SOME ENVIRONMENTAL CORRELATES OF FOREIGN MARKET SERVICE STRATEGIES

By

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Dedicated to

JOAN and ROBIN

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SOME ENVIRONMENTAL CORRELATES OF FOREIGN

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The purpose of this study was to investigate the relationship of several environmental characteristics of countries to (1) the marketing channel roles of domestic firms in foreign countries, (2) the level of United States exports, and (3) the level of United States foreign direct investment.

Three sets of constructs were developed as alternative methods of representing the political, social, cultural, economic, and other characteristics of a country that may affect international business operations. A theoretical model (the "environmental temperature model") of international business arrangements was the source for one set of constructs. The other two sets were developed inductively and empirically.

Construct validation was performed on measures of the characteristics postulated by the environmental temperature model using factor analytic techniques and correlational analysis. Data used in this study were obtained from a sample of fifty-three countries for the years 1965 through 1967. The results of the validation indicate

that the several constructs originally proposed are not unitary, as hypothesized. Instead, they appeared to represent a more complex environmental structure involving many different elements.

Following construct validation, three theoretical models were developed (the environmental temperature model and two empirically derived alternative models) using the three sets of measures as potential correlates of an index of foreign marketing channel roles, the level of exports, and the level of investment. The relative validities of the models were tested by multiple regression analysis and stepwise multiple regression analysis. The results of this test do not entirely support the validity of the environmental temperature model of international business arrangements. While some of the constructs were found to be significantly related to the three criterion variables, others were not. In addition, interaction effects between constructs as well as nonlinear relationships between the constructs and criteria were found to be significant, although these relationships were not predicted by the environmental temperature model.

The results obtained in testing the models indicate that a country's language and culture are important elements of environmental structure and are related to a domestic firm's foreign market service strategies. These environmental elements along with the environmental elements that define a country's transportation network and its advertising and promotional media were found to be related to United States exports. A country's population, and the environmental elements defining a country's language and culture, its transportation network, and its advertising and promotional media were found to be related to United States foreign direct investment.

The continental location of countries was also found to be an important element of environmental structure. This element both affected and moderated the associations between other environmental elements and the criterion variables. Exports to and investment in countries located on the American continent were especially found to be different from other countries of the world and more sensitive to differences in environmental conditions than would otherwise be expected.

Data were also examined to investigate lead or lag associations between the constructs and the criterion variables. No such associations were found. However, there were indications that the values of the constructs and criterion variables were systematically changing with time or that the functional relationships between constructs and criterion variables were changing.

CHAPTER I
INTRODUCTION

The Internationalization of Business

In the past two decades, American business has increasingly looked abroad for the production and marketing of goods and services. This "internationalization of business" can be measured in part during this period by the growth in United States exports and increased foreign direct investments.* As can be seen from Table 1, the book value of foreign direct investments has grown rapidly from only 11.8 billion dollars in 1950 to 78.2 billion dollars in 1970, while exports have increased from 14.4 billion dollars to 62.9 billion dollars during the same interval. With an average annual growth rate of 9.9 percent for these two decades, foreign direct investments have outpaced the annual 6.4 percent growth rate of the United States gross national product. Similarly, United States exports, with a slightly smaller annual growth rate of 7.6 percent, have also exceeded the annual rate of growth of the gross national product.

The high levels of United States foreign direct investments and exports during these past two decades are but two indices of the increasing internationalization of business. The internationalization of business has, in fact, been accomplished in many different ways. For

*The term "foreign direct investments" should be considered a stock concept representing domestic ownership of foreign equity. "Foreign direct investment" is a flow concept representing net capital outflows to foreign countries plus reinvested foreign earnings.

TABLE 1

COMPARATIVE GROWTH OF UNITED STATES FOREIGN DIRECT INVESTMENTS, EXPORTS, AND GROSS NATIONAL PRODUCT, 1950 TO 1970
(Money Amounts in Billions of Dollars)

	1950	1970	Average annual growth (%)
U.S. foreign direct investments	11.8	78.2	9.9
U.S. exports of goods and services	14.4	62.9	7.6
U.S. gross national product	284.8	876.4	6.4

SOURCE: Survey of Current Business, United States Department of Commerce (Various Issues); United States Statistical Abstract, United States Department of Commerce (Various Issues).

instance, joint ventures, licensing agreements, and branch offices are some of the strategies that firms have used to expand their current foreign activities and penetrate new foreign markets. Other strategies and combinations of strategies, however, have also been used.

Since the internationalization of business can be accomplished in many different ways, the question can be raised: what determines the particular strategy or strategies that domestic firms will use in their international operations? This question is the central issue of this study.

International Business Theories

For most of human history, international business has consisted almost entirely of trade--that is, the importation and exportation of goods and services between countries. For this part of history,

international trade theory, which will be discussed in a following section of this chapter, has been useful in explaining almost all aspects of international business. Today, however, international business consists not only of trade but also the movement of money, assets, and personnel through a global network of interrelated organizations. This more complex structure of international business cannot be explained by international trade theory alone. Unfortunately, no single general theory has been developed that deals adequately with the present situation. Robock and Simmonds maintain that:

> The development of a theoretical basis, or framework, for explaining and predicting international business patterns is still in an early stage. There has been no movement to discard trade theory. But something more is needed. (1973, p. 16)

Numerous alternative theories have, however, been advanced to explain the different structures and processes of today's international business. It is a useful exercise to review briefly some of the theories of international business as well as the theory of international trade. Such a review can show the direction of current thought and illuminate its areas of weakness and strength.

A review of international business theories is useful for another reason. International business involves interrelated activities in many fields such as marketing, management, economics, and politics. A study of international business, therefore, often requires a multidisciplinary approach. Because the reader may not be acquainted with all of these fields, the following review may serve to illuminate these fields in the perspective of international business and provide a background for further discussion.

International Trade Theory

Beginning with Ricardo and Torrens in the early nineteenth century and extending into the present, the theory of international trade has had a long period of development and refinement (Schumpeter, 1954). This theory attempts to explain why trade occurs between countries, what products and services are traded, how gains from trade are distributed among the trading parties, and how international trade patterns are affected by disturbances. According to the theory, international trade will occur when two or more regions of the world have comparative advantages in the production of goods and services. It will be advantageous for each of these regions to specialize in producing the products or services for which it has a relatively greater production efficiency. That is, each region should produce those products and services for which its factor costs are comparatively the smallest.

When regions specialize in products or services for which they have a comparative advantage, then resources are used most efficiently to produce the greatest output. Trading this output for goods from other regions results in each region being better off than it would have been without specialization and trade.

This theory of international trade is rather simple and idealistic, since it is based on somewhat restrictive assumptions. These assumptions include (1) the absence of transportation costs between regions, (2) perfect competition between regions, (3) full employment of productive factors, (4) homogeneity of factor endowments, (5) the absence of technological innovation, and (6) immobile productive factors (Root, 1973). Rarely, however, are these assumptions matched by

real world conditions. Thus, the assumptions need to be and can be modified to make the theory more meaningful and realistic.

Root (1973) suggests that modifications can be included within the theory of international trade with little difficulty, even though they may complicate its explanation. He maintains that these modifications can improve the ability of the theory to predict present trade patterns.

One modification to the theory of international trade in which an assumption was relaxed was suggested by Gruber, Mehta, and Vernon (1967). They hypothesize that technological innovation is an important element of the dynamics of international trade and that innovation is not equally shared by all countries of the world. They maintain that because of high levels of expenditures on research and development, United States firms are able to develop products superior to those of firms in other countries and to exploit this technological advantage over foreign competition by exporting. Horst (1972) obtained empirical support for this hypothesis when he found that the research and development expenditures of United States manufacturing firms was significantly related to the level of exports to the Canadian market.

General Investment Theory

A general economic theory of international investment suggests that capital will move from one location to another in response to differences in marginal productivity. That is to say, capital will move from areas where it is abundant and earns a low rate of return to areas where it is scarce and earns a high rate of return. The general

investment theory thus suggests that firms will invest in foreign rather than domestic ventures when the foreign ventures provide higher rates of return.

The general investment theory, however, fails to account for more recent investment activity. Between the United States and Europe, for instance, investment dollars move simultaneously in both directions. That is, as domestic firms are investing in European ventures, European firms are investing in United States ventures (Robock and Simmonds, 1973).

To overcome this inability to account for simultaneous investment, various modifications to the general theory have been proposed. Lamfalussy (1961), for instance, has suggested that direct investment will occur whenever there are large and growing markets--regardless of their profitability. Scaperlanda and Mauer (1969) found support for the Lamfalussy version of investment theory in their study of the determinants of United States direct investment in the European Economic Community. Their research indicated that a country's national product, in fact, was directly related to the magnitude of United States foreign direct investment.

Oligopolistic Theory

A recent advance in investment theory by Hymer (1960) suggests that international investment and also other forms of international business come about because of the oligopolistic nature of domestic firms. That is, some United States firms possess a quasi-monopolistic, or oligopolistic, advantage over foreign firms. A United States firm, for instance, may have a superior production technology; may produce

highly differentiated products; or may possess managerial and organizational advantages. Consequently, the domestic firm may license its superior technology, products, or managerial know-how to foreign firms or it may invest in foreign production and marketing facilities and compete directly with foreign-owned producers.

A number of empirical studies have provided support for the hypothesized link between the oligopolistic nature of firms and various international business activities (see for example: Brash, 1966; Dunning, 1958; Horst, 1972). Caves (1971), in an interpretation of a study by Eastman and Stykolt (1967), also found that in the Canadian market foreign ownership of production facilities is significantly related to product differentiation.

Product Life-Cycle Theory

Raymond Vernon (1966) has advanced the theory that international trade and investment are accounted for by changes in a product's life-cycle. He applies the term "life-cycle" to the time-span during which a product will be produced for consumption.

Vernon hypothesized that United States entrepreneurs are likely to be the first innovators of a high-income or labor-saving product. In the early stage of a product's life-cycle, it will be produced in the United States primarily for domestic consumption.

After penetration of the home market, however, the producer will begin to look eagerly at the untapped potential of foreign markets and will begin to export the domestically manufactured product. Exports of the product will then increase as the product becomes more widely known in the foreign markets.

With time, the nature of both product and producer will change. Domestic competitors will begin to enter the market with standardized products and cost-saving production innovations. Foreign entrepreneurs will also begin to consider the possibility of local production to meet the expanding demand in their home market. These factors, in turn, will prompt dometic producers to supply the foreign demand for the product from within the foreign country. Consequently, investment dollars from the domestic firm will be channeled into the foreign country for the development of production and marketing facilities. With foreign production increasing, domestic exports of the product may level off and begin to decrease.

In the late stages of a product's life-cycle, labor cost differences between the host country and the United States may be crucial to production. The foreign labor costs may be low enough to offset transportation costs to the United States, and the product can then be exported from foreign countries into this country. More investment dollars would then be needed by domestic firms to expand their foreign production facilities to supply both foreign and domestic markets.

Thus the product life-cycle model explains how both investment and exports occur. In the early stages of a product's life-cycle exports to foreign countries predominate over investment. But as the product matures, investment replaces exports.

For the durable goods industry, L. T. Wells, Jr. (1969), found support for the product life-cycle theory. Other studies have also found it useful in explaining the past history of domestic firms (see for example: Stobaugh, 1968; Hirsch, 1967).

Recently, however, Vernon himself has concluded:

> Though this may be an efficient way to look at enterprises in the United States economy that are on the threshold of developing a foreign business, the model is losing some of its relevance for those enterprises that have long since acquired a global scanning capacity and a global habit of mind. (1971, p. 107).

Nonrational Investment Theory

The previously cited theories of international business all contain elements of a rational, objective decision process. In these models a firm's decision to invest in or export to a foreign country is determined by such objective, quantifiable, and rational criteria as cost of production, tariff barriers, research and development expenditures, and rate of return on investment.

Aharoni (1966) presents, however, quite a different view of international investment. He suggests that before a firm can make a decision to invest in a foreign country two things will occur. First, an initiating force will motivate a firm to consider investment in a foreign country. Secondly, the firm will then analyze the investment potential of the foreign country.

According to Aharoni, the initiating force may be nonrational, subjective, and nonquantifiable. It may be a force that arises within the domestic organization or outside of it. For example, while on vacation a corporate officer of a domestic firm may discover a potential market in a foreign country. His discovery of this potential market may be the initiating force that prompts him and his firm to consider the possibilities of foreign investment. The initiating force in this situation has occurred by "chance," since the consideration of foreign

investment might not have been made if the foreign country had not been included in the corporate officer's vacation itinerary.

Initiating forces can also arise in other ways. For instance, articles in newspapers, trade journals, and magazines which describe a foreign country may be read by a corporate officer. The information supplied by these articles may prompt the officer and his firm to consider the investment potential of the foreign country. The initiating force in this case was the reading of the articles by the corporate officer and the information about the foreign country that the articles contained. This initiating force has again occurred by "chance." Had the articles not been written or had they not been read by the corporate officer, the initiating force would not have occurred.

The analysis of potential foreign investment may also be influenced by nonrational and subjective criteria. For instance, a firm may follow a policy of not investing in South American countries. This policy may be based purely on the false belief that all South American countries are highly unstable and subject to internal disorder. Because the firm has neither rationally nor objectively questioned this belief, the firm's investment dollars may be directed toward countries with less desirable investment opportunities.

Although the Aharoni theory of foreign investment has been widely referenced in international business literature (see for example: Hays, 1971; Robock and Simmonds, 1973; Schreiber, 1970; Vernon, 1972), little empirical work has yet been done in testing this theory. A single exception is the study by Miller and Weigel (1972). They found that the decision by domestic firms to invest in Brazil was effected by initiating forces experienced by the firms. Unfortunately, no attempt was

made in their study to differentiate between rational and nonrational elements that might be included in these initiating forces. The possibility that nonrational or chance elements may enter into the decision to invesc abroad and also may enter into the analysis of different investment opportunities, therefore, awaits empirical verification.

The theories discussed previously in no way exhaust the number that have been suggested to account for international business. For international trade alone, a great body of theory exists, bearing on individual trade problems and situations (Tinbergen, 1954). The same can be said about studies of international investment. However, the foregoing theories seem to be representative of current thought. They are often cited in international business texts (see for example: Root, 1973; Robock and Simmonds, 1973; Hays, Korth, and Roudiani, 1972), and, as demonstrated by the studies cited previously, they have been the basis of recent research. While not exhausting the theoretical approaches to international business, they do contain a common theme also found in most other theories of international business--they tend to describe international business by emphasizing exports and foreign direct investment.

While foreign direct investment and trade may be important to the study of capital flows, balance of payments, and similar international economic and political matters, it is not the only measure of the internationalization of business. One could also consider such strategies as sales agencies, sales branches, joint ventures, and licensing agreements as indicators of the internationalization of business. Research that considers only foreign direct investment and trade

may be ignoring important phenomena that could help describe the operations of the modern international business organization more accurately.

Internationalization of business occurs not simply because a firm is investing or trading abroad; it comes about because a firm decides to provide services or products in one or more foreign markets. Through some combination of production and marketing strategies, the firm services the demand of both its domestic markets and markets in foreign countries.* These strategies, then, may be useful indices for analysis of the internationalization of business.

Market Service Strategies

The strategies that a firm may use to service a foreign market are numerous and varied. Some firms, for instance, have all of their production facilities located domestically and export directly to foreign marketing agents. Other firms service foreign markets locally through parent-owned manufacturing and marketing subsidiaries. Still other strategies involve different combinations of foreign production and marketing activities, different levels of parent-ownership and foreign participation, and different amounts of domestic and foreign investment capital.

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*In many instances in international literature the term "exploit" is often used to describe the action of a firm in a market. Many negative connotations are associated with the word exploit, however, and the assumption may be made that firms are insensitive to customers and society and have a proclivity to "gouge" a market for all it is worth. Because this policy is clearly not true of all firms, the term exploit will not be used to describe market activities. Instead the word "service" will be used to describe how firms supply want-satisfying goods and services to a market.

The availability of diverse strategies provides business organizations with alternative solutions to servicing foreign markets. For instance, some firms, as shown in Figure 1, may service foreign markets with the same strategy. Other firms, as shown in Figure 2, may use different strategies in different markets. Still other firms, as shown in Figure 3, may find that multiple strategies may be the most efficient method to service a single foreign market.

Foreign direct investment and exports are important and sometimes necessary elements in implementing and maintaining some of these market service strategies. Foreign direct investment and exports, however, do not completely describe the service strategies used in foreign markets. Different strategies require different levels of investment, exports, foreign participation, and foreign production and marketing. Because companies use different strategies and combinations of strategies to service foreign markets, studies that have considered only foreign direct investment and exports have only partially explained the servicing of foreign markets by international organizations.

McDonald and Parker (1962) maintain that exports and a high level of foreign investment are representative of market service strategies that lie at opposite ends of an evolutionary process. They suggest that a firm may become international through the following steps:

1. Export-import activity with little change in management orientation or production lines.
2. Foreign licensing and international transfer of technological know-how, with little change in management or orientation and domestic operations.
3. Investments in overseas operations, including assembly plants and full manufacturing, sometimes through joint ventures but largely independently. This stage involves substantial investment of funds and management efforts and leads to the development of international skills. Still, the domestic operations dominate company policy.

FIGURE 1

FIRM USING SIMILAR FOREIGN MARKET SERVICE
STRATEGIES IN DIFFERENT MARKETS

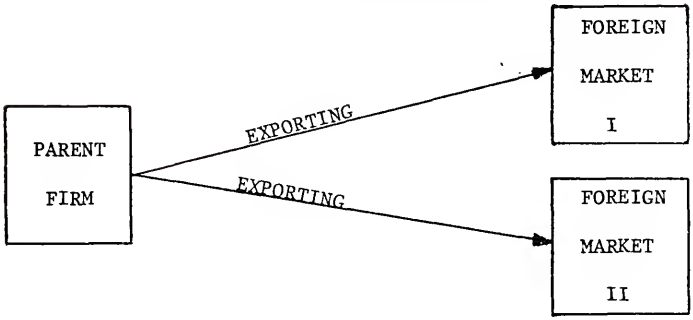


FIGURE 2

FIRM USING DIFFERENT FOREIGN MARKET SERVICE
STRATEGIES IN DIFFERENT MARKETS

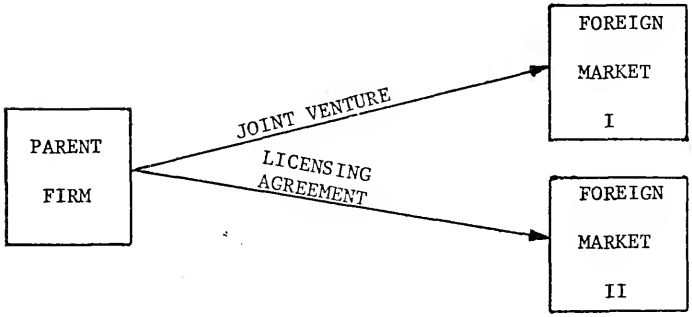
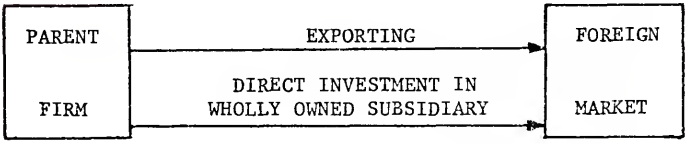


FIGURE 3

FIRM USING DIFFERENT FOREIGN MARKET SERVICE
STRATEGIES IN A SINGLE MARKET



4. Substantial increase in foreign investment, with foreign assets becoming an important part of total assets and overseas profits contributing a substantial part of overall company profits. At this point, the company emerges as a world enterprise, and there may be an integrated global approach to production, sales, finance, control, and other matters. (1962, pp. 17-24)

Dymsza (1972) points out that many other strategies are possible and that it is not necessary for all enterprises to evolve the same way. He also suggests that firms may bypass steps, evolve at different rates, and use more than one market service strategy simultaneously.

Since various strategies can be and are used to service different markets, the question can be raised "what determines the strategy that will be used to service a market?" This question, unfortunately, cannot be easily answered. International trade theory and investment theories provide insight only into exports and investment strategies. International business literature usually refers in general terms to the importance of firm, industry, or foreign market parameters in making market service strategy decisions. Very little theoretical or empirical work has focused on specific determinants of market service strategies. In order to better understand and explain the internationalization of business, however, the determinants of market service strategies need to be more thoroughly defined.

Statement of Purpose

The purpose of this study is to conduct an exploratory investigation of the determinants of market service strategies. More specifically, models will be developed relating market service strategies to potential determinants. The validity of these models will then be tested by analysis of empirical data.

CHAPTER II
THE DETERMINANTS OF FOREIGN MARKET SERVICE STRATEGIES

A model that provides a theoretical basis for the investigation of foreign market service strategies will be discussed in this chapter. This model was developed as a corollary to a model of international business arrangements suggested by Litvak and Banting (1968). Before presenting the model used in this study, first consider the Litvak and Banting model.

Litvak and Banting Model of International Business Arrangements

The theoretical model suggested by Litvak and Banting indicates that certain characteristics or environmental factors of a country determine the institutional structure of foreign marketing channels in terms of the roles of foreign marketing middlemen. For example, in some countries environmental factors may cause foreign marketing channels to take the form of foreign marketing middlemen operating as agents of domestic firms. In other countries the environmental factors may cause middlemen to become merchant wholesalers for domestic firms. In still other countries the environmental factors may cause middlemen and domestic firms to form joint ventures.

In the Litvak and Banting model the environmental factors are related to the degree of control that domestic firms exercise over their foreign marketing middlemen. This control, in turn, forces the foreign marketing middlemen to evolve and to assume specific

institutional roles. Hence, the environmental factors determine the structure of foreign marketing channels.

Litvak and Banting suggest that the institutional structure of foreign marketing channels is determined by the following environmental factors of a country:

1. Political stability
2. Market opportunity
3. Economic development and performance
4. Cultural unity
5. Legal barriers
6. Physiographic barriers
7. Geo-cultural distance

As explained by Litvak and Banting, each of these seven factors can be considered as a measure of a country's environment. Conceptualizing a country's environment in terms of a temperature scale, high political stability contributes to a "hot" environment. Low political stability contributes to a "cold" environment. In the same way each of the other six environmental factors contributes in part to the "environmental temperature" of a country.*

Cold Environments

According to Litvak and Banting, a country will possess a cold environment when the environmental factors of political stability, market opportunity, economic development and performance, and cultural unity are low and the environmental factors of legal barriers,

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*Definitions of environmental factors and their contribution to environmental temperature are presented in Appendix A.

physiographic barriers, and geo-cultural distance are high. For a domestic firm, such environmental conditions may be viewed as potentially risky for investment or involvement in foreign marketing and production activities. Consequently, the firm may be content to use a foreign marketing agent as its representative in that country's market and to grant him a major role in the foreign marketing channel. In cold environments, therefore:

> The manufacturer's agent finds few threats to his continuation as a pure agent. His principal is more inclined to let the agent handle his accounts as he sees fit, and competitive pressures toward institutional change are less dynamic. (Litvak and Banting, 1968, p. 461)

Hot Environments

A country possesses a hot environment when the environmental factors of political stability, market opportunity, economic development and performance, and cultural unity tend to be high and the environmental factors of legal barriers, physiographic barriers, and geo-cultural distance tend to be low. A domestic firm could view such a country as being safe for investment or involvement in foreign marketing and production activities. In addition, the firm may believe that increasing its control of the foreign marketing channel may provide greater profits. Therefore, the firm may form licensing agreements, partially owned subsidiaries, or wholly owned manufacturing subsidiaries in the foreign country.

A foreign marketing middleman, however, could not continue to exist as an agent of a domestic firm in a country with a hot environment. With the increased presence, power, and profit expectation of the domestic firm, the foreign marketing middlemen would have to enter

into licensing agreements, participate in joint ventures, or serve in some smaller channel role than pure agent. In hot environments:

> Environmental forces irresistibly push the agent toward new institutional structures. If he does not adapt, he finds he no longer has any principals to represent, or competitors have taken most of his business away. In other words, the environment is "too hot" for his continued existence as a pure agent. (Litvak and Banting, 1968, p. 461)

Related Studies

The concepts of environmental factors and environmental temperature were originally defined by Litvak and Banting in their theoretical model of international business arrangements. These two concepts have, subsequently, been used in related studies. Goodnow and Hansz, for instance, hypothesize:

> A firm will tend to pursue an entry strategy involving greater control and greater investment in marketing channel activities as the country's environment becomes "hotter" in the Litvak and Banting sense. (1972, p. 33)

In a study of 222 firms, Goodnow and Hansz compared the environmental temperature of countries with the strategies that were used when the firms initially entered and penetrated the foreign countries to market their principal products. In their study one hundred countries were first assigned an environmental temperature of hot, moderate, or cold. The entry strategies of the firms were then compared with the respective environmental temperatures of the countries in which the firms were establishing operations. They found that the extent of investment and the level of control that these firms exercised over foreign marketing channels were related to environmental temperatures of the countries. In countries with hot environments, the firms tended to invest heavily and use a large number of majority-owned

or jointly owned manufacturing facilities. In countries with cold environments, exporting through company-owned or agent-representative facilities predominated over all other entry strategies (Goodnow and Hansz, 1972).

While the results of the Goodnow and Hansz study tended to support their hypothesis, there were some important exceptions. A number of South- and Central-American countries, along with Spain, South Africa, the Philippines, and India, possessed larger numbers of majority-owned manufacturing facilities than would seem to be warranted by the countries' environmental temperatures. Goodnow and Hansz suggest that these discrepancies may occur because firms assign different levels of importance to the different environmental factors. In their study the environmental factors were considered to be of equal importance in determining the environmental temperature of a country. That is, environmental factors were given equal weight in each factor's contribution to environmental temperature. Firms, however, may be influenced unequally by market conditions, and the environmental factors should be given different weights when the environmental temperature of a country is determined. An environmental temperature obtained with the use of unequally weighted environmental factors may be quite different than if equally weighted factors were used. This difference may account for the discrepancies noted by Goodnow and Hansz.

Another possible reason for the discrepancies found by Goodnow and Hansz may be the need to include variables in their study to moderate other predictor variables. These moderator variables, for example, may define developed or undeveloped countries or the continental locations of countries and function in a prediction equation by forming

interactions with predictor variables. These interactions may then increase or decrease, only for those countries defined by the moderator variables, the weight that is associated with the predictor variables and that equates the predictor variables to the criterion variables.

As a hypothetical example of moderation effects, assume that the environmental factor political stability is associated with the level of United States foreign direct investment for all countries of the world. Further assume that this association is linear and positive and that an increase in political stability is associated with an increase in investment. A variable defining countries located in Europe will moderate political stability if the interaction between the variable and political stability is also found to be positively associated with United States foreign direct investment. This interaction indicates that the change in investment associated with a change in political stability is greater for European countries than for all other countries. The variable defining European location is, therefore, said to moderate the association between political stability and investment.

In another study, Masson (1973) hypothesized that the Litvak and Banting environmental factors could be used to determine the level of different types of United States foreign direct investment. Masson found that environmental factors were related to foreign direct investment in the areas of public utilities, manufacturing, petroleum, mining and smelting, and general investments. He also reported that different weights were associated with each of the environmental factors when they were used to predict the levels of the different types of

direct investment. He suggested that these weights might not be the same for all countries but may vary for different groups of countries.

