exporting countries sent representatives to Conarkry, Guinea to create a permanent organization to be called the International Bauxite Association (IBA). The seven founding nations, Australia, Guinea, Guyana, Jamaica, Sierra Leone, Surinam, and Yugoslavia, created a Secretariat to be located in Kingston, Jamaica to gather and disseminate information on the companies' bauxite operations. This act of creation was the culmination of a series of meetings on the subject in the early 1970's.

No agreement on prices resulted from this meeting as was the case with early OPEC meetings. In particular, the IBA seemed faced with two insurmountable problems. First, there was the dearth of information on the pricing of bauxite by the MNCs. With no international market for the mineral, the countries had been forced to rely on company assessments of what their bauxite was worth. Secondly, this absence of an international market and the total vertical integration of the majors, emphasized the dependence of the countries on the multinationals. The lesson of Guyana had demonstrated that even with nationalization the country had to rely on the goodwill of Alcan to purchase its bauxite and alumina and complete its processing
into aluminum. Hence, it seemed any action which antagonized the major firms would leave the country sitting on its unmarketable bauxite sources.

Nonetheless, Jamaica immediately took a spectacular gamble. It is perhaps ironic that the OPEC cartel stimulated action not only as a model, but out of necessity. Suddenly faced with huge increases in its oil import bill, Jamaica, as with many other developing nations, was thrown into dire economic straits. Given the island's already chronic social and labor problems, Jamaica was forced to set in motion events which would create what Business International called a "New Era for Bauxite Firms." "According to Manley, the severe economic problems facing the island outweigh the sanctity of contractual agreements."

On March 18, 1974, the government began talks with the five North American firms, Alcoa, Alcan, Reynolds, Kaiser, and Revere, which were to eventually include a whole series of demands:

1. the renegotiation of all contracts with the firms
2. the increasing of royalty and taxes by 600%
3. the takeover of all bauxite lands (about 200,000 acres) and control of the nation's bauxite reserves
4. the imposition of minimum production levels for each of the firms to prevent shifting of mining away from Jamaica (eventually lowered after other bauxite nations imposed same tax)
5. the initiation of equity participation discussions

At this time the firms had a total investment in Jamaica of roughly $800 million, and bauxite provided about 40% of the islands'
foreign exchange earnings, now in desperately short supply.

There was no indication at this point that the other bauxite countries would follow Jamaica's lead, and hence the firms adopted a tough stance.

The six firms have not taken this proposal lying down...the companies claim the higher tax on bauxite is unrealistic in terms of costs and investment needed to make aluminum. According to the firms, Jamaican bauxite would become uncompetitive vis-a-vis bauxite produced in other areas.^

Alcoa and Kaiser filed claims before the International Center for the Settlement of Investment Disputes (ICSID) of the World Bank charging breach of contract. While many writers at this time pointed out the dependence of Jamaica on the aluminum firms, due to the vertical integration of the industry, it should be pointed out that this vertical integration for some of the firms made the dependency a two-way street. As we have seen, Reynolds and Kaiser made heavy commitments to mining Jamaican bauxite. Both had converted their Gulf Coast refineries to processing specifically that ore. While Kaiser had recently entered the Australian bauxite mining industry, it still depended on Jamaica for more than 70% of its ore. This special vulnerability of Kaiser was not to go unnoticed by the Jamaican government.

The events of the next few months were to vindicate Jamaica's gamble. By September, Guyana had substantially raised its tax levy on Reynolds Guyana Mines Ltd. following the Jamaican example. "The Jamaican tax formula, however, is being applied in Guyana with some
adjustments for local conditions. For one thing, the Burnham Government factored in that Reynold's shipping and mining costs are higher in Guyana than in Jamaica. At the same time the new government of Surinam (that country was preparing to be granted independence in 1975) announced it intended to follow Jamaica in demanding more for its bauxite. The Congress of the Dominican Republic passed a bill to raise Alcoa's royalty payments. Alcoa mines only 5% of its bauxite from that island but seemed to have responded cooperatively. "Alcoa is showing a flexibility that should help it.... The company may grant the Dominican Republic any advantages in price it negotiates with other countries hosting Alcoa operations." Haiti also began negotiations for tax increases on Reynolds' local operation there, though Haiti provides only 10% of Reynolds' world production. Both Haiti and the Dominican Republic were invited to join the IBA along with Ghana.