A literature review revealed that although extensive reference to the Litvak and Banting model has been made in some marketing management texts (see for example: Lazer, 1971; Miracle and Albaum, 1971), the two studies by Goodnow and Hansz, and by Masson are apparently the only empirical tests of the model or its concepts. In each of these two studies the concepts of environmental factors and temperatures were used to study specific international business activities. In the Goodnow and Hansz study, environmental temperature was found to be related to foreign market entry strategies of firms. In the Masson study the environmental factors were found to be related to the levels of different types of foreign direct investment. Besides being useful in the study of entry strategies and of foreign direct investment, however, the Litvak and Banting model may also be useful in providing a framework and theoretical basis for examining and investigating the determinants of foreign market service strategies.

Conceptual Model of Foreign Market Service Strategies and their Determinants

I suggest that a conceptual model relating foreign market service strategies to their determinants can be defined as follows:

The market service strategies used by domestic firms operating in a foreign market are determined by the Litvak and Banting environmental factors, the market's economic development, and the continental location of the market.

An explanation of this model can be accomplished in two parts--first, by considering how environmental factors may determine

foreign market service strategies and, second, how a market's economic development and continental location may determine foreign market service strategies.

Foreign Market Service Strategies and Environmental Factors

In the Litvak and Banting model each environmental factor provides a measure of a country's environmental temperature. Environmental temperature is thus an artificial device that combines the measures of the seven environmental factors into a single parameter. In the previous explanation of the Litvak and Banting model, the use of environmental temperature provided a simple method for demonstrating the combined effects of all environmental factors upon the roles of foreign marketing middlemen. While environmental temperature may be related to middlemen's roles, the environmental factors determine environmental temperature; and these factors are thus the basic and fundamental determinants in the Litvak and Banting model.

In this discussion of the relationship between environmental factors and foreign market service strategies, the concept of environmental temperature will again be used. As in the Litvak and Banting model, environmental temperature will be used to combine the measures of the seven environmental factors and to provide a simple and succinct method for describing the effects of environmental factors upon foreign market service strategies. The reader is cautioned to remember, however, that environmental factors determine environmental temperature and these factors are hypothesized to be the fundamental and basic determinants of foreign market service strategies.

In the Litvak and Banting model, environmental factors determine the roles of foreign marketing middlemen. If environmental factors change so that environmental temperature changes, foreign middlemen may be forced to evolve and assume new institutional roles. But the level of control, production participation, and marketing participation of foreign middlemen are only a consequence of the particular foreign market service strategies that domestic firms elect to use in the foreign market. For each strategy that a domestic firm uses, a different channel role may be required for the foreign middlemen. His role must thus follow as a consequence of the strategy chosen by the domestic firm. The environmental factors of a foreign market, therefore, may be only indirectly related to the roles of foreign middlemen. A direct relationship may occur, however, between the environmental factors and the adoption of specific foreign market service strategies by domestic firms.

As an example of the possible relationship between environmental factors and foreign market service strategies, consider the situation that occurs when environmental factors produce a hot environmental temperature. According to the Litvak and Banting model, a hot environmental temperature will be associated with minor channel roles for foreign marketing middlemen. Minor channel roles for foreign marketing middlemen, however, indicate that domestic firms have major roles in their foreign marketing channels. This conclusion follows since marketing functions that are not included in the roles of foreign marketing middlemen must be accomplished by domestic firms. Therefore, a hot environmental temperature will also be associated with major channel roles for domestic firms.

Since a hot environmental temperature is associated with major channel roles for domestic firms and minor channel roles for foreign marketing middlemen, a hot environmental temperature can be considered as a determinant of the foreign market service strategies that produce those roles. In addition, since environmental factors alone determine a hot environmental temperature, the environmental factors can be considered as the basic and fundamental determinants of the same foreign market service strategies.

The relationship between environmental factors and foreign market service strategies can also be considered from the point of view of a cold environmental temperature. If the environmental factors produce a cold environmental temperature, then this cold environmental temperature, according to the Litvak and Banting model, will be associated with major channel roles for foreign marketing middlemen. Domestic firms, consequently, will have major roles in the foreign marketing channel.

Since a cold environmental temperature is associated with minor channel roles for domestic firms and major channel roles for foreign marketing middlemen, a cold environmental temperature can be considered as a determinant of the foreign market service strategies that produce those roles. The environmental factors, as determinants of the environmental temperature, can also be considered as the basic and fundamental determinants of the foreign market service strategies.

Perception of risks and opportunities

The environmental factors of a foreign market may determine the foreign market service strategy used by a domestic firm because of

the firm's perception of business risks and opportunities in the market. A low environmental temperature, from the point of view of the seven Litvak and Banting environmental factors, indicates a market with low political stability, market opportunity, economic development and performance, and cultural unity along with high legal barriers, physiographic barriers, and geo-cultural distance. These market conditions may be perceived by a domestic firm as detrimental to international business operations. The firm may consider the market as a risky business opportunity and may attempt to limit its investment, control, and foreign production activities in the foreign marketing channel.

A high environmental temperature, however, indicates a market with high political stability, market opportunity, economic development and performance, and cultural unity, along with low legal barriers, physiographic barriers, and geo-cultural distance. These market conditions may be perceived by a domestic firm as being conducive to international business operations. Because of perceived opportunities in such a market, the firm may attempt to maximize its investment, control, and foreign production activities in the foreign marketing channel and utilize a service strategy that provides it with a major role in the channel.

Environmental temperature and the single firm

Figure 4 provides an example of how the environmental factors of a foreign market may be related to the market service strategy used by a single domestic firm. If the environmental factors of a foreign market combine to form an extremely low environmental temperature, a firm

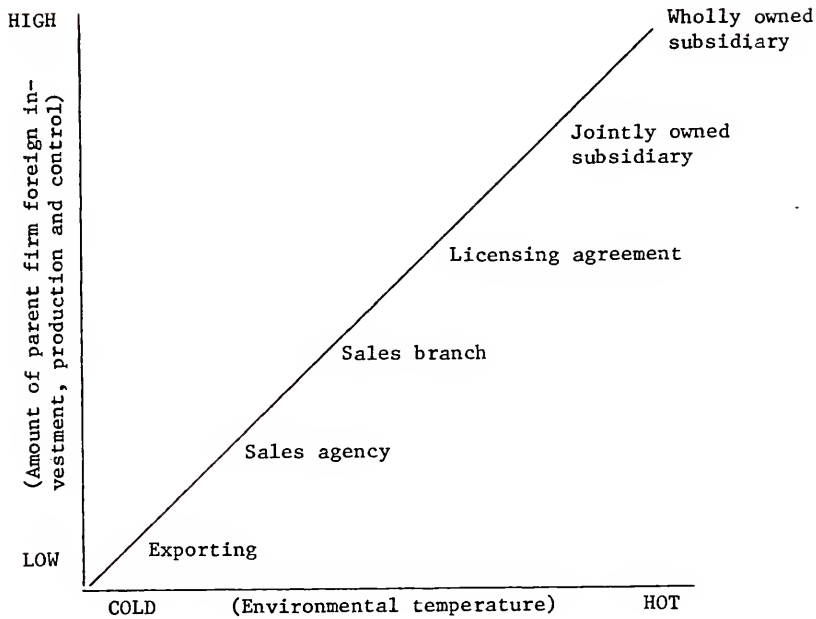
may participate in a very minor way in the foreign marketing channel. The firm may service the market by exporting, for instance. If the environmental temperature of the market is slightly higher, however, the firm may play a more major role in the foreign marketing channel by using a strategy such as sales agency. Progressively higher environmental temperatures may be associated with strategies that provide such progressively greater foreign channel roles for the domestic firm as sales branches, licensing agreements, jointly owned subsidiaries, and full subsidiary ownership.

Figure 4 may also be used as an example of the possible relationship between the foreign market service strategies used by a single domestic firm and the environmental temperature of many different foreign markets in which the firm is operating. For each market the firm may use a strategy associated with that market's environmental temperature. For example, in a market in which the environmental factors combine to form an extremely cold environmental temperature, the firm may use a foreign market service strategy such as exporting. In a market with an extremely hot environmental temperature, however, the firm may use a majority-owned subsidiary to service the market.

Since market conditions may change with time, the environmental factors may change and, consequently, the environmental temperature of the market may also change. If the environmental temperature of a market changes, a domestic firm operating in the foreign market may alter its foreign market service strategy. For example, again consider Figure 4 and a domestic firm using the strategy of sales agency in a foreign market with a moderately cold environmental temperature. If market conditions change and the environmental temperature of the

FIGURE 4

RELATIONSHIP OF FOREIGN MARKET SERVICE STRATEGIES AND ENVIRONMENTAL TEMPERATURE FOR A SINGLE FIRM



market warms slightly, the firm may wish to assume a more major role in the foreign marketing channel. The firm might adopt a foreign market service strategy, such as licensing agreement or joint venture. Larger increases in environmental temperature may result in the firm's use of a majority-owned subsidiary to service the market. The environmental temperature can, of course, decrease. In that case, the firm may change its service strategy and assume a more minor role in the foreign marketing channel. It might, for example, close a sales branch and open a sales agency or even adopt an exporting strategy

if the environmental temperature decreases to an extremely cold level.

The foreign market service strategies used in Figure 4 are not the only strategies available to domestic firms. This figure is presented only as a possible example for a single firm. Firms have many options available to them by which they can service foreign markets. Depending on the specific firm and foreign market, there may be entirely different sets of strategies other than those in Figure 4. Additionally, the relationship between environmental temperature and strategies may not be linear. However, for single firms I suggest that the tendency should be for high environmental temperatures to be associated with foreign market service strategies that provide firms with major channel roles and low environmental temperatures to be associated with foreign market service strategies that provide firms with more minor channel roles.

Environmental temperature and many domestic firms

The relationship between environmental temperatures and foreign market service strategies may also be considered in terms of many domestic firms. Figure 5 indicates a possibility for this relationship. This example indicates that (1) many different foreign market service strategies are being used at any specific environmental temperature, (2) the number of firms using a specific market service strategy increases with increasing environmental temperature, and (3) the number of firms using strategies that provide major channel roles increases at a greater rate with increasing environmental temperature than does the number of firms using strategies that provide more minor channel roles.

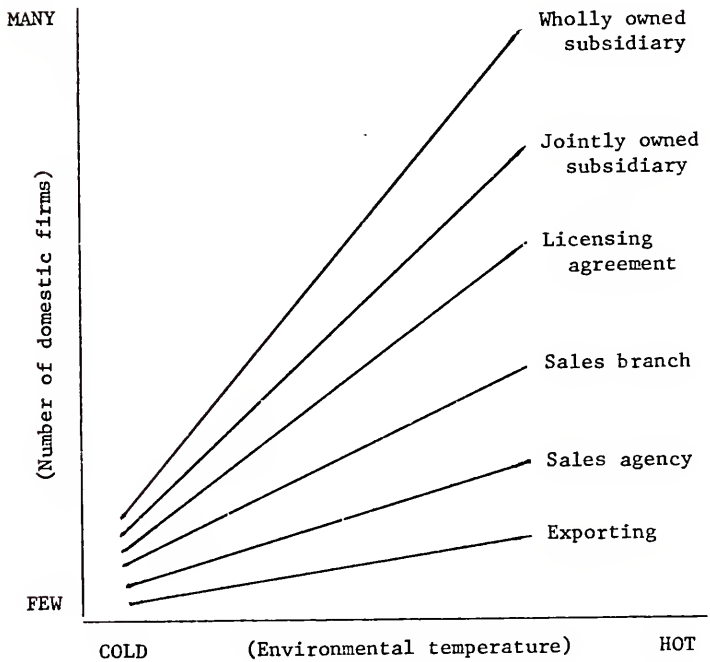
There are two reasons why multiple foreign market service strategies may be used simultaneously at any specific environmental temperature. First, as was suggested in the previous example of Figure 4, a single domestic firm should tend to assume a foreign market service strategy that provides an increasing channel role as the environmental temperature increases. It would be difficult to imagine, however, that every firm operating in a foreign market would use the same strategy at the same environmental temperature. Different firms may, in fact, use the same strategy at different environmental temperature levels. Each firm may also have an entirely different set of strategies associated with the environmental temperature range. Thus, throughout the entire environmental temperature range, any foreign market service strategy could conceivably be used by one or more firms.

The second reason that multiple foreign market service strategies have been represented throughout the entire temperature range was to account for single domestic firms using multiple strategies in the same foreign market. A firm may service a foreign market, for example, both by export of domestic output and by local production in a wholly owned foreign subsidiary. Other combinations of multiple foreign market service strategies are, of course, possible and reasonable. Thus, many different types of strategies can conceivably be used simultaneously at any specific environmental temperature.

Figure 5 indicates that the number of firms using each foreign market service strategy increases with increasing environmental temperature. This increase occurs in part because, as was suggested before, firms should tend to adopt foreign market service strategies

FIGURE 5

RELATIONSHIP OF FOREIGN MARKET SERVICE STRATEGIES AND ENVIRONMENTAL TEMPERATURE FOR MANY FIRMS



that provide increasing channel roles as environmental temperature increases. Therefore, the number of firms using the strategies that provide major channel roles should increase with increasing environmental temperature. If only a constant number of domestic firms operates in a foreign market, it might then be expected that the movement of firms into the strategies that provide major channel roles would cause a decline in the number of firms using strategies that provide minor channel roles. However, increasing environmental

temperature is determined by market conditions associated with less business risk and with greater market opportunity. New domestic firms may be motivated by these market conditions to penetrate and service the markets. The market service strategies of these new firms may be of any type, including the strategies associated with minor channel roles. The penetration of the market by new domestic firms at an increasing environmental temperature may then produce a net increase in the number of firms using each foreign market service strategy.

Figure 5 has been drawn to indicate that the number of domestic firms using strategies that provide major channel roles is increasing at a faster rate with increasing environmental temperature than is the number of firms using strategies that provide minor channel roles. The penetration of the foreign market by new firms may help provide an increase in the use of all market service strategies. But new firms can be expected to follow the suggested relationship of tending toward the use of strategies that provide major channel roles as the environmental temperature increases. In addition, firms previously operating in the market should tend to switch from minor to major channel role strategies with increasing temperature. The effect of these actions by both new and old firms may be not only a net increase in the use of all strategies but also a higher rate of increase in the use of the strategies providing major channel roles as the environmental temperature increases.

Figure 5 shows a linear relationship between environmental temperature and each of the foreign market service strategies. These relationships were used to simplify the discussion of the figure. Conceivably, a nonlinear relationship may exist between environmental

temperature and foreign market service strategies. Regardless of the linearity of the relationships, however, I suggest that the tendency should be for: (1) high environmental temperatures to be associated with foreign market service strategies that provide firms with major channel roles and (2) low environmental temperatures to be associated with foreign market service strategies that provide firms with more minor roles.

The effect of foreign market service strategies on environmental factors and temperature

In the examples of the single and multiple firms discussed previously, I have suggested how environmental temperature may affect and determine the marketing strategies used to service markets. Possibly, however, the use of foreign market service strategies by domestic firms can also affect environmental factors and the environmental temperature of foreign markets.

Investment in foreign subsidiaries and the production and marketing of new products, for instance, may create new consumer demand, increase purchasing power, stimulate the development of transportation and communication networks, and provide component parts and materials for other local industries. The licensing of new products and processes may increase the productivity of labor and provide an impetus to local firms to expand their research and development. Other strategies may also affect similar or additional elements of a market. Since environmental factors reflect different aspects of a market, activities of international firms that alter the market may also alter the environmental factors and temperature.

Foreign Market Service Strategies and a Market's Economic Development and Continental Location

The model of foreign market service strategies defined previously included the provision that a market's economic development and continental location are determinants of foreign market service strategies. Both economic development and continental location were included in this model to account for possible moderation effects. Both economic development and continental location may provide moderation effects because of firms' perceptions of different markets. If a market is economically developed, for instance, a domestic firm may have a generally favorable attitude toward that market because of its past performance, its future potential, and because it is economically similar to the United States (the home country of the firm and the market with which it is probably most familiar). Firms may have an unfavorable attitude toward undeveloped markets because the markets are economically dissimilar to the United States or because the firms may believe that the markets provide little present or future potential. Possibly, though, firms may believe that just the opposite conditions prevail for the two groups of markets. Economically developed markets, for example, may be perceived by firms as having reached the peak of their economic growth or of containing too many present or potential competitors. Undeveloped markets may be considered by firms as having the potential for future growth.

While no a priori justification exists for believing that firms perceive developed and undeveloped markets either one way or another, the distinction is reasonable. Economic and international business literature has tended to dichotomize countries into those that are

developed or undeveloped (see for example: Kuznets, 1972; Fink, 1972; Moyer, 1968). Firms may make the same dichotomy with markets and may form separate and different attitudes about the two groups.

Firms may also perceive markets differently, depending on each market's continental location. Some firms, for instance, may consider South, Central, and North American countries as economic satellites of the United States. These firms may believe that they can exert a strong influence on United States government policy toward these areas to benefit their own foreign operations (Bennett and Green, 1972). Consequently, these firms may be more favorably disposed toward business activities in the South- Central- and North-American markets than if United States government influence were not present.

European markets may also be perceived differently than are other markets. European countries share a common heritage with the United States; they have traditionally been trading and business partners with the United States and European countries have many formal economic, political, and military agreements. The attitudes and beliefs that firms have about past relationships with European countries may influence the firms' present and future activities in European markets.

If firms do perceive markets differently in terms of economic development or of continental location, then these perceptions may affect the manner in which other market conditions are perceived. The differential viewing of market conditions for separate groups of markets may have an effect upon the use of foreign market service strategies in these markets. Consequently, the ability to predict foreign market service strategies by the use of environmental factors may be enhanced by the use of economic development and continental location to classify markets.

The Need for Empirical Research

In previous sections of this chapter a conceptual model relating foreign market service strategies to possible determinants of these strategies was defined. A discussion then followed in which an explanation and interpretation of the model was presented, along with examples showing the possible relationship between foreign market service strategies and their determinants: Three important questions are suggested by this discussion: First, are the environmental factors meaningful conceptualizations of environmental structure? Second, can the model of foreign market service strategies be interpreted in quantitative terms so that foreign market service strategies and their hypothetical determinants can be systematically related? Third, does the model have any validity?

The question of whether the environmental factors are meaningful conceptualizations of environmental structure has been posed because these constructs were apparently developed by Litvak and Banting on a purely a priori basis. They provided no supporting evidence that would indicate the factors originated from empirical findings. Nor did they indicate that the environmental factors are suggested by or related to other meaningful and empirically verified concepts. Conceivably there are other constructs representing environmental structure that, compared to the environmental factors, provide equal or superior predictive ability and that are also justified on an empirical or theoretical basis.

The question concerning the quantitative interpretation of the model of foreign market service strategy was raised because the model has so far been interpreted only in qualitative terms. In previous

discussion it has been hypothesized that foreign market service strategies are determined by a market's environmental factors, economic development, and continental location. However, no suggestions have been made pertaining to the quantitative structure of the model--such as the weight associated with each determinant, the interrelationship between determinants, and the manner of combining and relating the determinants to foreign market service strategies. Litvak and Banting imply that the environmental factors are each monotonically related to the roles of foreign marketing middlemen. Because the model of foreign market service strategies is a direct corollary of the Litvak and Banting model, the environmental factors also may each be monotonically related to foreign market service strategy. However, the exact relationship between the hypothetical determinants and foreign market service strategies can only be determined from empirical evidence.

It might be suggested that the relationship between the determinants and environmental temperature should also be quantified. This relationship need not be quantified, however. In the discussion in previous sections of this chapter, environmental temperature was used in examples demonstrating the possible combined effects of the environmental factors on foreign market service strategies. If foreign market service strategies can be shown to be determined by some such combination of variables as the environmental factors, then environmental temperature can be arbitrarily defined as any monotonically increasing function of the same combination of variables.

The need then is not to quantify the relationship between the suggested determinants, environmental temperature, and foreign market service strategies, but to quantify the model in terms of the determinants and foreign market service strategies.

Empirical research can assist in providing an answer to the validity of the environmental factors, the quantification of the model, and the validity of the model. Therefore, to investigate the conceptual model of foreign market service strategies, empirical data will be examined and analyzed in this study. In addition, the ability of a market's environmental factors, economic development, and continental location to predict United States exports and foreign direct investment will also be considered in the empirical research.

United States exports are included in this study, since they are easily observable and are a major element of international business. But more importantly, exports are the result of the market service strategy of exporting. Since a market's environmental factors, economic development, and continental location may determine marketing service strategies, in general, they may also determine such a single marketing service strategy as exporting.

United States direct investment is included in this study because of the suggestion by Masson that it is determined by environmental factors and because, like exports, it is easily observable and is an important and major element of international business.

Research Hypotheses

Three hypotheses will be treated in this investigation. These hypotheses are stated as follows:

Hypothesis I

Foreign market service strategies of domestic firms are related to a market's environmental factors, economic development, and continental location.

Hypothesis II

The level of United States exports is related to a market's environmental factors, economic development, and continental location.

Hypothesis III

The level of United States direct investment is related to a market's environmental factors, economic development, and continental location.

CHAPTER III
METHODOLOGY

In Chapter II three hypotheses were developed from a conceptual model of foreign market service strategies. An exploratory investigation of this model and a test of these hypotheses was accomplished through an examination of empirical data. This empirical study was carried out in two phases. Each of these phases requires extensive discussion to describe the research methodology involved. Therefore, each phase will be considered separately, in detail, in following chapters. However to provide continuity for the following chapters, a general outline of the methodology used in the research design and the selection of the subject population will be briefly described here.

Research Design

The first phase of the research was designed to accomplish three objectives: (1) the operational definition of variables, (2) the collection of data, and (3) the validation of constructs. In the first step of this phase of this study, the three hypotheses developed in Chapter II were examined to determine independent (predictor) and dependent (criterion) variables. The predictor variables determined by this examination consisted of the seven environmental factors, a market's economic development, and a market's continental location. The criterion variables consisted of foreign market service strategies, United States exports, and United States foreign direct investment. For each of these predictor and criterion variables, explicit

definitions were then developed. Finally, from these definitions, operational variables, which could be used as surrogates or proxies for the predictor and criterion variables, were defined.

Following the definition of operational variables, data were collected from secondary archival sources. These sources were used to observe the operational variables for a subject population for each of the years 1965, 1966, and 1967. These observations were designated for future references as the "observed data values." For each operational variable and subject, the mean of the observed data values for the three years was then calculated. These means were designated for future reference as the "mean data values."

The validation of constructs was the final step of the first phase of this study. This validation of constructs was necessary because concepts, such as political stability, are conceptualizations that are inherently unobservable. However, these concepts are theoretically reflected in the operational variables developed for each concept. If the operational variables representing a specific concept tend to covary--that is, agree with each other--and if these variables are related to other variables in theoretically meaningful ways, then we have evidence that the operational variables are useful measures of the concept and that the concept is a useful conceptualization of phenomena.

The Litvak and Banting environmental factors and a country's economic development are constructs and theoretical conceptualizations of environmental structure. Two methods were used in validating these constructs. The first method was used on all of the environmental factors and consisted of the factor analysis of data for the operational variables representing each environmental factor. From this analysis the

underlying concepts, which these operational variables measure, were determined. Variables based on these underlying concepts were then defined, and values were calculated for these variables for the subject population.

The underlying dimensions defined by factor analysis represent groupings of those operational variables that covary. If these dimensions are similar to the environmental factors, then the dimensions are valid measures of the environmental factors and the environmental factors are meaningful conceptualizations of environmental structure. If the dimensions are not similar to the environmental factors, the factors are either not valid measures of environmental factors or the environmental factors do not represent meaningful conceptualizations of environmental structure. Because multiple operational variables were defined for each environmental factor, it is unlikely that among all the multiple variables, none provides a valid measure for the environmental factor. Therefore, if the underlying dimensions are dissimilar to the environmental factors, then quite possibly the environmental factors do not meaningfully represent environmental structure.

A second method to test the validity of constructs was used on the environmental factor political stability and on the environmental factor economic development and performance. The method was also used to test the construct representing a country's economic development. This test of construct validity consisted of the use of correlation analysis to determine how the constructs of this study were related to other independently derived constructs. Those constructs that are related in a meaningful way to other theoretical constructs represent elements of a much larger body of knowledge--a body of knowledge which

has independent validity. Consequently, support is also provided for the validities of this study's constructs (Heeler and Ray, 1972; Campbell and Fiske, 1959).

Following the validation of constructs, variables developed from the factor analysis, along with the operational variables for a market's economic development and continental location, were designated as the operational variables to be used in the second phase of the study.

The second phase of this study consisted of the development and test of analytical models that relate environmental structure to foreign market service strategies, United States exports, and United States foreign direct investment. Because a literature review had revealed that there were no existing alternatives to the model of foreign market service strategies developed in Chapter II, two empirically derived models were developed, tested, and compared against the model of foreign market service strategies. This comparison of models provided the opportunity to assess the ability of the environmental factors to predict international business activities and to determine whether they are superior to other alternative constructs. Testing the validities of the three models also provides evidence indicating the quantitative nature of the relationship between environmental structure and the three criterion variables. This evidence could be used to (1) check the Litvak and Banting assumptions that the environmental factors are all individually and monotonically related to the roles of foreign marketing middlemen and (2) check the presence of moderation effects.

Each of the three analytical models tested in the second phase of the study contained potential predictor variables composed of various combinations of main-effect, cross-product, and polynomial terms. The same combination of terms in each model was tested as potential predictors of the three criterion variables. Thus, from each model three equations were developed: one to predict foreign market service strategies, a second to predict United States exports, and a third to predict United States foreign direct investment.

In the first analytical model, the operational variables that were designated at the end of the first phase of the study were used directly as various main-effect, cross-product, and polynomial terms.

For the second model, the set of values for the variables that were developed from the factor analysis in the first phase of the study were themselves factor analyzed. This second factor analysis provided the means to determine and define underlying concepts, which may be more fundamental than those concepts developed in the first factor analysis. For each of those concepts obtained in the second factor analysis, variables were defined and values for those variables were calculated for the subject population. These variables, along with the operational variables for a market's economic development and continental location, were then used in various main effect, cross-product, and polynomial terms in the second model.

For the third model, the variables that were developed from the factor analysis in the first phase of the study were combined to obtain single variables representing each of the Litvak and Banting environmental factors. These variables, along with the operational varibles for a market's economic development and continental location, were then

used to construct various independent main-effect, cross-product, and polynomial terms in the third model.

When the validity of the three models was tested, both multiple regression and stepwise multiple regression were used. The data base for these tests consisted of mean data values obtained in the first phase of the study and data values calculated for the variables developed by factor analysis.

Subject Population

The conceptual model and the three hypotheses developed in Chapter II relate foreign market service strategies, United States exports, and United States foreign direct investment to their determinants within the concept of a market. The use of the term "market" to designate an area of foreign business activity may provide greater validity for the model and hypotheses than if the term "country" were used. While a market and a country can be considered as synonymous terms, firms can conceivably perceive markets as existing outside the limitations created by the arbitrary and artificial boundaries of nations. For example, a market may be considered to exist across national boundaries. In addition, multiple markets may also be perceived to exist within a single country. Thus, the use of market, and not country, to specify an area of foreign business activity increases the potential of the model and hypotheses to describe valid relationships.

In this study, however, observations of operational variables could only be obtained for areas consisting of individual countries. While the model and hypotheses provide the capability for investigating a wider scope of international business activities, this study was

constrained to the investigation of those situations where a country and a market were considered as identical.

Observations of each of the operational variables were obtained for a total of fifty-three countries throughout the world. These countries are listed in Appendix B. The methodology used in selecting these countries will be discussed in detail in the following chapter.

CHAPTER IV
OPERATIONAL DEFINITION OF VARIABLES, DATA COLLECTION, AND CONSTRUCT VALIDATION

In this chapter, a detailed review of the methodology involved in three operations of this study will be presented. These operations are the operational definition of variables, the collection of data, and the validation of constructs. Each of these operations will be discussed separately. In addition, the specific results of these operations performed on predictor and criterion variables also will be presented.

Operational Definition of Variables

The operational definition of variables involves the specification of observables that can be used as underlying theoretical constructs involved in a hypothesis. This operationalization process is important because it allows inherently unobservable phenomena (such as "political stability") to be represented quantitatively instead of verbally. With quantitative observations of variables, the validity of a hypothesis can then be statistically tested.

The operationalization process is additionally important because in specifying how phenomena can be measured, the researcher is forced to consider the exact meaning of the phenomena. Dunnette suggests:

> The simple act of specifying measurement operations forces us to define explicitly what we wish to talk about, thereby ruling out ambiguities of speculation, loose definition, and distortions of personal perception that contribute so greatly to imprecision in everyday discourse. (1966, p. 14)

The operational definition of variables for this study was accomplished in two steps. First, those variables that permit an empirical test of the theory of foreign market service strategies were determined. These variables were designated as predictor and criterion variables. The predictor variables consisted of the seven environmental factors, a market's economic development, and a market's continental location. The criterion variables consisted of foreign market service strategies, United States exports, and United States foreign direct investment.

For each of these predictor and criterion variables, explicit conceptual definitions were developed. For the seven environmental factors, the definitions suggested by Litvak and Banting were generally used. However, in a few cases, it was necessary to make some changes to their definitions both to conform to current knowledge and to make the environmental factors separate and mutually exclusive of each other. The remaining predictor and criterion variables were defined by reference to current literature.

In the second step of the operational definition of variables, operational (observable) variables that could serve as proxies for the conceptual predictor and criterion variables were selected. The operational variables that were selected fulfilled two requirements. First, the operational variables were consistent with the definitions developed previously for the conceptual predictor and criterion variables; and, second, the operational variables were observable in many different countries.

Multiple operational variables were selected for each of the seven environmental factors and for a market's continental location. For the environmental factors, multiple operational variables were

selected for three reasons. First, no single operational variable was deemed sufficient to measure adequately all elements of each environmental factor. For instance, the factor geo-cultural distance contains both geographic and cultural elements. The second reason for selecting multiple operational variables was to increase the likelihood that at least one operational variable provided an adequate measure of a specific element of an environmental factor. Finally, multiple operational variables were selected because any single measure is subject to both systematic and random error. Adding over many indicants of the underlying construct tends to cancel out these sources of error, especially random error.

Multiple operational variables were selected for a market's continental location to define separate continents of the world. These operational variables could then be tested separately to determine moderation and interaction effects that might be associated with the specific continental location of a market.

A single operational variable was selected as a proxy for a market's economic development, and single operational variables also were selected as proxies for each of the criterion variables that consisted of foreign market service strategies, United States exports, and United States foreign direct investment. Single operational variables were deemed adequate for the criterion variables because there existed single observables that were essentially synonymous with each of the criterion variables. A single operational variable was chosen for the economic development of a market because a single variable allowed the dichotomization of markets into those that were economically developed and those that were economically undeveloped.

Data-Collection

Initially an attempt was made to obtain measurements of all the operational variables for each of the years 1965, 1966, and 1967 for a subject population of 113 countries. Countries that were members of the United Nations or countries that were included in recent international business literature were chosen for this sample. The years 1965, 1966, and 1967 were chosen since the most data were available for this period of time. For the years prior to 1965, United States foreign direct investment data were not available for a large sample of countries. For the years following 1965, the available data sources were inadequate to provide more current values of the operational variables.

Data values for the operational variables were obtained from secondary-archival sources and from the United States Department of Commerce. For future reference these data values will be called observed data values. The sources of these observed data values for all the operational variables are listed in Appendix C. In many cases observed data values could not be obtained for a specific country in the subject population. The factor analysis that would be used in later stages of this study, however, does not allow for missing data. Therefore, those countries for which complete data could not be obtained were dropped from the subject population and were excluded from further analysis.

The final sample for which all operational variables could be measured consisted of fifty-three countries.* These countries are listed in Appendix B.

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*Belgium and Luxembourg have highly interrelated, if not common, economic and political systems. These two countries were therefore

The arithmetic mean of the observed data values for the years 1965, 1966, and 1967 was calculated for each operational variable for each country in the subject population. These mean observed data values were calculated because extreme fluctuations were noted in the values of the operational variables from year to year. These fluctuations may be due to transient or random events--events that may not be associated with any of the parameters in the model of foreign market service strategies. Averaging the observed data values over a three-year period reduces these fluctuations and results in values that may be more representative of long-term conditions.

After computing the means of the observed data values, the distribution of these values for each operational variable was standardized. These standard distributions were obtained by transforming each mean observed data value into a standard score with the use of the following equation:

$$Z_{ij} = \frac{X_{ij} - \bar{X}_i}{SD_i}$$

Whereas Z_{ij} is a standard score for operational variable i and country j, X_{ij} is the mean observed data value for operational variable i and country j, $\bar{X}_i$ is the mean of the mean observed data values for operational variable i, and SD_i is the standard deviation of the mean observed data values for operational variable i.

The standard score data associated with the operational variables for the three criterion variables--foreign market service strategies, domestic exports, and foreign direct investment--were included in the

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counted in the subject population as one country and all operational variables were also measured as if they were one country.

data base that was subsequently used to test the model of foreign market service strategies. Similarly, the standard score data for continental location and economic development were also included in this data base. However, the standard score data associated with the seven environmental factors were used to determine the environmental structure of a country. The method by which the environmental structure of a country was determined will be discussed in the following section of this chapter.

Construct Validation

The validation of constructs as discussed in Chapter III involves the determination of whether theoretical concepts are validly represented by operational measures and whether the theoretical concepts are meaningful and useful conceptualizations of phenomena. Two methods, which will be discussed in following sections, were used in this study to validate constructs. The first method was used on all the environmental factors and consisted of the factor analysis of data for the operational variables representing each environmental factor. The second method was used on only the environmental factor political stability, the environmental factor economic development and performance, and the variable economic development. This second method consisted of the use of correlation analysis to determine how constructs were related to other independently derived constructs.

Construct Validation by Factor Analysis

Litvak and Banting hypothesized that the environmental factors are unitary concepts and that each factor represents a single element of environmental structure. To determine the validity of these constructs, the standard scores associated with each environmental factor

were factor analyzed. This process of factor analysis, which will be discussed in the following section of this chapter, produces factors that define separate dimensions of a country's environmental structure. These dimensions can be compared to the definitions of the environmental factors to determine whether the environmental factors are valid conceptualizations of the environmental structure that is inherent in the operational measures.

Measures for each of the factors obtained by factor analysis were also calculated for each of the countries in the subject population. These measures, representing observations of the environmental dimensions, were then included in the data base that was subsequently analyzed to test the relationship between environmental structure and the three criterion variables.

Factor analysis

In factor analysis, a correlation matrix is analyzed to determine which variables cluster together to provide information on the same concept. This clustering of variables is called a factor. Each factor can be considered as the central concept or underlying dimension that the clustered variables measure.

The amount of information that clustered variables measure is determined in factor analysis by the factor loadings of each variable. Those variables with high factor loadings for a specific factor provide more information about an underlying dimension than do variables with smaller factor loadings.

In factor analysis, absolute values for factor loadings from .40 to .50 are considered significant and absolute values equal to or greater than .50 are considered as quite significant (Frank, Kuehn, and Massey,

1962). Variables with significant or quite significant factor loadings for a single factor can be considered to measure individually the same underlying dimension. By examining the variables that load highly on a factor, the researcher can often determine the underlying dimension that the variables measure. The factor can then be named for this dimension.

The high loading of more than one variable on a factor occurs because variables provide separate measures of the same factor. The separate measures of the factor can be combined to form a single measure of the factor as follows: first, the algebraic signs of the factor loadings for the variables that load highly on a factor are determined. These signs are interpreted as unit vectors. That is, a plus sign is interpreted as a +1 and a minus sign is interpreted as a -1. The standardized scores for the variables for a subject of the subject population are then multiplied by each variable's unit vector to form vector scores. Finally, the vector scores are summed to produce a single measure of the factor for the subject. This measure is called a factor score.

Like variables, factors also can covary. In factor analysis the relationship between the factors can be changed by "rotation." This rotation is accomplished by changing the initial factor structure to obtain a second set of factors which are defined by new clusters of variables. The second set of factors then represents new underlying dimensions.

Many different techniques are available for factor rotation. The specific technique that is used is determined by the interpretability of the rotated factors--that is, how well the underlying dimensions

can be defined in meaningful terms. The most desirable rotation technique is also the one producing factors that have been used and validated in other research. Rummel (1963) suggests that if underlying structure is completely unknown, then orthogonal rotation should first be used. Each of the factors produced by this rotation contains variables that are maximally related to each other, and the total factor structure is most parsimonious mathematically (Guertin and Bailey, 1970).

Factor analysis of environmental factor data

Recall that for each environmental factor, operational variables were selected and measured for each country of the subject population and the distributions of these measurements were then standardized to produce standardized scores. These standardized scores associated with each environmental factor and each subject country were factor analyzed. Principal axis factor analysis with varimax orthogonal rotation was used to extract factors for each environmental factor.

Factor loadings with an absolute value equal to or greater than .50 were used to select operational variables that measured the underlying dimension of a rotated factor. The .50 value was used because it minimized the selection of the same variable for more than one factor. It was felt that this conservative approach to developing factors would allow a country's environment to be defined by the simplest and most basic factor structure.

For some of the factors that were extracted by factor analysis, more than one operational variable was found to load significantly on a single factor. Single measures of factors were obtained by calculating factor scores for each factor for each of the subject countries. The

factor scores for all factors for all subjects were then included in the data base that was subsequently analyzed to test the model of foreign market service strategies.

Construct Validation by Correlational Analysis

Construct validation was accomplished in this study not only by factor analytic technique but also through correlational methods. Correlational methods were used because the validity of constructs is supported if the constructs are related to other concepts and also operate in meaningful and expected ways (Heeler and Ray, 1972; Runkel and McGrath, 1972; Cronbach et al, 1963).

Three constructs were included in this test of construct validation. These constructs were the environmental factor political stability, the environmental factor economic development and performance, and the variable economic development. No independent measures that might be meaningfully related to the other constructs of this study could be defined. Consequently, these other constructs were excluded from this correlational method of construct validation.

As a first step in validation of each construct, an independent measure of a concept that should be meaningfully related to the construct was defined and measured. Next, the correlations between the observations of the independent measures and the observations of the construct's operational variables were calculated. Finally, the resultant correlation coefficients were examined to determine whether the independent measure was related to the construct as expected.

Additional Methodological Considerations

Random Error

Errors can be introduced into research data, and they may seriously affect the results and conclusions of a study. These errors may be either systematic or random. An error occurs when data have been either overstated or understated. This error will be a random error when all elements of data have an equally probable chance of being overstated or understated and the direction and magnitude of the error is uncorrelated with any other data. Random errors may result for such reasons as human mistakes, mechanical malfunctions, or electronic failures; and random errors may occur during the collection of data or any of the subsequent steps involved in analyzing the data. The use of secondary-archival data in a study also increases the possibility of random errors because of the additional chance of typographical and printing mistakes.

A number of positive actions were taken in this study to reduce the occurrence of random errors. Whenever possible, data obtained from one secondary source were cross-checked with data from one or more alternative sources. Data inconsistencies between sources were then examined, and any differences were resolved before the data were incorporated into the study. In this way, typographical errors, printing errors, or other errors originating in a single secondary data source could be detected and the propagation of these errors into this study's data base could be prevented.

The activity of handling and processing data by physical, mechanical, and electronic methods can also result in the generation of random

errors. "Dummy data" were included with the research data in many steps of the analysis to guard against these errors. These dummy data were selected to provide specific predetermined results from the analysis. Deviations from the expected results were then used to indicate that data errors were being generated.

In addition to dummy data, checksums and other parity types of information were included with the research data in some steps of the analysis to detect erroneous changes in data values. In other steps of the study, the accuracy of data that had been transcribed or recorded from other sources were verified by physically cross-checking the data with their original source.

Although a great deal of effort was expended in reducing the generation of random errors, the probability of their occurrence in this study must be presumed to be greater than zero. Given that random errors have been introduced into the data base, the question can be posed: what effect will such error have on the results of this research?

To answer this question, one must consider the effects of random data errors on both correlational analysis and factor analysis, the two primary analysis tools used in this study. In correlational analysis, data containing random errors will reduce the value of correlations between measures from the value that would be obtainable with data that are free of random errors. Measures that would be significantly correlated when data do not contain random errors may then be insignificantly correlated when data contain random errors. Consequently, random errors may have the effect of reducing the number of correlations that are found to be significant.

The presence of random data errors, however, does not damage any significant results that are obtained by correlational analysis. On the contrary, the existence of random errors serves to strengthen the confidence that may be placed in significant correlations, since the level of significance would be higher if the data were free of random errors.

The effects of random error on factor analysis have been analyzed by Cattell (1952) and Rummel (1963) and experimentally investigated by Mosier (1939). These investigators indicate that an orthogonal rotation with data contaminated by random errors will produce factor loadings somewhat lower than would be produced with uncontaminated data. But the factor structure as a whole will not be distorted. In factor analysis, then, the same factors will be extracted with or without the presence of random errors.

Systematic Error

Systematic error occurs when a measure is consistently understated or overstated so that the induced error of the measure is correlated with the same measure or with another measure. Some of the same causes of random errors may also cause systematic errors. For example, human mistakes, mechanical malfunctions, or electronic failures that may occur during the collection and subsequent analysis of data may result in the generation of systematic errors.

The same safeguards and actions for detecting and preventing random errors were applicable and were used to detect and prevent systematic errors. For instance, dummy data, checksums, and parity information were used in the processing and handling of research data

to detect the occurrence of systematic error. The cross-checking of data between alternative secondary sources also provided a means for detecting the systematic overstatement of data by one source.

While every effort was made to prevent and detect systematic errors, it would be a mistake to assume that no systematic error was inherent in the political, economic, social, and cultural data used in this study. For example, some of the observations of these parameters originated with sources located within developing countries. These are countries that may have a need to present to other countries of the world the appearance of a politically stable and economically sound nation. Consequently, the data sources may have been influenced to understate politically destabilizing events and overstate economic measures.

Systematic errors may be multiplicatively related to a measure and cause a systematic understatement or overstatement of data. The systematic understatement or overstatement of data may result in correlations between measures that are overly low or overly high, respectively. If systematic errors in data cause overly low correlations, then the effects on the results of this study will be the same as in the case of data with random errors. That is, a smaller number of significant correlations may be obtained with the contaminated data than would have been obtained with data that were free of systematic errors. However, the lowering of the correlational levels by systematic errors, as with random errors, will strengthen the confidence that may be placed in the significant correlations that are found.

If systematic data errors create overly high correlations between measures, then some correlations that would not be significant with data

that do not contain systematic errors may be accepted as significant. The systematic overstatement of data, therefore, requires that less confidence be placed in the results of correlational analysis, since significant correlations may have been erroneously produced.

Systematic data errors can also affect the results of factor analysis. Rummel (1963) maintains that the factor structure obtained with data containing systematic errors may be seriously distorted. This distortion may allow incorrect factors to be extracted from the data.

Because of the damaging effects that systematic errors can have on the results of a study, an attempt was made to measure the systematic error that might be inherent in some of the data. Even though very little can be done to remove the effects of systematic error, the knowledge of its presence or absence can provide a measure of confidence in the results and conclusions of the study. The techniques used and the results obtained in measuring systematic error will be considered in other sections of this chapter.

Criterion and Predictor Variables

In the remaining sections of this chapter, the specific results that were obtained from the definition of operational variables and collection of data will be presented. The results of these operations will be presented for each of the criterion and predictor variables used in this study. In addition, development of the underlying dimensions for the environmental factors will also be presented in each discussion of an environmental factor.

Foreign Market Service Strategies

The criterion variable foreign market service strategies was defined in this study as:

> The different methods that domestic firms use to produce and market goods and services in foreign markets. These methods require different foreign roles for the domestic firm in terms of foreign channel control, foreign production, and foreign marketing.

It might be expected that an operational variable could be developed and used to enumerate the foreign market service strategies of domestic firms. Enumeration of foreign market service strategies, however, is a difficult task. Except in a few isolated instances, firms have not specified in published reports or annual statements the market service strategies that they have used in foreign countries. Foreign countries, likewise, have not published or made available information concerning the foreign market service strategies that domestic firms have used within their borders.

Instead of enumerating the different types of foreign market service strategies, I suggest that the levels of United States exports and United States foreign direct investment may provide a means of measuring the use of different foreign market service strategies. To understand how these two parameters may be used, first consider the definition cited above for the criterion variable foreign market service strategies. According to this definition, the service strategies that a domestic firm uses in a foreign market require different foreign roles for domestic firms. Of all the strategies available to a firm, the strategy of exporting results in the smallest foreign role because the tasks of foreign channel control, foreign production, and foreign marketing for the firm are either minor or nonexistent. And, in

exporting, little or no foreign direct investment is required for the firm.

Strategies other than exporting bring about a greater allocation of the channel tasks to the domestic firm. These strategies may reduce the amount exported by the firm, but they will, undoubtedly, require foreign direct investment. In fact, strategies that result in large foreign roles with high levels of foreign channel control, foreign production, and foreign marketing for the domestic firm may be associated with high levels of foreign direct investment.

As an example of the different foreign market service strategies available to a firm, consider the following:

Strategy 1. Wholly owned subsidiary

Strategy 2. Joint venture

Strategy 3. Sales branch

Strategy 4. Sales office

Strategy 5. Exporting

These strategies are rank-ordered according to the foreign role of the domestic firm. Strategy 1 requires the greatest foreign role, in terms of channel control, foreign production, and foreign marketing; and Strategy 5, the smallest foreign role. Besides being ordered according to foreign role, however, the strategies are rank-ordered according to the amount of foreign direct investment required to implement that strategy. Strategy 1 requires the greatest foreign direct investment and Strategy 5 the smallest.

The parallel ranking of strategies by the level of foreign direct investment and of a domestic firm's foreign role occurs because a firm usually acquires an increased foreign role--increased channel control,

foreign production, and foreign marketing--by foreign direct investment. Strategies other than the preceding five strategies could have been used and ranked according to the level of foreign direct investment required to implement them. Similar results, however, would have been obtained: strategies ordered by foreign direct investment would also be ranked by the level of a domestic firm's foreign role.

If a market is serviced with strategies, such as Strategy 1 or 2, that produce large foreign roles for domestic firms, then the level of foreign direct investment to the market, compared to the level of exports to the market, should be high. If another market is serviced with strategies, such as Strategies 4 or 5, that produce smaller foreign roles for the domestic firm, then the level of foreign direct investment to the market, compared to the level of exports to the market, should be low.

Comparing the ratio of foreign direct investment to exports for two markets may yield the following inequality.

$$\left[\frac{\text{Foreign direct investment}}{\text{Exports}}\right]_{\alpha} > \left[\frac{\text{Foreign direct investment}}{\text{Exports}}\right]_{\beta}$$

here: α = a market where Strategy 1 or 2 is predominantly used.

β = a market where Strategy 4 or 5 is predominantly used.

In fact, this inequality should hold for any two markets in which the α market is being serviced by strategies that tend to provide larger foreign roles for the domestic firm than do those strategies in the β market. Therefore, the ratio of the value of foreign direct investment to the value of exports apparently provides an indication of the use of different foreign market service strategies in different markets. This

indication of different foreign market service strategies is not produced directly in terms of specific strategies but indirectly in terms of the different levels of roles that domestic firms tend to use in different markets.

The ratio of the value of foreign direct investment to the value of exports may also be useful for studying the changing use of strategies in a single market. For instance, if the ratio is observed to increase from year to year for a single market, then this increase may indicate that firms are adopting strategies that provide them with greater foreign roles. Conversely, a declining ratio may indicate that firms are adopting strategies with smaller foreign roles.

The values of foreign direct investment to a market and exports to a market are the aggregate values resulting from many domestic firms using many different strategies. Using aggregate values to obtain a measure of the use of different foreign market service strategies may be superior to enumerating the specific strategies that a sample of firms use. This superiority results because aggregate values allow for a study of the average behavior of many firms instead of specific behavior of a few firms. Grunfeld and Griliches (1960) point out that the use of aggregated economic variables may produce a net gain in information by reducing the specification error inherent in microeconomic relationships. In situations where the micro behavior cannot be specified perfectly in terms of micro equations, the use of aggregated values of a variable, while producing an aggregation error, often produces a greater aggregation gain.

R. Eisner (1967) also suggests that aggregation of investment data is sometimes useful because specific investment decisions of firms

are often the results of both permanent and transitory determinants. To the extent that strategies require foreign direct investment, then these strategies may also be the result of permanent and transitory determinants. Aggregate values tend to eliminate transitory phenomena in much the same way that multiple measures of a construct tend to eliminate random error. The use of aggregate values then, allows one to focus on the permanent or average elements of a decision process.

The operational variable for foreign market service strategies was defined in this study as the ratio of United States foreign direct investment to United States exports.* For future reference this operational variable will be called the index of foreign market service strategies. Measurements of this operational variable were obtained for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each subject country, the distribution of the resultant mean observed data values was standardized, and the standard scores were then included in the data base.

United States Exports

The criterion variable United States exports was defined as the value of domestically produced merchandise and of foreign produced merchandise that is shipped from domestic sources to foreign locations (U.S. Department of Commerce, Business Statistics, 1967).

United States exports was considered as an operational variable, and observations for this variable were obtained for each of the subject countries for each of the years 1965, 1966, and 1967. The

*Unless otherwise indicated, all operational variables used in this study were quantitative variables.

arithmetic mean of the observed data values for the three years was calculated for each subject country, the distribution of the resultant mean observed data values was standardized, and the standard scores were then included in the data base.

United States Foreign Direct Investment

The criterion variable United States foreign direct investment was defined as the net capital outflows to foreign countries plus reinvested foreign earnings that are used by United States persons, organizations, or affiliated groups to acquire equity interest in foreign located business organizations (U.S. Department of Commerce, U.S. Direct Investments Abroad: 1966, 1970).

United States foreign direct investment was considered as an operational variable, and observations for this variable were obtained for each of the subject countries for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each subject country, the distribution of the resultant mean observed data values was standardized, and the standard scores were then included in the data base.

Political Stability

Litvak and Banting defined political stability as:

> A system of government which permits representative of the major segments of its society, enjoys the confidence of its people, generates conditions for continuity of business operations, and is sympathetic to private enterprise. (1968, p. 461)

This definition would seem to be more descriptive of a country with representative democratic government and a laissez-faire economy than a definition of political stability. Because Litvak and Banting's definition did not appear to define political stability adequately,

a second definition was developed and used in this study. This second definition defines political stability as a system of government that maintains continuity and consistency within laws, policies, and legal enforcement and provides enduring and steady character and purpose.

Operational variables were not selected to measure political stability directly. Instead, political instability was defined as opposite to political stability and opposite in all respects to the second definition of political stability given. Operational variables that measure political instability--that is, reverse-scored measures of political stability--were selected and were then used throughout the analysis of data. Results from the analysis that contained these operational variables, however, were translated into terms of political stability.

Two different methods were used to select operational variables that measure political instability. The first method was suggested by Feierabend and Feierabend (1966). They maintained that political instability is indicated by the amount of aggressive conflict that occurs within a country. According to them, political instability is

> The amount of aggression directed by individuals or groups within the political system against other groups or against the complex of office holders and individuals and groups associated with them. Or, conversely, it is the amount of aggression directed by these office holders against other individuals, groups, or office holders within the polity. (p. 250)

Five operational variables were selected to measure some of the events that Feierabend and Feierabend suggested represent conflict behavior and political destabilization. These five variables were

1. Number of protest demonstrations during previous eight years
2. Number of riots during previous eight years

3. Number of armed attacks during previous eight years
4. Number of deaths from domestic violence during previous eight years
5. Number of government sanctions during previous eight years

Each of these five variables was considered as a separate measure of political instability. Observations of these variables were obtained for each of the subject countries for each of the years 1965, 1966, and 1967. The arithmetic mean of the observations for the three years was calculated for each variable for each subject country, and the distribution of the resultant mean observed data values for each variable was then standardized.

Another method used to measure political instability was suggested by Taylor (1969). He maintained that political instability may be measured by considering the number of illegitimate changes in the central government to the total number of illegitimate and legitimate governmental changes. Four variables were selected that could be measured and could be used to represent Taylor's concept of governmental change. These four variables were

1. Number of regular executive transfers during previous eight years
2. Number of renewals of executive tenure during previous eight years
3. Number of executive adjustments during previous eight years
4. Number of irregular executive transfers during previous eight years.

Observations for these four variables were obtained for each subject country for each of the years 1965, 1966, and 1967. An approximation

of Taylor's measure of political instability was then computed for each subject country and year of the sample population by dividing the sum of the values of the last two variables by the sum of the values of all four variables. For further reference this measure will be called the "index of political instability."

The arithmetic mean of the computed values for the index of political instability for the years 1965, 1966, and 1967 was calculated for each subject country, and the distribution of the resultant mean observed data values was standardized. In addition, mean observed data values were also calculated for each of the five variables that were used to compute the index of political instability for each of the subject countries, and the distribution of these mean observed data values for each variable was then standardized.

The standard score data for the five operational variables of conflict behavior, the four operational variables used to compute the index of political instability, and the operational variable index of political instability were analyzed by principal axis factor analysis followed by varimax orthogonal rotation. Data for the five variables of conflict behavior and the index of political instability were included in this factor analysis, since these variables and the index each measure political instability. Data for the five variables that were used to compute the index of political instability were also included in the analysis since it is possible that these variables individually measure political instability.

Four factors were extracted from the data by factor analysis. The factor loadings for each variable on each factor are shown in

Table 2.* In addition, those factor loadings that are quite significant (an absolute value $\geq$ .50) have been indicated in this table by an asterisk.

The first factor contained four variables with quite significant factor loadings. The common dimension measured by these variables was defined as "executive resistance and change due to internal turmoil." The first factor was, therefore, named after this dimension.

The common dimensions of the variables that loaded quite significantly on each of the other three factors were also defined. The factors were named after these dimensions as follows: Factor 2 was named "executive change by coups and by constitutional means," Factor 3 was named "political instability," and Factor 4 was named "violent repression."

Factor scores were calculated for each of the four factors for each subject country, and the resultant scores were then included in the data base.

For each of the four factors, a single score was calculated for each country of the subject population. As an example of these

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*The operational variables shown in Table 2 are reverse- scored measures of political stability--that is, they measure political instability. The positive factor loadings of these variables, therefore, indicate factors of political instability. However, to maintain consistency with the names of the Litvak and Banting environmental factors, the factors indicated in Table 2 will be referred to collectively as political stability factors. To prevent confusion about the direction of measurement, future references to political stability factors will include the note "reverse-scored" to indicate that the factors represent political instability.