Supported now by the other IBA members' actions, Jamaica realized an increase in its bauxite revenues for 1974 to $200 million (as opposed to $27 million for 1972 and 1973). Jamaica proceeded with its equity negotiations, singling out Kaiser as its first target and in late 1974 reached an agreement in principle. Kaiser seems to have been well aware of its vulnerability and has long cooperated with the government on various projects. In 1969 Kaiser established a private development corporation to channel technology and funds for development into the economy, and proposed an innovative scheme for reversing the country's "brain drain" problems. As a result the
1974 agreement say many concessions on both sides.

...the Jamaican Government will own 51% of Kaiser's existing bauxite operations. Jamaica will put up the necessary $15 million over a 10 year period at 8.5% annual interest. A new company to run this facility will be created under the direction of an executive board made up of equal representation from both Kaiser and the government. However Kaiser will continue to manage the operations.

Kaiser guaranteed to give Jamaica a profit return of 12%. In addition Jamaica agreed to purchase 40,000 acres of desperately needed agricultural land from Kaiser for $8 million and then lease back enough land to give Kaiser reserves for 30 years. Jamaica agreed to give Kaiser a reduction in its tax levy for three years from 8.5% to 7.5%. After this agreement was concluded, Kaiser decided to withdraw its case from the ICSIA. "Kaiser's president stated that the new accord is 'the beginning of a new and positive relationship' between his firm and the Jamaican government." This seems corroborated by the fact that shortly there after Jamaica invited Kaiser to participate in its talks with Mexico over a joint refiner-smelter plan.

With this agreement with Kaiser, Jamaica turned to negotiations with Reynolds and Revere. These negotiations turned out to be quite protracted and an agreement with Reynolds was not concluded till March 1977. This agreement took much the same form as the earlier agreement with Kaiser.

Jamaica waited to begin the sticky issue of negotiations with the firms which had alumina refineries on the island (Alcoa, Alcan,
Alpart) till last. The negotiations with Alcoa were settled with amazing dispatch. By October 1976, the two parties had signed a pact "which has been hailed by both parties as mutually beneficial."^13 Basically the plan calls for the creation of a joint venture, Jamalco, to manage Alcoa's bauxite and alumina operations. The government will hold a 6% interest in Jamalco, and will have two of the seven positions on the executive board. The provisions for the sale of Alcoa's landholdings are similar to those in the Kaiser pact. Jamaica can take 6% of the output to sale for its own alumina commitments to smelters with Mexico and Venezuela. Alcoa also agreed to withdraw its complaint from the ICSID.

Jamalco will start off with goodwill on both sides. Alcoa's chairman billed the accord as a "winning situation for both parties, and that's the kind of situation that works."

Manley echoed the chairman's feelings at the signing ceremony pointing out that the negotiations with Alcoa were the last to begin but the first to be completed.^14

Protracted negotiations with Alcan did not conclude until late 1978. Following the Jamalco formula, the government will own 7% in a bauxite-alumina joint venture creatively named Jamaican.^15 With the conclusion of this pact, Jamaica had successfully negotiated with each of the majors. The cases before the ICSID had all been withdrawn and equanimity appeared to reign in relations between the aluminum multinationals and the bauxite governments.

The sole exception to this mellifluous climate was Jamaica's negotiations with the independent Revere Copper and Brass, Revere
appears to be the only firm to have stuck with an uncompromisingly querulous attitude. Revere challenged the validity of the tax in the Jamaican Supreme Court, and refused to make its payments to the government which by January 1977 had totalled US $7 million in back taxes. The Jamaican courts ruled against Revere and the firm took its case to OPIC.

Revere also took its complaint to the US's Overseas Private Investment Corp (OPIC) under which its Jamaican subsidiary is insured. Revere claimed that since the bauxite production levy was tantamount to expropriation, it was entitled to US $66.5 million in damages...16

But with all the positive euphorisms of the majors' statements, Revere's case did not come across well.

Considering that Revere lost money in Jamaica even without the levy and that Alcoa, Alcan, and the Alpart consortium were somehow able to live with the levy, Revere's claim fell pretty flat. OPIC rejected it and the issue is now headed for arbitration.17

Indeed as a marginal producer of aluminum, Revere had long had problems competing with the majors. "Competitors say that both the Scottsboro (Alabama) smelter and the rolling mill and the Maggotty (Jamaica) alumina refinery were all too small, too inefficient and fundamentally too badly designed to have ever paid off."18

Nonetheless, it is interesting to speculate why it was the lone minor among the aluminum firms that adopted such a conflictual position toward the cartel. This again raises the question of the effect of producer nation cartels on concentration and monopoly power throughout the industry. Indeed, Bergstein suggests that this very
point explains much of the cooperative behavior of the majors.
"...as in oil, the active engagement of the producing countries may create a situation which the firms were never quite able to achieve on their own—effective control over pricing and production throughout the aluminum market."\(^{19}\)

Marginal producers in the industry have long had a history of troubles in competing with the majors (recall Harvey, Olin, Anaconda to name a few). For Revere the cartel appears to have been the straw that broke the camel's back. On March 10, 1977, Revere followed the path of its former partner Olin out of the industry by agreeing to sell its Scottsboro smelter to Alcan.