The specific names developed for each factor in Table 2 will represent the true direction of measurement for the factor. Consequently, future references to specific factors will not require an additional note indicating their direction of measurement.

TABLE 2

FACTOR LOADINGS FOR POLITICAL STABILITY FACTORS

Variable	Factor loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Number of protest demonstrations during previous eight years	.77*	.29	-.20	.21
Number of riots during previous eight years	.58*	.48	-.04	.34
Number of armed attacks during previous eight years	.08	.61*	-.01	.54*
Number of deaths from domestic violence during previous eight years	.02	-.19	.11	.78*
Number of governmental sanctions during previous eight years	.53*	.29	.12	.64*
Number of regular executive transfers during previous years	.15	.78*	-.08	-.17
Number of renewals of executive tenure during previous eight years	.44	-.16	-.79*	-.07
Number of executive adjustments during previous eight years	.87*	.10	.20	-.03
Number of irregular executive transfers during previous eight years	.36	.61*	.45	-.01
Index of political instability	.41	-.21	.81*	.15

*Factor loading $\geq$ an absolute value of .50.

calculations, measures of Factor 3, the political instability factor, were determined with the use of the following equation:

$$F_{3,i} = (-1)Z_{et,i} + (+1)Z_{pi,i}$$

Where $F_{3,i}$ = single measure of Factor 3 for country i.

$Z_{et,i}$ = standard score of the operational variable, number of renewals of executive tenure during previous eight years, for country i.

and $Z_{pi,i}$ = standard score of the operational variable, index of political instability, for country i.

The term $Z_{et,i}$ is multiplied by a minus one, since the operational variable number of renewals of executive tenure during previous eight years has a negative and quite significant factor loading on Factor 3. The term Z_{pi} is multiplied by a positive one, since the operational variable index of political instability had a positive and quite significant factor loading on Factor 3. Single measures of the factors for all the environmental factors for all subject countries were calculated in a similar fashion.

Test for systematic error and construct validation

Observations for the five variables of governmental change that were used to compute the index of political instability and for the four variables for politically destabilizing conflict behavior may be systematically understated. This possibility exists because censorship of news-reporting organizations may prevent news of all conflict behavior and governmental change from being disseminated (Rummel, 1963). The data used in this study may have been obtained from these organizations and, consequently, may be understated because of this censorhip.

However, the possibility that the data are overstated because of censorship is highly unlikely, since it would be difficult to believe that censorship would result in the reporting of more conflict behavior and governmental change than actually occurred.

To test the proposition that the measures for the ten variables of conflict behavior and governmental change were systematically understated, product moment correlations were obtained between measures for each of the ten variables and measures for freedom of the press. For forty-seven countries of this study's subject population, these measures for freedom of the press were obtained from Taylor and Hudson (1972) and were interpreted as measures of the absence of censorship. All correlations were found to be negative and significant ($P < .05$). These negative correlations indicate that there is less freedom of the press--that is, more censorship of the press--as countries exhibit greater amounts of conflict behavior and governmental change. If censorship results in the suppression of reporting of conflict behavior and governmental change, then the negative correlations indicate that higher levels of conflict behavior and governmental change are more highly understated. It must be concluded then that the measures of conflict behavior and governmental change used in this study are quite probably understated systematically.

As indicated previously, data containing systematic error can distort the factor structure obtained with factor analysis. Since the measures of conflict behavior and governmental change are probably understated systematically, the underlying dimensions of political stability that were obtained by the factor analysis of these measures may be

distorted. Any results obtained in this study that include the political stability factors, therefore, must be interpreted with caution.

The test for systematic error in the measures of political stability also may be used for a test of the construct validity of political stability. Freedom of the press is a concept that can be expected to be related to political stability. That is, it seems reasonable to presume that less freedom of the press is associated with less political stability. The significantly negative correlations that were obtained between measures for freedom of the press and measures for conflict behavior and governmental change support this presumption. If measures of political stability are related to measures of another concept in a meaningful and expected way, then the concept of political stability may be part of a network of related concepts. Consequently, this evidence supports the construct validity of political stability (Runkel and McGrath, 1972).

Market Opportunity

The environmental factor market opportunity was defined by Litvak and Banting as:

> A sufficient number of customers with incompletely satisfied needs and the necessary resources with which to satisfy those needs for the product or service in question. A "hot" factor when opportunity is high. (1968, p. 461)

Both marketing concepts and economic concepts are contained in this definition of market opportunity. For instance, the phrase "satisfying customer needs" is traditionally associated with marketing while the term "resources" is usually interpreted as an economic concept. Although no problem is presented by the marketing terminology, the

economic elements of the definition are closely aligned and overlap with the Litvak and Banting definition for the environmental factor economic development and performance. As will be discussed in the following section, the economic environment of a country will be defined and described totally by the environmental factor economic development and performance. Therefore, the economic related concepts in the Litvak and Banting definition of market opportunity were deleted.

In addition to removing the economic concepts from the definition of market opportunity, the definition was also changed to indicate that market opportunity occurs when potential customers can be informed of the availability of goods and services. This change was made because it was felt that market opportunity cannot exist in a country unless there are means available for informing potential customers of the existence of need-satisfying goods and services.

The net effect of all changes to the definition resulted in market opportunity being defined as a sufficient number of potential customers with incompletely satisfied needs who can be informed of the availability of goods and services to satisfy those needs.

Using this definition for market opportunity, the following six operational variables were selected for market opportunity:

1. Population
2. Population density
3. Number of newspapers per capita
4. Number of telephones per capita
5. Number of radios per capita
6. Number of television receivers per capita

These six quantitative variables measure market opportunity in two ways. The first two variables, population and population density (in number of people per square mile), provide measures of the gross number of potential customers and the concentration of potential customers in a market. The last four variables provide measures of some of the promotional media that firms use to disseminate information and to inform potential customers of need-satisfying goods and services.

The six operational variables for market opportunity were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each variable for each subject country and the distribution of the resultant mean observed data values for each variable was then standardized.

The standard scores for the six operational variables that measure market opportunity were factor analyzed. Three orthogonal factors were extracted from these data. The factor loadings for the six variables on each factor are shown in Table 3.

The three factors obtained by factor analysis were named as follows: Factor 1 was named "marketing media," Factor 2 was named "population density," and Factor 3 was named "population." Factor scores were calculated for each of these three factors for each subject country, and these scores were then included in the data base.

Economic Development and Performance

Litvak and Banting defined the environmental factor economic development and performance as:

TABLE 3

FACTOR LOADINGS FOR MARKET OPPORTUNITY FACTORS

Variable	Factor loading		
	Factor 1	Factor 2	Factor 3
Population	-.07	-.01	1.00*
Population density	.03	1.00*	-.00
Number of newspapers per capita	.91*	.25	-.03
Number of telephones per capita	.94*	.00	-.04
Number of radios per capita	.89*	-.04	-.14
Number of televisions per capita	.97*	-.06	.00

*Factor loading $\geq$ an absolute value of .50.

> The level of a country's economic growth, efficiency, equity, and stability, which shape the environment for private enterprise. Applying Rostow's classification within the context of this definition, levels would be grouped as follows:
>
> Low. The traditional society, the preconditions for takeoff. A "cold" factor.
>
> Medium. The drive to maturity. A "moderate" factor.
>
> High. The age of high mass-consumption. A "hot" factor. (1968, p. 461).

This definition of economic development and performance is expressed totally in economic terms. As was mentioned in the previous section, Litvak and Banting also defined market opportunity, in part, with economic terms. In addition, several other environmental factors

can be operationalized with variables that measure a country's economic condition. Unfortunately, defining or operationalizing different environmental factors by the same economic terms or variables reduces the ability to differentiate between those factors. For this reason, the environmental factor of economic development and performance was considered as the only factor that describes the economic condition of a country.

Since the definition of economic development and performance suggested by Litvak and Banting contains only economic terms, it was retained in its original form. All other environmental factors, however, were redefined or operationalized, when necessary, in noneconomic terms.

It was felt that the economic development and performance of a country is indicated by its productive output, its use of resources and the growth rate of both its productive output and its use of resources. Fourteen operational variables were selected to measure these four indicants. These fourteen variables were

1. Gross domestic product
2. Gross domestic product per capita
3. Energy consumption
4. Energy consumption per capita
5. Steel consumption
6. Steel consumption per capita
7. Distribution of male labor force in agriculture
8. Average annual rate of growth of gross domestic product, 1960 - 1965
9. Average annual rate of growth of gross domestic product per capita, 1960 - 1965

10. Average annual rate of growth of gross domestic product, 1965 - 1969
11. Average annual rate of growth of gross domestic product per capita, 1965 - 1969
12. Average annual rate of growth of gross domestic product, short period ending 1965
13. Average annual rate of growth of gross domestic product, long period ending 1965
14. Average annual rate of growth of energy consumption

Of these fourteen variables, the two variables gross domestic product and gross domestic product per capita were selected to measure the productive output of a country. The five variables energy consumption, energy consumption per capita, steel consumption, steel consumption per capita, and distribution of male labor force in agriculture were selected to measure a country's use of resources.

Since the measurement of growth rate can be highly dependent on the time period used, six different variables representing different time periods were selected to measure a country's economic growth. These variables measure both the average annual rate of growth of gross domestic product and the average annual rate of growth of gross domestic product per capita.

The variable average annual rate of growth of energy consumption was selected to measure a country's growth rate in use of resources.

All fourteen of the operational variables were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each variable for each subject country, and the distribution of

the resultant mean observed data values for each variable was then standardized.

The standard scores for the fourteen operational variables that measure economic development and performance were factor analyzed. Four orthogonal factors were extracted from the data. The factor loadings for the fourteen variables on each factor are shown in Table 4.

The four factors obtained by factor analysis were named as follows: Factor 1 was named "economic growth rate," Factor 2 was named "economic development per capita," Factor 3 was named "aggregate economic performance," and Factor 4 was named "growth rate of energy consumption." Factor scores were calculated for each of these four factors for each subject country, and these scores were then included in the data base.

Test for systematic error and construct validation

The observations of the fourteen measures of economic development and performance may contain systematic error. This possibility exists because the less developed countries of the world may exaggerate their economic development and performance to enhance and strengthen their image in world affairs. Because developed countries have less of a reason to exaggerate economic development and performance, any induced error in economic parameters may systematically decrease as countries become more economically developed.

The observations of the economic development and performance measures used in this study were obtained primarily from agencies of foreign governments. The ability of these agencies to report discrepant data may be limited by the presence of a free press that can question

TABLE 4

FACTOR LOADINGS FOR ECONOMIC DEVELOPMENT AND PERFORMANCE FACTORS

Variable	Factor loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Gross domestic product	-.01	.31	.93*	-.03
Gross domestic product per capita	.01	.96*	.17	.05
Energy consumption	-.04	.37	.90*	-.06
Energy consumption per capita	-.12	.91*	.26	.02
Steel consumption	.06	.26	.94*	.03
Steel consumption per capita	.04	.89*	.37	.04
Distribution of male labor force in agriculture	.08	-.86*	-.27	.06
Average annual rate of growth of gross domestic product, 1960-1965	.97*	.06	-.09	-.04
Average annual rate of growth of gross domestic product per capita, 1960-1965	.96*	.19	-.03	.01
Average annual rate of growth of gross domestic product, 1965-1969	.75*	-.33	.07	.05
Average annual rate of growth of gross domestic product per capita, 1965-1969	.83*	-.03	.19	.27

TABLE 4 - continued.

Variable	Factor loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Average annual rate of growth of gross domestic product, short period ending 1965	.96*	.06	-.10	-.03
Average annual rate of growth of gross domestic product, long period ending 1965	.93*	-.03	.02	.02
Average annual rate of growth of energy consumption	.10	-.03	-.05	.98*

*Factor loading $\geq$ an absolute value of .50.

government accounts and independently investigate economic matters. The more that news agencies are censored, however, the more strictly a government may control the dissemination and reporting of erroneous information.

To test for systematic error, correlation coefficients were calculated between each of the fourteen measures of economic development and performance and independent observations of freedom of the press. These observations for freedom of the press were obtained from Taylor and Hudson (1972) for forty-seven countries of this study's subject population. The correlation between freedom of the press and the operational variable, average annual rate of growth of gross domestic product, 1965 - 1969, was found to be negative and significant ($P < .05$). If governmental control of the press does affect the reporting of economic

development and performance data and if contamination of data decreases with decreasing governmental control, then these significant correlations may be an indication of systematic error. Because systematic error may decrease with increasing values of the average annual rate of growth of gross domestic product, 1965 - 1969, positive correlations that are obtained in this study and that involve this operational variable will not be harmed by the systematic error. Instead, greater confidence may be placed in any significant correlations that are obtained.

The systematic error that is potentially inherent in the observations for the annual rate of growth of gross domestic product, 1965 - 1969, may distort the factor structure that is obtained with factor analysis. Any results obtained in this study that include this variable, therefore, must be interpreted with caution.

The correlations between freedom of the press and the operational variables energy consumption, gross domestic product per capita, energy consumption per capita, and steel consumption per capita were all found to be positive and significant. The correlation between freedom of the press and distribution of male labor force in agriculture was found to be negative and significant ($P < .05$). These correlations do not appear to be indicative of systematic error in the operational variables. That is, no reasonable link could be made between systematic error and the operational variables that would result in the observed correlation coefficients. These correlations, therefore, may be attributable to phenomena other than systematic error.

The correlation coefficients involving measures of economic development and performance that have not previously been discussed were all

found to be insignificant. These coefficients, therefore, do not provide evidence that is indicative of systematic error.

The test of the economic development and performance measures for systematic error also provides a test of construct validity. The possibility that systematic error may be contained in the measures for the annual rate of growth of gross domestic product, 1965 - 1969, is consistent with what would be expected for this variable. The construct validity of the variable is therefore supported by empirical evidence. The results for all the other variables that were tested for systematic error, however, do not provide support for the construct validity of the variables. Conceivably, these variables are valid measures of economic development and performance but the hypothesized relationship between the variables and freedom of the press is not valid.

Cultural Unity

The literature on international business has emphasized the importance of a few cultural characteristics in the development of business strategies. Religion, ethnic background, and language, for instance, are often cited as important cultural parameters affecting business operations in different foreign countries (Salera, 1969; McCarthy, 1968; Robock and Simmonds, 1973). As an example of how these cultural parameters may affect business operations, consider the marketing of the same product in both India and Japan.

India has a pluralistic society composed of many different religious, racial, and linguistic subpopulations. Multiple distribution, pricing, and promotional strategies may be required to service each of these separate subpopulations. Japan, however, has a more homogeneous society composed of people with similar religious, racial, and

linguistic backgrounds. A single distribution, pricing, and promotional strategy, therefore, may be sufficient to market a product in this highly unified society.

While cultural unity is not explicitly defined in terms of religion, race, and language by Litvak and Banting, their definition is not inconsistent with the premises that these cultural parameters do affect business operations. They defined cultural unity as:

> The values, goals, attitudes, social relationships and interactions between distinct segments within a country's people in terms of shared heritage, unassailed by competing groups. A "hot" factor when unity is high. (1968, p. 461)

Because the Litvak and Banting definition of cultural unity is consistent with the concept of culture that is often contained in international business literature, it was retained in its original form. Five operational variables were selected to measure cultural unity. These variables were

1. Religious heterogeneity
2. Linguistic heterogeneity
3. Racial heterogeneity
4. Ethnic and linguistic fractionalization
5. Literacy.

The first four variables were selected to measure the extent to which a group of people share a single common heritage in religion, race, and language. The last variable, literacy, was selected because the ability to read may be important for the dissemination of beliefs, attitudes, and other cultural elements among a group of people (Robock and Simmonds, 1973).

The first three variables are coded or "dummy" variables that possess a value of either 1 or 0. A value of 1 indicates the condition

for which the variable was named, and a value of 0 indicates the opposite condition. The last two variables are quantitative variables that are measured in percentage.

The first four operational variables are reverse-scored and measure cultural disunity. As in the case of the operational variables that measure political instability, the variables that measure cultural disunity were used throughout the analysis of data. Results from the analysis that contained these variables were then translated into terms of cultural unity.

The five operational variables that measure cultural unity and disunity were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values was calculated for each variable for each subject country, and the distribution of the resultant mean observed data values for each variable was then standardized.

The standard scores for the operational variables that measure cultural unity and disunity were factor analyzed. Three orthogonal factors were extracted from the data. The factor loadings for the five variables on each factor are shown in Table 5.*

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*The first four operational variables listed in Table 5 are reverse-scored measures of cultural unity--that is, they measure cultural disunity. Positive factor loadings for all operational variables indicate factors of cultural disunity. To maintain consistency with the names of the Litvak and Banting environmental factors, the factors indicated in Table 5 will be referred to collectively as "cultural unity" factors. To prevent confusion about the direction of measurement, future references to cultural unity factors will include the note "reverse-scored" to indicate that the factors represent cultural disunity.

The specific names developed for each factor in Table 5 will represent the true direction of measurement for the factor. Consequently, future references to specific factors will not require an additional note indicating their direction of measurement.

TABLE 5

FACTOR LOADINGS FOR CULTURAL UNITY FACTORS

Variable	Factor loading		
	Factor 1	Factor 2	Factor 3
Religious heterogeneity	.15	.95*	.09
Linguistic heterogeneity	.88*	.24	-.07
Racial heterogeneity	.02	.09	.98*
Ethnic and linguistic fractionalization	.90*	.31	-.05
Literacy	-.79*	.26	-.35

*Factor loading $\geq$ an absolute value of .50.

Legal Barriers

Litvak and Banting defined legal barriers as:

> A proliferation of public measures in the form of laws and regulations which either deliberately or unintentionally restrict or discourage existing business activities and the future environment for private enterprise. A "cold" factor when barriers are high. (1968, p. 464).

This definition of legal barriers may be applicable to a firm that operates entirely within the boundaries of a single foreign country. However, it does not sufficiently emphasize the legal barriers encountered in both the international investment and trade activities of domestic firms.

For instance, the definition does not specifically include the legal restrictions that are used in some foreign countries as a barrier to foreign direct investment. Nor does it mention the tariff regulations and import quotas that are also encountered in some countries as

a barrier to trade. Each of these barriers may limit the types of market service strategies that domestic firms can use in a foreign market. Expanding the definition of legal barriers to include investment and trade restrictions should, therefore, make the term more descriptive of the legal environment in which firms operate. For this reason, legal barriers were redefined as a proliferation of public measures in the form of laws and regulations that either deliberately or unintentionally restrict or discourage existing or future business activities, foreign trade, or investment. A "cold" factor when barriers are high.

Five operational variables were selected to measure legal barriers. These variables were

1. Tariffs on imports
2. Tariffs as percentage of imports
3. Total exports of country
4. Total imports plus exports of country
5. Type of legal system.

The two tariff variables were selected as measures of legal barriers, since tariffs directly affect both trade and foreign direct investment (Brash, 1966; Root, 1973; Pizer and Cutler, 1965). The variable total exports of country and the variable total imports plus exports of country were selected as measures of legal barriers, since they may provide a gross measure of the overall restrictions and obstacles to international trade.

The variable type of legal system was selected to measure unofficial legal barriers. These barriers were measured because United States businessmen may view a legal system other than our own

civil and common law as an unfamiliar, complicated element of foreign business. Foreign legal systems may, therefore, create self-imposed barriers to international business activities.

Type of legal system was a dummy variable. A zero value was used to indicate a civil or common law system, and a value of one was used to indicate all other legal systems. The other four variables were all quantitative variables.

The five operational variables for legal barriers were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each variable for each subject country, and the distribution of the resultant mean observed data values for each variable was then standardized.

The standard scores for the five operational variables that measure legal barriers were factor fanalyzed. Two orthogonal factors were extracted from the data. The factor loadings for the five variables on each factor are shown in Table 6.

The two factors that were obtained by factor analysis were named as follows: Factor 1 was named "international commerce and tariffs on imports" and Factor 2 was named "legal system and tariffs as percentage of imports." Factor scores were calculated for these two factors for each subject country, and these scores were then included in the data base.

Physiographic Barriers

Physiographic barriers is a term not commonly used in international business literature. Because physiographic barriers may

TABLE 6

FACTOR LOADINGS FOR LEGAL BARRIERS FACTORS

Variable	Factor loading	
	Factor 1	Factor 2
Tariffs on imports	.75*	.33
Tariffs as percentage of imports	-.07	.86*
Total exports of country	.96*	-.07
Total imports plus exports of country	.98*	-.04
Type of legal system	-.13	-.70*

*Factor loading $\geq$ an absolute value of .50.

be a concept created by Litvak and Banting, their definition for this factor was used in its original form. Litvak and Banting defined physiographic barriers as:

> The obstacles to the development of efficient business operation created by the physical landscape or land forms of the country. A "cold" factor when barriers are high and infrastructure is weak. (1968, p. 461)

This definition indicates that physiographic barriers are created by a country's adverse physical landscape or land forms. Topological characteristics and geological formations, however, are difficult to quantify and almost impossible to compare between countries. Fortunately, the definition also states that the factor can be measured by infrastructure.

The term infrastructure is typically used to describe the communication networks, transportation facilities, and other agencies that are supportive of business operations (Hays, Korth, and Roudiani, 1972). The reason that the physiographic barriers of a country may be measured by its infrastructure may be due to a high level of association between the physical landscape of a country and its infrastructure. For example, mountain chains or other rugged terrain may hamper the development of communications networks, transportation facilities, and other elements of a country's infrastructure. Conversely, flat landscapes and long, navigable rivers may facilitate the development of a country's infrastructure.

In this study a weak or undeveloped infrastructure was considered as a physiographic barrier that creates an obstacle to business operations. A stronger or more developed infrastructure was considered as a physiographic barrier that creates comparatively less of an obstacle to business operations.

Eleven operational variables were selected to measure a country's infrastructure. These eleven variables were

1. Railroad length
2. Motor vehicle road length
3. Number of motor vehicles
4. Railroad passenger traffic
5. Aviation passenger traffic
6. Land area
7. Railroad density
8. Motor vehicle road density
9. Motor vehicle density

10. Railroad passenger density

11. Aviation passenger density

The first six of these eleven variables were considered as gross measures of the different elements of a country's infrastructure. In addition, the variable land area was divided into each of the other five variables. This operation produced the last five variables that provide density measurements of the different elements of a country's infrastructure.

The five operational variables for physiographic barriers were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each variable for each subject country, and the distribution of the resultant mean observed data values for each variable was then standardized.

The standard scores for the eleven operational variables that measure physiographic barriers were factor analyzed. Three orthogonal factors were extracted from the data. The factor loadings for the eleven variables on each factor are shown in Table 7.

The three factors obtained by factor analysis were named as follows: Factor 1 was named "transportation development," Factor 2 was named "transportation network," and Factor 3 was named "railroad usage." Factor scores were calculated for these three factors for each subject country and these scores were then included in the data base.

Geo-Cultural Distance

Litvak and Banting defined geo-cultural distance as:

TABLE 7

FACTOR LOADINGS FOR PHYSIOGRAPHIC BARRIERS FACTORS

Variable	Factor loading		
	Factor 1	Factor 2	Factor 3
Railroad length	.01	.90*	.24
Motor vehicle road length	-.03	.95*	.06
Number of motor vehicles	.62*	.57*	.10
Railroad passenger traffic	.03	.25	.95*
Aviation passenger traffic	.56*	.71*	.15
Land area	-.27	.83*	-.13
Railroad density	.82*	-.05	.31
Motor vehicle road density	.85*	.01	.06
Motor vehicle density	.89*	-.03	-.09
Railroad passenger density	.44	-.06	.87*
Aviation passenger density	.84*	-.05	.10

*Factor loading $\geq$ an absolute value of .50.

> Barriers created by geographic separation, cultural disparities between countries and problems of communication resulting from differences in social perspectives, attitudes and language. A "cold" factor when distance is high. (1968, p. 461)

This definition of geo-cultural distance appeared to be consistent with international management and marketing literature that suggests both geographical distances and cultural dissimilarities can present obstacles and barriers to international business operations. The Litvak and Banting definition of geo-cultural distance, therefore, was retained in its original form.

Six operational variables were selected to measure geo-cultural distance. They were

1. Non-Judeo-Christian religion
2. Non-Western civilization
3. Non-English speaking
4. Landlocked country
5. Distance from United States
6. Air Fare from New York to capital city

The first three of these variables measure the cultural distance between the United States and a foreign country. The fourth variable, landlocked country, measures the trade barriers that may occur because a country does not possess a seaport. The last two variables measure the barriers and obstacles to trade and communications that may occur because of the geographic distance between the United States and a foreign country.

The first four variables are dummy variables. A value of one indicates the condition for which the variables were named and a value of zero indicates the opposite condition. The last two variables are quantitative variables.

The five operational variables for geo-cultural distances were measured for each subject country for each of the years 1965, 1966, and 1967. The arithmetic mean of the observed data values for the three years was calculated for each variable for each subject country, and the distribution of the resultant observed data values for each variable was then standardized.

The standard scores for the six operational variables that measure geo-cultural distance were factor analyzed. Three orthogonal

factors were extracted from these data. The factor loadings for the six variables on each factor are shown in Table 8.

The three factors obtained by factor analysis were named as follows: Factor 1 was named "distance to dissimilar religion," Factor 2 was named "non-English speaking/non-Western civilization," and Factor 3 was named "landlocked country." Factor scores were calculated for these factors for each subject country, and these scores were then included in the data base.

Continental Location

Initially, seven categories were defined to designate the locations of the subject countries. These categories were

1. North America
2. Central America
3. South America
4. Europe
5. Asia
6. Africa
7. Oceania

It was discovered that some of these categories designated the continental location of only a single country in the subject population. Because statistical limitations are encountered in analyzing single subject categories, the seven categories were combined into three categories each of which designated the continental location of more than one country. The three categories were North, Central, and South America; Europe; and Asia, Africa, and Oceania.

Two dummy variables were constructed to measure the continental location of a country specified by the three categories. These two

TABLE 8

FACTOR LOADINGS FOR GEO-CULTURAL DISTANCE FACTORS

	Factor loading		
	Factor 1	Factor 2	Factor 3
Non-Judeo-Christian religion	.74*	.45	-.16
Non-Western civilization	.17	.80*	-.38
Non-English speaking	-.06	.87*	.21
Landlocked country	-.02	-.01	.96*
Distance from United States	.96*	-.10	.05
Air fare from New York to capital city	.97*	.03	-.05

*Factor loading $\geq$ an absolute value of .40.

continental location variables were named after the category North, Central, and South America and the category of Asia, Africa, and Oceania. The two variables were coded so that a value of one designated that a country was located in the area for which the variable was named. A value of zero designated that the location of the country was different from the area for which the variable was named. A country located in Europe was designated by zero values for both variables.

The two operational variables that measure continental location were measured for each subject country and the resultant values were then included in the data base.

Economic Development

A literature review revealed that many different methods could be used to determine the economic development of a country (Rostow, 1960; Scaperlanda and Mauer, 1969; Goldberg, 1972). Because there appeared to be no correct or consistently used method, it was decided to dichotomize countries into those that were developed and those that were undeveloped.

The value of the gross domestic product per capita was used to define the economic development of countries. Those countries with a gross domestic product per capita greater than or equal to $600 were considered as developed, and countries with a gross domestic product per capita less than $600 were considered as undeveloped.

The gross domestic product per capita was used to define developed and undeveloped countries because it is a single indicant measuring the gross economic output of a country and it was observable for the entire subject population. The value of $600 for the gross domestic product per capita was used for two reasons. First, this value split the subject population into two groups, each of which was not significantly larger than the other (twenty-one developed countries, thirty-two undeveloped countries). Second, at a value of $600 all subject countries retained the same state of economic development during the three-year period. That is, during the three years no country was observed to change from an undeveloped to a developed country or vice versa.

A dummy variable named "economic development" was used to indicate the economic development of a country. A value of one for this

variable designated a developed country, and a value of zero designated an undeveloped country.

The operational variable for economic development was measured for each subject country for each of the years 1965, 1966, and 1967, and the resultant values were then included in the data base.

Validation of economic development

The validity of the economic development variable was examined by comparing measures of this variable with independently derived measures of economic development. These independently derived measures were obtained from Liander (1967) and consisted of observations on fifty of the countries contained in this study's subject population. The value of the product moment correlation between the two sets of measures was found to be .67 ($P < .001$; R corrected for shrinkage = .65).* Because

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*Unless otherwise indicated, all correlation coefficients reported in this study will be Pearson product-moment correlations. Both simple and multiple correlation coefficients have been corrected for shrinkage with the use of a formula suggested by Tatsuoka (1969). This formula is

$$R = \sqrt{1 - \frac{N - 1}{N - P - 1}(1 - R_o^2)}$$

Where R = Correlation coefficient corrected for shrinkage
R_o = Observed (uncorrected correlation coefficient)
N = Number of cases in the sample
P = Number of predictors

of this highly significant correlation, it was concluded that gross domestic product per capita probably does measure economic development.

Data Base Variables

The factor analysis of data for the seven environmental factors produced a total of twenty-two separate factors. These twenty-two factors are listed together in Table 9. For convenience in future reference to these factors, they have been given unique identification codes F_1 through F_{22} as shown in the table.

For two variables that measure a country's continental location and the single variable that measures a country's economic development have also been listed in Table 9. These three variables have been identified as D_1 through D_3.

The three criterion variables, index of foreign market service strategies, United States exports, and United States foreign direct investment, have been listed in Table 9 also. These three criterion variables, the twenty-two factors for the environmental factors, and the three variables for the country's continental location and economic development constitute the total set of variables that were measured for each subject country. These measurements were considered as the data base that would be analyzed in testing the model of foreign market service strategies.

TABLE 9

DATA BASE VARIABLES AND VARIABLE IDENTIFICATION

Variable name	Variable identification
Political stability factors	
Executive resistance and change due to internal turmoil	F_1
Executive change by coups and by constitutional means	F_2
Political instability	F_3
Violent repression	F_4
Market opportunity factors	
Marketing media	F_5
Population density	F_6
Population	F_7
Economic development and performance factors	
Economic growth rate	F_8
Economic development per capita	F_9
Aggregate economic performance	F_{10}
Growth rate of energy consumption	F_{11}
Cultural unity factors	
Linguistic heterogeneity	F_{12}

TABLE 9 - continued.

Variable name	Variable identification
Religious heterogeneity	F_{13}
Racial heterogeneity	F_{14}
Legal barriers factors	
International commerce and tariffs on imports	F_{15}
Legal system and tariffs as percentage of imports	F_{16}
Physiographic barriers factors	
Transportation development	F_{17}
Transportation network	F_{18}
Railroad usage	F_{19}
Geo-cultural distance factors	
Distance to dissimilar religion	F_{20}
Non-English speaking/non-Western civilization	F_{21}
Landlocked country	F_{22}
Continental location variables	
North, Central, and South America	D_1
Asia, Africa, and Oceania	D_2

TABLE 9 - continued.

Variable name	Variable identification
Economic development variable	
Economic development	D_3
Criterion variables	
Index of foreign market service strategies	Index of foreign market service strategies
U.S. exports	U.S. exports
U.S. foreign direct investment	U.S. foreign direct investment

CHAPTER V
MODEL DEVELOPMENT, METHODOLOGY OF VALIDATION, AND DATA ANALYSIS

The purpose of this chapter is to discuss three topics: (1) the development of two alternatives to the Litvak and Banting environmental factor model, (2) the methodology used in testing the relative validities of the two alternate models and the Litvak and Banting model, and (3) the results of data analysis. The chapter is divided into three major sections--one for each of the alternative models and one for the Litvak and Banting model. The three topics as applicable to each model will be discussed in their respective sections.

The three models to be discussed in this chapter provide a possible relationship between constructs representing a country's environment and the three criterion variables--index of foreign market service strategies, United States exports, and United States foreign direct investment. The separate constructs used in these models represent alternative methods of defining and measuring the environmental conditions of a country. The models, therefore, provide a means of determining the predictive ability of the constructs and of assessing their comparative strengths and weaknesses.

First-Order Factor Model

The first model to be developed used the twenty-two first-order factors F_1 through F_{22} as environmental indicants. This model will henceforth be referred to as the first-order factor model.

The first-order factor model provides a base line against which to assess the other two models. The first-order factors that were used in this model as predictors of the three criterion variables represent the simplest and most basic constructs in comparison to the constructs used in the other two models. The constructs used in these two models were obtained by the algebraic and factor analytic manipulation of first-order factor scores, and, consequently, these constructs represent a higher order of complexity and abstraction than the first-order factors. Only if the constructs in the other models are theoretically meaningful will the multiple correlations obtained for these models exceed those of the first-order factor model.

Model Construction

The first-order factor model consists of three prediction equations (one equation for each of the three criterion variables). The twenty-two first-order factors F_1 through F_{22} and the three moderator variables--the continental location variables D_1 and D_2 and the economic development variable D_3--were used to construct predictor variables for the three equations of the model.* The predictor variables tested for each equation of the model consisted of the following:

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*The continental location variables and the economic development variable are coded variables possessing values of 0 and +1. Although a considerable amount of controversy exists about the appropriate coding methods for multiple regression analysis and correlation analysis (see for example: Appelbaum and Cramer, 1974; Wolf and Cartwright, 1974; Bogartz, 1975), Overall, Spiegel, and Cohen (1975) suggest that the controversy is more apparent than real. They maintain that equivalent parameter estimates and tests of significance are obtained from both orthogonal and nonorthogonal designs. Their suggestion, therefore, indicates that the results from this study would be the same even if the continental location variables and the economic development variables were coded for an orthogonal design and possessed values such as -1 and +1.

1. Main-effects composed of the separate first-order factors F_1 through F_{22} and the separate moderator variables D_1, D_2, and D_3.
2. Cross-products for all combinations of two different main-effects.
3. Second-, third-, and fourth-order polynomials of F_1 through F_{22} [for example, $(F_1)^2$, $(F_1)^3$, and $(F_3)^4$].

Additional predictor variables composed of higher order polynomials, cross-products between three or more main-effects, and cross-products involving polynomials could have been included with the predictor variables tested for the first-order factor model. The addition of these predictor variables, however, would have drastically complicated both the model and the procedure for testing its validity. These additional predictor variables would also have been extremely difficult to interpret in terms of how they represent different elements of a country's environment.

A total of 388 separate predictor variables potentially could have been tested in each prediction equation of the model. These variables provide a large sample of those that could be constructed from the twenty-two first-order factors. Because this research was exploratory in nature, it was felt that the terms that were included as predictor variables would be sufficient for an initial investigation into the predictive ability of the first-order factors.

Two statistical methods were used to test the validity of the first-order factor model, multiple regression analysis and stepwise multiple regression analysis. These methods will be briefly discussed in the following two sections.

Multiple Regression Analysis

Multiple regression analysis is used to test the validity of theoretical models that are similar to the first-order factor model. The validity of a model is evaluated by testing the statistical significance of the relationship between predictor variables and a criterion variable in prediction equations of the model. The significance of the relationship between a predictor variable and a criterion variable is indicated in multiple regression analysis by the predictor variable's F-Ratio. The significance of the relationship between all combined predictor variables and the criterion variables is indicated by the overall F-Ratio. Multiple regression analysis also provides an estimate of the multiple correlation coefficient, R, that when squared may be interpreted as the proportion of variance in the criterion variable accounted for by the predictor variables in the equation. Multiple regression analysis also provides an estimate of the regression coefficients (the weights assigned in predicting the value of the criterion variable).

In multiple regression analysis, all predictor variables in the equation are tested simultaneously. This simultaneous testing requires that the number of observations (N) must exceed the number of predictor variables (K) in the equation (i.e., $K < N$).

Stepwise Multiple Regression Analysis

Stepwise multiple regression analysis, like multiple regression analysis, is often used to test the validity of theoretical models. Like multiple regression analysis, the values of the individual and overall F-Ratios, the multiple correlation coefficients, and the regression coefficients are determined for prediction equations in

stepwise multiple regression analysis. But unlike multiple regression analysis, it can be used in the analysis of data containing predictor variables that equal or exceed the number of observations of those variables (i.e., $K \geq N$).

In stepwise multiple regression analysis, a prediction equation is constructed in successive steps by introducing into the equation single predictor variables that are statistically significant or by removing from the equation single predictor variables that are statistically insignificant. In the initial step of stepwise multiple regression analysis, the equation contains one predictor variable. The predictor variable selected for this first step is the one with the highest degree of statistical significance, as measured by that variable's F-Ratio. In the second step of stepwise multiple regression analysis, the predictor variable that has the greatest statistical significance, among all the variables that are not in the equation, is introduced. In subsequent steps, individual predictor variables are either introduced into the equation, if they are more significant than any other variables not in the equation, or individual predictor variables are removed from the equation, if they are no longer statistically significant.

No statistical limitations are violated when stepwise multiple regression analysis involves more predictor variables than observations of those variables. The predictor variables can be introduced into the prediction equation or removed from it in successive steps. The analysis can then be terminated when the introduction of another predictor variable into the prediction equation would produce an equation in which the number of predictor variables equals the number of observations of

those variables. In addition, the analysis can also be terminated when all statistically significant predictor variables have been introduced into the prediction equation.

Procedure for Testing the Validity of the First-Order Factor Model

The validity of the first-order factor model could not be tested by a procedure involving either the single multiple regression analysis or the single stepwise multiple regression analysis of each equation of the model. Multiple regression analysis could not be used, because the data base for this study included only fifty-three observations for the first-order factors F_1 through F_{22} and the moderator variables D_1, D_2, and D_3. Consequently, multiple regression analysis could not be undertaken, because the number of predictor variables (388) for each equation exceeded the number of observations (53) of those variables.

A single stepwise multiple regression analysis of each equation also could not be performed because of computer and software limitations.

Instead of using a procedure involving either the single multiple regression analysis or a single stepwise multiple regression analysis of each equation of the first-order factor model, a procedure was developed to use the repeated application of stepwise multiple regression analysis, along with the single application of multiple regression analysis.

This procedure, consisting of six steps, is performed separately for each of the three prediction equations of the first-order factor model to determine which predictor variables are significantly related to the criterion variables. The predictor variables are assigned to different steps of the procedure, and either multiple regression analysis or stepwise multiple regression analysis is then used in each step

to determine their statistical significance. The six steps of the procedure are performed as follows:

Procedure step one

In the first step of the procedure the first-order factors F_1 through F_{22} are used as the only predictors. By use of multiple regression analysis, data are then analyzed to determine which of the designated predictor variables are significantly related to the criterion variable.

Procedure step two

In the second step, the twenty-two first-order factors are again designated as predictor variables of the same criterion variable that was used in the first step. In the second step of the procedure, however, stepwise multiple regression analysis is used to determine which predictor variables are significantly related to the criterion variable.

Both steps one and two are performed three times--once for each prediction equation to determine which predictors are significantly related to each criterion variable. Those predictor variables that, in either step one or two, are found to be significantly related to at least one criterion variable are retained for use in the remaining steps of the procedure. Those variables that are not found to be significantly related to any criterion variables are excluded from use in the remaining steps of the procedure.

The first two steps of the procedure are used to reduce the number of predictor variables to a manageable number that can reasonably be tested. The selection of first-order factors by the methods of both

stepwise multiple regression analysis and multiple regression analysis is superior to the use of only one of the methods because it increases the chance of selecting factors that have predictive ability. Those factors that are selected and that do not contribute to the prediction of a criterion variable independently of other selected factors will be excluded from the prediction equation by the stepwise multiple regression analysis of the remaining four steps of the procedure.

Considering only those factors retained in the first two steps:

1. Cross-products are formed for all combinations of two different first-order factors.
2. Cross-products are formed between each of the first-order factors and each of the moderator variables D_1, D_2, and D_3.
3. Second-, third-, and fourth-order polynomials are formed for all the first-order factors.

Each of these cross-products and polynomials, along with the moderator variables, D_1, D_2, and D_3, and the first-order factors that were retained following steps one and two, are used in the remaining four steps of the procedure. The retained first-order factors and the cross-products between the first-order factors are assigned to step three of the procedure. The moderator variables, D_1, D_2, and D_3 are assigned to step four. The cross-products between the first-order factors and D_1, D_2, and D_3 are assigned to the fifth step. The polynomial terms are assigned to the sixth, and last, step.

Procedure steps three through six

In each of the last four steps, stepwise multiple regression is used to determine which of the predictor variables that have been assigned to a specific step are significantly related to a criterion

variable. In the third and subsequent steps of the procedure, if a predictor variable is found to be significantly related to a criterion variable in one step of the procedure, it also is included as a predictor variable in the next step of the procedure.

In the last four steps, main-effect predictor variables are always forced into the equation on the first step of the stepwise multiple regression analysis. This action insures that any interaction effects that are obtained in the final prediction equation contribute independently of their component main effects to prediction of the criterion variable.

The last four steps of the procedure are repeated three times--once for each of the three criterion variables. The final results of the procedure are three prediction equations, each of which refers to one criterion variable. Also included in the results of the procedure are the F-Ratios and the regression coefficients for the predictor variables and the multiple correlation coefficient, R, for each prediction equation.

It should be noted that the six steps of the procedure do not necessarily test all predictor variables of the first-order factor model. Before any data are analyzed, all predictor variables have an equal chance of being tested for their significance as predictors of the criterion variables. Once the first and second steps of the procedure have been accomplished, however, this is no longer true. If a first-order factor is not found to be a significant predictor of at least one criterion variable in the first and second steps of the procedures, then it is not included in cross-product and polynomial terms in the following steps of the procedure.

The fact that all predictor variables have not been tested, however, should not present a problem, since all the possible linear and nonlinear terms that can be constructed from the twenty-two first-order factors and three moderator variables were not included as predictor variables. Because the first-order factor model was developed empirically and inductively, it is not necessary to test all possible predictor variables as it would be in a conceptual and deductively derived model. It can also be argued that since the study is exploratory in nature, it is not necessary nor is it intended to be the definitive and final work on foreign market service strategies. A large portion of the predictor variables will have been tested. Those that are not can provide material for future research.

Data Analysis

The procedure to test the validity of the first-order factor model was carried out using data from the previously described data base. Because the volume of information that was obtained from the six steps of the procedure is rather large, the results of each step will not be presented here. Instead, they are presented in tabular form in Appendix D. The final results of the analysis, however, are presented in this chapter in Tables 10 through 12.

The results presented in Table 10 show that the variable non-English speaking/non-Western civilization was the only significant predictor of the index of foreign market service strategies. The negative regression coefficient for this predictor indicates that countries that are non-Western in culture and that do not primarily use the English language have a low ratio of investment to exports compared to the other countries of the subject population. This low ratio means

TABLE 10

TEST SUMMARY OF THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance level, P <
F_{21}	Non-English speaking/ non-Western civilization	-.2393	10.00	.005
(Constant)		.0000		

Note: R = .40 (R^2 = .16; R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

that in those countries, domestic firms use foreign market service strategies that provide more minor channel roles for themselves and more major channel roles for the foreign marketing middlemen.

The results presented in Table 11 show that the two variables marketing media and North, Central, and South America are positively related to United States exports. In addition, the third- and fourth-order polynomials of the transportation network variable are also positively related to exports. The interaction North, Central, and South America x non-English speaking/non-Western civilization, however, is negatively related to exports. These results indicate that the United States exports more to countries that possess more developed marketing media and to countries in North, Central, and South America. However, the level of exports is reduced for countries in the American continent that are non-Western in culture and language.*

*Because all subject countries that are located in the American continent have a Western culture, any variance in United States exports

TABLE 11

TEST SUMMARY OF THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = UNITED STATES EXPORTS

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance level, P <
F_5	Marketing media	.0492	8.76	.01
D_1	North, Central, and South America	2.4531	17.74	.001
$D_1 \times F_{21}$	North, Central, and South America x non-English speaking/ non-Western civilization	-2.3566	18.90	.001
$(F_{18})^3$	Transportation network	.0060	13.57	.001
$(F_{18})^4$	Transportation network	.0006	10.80	.001
(Constant)		-.1242		

Note: R = .93 (R^2 = .86; R corrected for shrinkage = .92), overall F-Ratio = 58.54 (P < .001 with 5/47 d.f.).

The results also indicate that a nonlinear relationship exists between the development of a country's transportation network and the level of United States exports. Much higher levels of exports are made to those countries with more highly developed transportation networks than to those countries with less developed transportation networks.

that is explained by the variable non-English speaking/non-Western civilization must be attributable to differences in language between the United States and the foreign countries.

TABLE 12

TEST SUMMARY OF THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = UNITED STATES FOREIGN DIRECT INVESTMENT

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance level, P <
D_2	Asia, Africa, and Oceania	-.4750	36.21	.001
$F_5 \times F_{18}$	Marketing media x transportation network	.0296	158.38	.001
$D_1 \times F_{18}$	North, Central, and South America x transportation network	.0884	18.61	.001
$D_1 \times F_{21}$	North, Central, and South America x non-English speaking/ non-Western civilization	-.2347	8.64	.01
$(F_7)^2$	Population	.0241	14.12	.001
(Constant)		.0110		

Note: R = .97 (R^2 = .94; R corrected for shrinkage = .96), overall F-Ratio = 151.27 (P < .001 with 5/47 d.f.).

The results of Table 12 show that the interaction marketing media x transportation network, the interaction North, Central, and South America x transportation network, and the fourth-order polynomial of the variable population are positively related to United States foreign direct investment. The variables Asia, Africa, and Oceania and the interaction North, Central, and South America x non-English speaking/ non-Western civilization are negatively related. These

results indicate that higher levels of foreign direct investment occur in countries with both more developed marketing media and transportation networks and in countries on the American continent that possess more developed transportation networks. Those countries on the American continent that are non-Western culturally and linguistically, however, have a lower level of investment. Countries in Asia, Africa, and Oceania also have a lower level of investment than would otherwise be expected.

The results also indicate that a nonlinear relationship exists between the population of a country and the level of United States foreign direct investment. A much higher level of investment occurs in countries with large populations than in countries with small populations.

Second-Order Factor Model

A second set of constructs representing different elements of a country's environment was developed as an alternative to the first-order factors. The constructs of this alternative set were named second-order factors, since they were obtained in the factor analysis of the factor scores for the first-order factors.

Because the first-order factors represent underlying dimensions of a country's environment, the second-order factors also represent underlying dimensions of a country's environment. However, the underlying dimensions that these second-order factors represent may be broader and more global than the first-order factors. That is, they may be a higher level of abstraction and a more general specification of the environmental elements that affect international business decisions than the first-order factors. The first-order factors may only

represent specific subelements of the underlying dimensions measured by the second-order factors.

The second-order factors were obtained by principal axis factor analysis followed by varimax orthogonal rotation. Seven second-order factors were obtained in this analysis. The factor loadings of the first-order factors on each of the second-order factors are shown in Table 13.

A factor loading greater than or equal to an absolute value of .40 was required to select the first-order factors that define a second-order factor. This criterion was chosen since it resulted in the maximum use of data with every first-order factor being selected for at least one second-order factor. In addition, by using this criterion all the first-order factors that were selected to define a second-order factor appeared to be compatible among themselves in measuring the same underlying dimension. The first-order factors selected using .40 also define second-order factors which seemed to represent highly differentiated and separate aspects of environmental structure.

Table 14 indicates the name given to each of the seven second-order factors. These names were derived by inspecting the first-order factors that loaded on each second-order factor and then determining the common dimension that the first-order factors represent. Also indicated in Table 14 are the identification codes S_1 through S_7 that were assigned to each of the second-order factors and that will be used in future references to them.

TABLE 13

FACTOR LOADINGS FOR SECOND-ORDER FACTORS

First-order factor identification	First-order factor name	Second-order factor loading						
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
F_1	Executive resistance and change due to internal turmoil	-.02	.60*	.67*	.13	-.13	.01	-.10
F_2	Executive change by coups and constitutional means	-.23	.04	.73*	.05	-.12	-.02	.22
F_3	Political instability	-.75*	-.03	.16	-.13	.22	.02	-.08
F_4	Violent repression	-.14	.12	.82*	.30	-.14	.05	-.08
F_5	Marketing media	.88*	-.10	-.19	-.03	.06	-.05	.18
F_6	Population density	.05	-.06	.00	.15	.71*	-.09	-.00
F_7	Population	-.04	.83*	.08	.17	-.16	-.10	-.13
F_8	Economic growth rate	-.12	.00	-.20	.21	.62*	.02	-.12
F_9	Economic development per capita	.91*	-.11	-.12	.02	.11	-.01	.11
F_{10}	Aggregate economic performance	.70*	.57*	.04	-.11	.18	.19	-.06

Table 13 - continued.

First-order factor identification	First-order factor name	Second-order factor loading						
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
F_{11}	Growth rate of energy consumption	-.06	.10	.64	.28	-.08	.05	.21
F_{12}	Linguistic heterogeneity	-.47*	.08	.13	.45*	-.35	.49*	-.13
F_{13}	Religious heterogeneity	.27	.01	.03	-.01	-.03	.92*	.08
F_{14}	Racial heterogeneity	-.40*	-.12	.12	-.69*	-.08	.25	-.17
F_{15}	International commerce and tariffs on imports	.83*	.35	.06	-.13	.09	.19	-.05
F_{16}	Legal structure and tariffs as percentage of imports	-.03	.08	-.07	-.81*	-.25	-.03	.07
F_{17}	Transportation development	.83*	.18	-.00	-.10	.23	.06	.15
F_{18}	Transportation network	.67*	.42*	.11	-.11	-.18	.11	-.30
F_{19}	Railroad usage	.28	.63*	-.09	.02	.44*	.21	.25
F_{20}	Distance to dissimilar religion	-.26	.27	.13	.77*	.18	.16	-.03
F_{21}	Non-English speaking/ non-Western civilization	-.81*	.18	.08	-.07	.24	-.11	.09
F_{22}	Landlocked country	.11	-.08	-.04	-.01	-.08	.05	.86*

*Factor loading $\geq$ an absolute value of .40.

TABLE 14

SECOND-ORDER FACTOR NAMES AND IDENTIFICATION

Second-order factor number	Second-order factor name	Second-order factor identification
1	Developed, unified, stable, Western countries	S_1
2	Large developed countries with some internal stress	S_2
3	Undeveloped dictatorships	S_3
4	Excolonial countries	S_4
5	Crowded, economically developing countries	S_5
6	Pluralistic societies	S_6
7	Landlocked countries	S_7

Model Construction

The second model to be developed as an alternative to the Litvak and Banting model used the seven second order-factors S_1 through S_7 as environmental indicants. This model will henceforth be referred to as the second-order factor model.

The second-order factor model, like the first-order factor model, consisted of three prediction equations (one equation for each of the three criterion variables). The seven second-order factors S_1 through S_7 and the three moderator variables--the continental location variables D_1 and D_2 and the economic development variables D_3--were used to construct predictor variables. The predictor variables tested for each equation of the model consisted of the following:

1. Main-effects composed of the separate second-order factors S_1 through S_7 and the separate moderator variables D_1, D_2, and D_3.
2. Cross-products for all combinations of two different main-effects.
3. Second-, third-, and fourth-order polynomials of S_1 through S_7.

Procedure for Testing the Validity of the Second-Order Factor Model

The procedure that was developed to test the validity of the second-order factor model was only slightly different from the procedure used to test the first-order factor model. There were a total of seventy-three predictor variables for each equation of the second-order factor model compared with 348 predictor variables that could have been potentially tested for the first-order factor model. This smaller number of predictor variables in the second-order factor model allowed a somewhat simpler testing procedure, and, consequently, only five sequential steps were required to test all of the predictor variables for each equation of the model. In addition, it also was possible to test each and every predictor variable.

The procedure to test the validity of the second-order factor model is performed separately for each of the three criterion variables. The assignment of predictor variables for each equation is as follows: S_1 through S_7 are assigned to the first step; the cross-products between the factors are assigned to the second step; the moderator variables D_1, D_2, and D_3 are assigned to the third step; all cross-products between the second-order factors and D_1, D_2, and D_3 are assigned to the

fourth step; and the polynomial terms are assigned to the sixth, and last, step.

Stepwise multiple regression analysis is used in each of the five steps of the procedure to determine which of the variables assigned to the specific step are significant predictors. Variables that were found to be significant predictors of a criterion variable in one step of the procedure are assigned as predictor variables to the next step of the procedure.

In the first step of the procedure the second-order factors, S_1 through S_7, are introduced into the prediction equation in descending order of their level of significance. In each of the remaining four steps of the procedure, however, main-effect terms are always introduced into the prediction equation on the first step of the stepwise multiple regression analysis. This procedure, like that for the first-order factor model, insures that any interaction effects in the final prediction equation contribute independently of their component main-effects.

Data Analysis

Factor scores were calculated for each second-order factor for each subject country, using the same method that was used in calculating the factor scores for the first-order factors. The standardized scores for the first-order factors were used as the values of the first-order factors in these computations. The distribution of the factor scores for the second-order factors was then standardized.

The procedure to test the validity of the second-order factor model was carried out using data from the data base and the standard

factor-scores for the second-order factors. The results of each of the five steps of the procedure for each equation of the second-order factor model are presented in tabular form in Appendix E. The final results of the analysis are presented in this chapter in Tables 15 through 17.

The results presented in Table 15 show that the variable developed, unified, stable, Western countries is positively related to the index of foreign marketing service strategies and the fourth-order polynomial of the variable large developed countries with some internal stress is negatively related to the index of foreign marketing service strategies. These results indicate that, in those subject countries that are more economically developed, culturally unified, politically stable, and have a Western culture, domestic firms use marketing strategies that provide more major channel roles for themselves and more minor channel roles for the foreign marketing middlemen than would otherwise be expected.

The results also indicate that a nonlinear relationship exists between the variable large developed countries with some internal stress and the index of foreign marketing service strategies. Also for those countries that are observed to be more populated, economically developed, and possess more internal stress, the marketing channel roles of domestic firms and foreign marketing middlemen are much more minor and major, respectively, than in countries that are less populated, economically undeveloped, and possess less internal stress.

The results presented in Table 16 show that the variables developed, unified, stable, Western countries; North, Central, and South America; and Asia, Africa, and Oceania and the interactions North, Central, and South America x developed, unified, stable, Western

TABLE 15

TEST SUMMARY OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKETING SERVICE STRATEGIES

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance Level, P<
S_1	Developed, unified, stable, Western countries	.0229	14.42	.001
$(S_2)^4$	Large developed countries with some internal stress	$-.2038 \times 10^{-5}$	4.55	.05
(Constant)		.0853		

Note: R = .48 (R^2 = .23; R corrected for shrinkage = .45), overall F-Ratio = 7.49 (P < .005 with 2/50 d.f.).

countries and North, Central, and South America x pluralistic societies are positively related to United States exports. The interaction North, Central, and South America x excolonial countries; the interaction economic development x large developed countries with some internal stress; and the fourth-order polynomial of the variable large developed countries with some internal stress are negatively related to United States exports.