Indeed, since the cartel, the majors have changed their policy on pricing. "'We have left the path of (market) penetration pricing for a path that emphasizes financial performance,' explains John L. Diedrich, Alcoa's general sales manager."\(^{20}\) Consequently, Alcoa boosted its price several times in 1977 and 1978 and "what Alcoa does, the other aluminum producers will follow." (and did) "In such a position of strength, Alcoa is telling customers, in so many words if they want aluminum...they will have to pay for it."\(^{21}\) By early 1979 the result was clear. With profits climbing ever higher, Alcoa chairman, W. George seems to be near attaining his predicted (back in February, 1977)\(^{22}\) 14\% return on investment, a figure unheard of for Alcoa since it old monopoly days. "...domestic producers have chosen to hold back expansion, run at near-capacity, and jack up prices as far as demand—and the law—will allow,"\(^{23}\) The majors have few plans
for expansion and with aluminum supplies growing short, one wonders why no new entrants are being attracted to the field. *Business Week* lays the blame on higher costs and bauxite. "An assured supply of bauxite has been a key factor ever since the formation of the cartel-like International Bauxite Assn." With this greater profitability *Forbes* has been running leads to articles such as "Aluminum's Bosses are Beaming," and "Aluminum Turns to Gold."

To summarize, this chronicle of the Bauxite cartel has traced the reaction of the firms to the cartel formation. The initial reactions of all the firms fall under the "Conflictive" heading of Table 12. In particular, the companies responded with "Begin legal proceedings against government" and "Make bellicose public statements." In addition, Revere decided to "withhold taxes." Shortly thereafter, all four of the majors, Alcoa, Alcan, Kaiser, and Reynolds had all dropped their conflictive responses in favor of cooperative actions. These actions included "Offer concessions in bargaining position" by allowing partial government ownership of the mines, and "Issue conciliatory statements." From this narrative the author concludes that the ultimate response of the major firms was cooperative as was predicted on the basis of the last row of Table 11. The only failing of the prediction lies in the initial, shortlived conflictive reaction. More will be said of this failing in the final section of this chapter.
IMPLICATIONS: THE "PROFIT-SHARING CARTEL"

Some writers have compared the bauxite cartel to OPEC.

The unilateral seizure by Guyana of its subsidiary in 1971 had something of the catalytic impact in disrupting the traditional dominance of the companies that Libya's oil nationalization and price demands did during the same period.25

The scenario as it developed represents "price leadership" by Jamaica, followed individually by other countries, rather than pure cartel action. This is exactly what happened in oil in 1971, when Libya and the Persian Gulf states began the oil offensive by "leapfrogging" each other's tax demands.26

But these comparisons apart, the Bauxite agreements are not entirely the same as for the OPEC cartel. In negotiations over equity, Jamaica gave the companies a temporary cut in their tax from 8 or 8.5% to 7.5%. The real breakthrough for the bauxite countries was in indexing the price of bauxite to the price of aluminum. Given the nature of the aluminum industry (Chapter 4), higher prices mean higher profits for the majors and higher tax revenues for the cartel. In effect, the two groups appear to be cooperating to exercise monopoly power. The result resembles a "profit-sharing" scheme than confrontation between the companies and the governments.

To promote such a result (greater coordination with the firms), IBA explicitly seeks "partnership" with the companies. Indeed, Jamaican officials advocate higher profits for the firms in the near future. The producing countries insist on being the senior partners, but clearly recognize that it behooves them to use the companies rather than treat them as enemies.27
In the early 1980's Jamaica's "cut of the take" will increase to 8.5% and IBA may negotiate higher percentages later. But for the firms, gross profits are still profits, particularly when the cartel is in part responsible for those higher profits.