These results indicate that United States exports more to countries that are economically developed, culturally unified, politically stable and possess a Western culture and to countries that are located in North, Central, or South America than would otherwise be expected. In addition, countries that possess all of these characteristics receive even larger levels of United States exports than do other countries.

TABLE 16

TEST SUMMARY OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = UNITED STATES EXPORTS

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance Level, P<
S_1	Developed, unified, stable, Western countries	.0180	39.33	.001
D_1	North, Central, and South America	.5381	9.58	.005
D_2	Asia, Africa, and Oceania	.2635	4.26	.05
$D_1 \times S_1$	North, Central, and South America x developed, unified, stable Western countries	.0820	230.12	.001
$D_1 \times S_4$	North, Central, and South America x excolonial countries	-.1439	22.71	.001
$D_1 \times S_6$	North, Central, and South America x pluralistic societies	.1960	49.53	.001
$D_3 \times S_2$	Economic development x large developed countries with some internal stress	-.0180	5.75	.025
$(S_2)^4$	Large developed countries with some internal stress	$.1864 \times 10^{-5}$	26.00	.001
(Constant)		-.3780		

Note: R = .97 (R^2 = .94; R corrected for shrinkage = .96), overall F-Ratio = 95.62 (P < .001 with 8/44 d.f.).

Countries located in the American continent that were former colonies receive a lower level of United States exports while countries in the Americas that have pluralistic societies receive a large level of exports. All subject countries in Asia, Africa, and Oceania, however, receive a larger level of exports.

A negative nonlinear relationship exists between the variable large developed countries with some internal stress and the variable United States exports. Those countries that are highly populated, economically developed, and possess a high level of internal stress receive a much smaller level of exports than do countries that are not as highly populated, economically developed, or do not possess a high level of internal stress.

The results presented in Table 17 show that the variables developed, unified, stable Western countries; pluralistic societies; and North, Central, and South America and the interactions developed, unified, stable, Western countries x pluralistic societies; North, Central, and South America x developed, unified, stable, Western countries; and North, Central, and South America x pluralistic societies are positively related to United States foreign direct investment. The interactions Asia, Africa, and Oceania x large developed countries with some internal stress and economic development x developed, unified, stable, Western countries are negatively related to United States foreign direct investment.

These results indicate the United States invests more in countries that are economically developed, culturally unified, politically stable, and possess a Western culture; in countries that have pluralistic societies; and in countries that are in North, Central or South America.

TABLE 17

TEST SUMMARY OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = UNITED STATES FOREIGN DIRECT INVESTMENT

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance Level, P<
S_1	Developed, unified, stable, Western countries	.0365	282.58	.001
S_6	Pluralistic societies	.0526	11.28	.005
D_1	North, Central, and South America	.7003	75.45	.001
$S_1 \times S_6$	Developed, unified, stable, Western countries x pluralistic societies	.0052	45.45	.001
$D_1 \times S_1$	North, Central, and South America x developed, unified, stable, Western countries	.0530	147.24	.001
$D_1 \times S_6$	North, Central, and South America x pluralistic societies	.0995	18.51	.001
$D_2 \times S_2$	Asia, Africa, and Oceania x large developed countries with some internal stress	-.0114	5.88	.025
$D_3 \times S_1$	Economic development x developed, unified, stable, Western countries	-.0430	44.61	.001
(Constant)		-.2964		

Note: R = .98 (R^2 = .96; R corrected for shrinkage = .98), overall F-Ratio = 154.36 (P < .001 with 8/44 d.f.).

Additionally, countries that are economically developed, culturally unified, politically stable, possess a Western culture, and have a pluralistic society or are located on the American continent and countries that are located on the American continent and have a pluralist society are associated with higher levels of investment than other countries.

The results also indicate that investment is lower in those countries in Asia, Africa, and Oceania that have large populations, are economically developed, and have some internal stress. Investment is also lower in those countries that are the more economically developed of all the developed countries and that are also culturally unified, politically stable, and possess a Western culture.

Environmental Factor Model

The Litvak and Banting environmental factor model was the third to be developed. This model used the Litvak and Banting environmental factors as constructs representing the different elements of a country's environment. The environmental factors in the model represent the operationalized form of the constructs defined by Litvak and Banting.

Each environmental factor was obtained by summing all the first-order factors that measure the different underlying dimensions of the environmental factor. For example, the environmental factor "political stability" was obtained by the summation of the first-order factors F_1, F_2, F_3, and F_4. The first-order factors that were used to calculate each of the seven environmental factors are shown in Table 18. Also included in this table are the identification codes E_1 through E_7 that will be used in future reference to the environmental factors.

Model Construction

The environmental factor model, like the other two models, consisted of three prediction equations (one equation for each of the three criterion variables). The seven environmental factors E_1 through E_7 and the three moderator variables—the continental location variables D_1 and D_2 and the economic development variable D_3--were used to construct predictor variables. The predictor variables tested for each equation of the model consisted of the following:

1. Main-effects composed of the separate environmental factors E_1 through E_7 and the separate moderator variables D_1, D_2, and D_3.
2. All cross-products formed between combinations of two different main-effects.
3. Second-, third-, and fourth-order polynomials of E_1 through E_7.

Procedure for Testing the Validity of the Environmental Factor Model

The same procedure that was used to test the second-order factor model was used to test the environmental factor model. For each prediction equation of the environmental factor model, main-effect, cross-product, and polynomial predictor variables were assigned to one of the five steps of the procedure in the same manner as in the test of the second-order factor model. Stepwise multiple regression analysis was then used in each step to determine those predictor variables that were significantly related to a criterion variable.

Data Analysis

Scores for each of the environmental factors E_1 through E_7 for each of the subject countries were calculated using the standardized factor scores for the first-order factors. The distribution of scores for each of the environmental factors was then standardized.

The procedure to test the validity of the environmental factor model was carried out using data from the data base and the standard scores for the environmental factors. The results of each of the five steps of the procedure for each equation of the model are presented in tabular form in Appendix F. The final results of the analysis are presented in this chapter in Tables 19 through 21.

The results presented in Table 19 show that the interaction Asia, Africa, and Oceania x geo-cultural distance is negatively related to index of foreign market service strategies. These results indicate that in those countries that are located in Asia, Africa, or Oceania and that are geographically and culturally distant from the United States, domestic firms use foreign market service strategies that provide more minor roles for themselves and more major roles for foreign marketing middlemen than would otherwise be expected.

The results presented in Table 20 show that the variable physiographic barriers and the interactions economic development and performance x physiographic barriers; North, Central, and South America x market opportunity; North, Central, and South America x physiographic barriers; and Asia, Africa, and Oceania x economic development and performance are positively related to United States exports. The table shows that the interaction North, Central, and South America x geo-cultural distance is negatively related to exports.

TABLE 18

RELATIONSHIP BETWEEN ENVIRONMENTAL FACTORS AND FIRST-ORDER FACTORS

Environmental factor		
Factor identification	Factor name	Relationship between environmental factor and first-order factors
E_1	Political stability	$E_1 = F_1 + F_2 + F_3 + F_4$
E_2	Market opportunity	$E_2 = F_5 + F_6 + F_7$
E_3	Economic development and performance	$E_3 = F_8 + F_9 + F_{10} + F_{11}$
E_4	Cultural unity	$E_4 = F_{12} + F_{13} + F_{14}$
E_5	Legal barriers	$E_5 = F_{15} + F_{16}$
E_6	Physiographic barriers	$E_6 = F_{17} + F_{18} + F_{19}$
E_7	Geo-cultural distance	$E_7 = F_{20} + F_{21} + F_{22}$

These results indicate that the United States exports more to countries that have smaller physiographic barriers than to other countries. If countries that have smaller physiographic barriers also have a high level of economic development and performance or are located in the American continent, then they receive even more exports from the United States than those with only smaller physiographic barriers. If countries are located in the American continent and have high market opportunity, then they receive more exports. However, if countries in the Americas are geographically or culturally distant from the United States, they receive less exports. Countries in Asia, Africa, or Oceania that have a high level of economic development and performance receive a higher level of United States exports than would be expected for other countries.

TABLE 19

TEST SUMMARY OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

Significant predictor variables				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance Level, P <
$D_2 \times E_7$	Asia, Africa, and Oceania x geo-cultural distance	-.1593	6.70	.025
(Constant)		.2067		

Note: R = .34 (R^2 = .12; R corrected for shrinkage = .31), overall F-Ratio = 6.70 (P < .025 with 1/51 d.f.)

The results presented in Table 21 show that the interactions, market opportunity x physiographic barriers; North, Central, and South America x market opportunity; North, Central, and South America x physiographic barriers; and economic development x geo-cultural distance are positively related to United States foreign direct investment. The table also shows that the interactions North, Central, and South America x geo-cultural distance and Asia, Africa, and Oceania x geo-cultural distance are negatively related to United States foreign direct investment.

These results indicate that a higher level of investment is made in those countries that possess high market opportunity and low physiographic barriers. If countries are located in the American continent and possess high market opportunity or have low physiographic barriers then the level

TABLE 20

TEST SUMMARY OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = UNITED STATES EXPORTS

Significant predictor variable				
Variable identification	Variable name	Regression coeffcient	F-Ratio	Significance Level, P<
E_6	Physiographic barriers (reverse scored)	.0334	25.60	.001
$E_3 \times E_6$	Economic development and performance x physiographic barriers (reverse scored)	.0023	18.42	.001
$D_1 \times E_2$	North, Central, and South America x market opportunity	.1293	15.81	.001
$D_1 \times E_6$	North, Central, and South America x physiographic barriers (reverse scored)	.0593	12.28	.001
$D_1 \times E_7$	North, Central, and South America x geo-cultural distance	-.3504	230.39	.001
$D_2 \times E_3$	Asia, Africa, and Oceania x economic development and performance	.0134	6.12	.025
(Constant)		-.1912		

Note: R = .98 (R^2 = .96; R corrected for shrinkage = .98), overall F-Ratio = 153.60 (P < .001 with 6/46 d.f.

TABLE 21

TEST SUMMARY OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = UNITED STATES FOREIGN DIRECT INVESTMENT

Significant predictor variable				
Variable identification	Variable name	Regression coefficient	F-Ratio	Significance Level, P<
$E_2 \times E_6$	Market opportunity x physiographic barriers (reverse scored)	.0116	169.67	.001
$D_1 \times E_2$	North, Central, and South America x market opportunity	.0950	8.56	.01
$D_1 \times E_6$	North, Central, and South America x physiographic barriers (reverse scored)	.0692	20.82	.001
$D_1 \times E_7$	North, Central, and South America x geo-cultural distance	-.3041	129.03	.001
$D_2 \times E_7$	Asia, Africa, and Oceania x geo-cultural distance	-.2478	41.67	.001
$D_3 \times E_7$	Economic development x geo-cultural distance	.1634	19.12	.001
(Constant)		-.1524		

Note: R = .98 (R^2 = .96; R corrected for shrinkage = .98), overall F-Ratio = 166.68 (P < .001 with 6/46 d.f.).

of United States investment is higher. Countries that are geographically and culturally distant and are economically developed have a higher level of investment. However, if a country is geographically and culturally distant and is located in the Americas or in Asia, Africa or Oceania, it has a lower level of investment.

Test for Differences in Predictive Ability for All Models

The predictive abilities of the first- and second-order factor models and the environmental factor model were tested to determine whether there were any differences between the models in predicting each of the three criterion variables. The multiple correlation coefficients that were obtained in validating the three models are measures of predictive abilities, and Z scores associated with these coefficients were used in the test. Normally distributed values associated with the differences between two Z scores were calculated for each combination of two different models for each criterion variable.* These values are shown in Table 22.

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*Normally distributed values associated with differences between Z scores were calculated using the following formula suggested by Hays (1963):

$$\frac{Z_1 - Z_2}{\sqrt{1/(N-3)}}$$

Where Z_1 and Z_2 = two different Z scores.
N = number of observations used in calculating multiple correlation coefficients.

In calculations using this formula and in testing the Z scores associated with the first-order factor model against the Z scores of each of the other two models, the Z scores of the first-order factor model were used as the Z_1 term. In testing the differences in Z scores between the second-order factor model and the environmental factor model, the Z scores for the second-order factor model were used as the Z_1 term.

TABLE 22

TEST RESULTS OF THE DIFFERENCES BETWEEN MULTIPLE CORRELATION COEFFICIENTS

Models for which correlation coefficients were tested	Criterion variable: Index of foreign market service strategies	U.S. exports	U.S. foreign direct investment
First-order factor model and second-order factor model	.70	3.07*	1.46
First-order factor model and environmental factor model	-.49	4.52*	1.46
Second-order factor model and environmental factor model	-1.46	1.46	.0

*P < .01

The results presented in Table 22 indicate that there are no significant differences in the multiple correlation coefficients of the three models for prediction of the index of foreign market service strategies and United States foreign direct investment. That is, for these two criteria the three models provide equal predictive abilities. For the criterion United States exports, however, Table 22 shows that the first-order factor model is significantly different from both of the other models but there is no significant difference between the second-order factor model and the environmental factor model. Because the first-order factor model has the smallest correlation coefficient, the test results indicate that it has less predictive ability for United States exports than do the other two models.

In testing the differences between correlation coefficients, it is assumed that the correlations are independent of each other. Data used in validating each of the three models were obtained from the same data base; therefore, the conclusion must be made that the multiple correlation coefficients of the models are not independent of each other. Because an assumption of the test between coefficients is violated, results of this test must be interpreted with caution, and until further research is performed these results must be considered as provisionary.

CHAPTER VI
INTERPRETATION OF RESULTS AND CONCLUSIONS

The purpose of this study was to investigate environmental structure by developing and comparing alternative conceptualizations of environmental structure and by comparing the validities of these conceptualizations as predictors of foreign market service strategies, United States exports, and United States foreign direct investment. Environmental structure is so complex and includes so many interrelated elements that the researcher cannot claim to have completely assessed all potential elements of a country's environment or all their associations with the three criteria. A number of pertinent observations and conclusions, however, can be made.

This final chapter consists of four sections. In the first section the results of this study will be examined to determine how well the Litvak and Banting environmental factors represent environmental structure and how valid these factors are as predictors of the three criterion variables. This section also includes a test of the three research hypotheses, a discussion of what the test results reveal about environmental structure and its relationship to the three criterion variables, and a discussion of how the results support current theory. In the second section the results of an investigation of lead and lag associations between environmental constructs and the three criterion variables will be presented and interpreted. In the third section some implications that appear relevant to international

business will be presented. In the fourth, and last, section suggestions for future research will be made.

Environmental Structure and Its Relationship to the Three Criterion Variables

Litvak and Banting Environmental Factor Model

Litvak and Banting hypothesized that the seven environmental factors are unitary concepts and that each factor represents a single element of the underlying structure of a country's environment. Litvak and Banting also suggest that each of the environmental factors is monotonically related to the roles of foreign marketing middlemen. The results of this study, however, indicate that the environmental factors are not unitary concepts and are not all monotonically related to the roles of foreign marketing middlemen.

Validity of the environmental factors

If the environmental factors are unitary concepts, then it would be expected that dimensions similar to the environmental factors would be produced by the factor analysis of data that represent measurements of the environmental factors. The factor analysis performed in this study revealed, however, that the data for each environmental factor appeared to be associated with more than one element of a country's environmental structure. For example, the factor analysis of data for cultural unity resulted in the definition of the three separate dimensions-linguistic heterogeneity, religious heterogeneity, and racial heterogeneity. The factor analysis of data for each of the other environmental factors similarly resulted in the definition of multiple dimensions. This empirical evidence, therefore, suggests that the

environmental structure of a country is composed of many more different and specific elements than those indicated by the environmental factors.

Other results obtained in this study also indicate that the environmental factors are not unitary concepts. For instance, data representing measurements of the first-order factors were factor analyzed to obtain dimensions of a country's environment that may be even more basic and fundamental than the first-order factors are. This analysis produced seven second-order factors, each composed of one or more first-order factors. If the environmental factors represent the structure of a country's environment in terms of groups of related elements, then it might be expected that the second-order factors, which do represent groupsings of related elements may be similar to the environmental factors. None of the second-order factors, however, can be interpreted in terms that are in any way similar to the Litvak and Banting environmental factors. In fact, the second-order factors appear to define environmental structure in a much more complex manner than do the environmental factors. Thus, again empirical evidence suggests that the environmental factors are not unitary concepts.

Relationship between environmental factors and criterion variables

The results of this study indicate that neither are the environmental factors all related to foreign market service strategies nor are their relationships monotonic. These results also indicate that neither are the environmental factors all related to the roles of foreign marketing middlemen nor are these relationships monotonic. For example, when the environmental factor model was validated, the

interaction between North, Central, and South America and geo-cultural distance was found to be the only significant predictor of the index of foreign market service strategies. This index is a measure of the roles assumed by domestic firms in foreign marketing channels, and since the roles of foreign marketing middlemen follow from the roles of domestic firms, the index is also a measure of the roles of foreign marketing middlemen. Therefore, the interaction between American continental location and geo-cultural distance is significantly related to the roles of foreign marketing middlemen. Except for geo-cultural distance, no other environmental factor--either individually, or as a component of a cross-product, or as a polynomial term--was found to be related to the roles of foreign marketing middlemen. Thus, the empirical evidence does not support the contention that all the environmental factors are related to the roles of foreign marketing middlemen. In addition, the hypothesized monotonic relationship between environmental factors and middlemen's roles was not supported, because geo-cultural distance was a component of an interactive term and was, therefore, not monotonically related to middlemen's roles.

The results obtained in validating the environmental factor model also indicate that neither are the environmental factors all related to both United States exports and United States foreign direct investment nor are the relationships monotonic. For example, the environmental factors market opportunity, economic development and performance, physiographic barriers, and geo-cultural distance were found to be significant predictors of the two criterion variables. But the factors political stability, cultural unity, and legal barriers were not found to be monotonically related to a criterion variable.

All the environmental factors with the exception of physiographic barriers were related to exports and investment as components of cross-products. These factors, therefore, cannot be considered as being monotonically related to the criterion variable. The environmental factor physiographic barriers was not only a component of cross-product terms but also was individually a predictor of United States exports. Thus, physiographic barriers was the only factor that was found to be monotonically related to a criterion variable.

Comparative Validities of the Three Models

One method to determine the usefulness of a theory is to compare its validity against the validities of alternative theories. Conceivably, the Litvak and Banting environmental factors may be a conceptualization of environmental structure that provides greater predictive abilities than do other conceptualizations of the same structure. Unfortunately, there are no existing models that relate environmental structure to the roles of foreign marketing middlemen and that can be tested and compared to the environmental factor model. In lieu of existing alternative models, data were examined in this study to empirically derive two separate models relating environmental structure to foreign market service strategies and, hence, the roles of foreign marketing middlemen. These two models then served as alternatives to the Litvak and Banting model and provided a means of determining its usefulness.

When alternative models were developed, environmental structure was defined in terms of first-order factors and second-order factors. These factors were tested as components of the first- and second-order

factor models, respectively, and the validities of these models were then compared to the validity of the environmental factor model. Results presented in the previous chapter show that there are no significant differences in the multiple correlation coefficients of the three models for prediction of the index of foreign market service strategies. These results indicate that the environmental factor model is not superior to the empirically derived models in predictive ability. These results also suggest that the environmental factors do not provide a more useful conceptualization of environmental structure than do (1) the empirically derived first-order factors, which define environmental structure in terms of numerous underlying dimensions, and (2) the empirically derived second-order factors, which define environmental structure in terms of groups of related first-order factors.

The three models were also tested for differences in their abilities to predict United States exports and United States foreign direct investment. The results presented in the previous chapter show that for prediction of United States foreign direct investment there were no differences in the models. Again the evidence indicates that the environmental factors are not superior to the empirically derived factors.

For prediction of United States exports, the results in the previous chapter show that the environmental factor model had a significantly larger multiple correlation coefficient, and hence greater predictive ability, than did the first-order factor model. This result suggests that the conceptualization of environmental structure in terms of environmental factors may be more meaningful than the

conceptualization inherent in the first-order factors. However, the results also show that there is no significant difference between the multiple correlation coefficients for the environmental factor model and the second-order factor model. Therefore, the second-order factors may be as conceptually meaningful as the environmental factors are. For the three criterion variables tested, the environmental factor model has not demonstrated predictive abilities superior to models that were empirically derived.

Tests of the Research Hypotheses

The results obtained in testing the validity of the environmental factor model presented in the previous chapter provide evidence that may be used in a test of each of the three research hypotheses. These hypotheses and the test results are discussed in the following paragraphs:

Hypothesis I. Foreign market service strategies of domestic firms are related to a market's environmental factors, continental location, and economic development.

The results that were obtained in testing the validity of the environmental factor model show that the interaction between the location variable Asia, Africa, and Oceania and the environmental factor geo-cultural distance was the only predictor that was significantly related ($P < .05$) to the index of foreign market service strategies. Table 19 in Chapter V indicates that this single interaction accounted for 12 percent ($R^2 = .12$) of the variance in the index of foreign market service strategies. All other factors and variables that were tested, either individually or as components of interactions or as

polynomials, were not significantly related to the index of foreign market service strategies. Because not all of the potential predictors were found to relate significantly to a measure of foreign market service strategies, Hypothesis I was only partially supported by empirical evidence.

Hypothesis II. The level of United States exports is related to a market's environmental factors, continental location, and economic development.

Table 20 in Chapter V shows that the variable physiographic barriers and the interactions economic development and performance x physiographic barriers; North, Central, and South America x market opportunity; North, Central, and South America x physiographic barriers; and North, Central, and South America x geo-cultural distance are all significantly related to the level of United States exports. The table also indicates that 96 percent of the variance in the level of exports was accounted for by physiographic barriers and the interactions. Because not all potential predictors were found to be significantly related to the level of exports, Hypothesis II was therefore only partially supported by empirical evidence.

Hypothesis III. The level of United States foreign direct investment is related to a market's environmental factors, continental location, and economic development.

Table 21 shows that the interactions market opportunity x physiographic barriers; North, Central, and South America x market opportunity; North, Central, and South America x physiographic barriers; North, Central and South America x geo-cultural distance; Asia, Africa, and Oceania x geo-cultural distance; and economic development x

geo-cultural distance are all significantly related to the level of United States foreign direct investment. As indicated in the table, these interactions account for 96 percent of the variance in investment. Because not all potential predictors were found to be significantly related to the level of United States foreign direct investment, Hypothesis III was only partially supported by empirical evidence.

The results obtained in testing the three research hypotheses indicate that (1) the environmental factors are not all related to foreign market service strategies, United States exports, and United States foreign direct investment and (2) the factors that are significant predictors are related to the criterion variables as individual terms and as components of cross-products. These results have been considered in detail in a previous section of the chapter and so will not be considered here.

Important Elements of Environmental Structure

If environmental structure contains a central concept that is associated with the index of foreign market service strategies, then it would be expected that this central concept would repeatedly show strong association with the index, no matter how the concept was measured. The first-order factor representing non-English speaking/non-Western civilization was a predictor or a component of a predictor in each of the three theoretical models. Because these models measure environmental structure by three different sets of constructs, the non-English speaking/non-Western civilization concept contained in each of these constructs may represent a central concept and an important element of environmental structure that is associated with the index of foreign market service strategies.

The non-English speaking/non-Western civilization concept is also shown to be uniquely important as a predictor of the index of foreign market service strategies by the fact that the multiple correlation coefficients for the three models were not found to be significantly different from each other. The first-order factor that measures the non-English speaking/non-Western civilization concept was the only predictor in the first-order factor model. The first-order factor was also a component of predictors in the other two models, and as a component part it defines only part of environmental structure measured by the predictors. The statistically equal multiple correlation coefficients for the three models indicate that the environmental structure measured by the predictors provides no greater predictive ability than the environmental structure measured solely by the first-order factor. Because the predictors of the second-order factor model and environmental factor model measure elements of environmental structure that are independent of that measured by the first-order factor, these additional elements of environmental structure do not increase predictive ability over that obtainable with the first-order factor. Thus, non-English speaking/non-Western civilization appears to define an important central concept of environmental structure that is associated with the index of foreign market service strategies.

The three first-order factors--marketing media, transportation network, and non-English speaking/non-Western civilization--are contained in various terms of the first-order factor model that were found to be significant predictors of United States exports. These three first-order factors are also components of predictors in both the second-order factor model and the environmental factor model. In

addition, the first-order factor non-English speaking/non-Western civilization is not only a component of predictors in all three models but it is also a component of similar interactions in all three models. In the first-order factor model this factor interacts with North, Central, and South America to form a significant predictor of United States exports. In the second-order factor model the factor is a component of developed, unified, stable Western countries, which interacts with North, Central, and South America. In the environmental factor model the factor is a component of geo-cultural distance, which interacts with North, Central, and South America. The fact that the three first-order factors were components of predictors in the three models and the fact that one of these factors was a component of similar interactions in all the models are strong evidence that the factors represent elements of environmental structure important in predicting United States exports. However, because correlation coefficients for the second-order factor model and the environmental factor model are significantly greater than that of the first-order factor model, the three first-order factors may not be the most meaningful conceptualization of environmental structure. The difference in correlation coefficients indicates that the environmental structure measured by the predictors of both the second-order factor model and environmental factor model provides greater predictive ability than does the environmental structure measured solely by the three first-order factors. The second-order factors or the environmental factors, therefore, may provide a more basic and underlying characterization of environmental structure than the three first-order factors.

For United States foreign direct investment the four first-order factors--marketing media, population, transportation network and non-English speaking/non-Western civilization--appeared as predictors and components of predictors in all three theoretical models. Again, interactions that occurred in the first-order factor model were found in similar interactions in the other models. For instance, in all three models the first-order factor non-English speaking/non-Western civilization was a component of predictors that interacted with North, Central, and South America. The first-order factor transportation network was also a component of predictors that interacted with North, Central, and South America in all three models. Because the four first-order factors appear as components of predictors in all of the models and because of the similar interactions in these models involving some of the factors, it is suggested that these four first-order factors define elements of environmental structure that are highly important for prediction of United States foreign direct investment. The statistically similar multiple correlation coefficients for the three models also indicate that the four first-order factors are highly important. The environmental structure measured by predictors of both the second-order factor model and environmental factor model provided no greater predictive ability than did the environmental structure defined solely by the four first-order factors. Thus, again, the four first-order factors appear to represent central environmental concepts.

Continental location and economic development variables

When the validities of the three theoretical models were tested, the variables representing a country's continental location and

economic development were found in many instances to moderate the association between other predictors and the criterion variables. As one example of the moderation effects, consider the results obtained in testing the validity of the environmental factor model for the criterion variable United States exports (see Table 20). In this test the environmental factor physiographic barriers and the interaction North, Central, and South America x physiographic barriers were both found to be significant predictors. The positive regression coefficient associated with the reverse scored predictor physiographic barriers is an indication that greater amounts of United States exports are made to countries with lower physiographic barriers than to countries with higher barriers. The positive regression coefficient associated with the interaction is an indication that even greater amounts of exports are made to countries that have low physiographic barriers and are located in the Americas than to countries that also have low barriers but are located elsewhere. The variable North, Central, and South America, therefore, can be seen to moderate physiographic barriers by increasing, for only those countries located in the Americas, the weight attributed to physiographic barriers as a predictor of the value of United States exports.

The results obtained in testing the validities of the three theoretical models provide evidence that the continental location variables and economic development variable also affect the association between predictor and criterion variables in a manner other than by moderation. For example, continental location or economic development variables often interact with an individual first-order factor, second-order factor, or environmental factor. The factor in the

interaction term, however, is often not represented in the prediction equation individually as a significant predictor. The effect of these phenomena is that the continental location and economic development variables select specific factors for association with a criterion variable. For instance, when the validity of the environmental factor model was tested, the interaction between North, Central, and South America and geo-cultural distance was found to be significantly and negatively related to United States exports, while geo-cultural distance was not by itself a predictor of United States exports (see Table 20). These results indicate that geo-cultural distance is associated with the level of United States exports for countries located in the Americas, but for countries located elsewhere geo-cultural distance is not associated with exports. Thus, in this example the variable North, Central, and South America selects an association between geo-cultural distance and United States exports.

In addition to continental location and economic development variables moderating and selecting other predictors, these variables are also found to be direct predictors. In these instances, for countries defined by these variables, the value of the criterion variable is generally different than would otherwise be expected. For instance, the variable Asia, Africa, and Oceania was found to be a significant predictor of United States exports in the second-order factor model (see Table 16). The positive regression coefficient for this location variable indicates that countries located in Asia, Africa, and Oceania receive a greater amount of exports than would otherwise be expected. The location variable Asia, Africa, and Oceania, therefore, differentiates countries defined by the variable from all other countries.

The presence of the continental location and economic development variables in the results of this study supports the previously discussed suggestion that a country's continental location and economic development do affect the decision of domestic firms and their international business activities. For instance, the repeated occurrences of the variable North, Central, and South America as a component of many cross-product terms suggests a pattern of behavior by domestic firms toward countries in the Americas. These cross-product terms indicate that differences in the predicted values of the criterion variables obtained as the result of differences in the predictors are greater for countries in the Americas than for other countries. These results suggest that domestic firms may be more sensitive to the environmental structure of American countries than that of other countries.

The variable North, Central, and South America also appears in the results as an individual predictor and also indicates a pattern of behavior by domestic firms. In two of the models the presence of this variable indicates that domestic firms export more to American countries than would otherwise be expected. In one model the variable also indicates that more is invested in American countries than in other countries of the world with similar environmental conditions. From these results it may be concluded that domestic firms not only are more sensitive to the environmental condition of American countries, but for the purpose of export and investment, firms also view these countries as categorically different than other countries.

The variable Asia, Africa, and Oceania and economic development do not appear in the results of this study with anywhere near the same frequency as does the variable North, Central, and South America.

However, the few occurrences of the variable Asia, Africa, and Oceania in the results provide some evidence of the behavior of domestic firms toward countries defined by this variable. For instance, in the second-order factor model this location variable was found to be significantly and positively related to United States exports (see Table 16). The variable North, Central, and South America was also a significant predictor of United States exports in the second-order factor model, and the regression coefficient associated with it was larger than was the regression coefficient associated with the variable Asia, Africa, and Oceania. These results suggest that firms tend to export more to countries in Asia, Africa, and Oceania than to European countries but not as much as is exported to countries located in North, Central or South America, given that all countries have similar environmental conditions.

The variable Asia, Africa, and Oceania was also found to be a significant predictor of United States exports in the first-order factor model. But unlike the previous example, the variable North, Central, and South America was not contained in the prediction equation as an individual predictor. These results, being slightly different from the previous example, therefore suggest that more is exported to countries in Asia, Africa, and Oceania than to countries not only in Europe but also in the Americas, given that all countries have identical environmental characteristics.

The variable Asia, Africa, and Oceania was also found to be significantly and negatively related to United States foreign direct investment in the first-order factor model. This result suggests that firms invest less in countries defined by this variable than would otherwise be expected.

From these various results involving the variable Asia, Africa, and Oceania, it may be concluded that firms are quite willing to trade heavily with countries located in Asia, Africa, or Oceania but are not yet willing to make large dollar investments.

Relationship Between Test Results and Current Theory

In the previous section it was suggested that major elements of environmental structure appeared to be associated with the three criterion variables, regardless of the manner in which environmental structure was measured. If these elements are central or important concepts by which structure is related to international business activities, then it may be a useful and fruitful exercise to consider whether the test results, in terms of these important elements, support or deny current theories pertaining to international business activities. In the following sections the relationship between test results and those suggested by current theory will be considered separately for the criterion variables United States exports and United States foreign direct investment.

United States exports

In this study the environmental elements defined by marketing media, transportation network, and non-English speaking/non-Western civilization were found to be related to United States exports. Of these elements and their relationship to United States exports, none appears to support or deny international trade theory, which suggests that a country exports goods for which it has a comparative advantage over other countries. Had exports been classified into product categories and these categories tested individually, then perhaps this

study could have provided a test of trade theory. For instance, such a study might have indicated that the exportation of domestically produced capital intensive goods was made to countries that had a non-Western culture and that were non-English speaking. These results would then have provided support for international trade theory, since it can be argued that non-Western, non-English speaking countries are primarily unindustrialized countries that have a comparative advantage in labor intensive goods. These are the countries, therefore, that would be expected to export labor intensive goods while importing capital intensive goods.

Although the results of this study do not provide support for international trade theory, they do provide evidence that may partially support Vernon's (1966) product life-cycle theory. In this theory, products that are developed domestically are initially produced and distributed in the United States. The news of innovative products, however, is quickly disseminated throughout the world. Consequently, demand soon arises for the products in foreign markets. According to the product life-cycle theory, this foreign demand for products is initially supplied by the exportation of the products from the United States.

Quite possibly, the first foreign adopters of a new product may be industrial customers and consumers located in countries that are similar to the United States in culture and language. In these countries the news of a new product and the resultant demand for it would not be affected by language or cultural differences. Product awareness and the demand for new products in other countries, however, may occur slowly because of language and culture differences. Language

differences may impede the flow of product information and also delay product introduction because operating instructions and promotional campaigns, for example, must first be translated into the host country's language (Miracle, 1968). Cultural differences also may impede or prevent the introduction of a new product into a country. For instance, the introduction of a new alcoholic beverage into a Moslem country would certainly be met with resistance because of religious prohibitions.

If, as hypothesized by Vernon, products have a life-cycle in which the innovation of new products is soon followed by their exportation to foreign countries and if this exportation is initially to countries where language and culture are similar to those in the United States, then the variable non-English speaking/non-Western civilization that was found to be associated with exports in this study may support these suppositions. For all significant predictors involving the variable non-English speaking/non-Western civilization, the association between the predictors and United States exports was in a direction indicating that the more similar a country was to United States in language and culture, the greater the level of exports. These associations are, therefore, what would be expected for the introduction into foreign countries of products that have been recently developed in the United States and are in the early stages of their product life-cycle.

United States foreign direct investment

The environmental elements--marketing media, transportation network, non-English speaking/non-Western civilization, and

population--were found in this study to be related to United States foreign direct investment. The associations between non-English speaking/non-Western civilization and investment were found always to be in the direction indicating greater investment for countries more similar to the United States in language and culture. These associations may be evidence again supporting the product life-cycle. According to Vernon's theory, after a product has gained wide acceptance in foreign markets, United States firms will begin to invest in foreign production facilities to supply foreign demand. It might be expected that investment will be made first in the countries where the demand and use of the product was the greatest. These are probably countries with the longest experience with the product--that is, countries where the product was first introduced. As was discussed previously, these are countries that may have language and cultures that are similar to the United States. Therefore, investment dollars for the construction of production facilities may flow first to countries in which innovative products were first introduced. The associations between non-English speaking/non-Western civilization obtained in this study may have resulted from this flow of investment dollars, and they may be an indication of the later stages in the life-cycle of products.

The association between non-English speaking/non-Western civilization and foreign direct investment may also be evidence supporting the Ahorini theory that nonrational elements enter into the foreign investment decision process. Businessmen may possess more valid knowledge of countries most similar to the United States in language and culture; and they may possess more invalid, preconceived, or stereotypical views about countries different in culture and language. If,

in analyzing investment opportunities, domestic firms are influenced by invalid beliefs they then may reject countries that are dissimilar to the United States. For example, firms may not make investments in Latin American countries, because the firms believe these countries are all politically unstable. Investments made because of nonrational rather than rational criteria--such as return on investment, potential sales volume, or an objective appraisal of political stability--may have produced the association between non-English speaking/non-Western civilization and investment that was obtained in the study. Associations between non-English speaking/non-Western civilization and both United States exports and the index of foreign market service strategies may also be an indication that nonrational elements also enter into other areas of international business activities.

No attempt was made in this study to include return on investment as one of the elements of international business investigated. Consequently, the results are unable to provide direct evidence indicating support or denial of the general investment theory, which suggests that investments are made to countries providing the greatest return on investment. However, the fact that population appears as a predictor of foreign direct investment may be evidence that partially supports the Lamfalussy modification to general investment theory. As discussed in Chapter 1, Lamfalussy maintains that foreign direct investment will occur whenever there are large and growing markets--regardless of their profitability. Population may be a surrogate measure of market size, and thus the positive association between population and foreign direct investment found in this study may support the supposition that capital flows to large markets.

The variable marketing media was also found to be positively related to foreign direct investment, and countries with more developed marketing media were associated with higher levels of investment. This result may support the suggestion by Hymer that international investment comes about because of the oligopolistic nature of domestic firms. Firms that are oligopolistic may produce highly differentiated and specialized products. These products typically require extensive and intensive promotion both to establish and to maintain customer awareness of product differences (Sturdivant et al, 1970). If firms are going to produce and market these products in foreign countries, it seems reasonable that they would select countries that have developed marketing media that could be used to facilitate the promotion of products. Consequently, the positive association between marketing media and investment may be an indication of the foreign investment of oligopolistic firms.

Test of Lead or Lag Relationships

In this study data were also examined for possible lead or lag associations between criterion and predictor variables. The methodology used and the results obtained in this longitudinal study are presented in Appendix G. The conclusions drawn from this study are that no systematic lead or lag relationships are perceivable between predictor and criterion variables for the three-year period examined. That is, no predictor variable was found to be systematically related to the unexplained variance of a criterion variable observed one or two years before or after the measurement of the predictor variable.

It was observed in the longitudinal study, however, that quite often the correlations between a predictor variable for each of three years and a criterion variable for a single year tended to be of approximately equal magnitude. It was concluded that these results may be accounted for by the high correlations between observations of a predictor variable from year to year.

Results of the longitudinal study also suggest that values of the predictor and criterion variables may be systematically changing with time or that the functional relationship between predictor and criterion variables may be changing.

If lead or lag associations do exist between predictor and criterion variables, they may not have been detected in this study because either the sample period was too short to observe long duration associations or those associations that do occur within three years were obscured by extraneous fluctuations in data. Conceivably, predictor and criterion variables may be related over very long periods of time. For instance, a politically destabilizing event in a country--such as a coup d' etat--may have a profound, long-lasting effect upon domestic firms operating in that country. Even though political stability is realized after the coup, domestic firms may not wish to invest heavily or to assume major roles in their marketing channels until the firms have some familiarity with the new government and they are sure that coups are not going to become a recurring feature of the country's political environment. Thus, the effect of a coup d' etat may be observed years afterward in the low level of foreign direct investment and the presence of few foreign firms operating in the country.

If predictor and criterion variables are related within an interval of less than three years, then the sample period used in this study provided, at best, for observations of only one or two cycles of the relationship. Quite possibly, fluctuations in the data caused by random error or by unspecified events prevented the statistical detection of these associations. A sample period that provides for observations of many cycles of lead or lag associations would improve the chance of detecting these relationships.

Implications for International Management

Unlike a normative study, which attempts to provide direct evidence of what firms should do, this study was descriptive in nature and provided evidence related to the past behavior of firms. However, the results of this study may also have some implications for firms' future behavior. Consider, for example, firms operating in the domestic market that are widening their scope of operation by penetrating foreign markets. Also consider firms already operating in foreign markets that are expanding into other foreign markets. Some of these firms may wish to take a conservative approach to international business activities and follow the lead set by firms already operating in foreign markets. For the firms entering new markets the relationships between environmental structure and international business activities may provide useful insight into the strategies that other firms have used. Because the environmental element non-English speaking/non-Western civilization was negatively related to index of foreign market service strategies, firms can pattern their marketing service strategies after those of other firms by adopting strategies that provide more major

channel roles for themselves in countries where English is spoken and that are more Western in culture than in countries where English is not generally spoken and that are less Western.

Other firms entering new markets may take a less conservative approach to the development of their foreign market service strategies. These firms may use the relationship between environmental structure and foreign market service strategies as evidence of what strategies other firms have used and may use in the future. Consequently, the firms entering new markets may adopt foreign market service strategies that when compared to the strategies that other firms are expected to use are optimally competitive.

The relationships between a country's environmental structure and the three criterion variables were determined in this study by sampling different countries. If it is assumed that these relationships also apply to a single country observed at different points in time, then these relationships may be usefully employed both by a domestic firm operating in a foreign country and by the foreign country's government.

For a firm operating in a foreign country, anticipated changes in the environment structure may be a signal to anticipate changes in the level of United States exports or investment to that country or in the foreign market service strategies used by competitors. For instance, a country may plan to build new highways and railroads and further develop its transportation networks. Because transportation networks were found to be positively related to both the level of United States exports and investment, greater development of the country's transportation networks may result in greater exports and investment from the United States. A domestic firm operating in the country may wish to

take this information into account in planning production and marketing activities, since it may be an indication of future competition or the possible availability of cheaper component parts or resources.

Foreign governments may also use the relationships between economic structure and international business activities as a means of planning sound economic policies. As an example of how these relationships may be used, again consider transportation network--an environmental element that was found to be positively related to both exports and investment. This environmental characteristic can be altered by human effort and capital expenditures, unlike the cultural elements of environmental structure, which are essentially determined by the historical past. If a country wishes to increase the exports or the investment made by United States firms, then increasing the development of their transportation networks may bring about the desired effects.

Suggestions for Future Research

One area that may prove fruitful for future research is a thorough study of the lead and lag relationship that may exist between a country's environmental characteristics and international business activities, such as investment, trade, and foreign market service strategies. In this study the investigation of these relationships was only preliminary and rudimentary in nature and cannot be considered as a thorough investigation of these phenomena. The fact that no lead or lag relationships were found by this study should not deter future research, since the data that were examined represented a rather short time duration. A more thorough study of lead and lag relationships should, perhaps, include the examination of data representing a much longer time-frame. Such a study might detect not only long-duration

effects but also provide observation of short-duration effects repeated over numerous cycles.

The investigation of time-related effects is important because lead and lag relationships can be used to imply casuality between two or more events. It is quite possible that causal relationships exist among international business activities, a country's environmental characteristics, and perhaps other unspecified parameters. As was discussed previously, environmental characteristics may affect international business activities. For example, it was suggested that political instability brought about by a coup d' etat may affect the level of foreign investment in a country and the participation of foreign business in marketing channels. If such patterns of causality can be adequately specified and tested, the benefits to both science and the business community would be great. Possibly, specific international business activities also may affect environmental characteristics. Foreign direct investment, for example, may be made in communication and transportation industries, and the goods and services that are output from these industries may serve to improve a country's communication networks and transportation facilities. Because these networks and facilities are elements of a country's environmental structure, the foreign direct investment has brought about a change in the country's environment.

Conceivably, environmental characteristics and international business activities may be both affected by and affect parameters that have so far been unspecified. For instance, changing educational levels may have the effect of changing both a country's political stability and the exports that are made to that country. And both of

these changes may, in turn, affect the educational levels. Changing educational levels may affect and, in turn, be affected by political stability because as people become better educated they may become more aware of the strengths or inadequacies of their own political system. This awareness may be translated into increased political unrest or support for their government. If political unrest brings about a change in government, different educational policies may be instituted by the new government. These new polities may then eventually affect the educational levels of the country's population. Thus, changes in educational levels have affected the political characteristics of a country, which have, in turn, affected the educational levels.

Changing educational levels may also affect and, in turn, be affected by international business activities because better education may also broaden the economic aspirations of people and increase their needs and wants. Satisfaction of these needs and wants may be obtained by trade with foreign countries. The goods and services that are imported may then be used to improve a country's educational process and result in higher educational levels for its people. Thus, education may affect international trade and changes in trade may also affect educational levels.

Another area that may prove fruitful for future research is an investigation of environmental characteristics and the foreign market service strategies used by specific firms. As was discussed previously, there are certain advantages in a study that aggregates parameters to investigate average behavior of firms. However, for this study, the relatively low multiple correlation coefficients obtained in the

prediction of foreign market service strategies, compared to those obtained in the prediction of foreign direct investment and exports, may be an indication that the aggregation process, at least for foreign market service strategies, may not have been an advantageous technique. The aggregation of parameters may have suppressed fluctuations in phenomena and reduced the apparent relationship between a country's environmental characteristics and foreign market service strategies. If there is truly a relationship between environmental structure and foreign market service strategies, then, perhaps, this relationship may be more easily detected by a study that considers the strategies of individual firms.

If the strategies of individual firms are examined, industry specific relationships may alsc be isolated. Conceivably, the marketing service strategies used by a firm in one industry tend to be entirely different from the strategies used by firms in another industry, given the same environmental conditions. In fact, the use of different strategies by different sectors may account for the rather low multiple correlation coefficients obtained in predicting the strategies for all industry groups simultaneously.

In future research it may also be possible to investigate environmental characteristics for markets instead of countries. This approach may be superior because domestic firms may consider that countries are composed of multiple markets and each market may require a specific marketing strategy. Markets also may be considered to exist across national boundaries, and the same market service strategy may serve for more than one country.

No communist countries were included in the subject population of this study because, for the sample time period studied, foreign direct investment was prohibited in these countries. Recent changes in governmental policy in some communist countries, however, have provided the opportunity for foreign direct investment and the participation of Western firms in new ventures (Holt, 1973; Sukijasovic, 1970). In future studies it may be possible to include these countries in the subject population and to investigate the effects of communist governments on international business arrangements.

Many of the concepts included in this study are associated with specialized areas of scientific inquiry. For example, the environmental factors political stability, economic development and performance, cultural unity, and marketing opportunity are concepts associated with the areas of political science, economics, anthropology, and marketing, respectively. In these areas a substantial amount of theoretical and empirical work has already been accomplished. These specialized areas of scientific inquiry may provide theoretical justification for specific environmental characteristics that are conceptually meaningful, are related to existing theory, and are significantly related to international business activities. It may, therefore, prove useful to include theoretical relationships and constructs from these specialized areas in future research that involves environmental structure.

APPENDIX A. DEFINITIONS OF LITVAK AND BANTING ENVIRONMENTAL FACTORS

Litvak and Banting (1968, p. 461) have defined the seven environmental factors as follows:

1. Political Stability. A system of government which permits representation of the major segments of its society, enjoys the confidence of its people, generates conditions for continuity of business operations, and is sympathetic to private enterprise. A "hot" factor when stability is high.

2. Market Opportunity. A sufficient number of customers with incompletely satisfied needs and the necessary resources with which to satisfy those needs for the product or service in question. A "hot" factor when opportunity is high.

3. Economic Development and Performance. The level of a country's economic growth, efficiency, equity and stability, which shape the environment for private enterprise. Applying Rostow's classification (Rostow, 1960) within the context of this definition, levels could be grouped as follows:

   Low. The traditional society, the preconditions for takeoff and the takeoff. A "cold" factor.

   Medium. The drive to maturity. A "moderate" factor.

   High. The age of high mass-consumption. A "hot" factor.

4. Cultural Unity. The values, goals, attitudes, social relationship and interactions between distinct segments within a country's people in terms of shared heritage, unassailed by competing groups. A "hot" factor when unity is high.

5. Legal Barriers. A proliferation of public measures in the form of laws and regulations which either deliberately or unintentionally restrict or discourage existing business activities and the future environment for private enterprise. A "cold" factor when barriers are high.

6. Physiographic Barriers. The obstacles to the development of efficient business operations created by the physical landscape or land forms of the country. A "cold" factor when barriers are high and infrastructure is weak.

7. Geo-Cultural Distance. Barriers created by geographical separation, cultural disparities between countries and problems of communication resulting from differences in social perspectives, attitude and language. A "cold" factor when distance is high.

APPENDIX B. COUNTRIES INCLUDED IN SUBJECT POPULATION

1. Algeria
2. Argentina
3. Australia
4. Austria
5. Belgium and Luxembourg
6. Brazil
7. Canada
8. Chile
9. Colombia
10. Congo (Now named Zaire)
11. Costa Rica
12. Denmark
13. Dominican Republic
14. Ecuador
15. El Salvador
16. Finland
17. France
18. Ghana
19. Greece
20. Guatemala
21. Honduras
22. Hong Kong
23. India
24. Indonesia
25. Iran
26. Ireland
27. Italy
28. Japan
29. Liberia
30. Libya
31. Malaya
32. Mexico
33. Morocco
34. Netherlands
35. Nicaragua
36. Norway
37. Pakistan
38. Panama
39. Peru
40. Philippines
41. Portugal
42. South Africa
43. South Korea
44. Spain
45. Sweden
46. Switzerland
47. Taiwan
48. Thailand
49. Turkey
50. United Kingdom
51. Uruguay
52. Venezuela
53. West Germany

APPENDIX C. VARIABLES AND DATA SOURCES

TABLE C-1

VARIABLES AND DATA SOURCES

Criterion and predictor variables	Operational variables	Data Sources[a]
Foreign market service strategies	Foreign market service strategies	A,B,C,D
United States exports	United States exports	C,D
United States foreign direct investment	United States foreign direct investment	A,B
Political stability	Number of protest demonstra- during previous eight years	E
	Number of riots during previous eight years	E
	Number of armed attacks during previous eight years	E
	Number of deaths from domestic violence during previous eight years	E
	Number of government sanctions during previous eight years	E
	Number of regular executive transfers during previous eight years	E
	Number of renewals of executive tenure during previous eight years	E

TABLE C-1 - continued.

Criterion and predictor variables	Operational variables	Data Sources[a]
	Number of executive adjustments during previous eight years	E
	Number of irregular executive transfers during previous eight years	E
	Index of political instability	E
Market opportunity	Population	F
	Population density	F
	Number of newspapers per capita	E
	Number of telephones per capita	F,G
	Number of radios per capita	E,F,G
	Number of televisions per capita	F,G
Economic development and performance	Gross domestic product	H
	Gross domestic product per capita	F,H
	Energy consumption	G
	Energy consumption per capita	F,G
	Steel consumption	G

TABLE C-1 - continued.

Criterion and predictor variables	Operational variables	Data Sources[a]
	Steel consumption per capita	F,G
	Distribution of male labor force in agriculture	E
	Average annual rate of growth of gross domestic product, 1960-1965	H
	Average annual rate of growth of gross domestic product per capita, 1960-1965	H
	Average annual rate of growth of gross domestic product, 1965-1969	H
	Average annual rate of growth of gross domestic product per capita, 1965-1969	H
	Average annual rate of growth of gross domestic product, short period ending 1965	E
	Average annual rate of growth of gross domestic product, long period ending 1965	E
	Average annual rate of growth of energy consumption	E

TABLE C-1 - continued.

Criterion and predictor variables	Operational variables	Data Sources[a]
Cultural unity	Religious heterogeneity	I
	Linguistic heterogeneity	I
	Racial heterogeneity	I
	Ethnic and linguistic fractionalization	E
	Literacy	E
Legal barriers	Tariffs on imports	J
	Tariffs as percentage of imports	G,J
	Total exports of country	G
	Total imports plus exports of country	G
	Type of legal systems	I
Physiographic barriers	Railroad length	K
	Motor vehicle road length	K,L
	Number of motor vehicles	G
	Railroad passenger traffic	G
	Aviation passenger traffic	G
	Land area	F
	Railroad density	F,K
	Motor vehicle road density	F,K,L
	Motor vehicle density	F,G

TABLE C-1 - continued.

Criterion and predictor variables	Operational variables	Data Sources[a]
	Railroad passenger density	F,G
	Aviation passenger density	F,G
Geo-cultural distance	Non-Judeo-Christian religion	I,M
	Non-Western civilization	I
	Non-English speaking	N,O
	Landlocked country	N,P
	Distance from United States	Q
	Air fare from New York to capital city	E

[a]Data Sources coded as follows:

A = U.S. Department of Commerce, Survey of Current Business (Washington, D.C.: Government Printing Office, Various Issues).

B = U.S. Department of Commerce, Unpublished Data.

C = U.S. Department of Commerce, Statistical Abstract of the United States (Washington, D.C.: Government Printing Office, Various Issues).

D = U.S. Department of Commerce, Foreign Commerce and Navigation of the United States--1965 (Washington, D.C.: Government Printing Office, 1970).

E = Charles Lewis Taylor and Michael C. Hudson, World Handbook of Political and Social Indicators (New Haven, Conn.: Yale University Press, 1972).

TABLE C-1 - continued.

F = United Nations Department of Economic and Social Affairs, Demographic Yearbook (New York: United Nations, Various Issues).

G = United Nations Department of Economic and Social Affairs, Statistical Yearbook (New York: United Nations, Various Issues).

H = United Nations Department of Economic and Social Affairs, Yearbook of National Accounts Statistics (New York: United Nations, Various Issues).

I = Arthur S. Banks and Robert B. Textor, A Cross-Polity Survey (Cambridge, Mass.: M.I.T. Press, 1963).

J = United Nations Department of Economic and Social Affairs, Yearbook of International Trade Statistics (New York: United Nations, Various Issues).

K = S.H. Steinberg, ed., The Statesman's Year-Book (New York: St. Martin's Press, Various Issues).

L = Worldmark Encyclopedia of the Nations, Various Editions.

M = Bruce M. Russett et al, World Handbook of Political and Social Indications (New Haven, Conn.: Yale University Press, 1964).

N = 1973 Commercial Atlas and Marketing Guide (Chicago: Rand McNally & Company, 1973).

O = The World Almanac and Book of Facts (New York: New York World-Telegram, Various Issues).

P = Lloyd's Maritime Atlas, 6th ed. (London: Lloyd's, 1968)

Q = U.S. Army Air Force Equidistance Map #20-10, 1946 (U.S. Army, 1946).

APPENDIX D. TEST RESULTS OF THE FIRST-ORDER FACTOR MODEL

TABLE D-1

TEST RESULTS OF THE FIRST ORDER-FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
---No significant predictor variables in this step of the analysis----			
	Analysis step 2[b]		
F_{21}	-.2393	10.00	.005
(Constant)	.0000		
	Analysis step 3[c]		
F_{21}	-.2393	10.00	.005
(Constant)	.0000		
	Analysis step 4[d]		
F_{21}	-.2393	10.00	.005
(Constant)	.0000		

TABLE D-1 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 5[e]		
F_{21}	-.2393	10.00	.005
(Constant)	.0000		
	Analysis step 6[f]		
F_{21}	-.2393	10.00	.005
(Constant)	.0000		

[a]Multiple regression analysis of predictor variables F_1 through F_{22} Overall F-Ratio = 1.07 (P > .05 with 22/30 d.f.).