Much of the initial adverse reaction is attributable to the speed with which Jamaica moved, and the need of the companies to avoid repeating the mistake of the oil companies, which appeared to cave in too quickly in "abandoning the consumer interests." IBA staff and company personnel attend each other's parties and seem on wholly friendly terms.28

What the author is calling a "Profit-Sharing Cartel" is very similar to the role which Vernon (1977) sees the MNC playing as "tax collector" for the developing nations. By this term he refers to the attempts by some LDC's to use MNCs to increase the prices of their commodities with a bigger share of the return for both. By Vernon's terminology, the aluminum firms are decidedly acting as the "tax collectors." As was seen in Chapter 5, they appear to have little difficulty in passing on the price increases from bauxite to aluminum. With this rise in price, both parties have reaped bigger takes as the companies' higher profits would seem to suggest.

If the aluminum firms are the tax collectors for the bauxite nations, then it is consumers and other businesses in the US and other countries which must pay the tax. If the consuming nations continue to respond in the disorganized, passive manner that followed the OPEC oil increases, the situation is not likely to change in the near future.
Specifically, it is the many users of aluminum as an intermediate good who have complained the loudest. This group includes the manufacturers of cans, siding, machinery, automobiles, and it is not clear that all of them have been able to pass on the price increases. The automotive users are compensated in part by the increased demand with the energy crisis for light weight auto parts. A few manufacturers have benefited if their products are near substitutes for aluminum in certain uses (i.e., plastics in containers), but one group clearly not benefited is the copper firms as has been seen in Chapter 5. Ultimately, it is the final consumers of aluminum products which must pay the higher price, and the economy as a whole which suffers the effect of these price increases. It is not clear that labor, aside from being consumers, has suffered directly. Recall in Chapter 4 that the aluminum firms have not chosen to exploit the cheaper wage rates of Jamaica, and indeed, invited the United Steelworkers of America to organize the labor force—a unique policy for a MNC.

It is not clear to what extent the US military and government are affected by the cartel. The military, as was shown in Chapter 4, has consistently favored Jamaican production as more defensible than other sources and has been unconcerned about price. Unlike OPEC, the bauxite cartel has not yet attempted to link its economic clout to political issues which would offend the US government. Hence, the US's dependence on the bauxite cartel has not seems as onerous as OPEC. This situation could change dramatically if the cartel were unable to maintain its low profile due to some future crisis with
the US.

Clearly, it is the companies, their stockholders, and the governments of the bauxite nations who are gaining the benefits of increased revenues. It is impossible to suggest how the companies are using those funds and who is benefiting from that investment. The government of Jamaica has in the past used tax revenues to expand government programs and in particular, social welfare programs. But as one writer suggests (Stone, 1977) the bureaucracies the government has created serve more the educated middle class civil servants in its staffs than the real poor of the island.

One of the main focuses of the New International Economic Order (NIEO) has been the use of commodity agreements to create transfers of revenue from the wealthier states to the poorer. But an ironic "beggar thy neighbor" situation has often emerged. Jamaica was stirred to action by the massive increases in its oil bill and now much of the revenue it gains must be used just to balance that drain. Furthermore, at least part of the transfers gained by the high price of the commodity are being "recycled" to the developed states by the "tax collector" MNCs. Further research is needed to carefully measure and assess the impact of these folows. It seems that ultimately these commodity activities of the NIEO have only further crystalized the relative status differences among the less developed countries themselves.
The Generalizability of the Findings

Finally, one can ask to what extent this analysis is generalizable to other industries? How far can the author go in predicting corporate support for future cartels? First, it must be admitted that the author is generalizing from an extremely small set of cases. After OPEC appeared, many economists emphasized oil's exceptional nature, though bauxite now appears to be yet another exception. While the author is not able to offer a complete set of answers to the above questions, he can suggest a few directions for future research.

Table 11 at the end of Chapter 5 suggests the possible routes from cartel formation to company responses. To arrive at an ultimately cooperative situation, as occurred in this case, one must begin from the necessary conditions of price inelasticity and market concentration shown in the third row. This requirement is clearly demonstrated in the case of the banana cartel (UPEB) formed in 1974. It would seem the missing factor here was inelasticity in the market for bananas. The three major banana companies, United Brands, Standard Fruit, and Del Monte, perceived themselves as being caught between rising costs and an elastic market. Consequently, they "fought back with noted ferocity." Indeed, they took such actions as cutting production, organizing boycotts, refusing to pay the tax, and other responses listed under the conflictive behaviors of Table 12. United Brands even went so far as to make its now infamous payoff to the President of Honduras. The company response was so intransigent
that eventually the levy was dropped and the cartel fell apart. The author would predict that any future cartel which attempted the form with the situation as given in row one of Table 11 would likely face a conflictive response from the companies which may contribute to the downfall of the cartel.

This schema for predicting company responses is far from perfected. It cannot explain the brief initial period of conflictive behavior of the part of the aluminum firms before the new contracts were signed. To explain this, the schema must be further enriched with psychological and perceptual variables. This task, for which the author has not the training, must be left to future research. Until then, he can suggest but not choose among some alternative propositions:

1. The firms initially misperceived the nature of the markets and the nature of the benefits to them.

2. The firms were caught off guard and responded to threats with threats.

3. The firms needed to appear not to give in too quickly (a la Bergstein).

In any case this initial adverse reaction passed quickly to a state of cooperation. This may have occurred because the government's initial demands left room for eventual accommodation. Similarly, future cartel forming governments should be aware of the conditions under which they may achieve the corporations' cooperation.
Summary

From the reports of various business magazines, the author has found further evidence of aluminum MNC profits found in Chapter 5 to have resulted from the cartel formation. For the firms and the bauxite governments "Aluminum Turns to Gold" seems an appropriate description of the situation. Furthermore, the author's expectation that the benefit of increased profitability would lead to a cooperative response from the companies is ultimately affirmed. Some evidence that the cartel may have limited competition for the majors, by driving out smaller firms like Revere and limiting access to bauxite sources, but further research is required to affirm this point. The benefit of the cartel appear to be flowing to the firms and the governments. The specific arrangement for this is the bauxite tax set as a fixed percentage of the aluminum firms' new pricing policy, the inelastic and fairly uncompetitive nature of the aluminum market, and the IBA members' control of bauxite sources, higher aluminum prices means higher revenues for both groups.

Under fairly similar conditions, the author would expect a similar pattern of behavior to emerge. Given the economic requirements specified, the author would expect the MNCs in the cartelized industry to benefit from higher profits. Given the possibility of higher profits he would expect the firms to respond cooperatively to cartel attempts. He has not accounted for all the intervening variables, such as perceptual factors. But hopefully he has contributed an understanding of yet another aspect of the
independent political behavior of the MNC.
Footnotes to Chapter Six


13 "Jamaica's Accord with Alcoa Marks Major Breakthrough....," *BILA*, 1976, p. 344.


16 "Jamaican Accord with Reynolds Metals Co...," *BILA*, p. 117.


19 Bergstein (1976), p. 16.


APPENDIX A

Price Index for Metal and Metal Products in US

1970 = 100

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1978

Annual

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*After the 3rd Quarter of 1976 the index switches to 1975 = 100 base. Therefore, the author converted these given values by the conversion factor (Y=1.59) to give the values listed here with the same 1970 base.

Source: OECD Main Economic Indicators
### APPENDIX B

#### Aluminum Industry Profits

Summed quarterly profits for Alcoa, Alcan, Kaiser, and Reynolds converted to a relative percentage of the base quarter (1970 four quarter average).

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<td>Q4</td>
<td>23,831</td>
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<td>Q2</td>
<td>45,967</td>
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<td>38,478</td>
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<tr>
<td>Q4</td>
<td>46,171</td>
<td>67.3</td>
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</table>
Quarter | Total Earnings at 1970 Prices | Relative Percentage
--- | --- | ---
1977 Q1 | 67,916 | 99.0 *
Q2 | 102,458 | 149.3
Q3 | 73,389 | 107.0 *
Q4 | 82,888 | 120.8
1978 Q1 | 68,036 | 99.2
Q2 | 129,385 | 188.6
Q3 | 118,773 | 173.1

*Relative Percentage = Quarterly adj earnings/68,612
**in thousands of dollars

Copper Industry Profits

Base quarter (1970 quarterly average) = 133,553

Quarter | Total Adjusted Earning | Relative Percentage
--- | --- | ---
1971 Q3 | 29,406 | 22.0
Q4 | 62,563 | 46.8
1972 Q1 | 74,230 | 55.6
Q2 | 86,580 | 64.8
Q3 | 42,165 | 31.6
Q4 | 68,739 | 51.5
1973 Q1 | 142,820 | 106.9
Q2 | 121,482 | 91.0
Q3 | 146,512 | 109.7
Q4 | 155,181 | 116.2
1974 Q1 | 129,128 | 96.6
Q2 | 142,284 | 106.5
Q3 | 84,254 | 63.0
Q4 | 84,049 | 62.9
1975 Q1 | 55,079 | 41.2
Q2 | 58,598 | 43.9
Q3 | 23,148 | 17.3
Q4 | 39,623 | 29.7
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<th>Quarter</th>
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## APPENDIX C

### Aluminum Prices Adjusted for Inflation

Given on average quarterly basis.

For each quarter the quarterly average appears on top, the adjusted price underneath.

<table>
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