[b]Stepwise multiple regression analysis of predictor variables F_1 through F_{22}. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

[c]Stepwise multiple regression analysis of predictor variable F_{21} and all two-way cross-products formed among F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

[d]Stepwise multiple regression analysis of predictor variables F_{21}, D_1, D_2, and D_3. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

[e]Stepwise multiple regression analysis of predictor variable F_{21} and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

[f]Stepwise multiple regression analysis of predictor variable F_{21} and all second, third, and fourth order polynomials of the variables F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 10.00 (P < .005 with 1/51 d.f.).

TABLE D-2

TEST RESULTS OF THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. EXPORTS

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
F_{18}	.1811	12.74	.001
F_{20}	-.1879	8.03	.01
(Constant)	.0000		
	Analysis step 2[b]		
F_5	.0609	4.73	.05
F_{18}	.1533	35.80	.001
(Constant)	.0000		
	Analysis step 3[c]		
F_5	.1337	63.96	.001
$F_5 \times F_7$	.2200	18.90	.001
$F_5 \times F_{20}$	.0271	4.09	.05
$F_7 \times F_{20}$	.2546	35.46	.001
$F_7 \times F_{21}$	.5342	17.73	.001
$F_{18} \times F_{20}$	-.1054	91.71	.001
$F_{20} \times F_{21}$	-.0922	15.54	.001
(Constant)	-.0910		

TABLE D-2 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 4[d]		
F_5	.1599	56.42	.001
D_1	.5668	8.86	.005
D_2	.3354	8.86	.005
$F_5 \times F_7$	.2525	36.02	.001
$F_7 \times F_{20}$	.2203	24.33	.001
$F_7 \times F_{21}$	.5861	19.99	.001
$F_{18} \times F_{20}$	-.0801	66.33	.001
$F_{20} \times F_{21}$	-.0702	8.04	.01
(Constant)			
	Analysis step 5[e]		
F_5	.0989	111.96	.001
D_1	1.1835	262.67	.001
$F_5 \times F_7$	.3055	145.28	.001
$D_1 \times F_{21}$	-1.0371	528.72	.001
$D_3 \times F_7$	1.2357	164.34	.001
(Constant)	- .0445		
	Analysis step 6[f]		
F_5	.0492	8.76	.01

TABLE D-2 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
D_1	2.4531	17.74	.001
$D_1 \times F_{21}$	-2.3566	18.90	.001
$(F_{18})^3$	.0060	13.57	.001
$(F_{18})^4$	- .0006	10.80	.005
(Constant)	- .1242		

[a]Multiple regression analysis of predictor variables F_1 through F_{22}. R = .86 (R corrected for shrinkage = .74), overall F-Ratio = 3.87 (P < .001 with 22/30 d.f.).

[b]Stepwise multiple regression analysis of predictor variables F_1 through F_{22}. R = .76 (R corrected for shrinkage = .75), overall F-Ratio = 4.73 (P < .025 with 2/50 d.f.).

[c]Stepwise multiple regression analysis of predictor variables F_5, F_{15}, and all two-way cross-products formed among F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .92 (R corrected for shrinkage = .91), overall F-Ratio = 37.55 (P < .001 with 7/45 d.f.).

[d]Stepwise multiple regression analysis of predictor variables F_5, $F_5 \times F_7$, $F_5 \times F_{20}$, $F_7 \times F_{20}$, $F_7 \times F_{21}$, $F_{18} \times F_{20}$, $F_{20} \times F_{21}$, D_1, D_2, and D_3. R = .93 (R corrected for shrinkage = .92), overall F-Ratio = 35.96 (P < .001 with 8/44 d.f.).

[e]Stepwise multiple regression analysis of predictor variables F_5, D_1, D_2, $F_5 \times F_7$, $F_7 \times F_{20}$, $F_7 \times F_{21}$, $F_{18} \times F_{20}$, $F_{20} \times F_{21}$, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 206.19 (P < .001 with 5/47 d.f.).

[f]Stepwise multiple regression analysis of predictor F_5, D_1, $F_5 \times F_7$, $D_1 \times F_{21}$, $D_3 \times F_7$, and all second, third, and fourth order polynomials of the variables F_5, F_7, F_{18}, F_{20}, and F_{21}. R = .93 (R corrected for shrinkage = .92), overall F-Ratio = 58.54 (P < .001 with 5/47 d.f.).

TABLE D-3

TEST RESULTS OF THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. FOREIGN DIRECT INVESTMENT

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
F_{18}	.1976	19.18	.001
F_{20}	-.1334	5.15	.05
(Constant)	.0000		
	Analysis step 2[b]		
F_7	.3625	16.02	.001
F_{18}	.2198	97.75	.001
(Constant)	.0000		
	Analysis step 3[c]		
F_7	-.5636	10.32	.005
F_{18}	.1282	33.39	.001
$F_5 \times F_{18}$	.0173	18.14	.001
$F_7 \times F_{20}$	.1469	13.56	.001
$F_{18} \times F_{20}$	-.0284	30.24	.001
(Constant)	-.2643		

TABLE D-3 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 4[d]		
F_7	.1519	5.61	.025
F_{18}	.0562	8.89	.005
D_2	-.3794	16.31	.001
$F_5 \times F_{18}$	.0273	60.09	.001
$F_{18} \times F_{20}$	-.0209	22.33	.001
(Constant)	-.0589		
	Analysis step 5[e]		
D_2	-.4452	25.23	.001
$F_5 \times F_{18}$	.0267	113.46	.001
$D_1 \times F_{18}$	-.2844	10.24	.005
$D_1 \times F_{21}$	.0912	15.57	.001
(Constant)	.0558		
	Analysis step 6[f]		
D_2	-.4750	36.21	.001
$F_5 \times F_{18}$	.0296	158.38	.001
$D_1 \times F_{18}$	.0884	18.61	.001
$D_1 \times F_{21}$	-.2347	8.64	.01
$(F_7)^2$	.0241	14.12	.001
(Constant)	.0110		

TABLE D-3 - continued.

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[a]Multipe regression analysis of predictor variables F_1 through F_{22}. R = .89 (R corrected for shrinkage = .80), overall F-Ratio = 5.26 (P < .00) with 22/30 d.f.).

[b]Stepwise multiple regression analysis of predictor variables F_1 through F_{22}. R = .81 (R corrected for shrinkage = .80), overall F-Ratio = 16.03 (P < .001 with 2/50 d.f.).

[c]Stepwise multiple regression analysis of predictor variables F_7, F_{18}, and all two-way cross-products formed among F_5, F_7, F_{18} , F_{20} , and F_{21}. R = .96 (R corrected for shrinkage = .96), overall F-Ratio = 101.09 (P < .001 with 4/48 d.f.).

[d]Stepwise multiple regression analysis of predictor variables F_7, F_{18}, F_5 x F_{18} , F_7 x F_{20}, F_{18}x F_{20}, D_1, D_2, and D_3 . R = .96 (R corrected for shrinkage = .96), overall F-Ratio = 106.11 (P <.001 with 5/47 d.f.).

[e]Stepwise multiple regression analysis of predictor variables F_7, F_{18}, F_5 x F_{18}, F_{18} x F_{20}, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group F_5, F_7, F_{18}, F_{20}, and F_{21}. R= .96 (R corrected for shrinkage = .96), overall F-Ratio = 145.73 (P <.001 with 4/48 d.f.).

[f]Stepwise multipe regression analysis of predictor variables D_2, F_5 x F_{18}, D_1 x F_{18}, D_1 x F_{21}, and all second, third, and fourth order polynomials of F_5, F_7, F_{18}, F_{20}, and F_{21}, R = .97 (R corrected for shrinkage = .96), overall F-Ratio = 151.27 (P < .001 with 5/47 d.f.).

APPENDIX E. TEST RESULTS OF THE SECOND-ORDER FACTOR MODEL

TABLE E-1

TEST RESULTS OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
S_1	.0180	9.75	.005
(Constant)	.0000		
	Analysis step 2[b]		
S_1	.0180	9.75	.005
(Constant)	.0000		
	Analysis step 3[c]		
S_1	.0180	9.75	.005
(Constant)	.0000		
	Analysis step 4[d]		
S_1	.0180	9.75	.005
(Constant)	.0000		

TABLE E-1 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 5[e]		
S_1	.0229	14.42	.001
$(S_2)^4$	$-.2038 \times 10^{-5}$	4.55	.05
(Constant)	.0853		

[a]Stepwise multiple regression analysis of predictor variables S_1 through S_7. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 9.75 (P < .005 with 1/51 d.f.).

[b]Stepwise multiple regression analysis of predictor variable S_1 and all two-way cross-products formed among S_1 through S_7. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 9.75 (P < .005 with 1/51 d.f.).

[c]Stepwise multiple regression analysis of predictor variables S_1, D_1, D_2, and D_3. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 9.75 (P < .005 with 1/51 d.f.).

[d]Stepwise multiple regression analysis of predictor variable S_1 and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group S_1 through S_7. R = .40 (R corrected for shrinkage = .38), overall F-Ratio = 9.75 (P < .005 with 1/51 d.f.).

[e]Stepwise multiple regression analysis of predictor variable S_1 and all second, third, and fourth order polynomials of S_1 through S_7. R = .45 (R corrected for shrinkage = .45), overall F-Ratio = 7.49 (P < .005 with 2/50 d.f.).

TABLE E-2

TEST RESULTS OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. EXPORTS

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
S_1	.0331	45.17	.001
S_6	.0986	7.43	.01
(Constant)	.0000		
	Analysis step 2[b]		
S_1	.0338	80.55	.001
S_6	.1653	31.40	.001
$S_1 \times S_6$	.0098	37.21	.001
$S_2 \times S_5$	.0021	5.51	.025
(Constant)	.2135		
	Analysis step 3[c]		
S_1	.0423	90.99	.001
S_6	.1317	16.23	.001
D_1	.7634	9.11	.005
D_2	.5964	5.36	.05
$S_1 \times S_6$	.0070	16.52	.001
(Constant)	-.3051		

TABLE E-2 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 4[d]		
S_1	.0252	71.21	.001
D_1	.5700	10.83	.005
D_2	.2944	5.86	.025
$D_1 \times S_1$	.0805	213.93	.001
$D_1 \times S_4$	-.1493	25.36	.001
$D_1 \times S_6$	.1959	51.38	.001
$D_2 \times S_1$	-.0183	8.31	.01
$D_2 \times S_2$	.0587	29.78	.001
$D_3 \times S_2$	-.0389	15.81	.001
(Constant)	-.4616		
	Analysis step 5[e]		
S_1	.0180	39.33	.001
D_1	.5381	9.58	.005
D_2	.2635	4.26	.05
$D_1 \times S_1$	.0820	230.12	.001
$D_1 \times S_4$	-.1439	22.71	.001
$D_1 \times S_6$	.1960	49.53	.001
$D_3 \times S_2$	-.0180	5.75	.025
$(S_2)^4$	$.1864 \times 10^{-5}$	26.99	.001
(Constant)	-.3780		

TABLE E-2 - continued.

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[a]Stepwise multiple regression analysis of predictor variables S_1 through S_7. R = .69 (R corrected for shrinkage = .67), overall F-Ratio = 22.65 ($P < .001$ with 2/50 d.f.).

[b]Stepwise multiple regression analysis of predictor variables S_1, S_6, and all two-way cross-products formed among S_1 through S_7. R = .84 (R corrected for shrinkage = .83), overall F-Ratio = 29.49 ($P < .001$ with 4/48 d.f.).

[c]Stepwise multiple regression analysis of predictor variables S_1, S_6, $S_1 \times S_6$, $S_2 \times S_5$, D_1, D_2, and D_3. R = .85 (R corrected for shrinkage = .83), overall F-Ratio = 25.49 ($P < .001$ will 5/47 d.f.).

[d]Stepwise multiple regression analysis of predictor variables S_1, S_6, D_1, D_2, $S_1 \times S_6$, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group S_1 through S_7. R = .97 (R corrected for shrinkage = .96), overall F-Ratio = 88.50 ($P < .001$ with 9/43 d.f.).

[e]Stepwise multiple regression analysis of predictor variables S_1, D_1, D_2, $D_1 \times S_1$, $D_1 \times S_4$, $D_1 \times S_6$, $D_2 \times S_1$, $D_2 \times S_2$, $D_3 \times S_2$, and all second, third, and fourth order polynomials of S_1 through S_7, R = .97 (R corrected for shrinkage = .96, overall F-Ratio = 95.62 ($P < .001$ with 8/44 d.f.).

TABLE E-3

TEST RESULTS OF THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. FOREIGN DIRECT INVESTMENT

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
S_1	.0350	56.31	.001
S_6	.1128	10.89	.005
(Constant)	.0000		
	Analysis step 2[b]		
S_1	.0342	103.80	.001
S_6	.1780	49.09	.001
$S_1 \times S_6$	.0107	56.05	.001
$S_2 \times S_4$	-.0036	7.55	.01
(Constant)	.2676		
	Analysis step 3[c]		
S_1	.0368	121.60	.001
S_6	.1850	58.34	.001
D_1	.4006	6.51	.025
$S_1 \times S_6$	.0093	39.80	.001
$S_2 \times S_4$	-.0037	8.56	.01
(Constant)	.1052		

TABLE E-3 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 4[d]		
S_1	.0365	282.58	.001
S_6	.0526	11.28	.005
D_1	.7003	75.45	.001
$S_1 \times S_6$	.0052	45.45	.001
$D_1 \times S_1$	.0530	147.24	.001
$D_1 \times S_6$	.0995	18.51	.001
$D_2 \times S_2$	-.0114	5.88	.025
$D_3 \times S_1$	-.0430	44.61	.001
(Constant)	-.2964		
	Analysis step 5[e]		
S_1	.0365	282.58	.001
S_6	.0526	11.28	.005
D_1	.7003	75.45	.001
$S_1 \times S_6$	.0052	45.45	.001
$D_1 \times S_1$	.0530	147.24	.001
$D_1 \times S_6$	.0995	18.51	.001
$D_2 \times S_2$	-.0114	5.88	.025
$D_3 \times S_1$	-.0430	44.61	.001
(Constant)	-.2964		

TABLE E-3 - continued.

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[a]Stepwise multiple regression analysis of predictor variables S_1 through S_7. R = .73 (R corrected for shrinkage = .73), overall F-Ratio = 28.38 ($P < .001$ with 2/50 d.f.).

[b]Stepwise multiple regression analysis of S_1, S_6, and all two-way cross-products formed among S_1 through S_7. R = .89 (R corrected for shrinkage = .88), overall F-Ratio = 43.69 ($P < .001$ with 4/48 d.f.).

[c]Stepwise multiple regression analysis of S_1, S_6, $S_1 \times S_6$, $S_2 \times S_4$, D_1, D_2, and D_3. R = .90 (R corrected for shrinkage = .89), overall F-Ratio = 40.27 ($P < .001$ with 5/47 d.f.).

[d]Stepwise multiple regression analysis of S_1, S_6, D_1, $S_1 \times S_6$, $S_2 \times S_4$, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group S_1 through S_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 154.36 ($P < .001$ with 8/44 d.f.).

[e]Stepwise multiple regression analysis of S_1, S_6, D_1, $S_1 \times S_6$, $D_1 \times S_1$, $D_1 \times S_6$, $D_2 \times S_2$, $D_3 \times S_1$ and all second, third, and fourth order polynomials of S_1 through S_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 154.36 ($P < .001$ with 8/44 d.f.).

APPENDIX F. TEST RESULTS OF THE ENVIRONMENTAL FACTOR MODEL.

TABLE F-1

TEST RESULTS OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
E_6	.0399	6.67	.025
(Constant)	.0000		
	Analysis step 2[b]		
E_6	.0399	6.67	.025
(Constant)	.0000		
	Analysis step 3[c]		
---No significant predictor variables in this step of the analysis------			
	Analysis step 4[d]		
$D_2 \times E_7$	-.1593	6.70	.025
(Constant)	.2067		

TABLE F-1 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 5[e]		
$D_2 \times E_7$	-.1593	6.70	.025
(Constant)	.2067		

[a]Stepwise multiple regression analysis of predictor variables E_1 through E_7. R = .34 (R corrected for shrinkage = .31), overall F-Ratio = 6.67 (P <.025 with 1/51 d.f.).

[b]Stepwise multiple regression analysis of predictor variable E_6 and all two-way cross-products formed among E_1 through E_7. R = .34 (R corrected for shrinkage = .31), overall F-Ratio = 6.67 (P <.025 with 1/51 d.f.).

[c]Stepwise multiple regression analysis of predictor variables E_6, D_1, D_2, and D_3, overall F-Ratio = 2.34 (P < .05 with 4/48 d.f.).

[d]Stepwise multiple regression analysis of all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3, and single variables selected from the group E_1 through E_7. R = .34 (R corrected for shrinkage = .31), overall F-Ratio = 6.70 (P <.025 with 1/51 d.f.).

[e]Stepwise multiple regression analysis of predictor variable $D_2 \times E_7$ and all second, third, and fourth order polynomials of E_1 through E_7. R = .34 (R corrected for shrinkage = .31), overall F-Ratio = 6.70 (P <.025 with 1/51 d.f.).

TABLE F-2

TEST RESULTS OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = U.S. EXPORTS

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
E_6	.0766	38.06	.001
(Constant)	.0000		
	Analysis step 2[b]		
E_6	.0445	21.06	.001
$E_2 \times E_6$	.0131	15.50	.001
$E_2 \times E_7$	-.0278	50.34	.001
$E_3 \times E_6$	.0026	5.82	.025
$E_4 \times E_6$	.0100	11.56	.005
$E_4 \times E_7$	-.0176	11.13	.005
$E_5 \times E_6$	-.0086	42.13	.001
(Constant)	-.2565		
	Analysis step 3[c]		
E_6	.0445	21.06	.001
$E_2 \times E_6$	.0131	15.50	.001
$E_2 \times E_7$	-.0278	50.34	.001
$E_3 \times E_6$	.0026	5.82	.025

TABLE F-2 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P
$E_4 \times E_6$	.0100	11.56	.005
$E_4 \times E_7$	-.0176	11.13	.005
$E_5 \times E_6$	-.0086	42.13	.001
(Constant)	-.2565		
Analysis step 4[d]			
E_6	.0334	25.60	.001
$E_3 \times E_6$	.0023	18.42	.001
$D_1 \times E_2$	.1293	15.81	.001
$D_1 \times E_6$	.0593	12.28	.005
$D_1 \times E_7$	-.3504	230.39	.001
$D_2 \times E_3$	.0134	6.12	.025
(Constant)	-.1912		
Analysis step 5[e]			
E_6	.0334	25.60	.001
$E_3 \times E_6$	.0023	18.42	.001
$D_1 \times E_2$	.1293	15.81	.001
$D_1 \times E_6$	.0593	12.28	.005
$D_1 \times E_7$	-.3504	230.39	.001
$D_2 \times E_3$	.0134	6.12	.025
(Constant)	-.1912		

TABLE F-2 - continued.

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[a]Stepwise multiple regression analysis of predictor variables E_1 through E_7. R = .65 (R corrected for shrinkage = .64), overall F-Ratio = 38.06 (P < .001 with 1/51 d.f.).

[b]Stepwise multiple regression analysis of predictor variable E_6 and all two-way cross-products formed among E_1 through E_7. R = .94 (R corrected for shrinkage = .93), overall F-Ratio = 48.75 (P < 001 with 7/45 d.f.).

[c]Stepwise multiple regression analysis of predictor variables E_6, $E_2 \times E_6$, $E_2 \times E_7$, $E_3 \times E_6$, $E_4 \times E_6$, $E_4 \times E_7$, $E_5 \times E_6$, D_1, D_2, and D_3. R = .94 (R corrected for shrinkage = .93), overall F-Ratio = 48.75 (P < .001 with 7/45 d.f.).

[d]Stepwise multiple regression analysis of predictor variables E_6, $E_2 \times E_6$, $E_2 \times E_7$, $E_3 \times E_6$, $E_4 \times E_6$, $E_4 \times E_7$, $E_5 \times E_6$, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group E_1 through E_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 153.60 (P < .001 with 6/46 d.f.).

[e]Stepwise multiple regression analysis of predictor variables E_6, $E_3 \times E_6$, $D_1 \times E_2$, $D_1 \times E_6$, $D_1 \times E_7$, $D_2 \times E_3$, and all second, third, and fourth order polynomials of E_1 through E_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 153.60 (P < .001 with 6/46 d.f.).

TABLE F-3

TEST RESULTS OF THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = U.S. FOREIGN DIRECT INVESTMENT

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 1[a]		
E_4	.0829	6.70	.025
E_6	.0678	30.04	.001
E_7	-.1033	11.59	.005
(Constant)	.0000		
	Analysis step 2[b]		
E_4	.0482	9.42	.005
E_6	.0386	21.65	.001
E_7	-.0451	12.44	.005
$E_1 \times E_5$	.0058	7.56	.01
$E_2 \times E_3$	.0042	7.86	.01
$E_2 \times E_6$	.0091	13.03	.001
$E_4 \times E_6$	.0128	28.44	.001
$E_4 \times E_7$	-.0125	8.61	.01
$E_5 \times E_6$	-.0061	21.97	.001
$E_6 \times E_7$	-.0127	18.36	.001
(Constant)	-.1903		

TABLE F-3 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 3[c]		
E_4	.0408	5.06	.05
E_6	.0398	16.96	.001
$E_1 \times E_5$	.0072	8.88	.005
$E_2 \times E_3$	.0053	9.26	.005
$E_2 \times E_6$	.0091	9.69	.005
$E_4 \times E_6$	.0151	31.56	.001
$E_4 \times E_7$	-.0109	5.87	.025
$E_5 \times E_6$	-.0067	21.85	.001
$E_6 \times E_7$	-.0186	102.85	.001
(Constant)	-.1850		
	Analysis step 4[d]		
$E_2 \times E_6$	.0115	173.43	.001
$D_1 \times E_2$	.0929	8.56	.01
$D_1 \times E_6$	.0694	21.86	.001
$D_1 \times E_7$	-.3064	136.72	.001
$D_2 \times E_7$	-.2536	45.31	.001
$D_3 \times E_7$	.1757	22.32	.001
(Constant)	-.1363		

TABLE F-3 - continued.

Significant predictor variable	Regression coefficient	F-Ratio	Significance level, P <
	Analysis step 5[e]		
$E_2 \times E_6$	.0116	169.67	.001
$D_1 \times E_2$	.0950	8.56	.01
$D_1 \times E_6$	.0692	20.82	.001
$D_1 \times E_7$	-.3041	129.03	.001
$D_2 \times E_7$	-.2478	41.67	.001
$D_3 \times E_7$	.1634	19.12	.001
(Constant)	-.1524		

[a]Stepwise multiple regression analysis of predictor variables E_1 through E_7. R = .73 (R corrected for shrinkage = .71), overall F-Ratio = 18.55 (P < .001 with 3/49 d.f.).

[b]Stepwise multiple regression analysis of predictor variables E_4, E_6, E_7, and all two-way cross-products formed among E_1 through E_7. R = .97 (R corrected for shrinkage = .96) overall F-Ratio = 57.18 (P < .001 with 11/41 d.f.).

[c]Stepwise multiple regression analysis of predictor variables E_4, E_6, E_7, $E_1 \times E_5$, $E_2 \times E_3$, $E_2 \times E_6$, $E_4 \times E_6$, $E_4 \times E_7$, $E_5 \times E_6$, $E_6 \times E_7$, D_1, D_2, and D_3. R = .96 (R corrected for shrinkage = .95), overall F-Ratio = 49.71 (P < .001 with 9/43 d.f.).

[d]Stepwise multiple regression analysis of predictor variables E_4, E_6, $E_1 \times E_5$, $E_2 \times E_3$, $E_2 \times E_6$, $E_4 \times E_6$, $E_4 \times E_7$, $E_5 \times E_5$, $E_6 \times E_7$, and all two-way cross-products formed between single variables selected from the group D_1, D_2, and D_3 and single variables selected from the group E_1 through E_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 149.96 (P < .001 with 7/45 d.f.).

TABLE F-3 - continued.

[e]Stepwise multiple regression analysis of predictor variables $E_2 \times E_6$, $D_1 \times E_2$, $D_1 \times E_6$, $D_1 \times E_7$, $D_2 \times E_7$, $D_3 \times D_7$, and all second, third, and fourth order polynomials of E_1 through E_7. R = .98 (R corrected for shrinkage = .98), overall F-Ratio = 166.68 ($P < .001$ with 6/46 d.f.).

APPENDIX G. A STUDY OF LEAD AND LAG ASSOCIATIONS BETWEEN PREDICTOR AND CRITERION VARIABLES

Purpose

Data were examined in this study to identify lead and lag associations between predictor variables and the three criterion variables.

Method

The predictor and criterion variables of each prediction equation developed in the main part of this study were tested for lead and lag associations by a method suggested by Draper and Smith (1966). First, residual values of the criterion variable were calculated for each subject country for each of the years 1965, 1966, and 1967. Each of these residual values is the difference between the observed value of the criterion variable and the value calculated with the use of the prediction equation. Following the calculation of residual values, a correlation matrix was then developed between the residuals for each of the three years and observations of the predictor variables for each of the three years.

Residual values can be considered as the variance in the criterion variable that is unexplained by the predictor variables. If there are any lead or lag relationships between a predictor and criterion variable, then the residuals may be explained by the predictor variable measured before or after the sampling period associated with the residual values. A lead or lag relationship may be detected in the correlation matrix by a systematic pattern in correlations between a predictor variable measured one or two years before or after the sampling period associated with the residuals.

Data Analysis and Results

The data that were used in the main part of this study were also used to study lead and lag associations. Standard scores for the observed data values were used in the calculations of standard scores for the first-order factors, second-order factors, environmental factors and criterion variables for each of the years 1965, 1966, and 1967. In these calculations the relationships between operational variables and factors were kept the same as in the main part of this study.

Residual values were calculated for each of the criterion variables for each of the three years. These values were then correlated against the values of the predictor variables for each of the three years. The resultant correlations matrices are shown in Tables G-1 through G-9.

No systematic patterns in correlations that could be accounted for by lead or lag relationships were detected in the correlation matrices. In some cases, observations of a predictor variable were significantly correlated with residual values by a separation of one or two years. However, the correlations for the predictor and residuals did not systematically lead or lag each other in magnitude or sign.

The tables do show that for many predictor variables the correlations between a predictor variable for each of the three years and residuals for a single year are all approximately of the same magnitude. This pattern of correlations may have occurred because the values of each predictor variable for a subject country are highly correlated with each other from year to year. Consequently, the correlation between a predictor variable for one year and a set of residuals will be very similar to the correlation between the predictor variable

for another year and the same set of residuals.

It is also apparent from the tables that for many predictor variables the correlations between a predictor variable for each of three years and the residual values for 1965 tend to be opposite in sign and magnitude to the correlations for the 1967 residuals. And the correlations for the 1966 residuals tend to be intermediate in value to those of 1965 and 1967. This pattern may be accounted for because the values of the criterion and predictor variables may be sytematically increasing or decreasing through the three-year period or because the functional relationship between variables is systematically changing.

TABLE G-1

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

		Residual value		
Predictor variable	Year	1965	1966	1967
F_{21}	1965	.19	-.12	-.09
	1966	.19	-.12	-.09
	1967	.19	-.12	-.09

TABLE G-2

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. EXPORTS

		Residual value		
Predictor variable	Year	1965	1966	1967
F_5	1965	-.28*	-.06	.30*
	1966	-.27*	-.05	.30*
	1967	-.26*	-.04	.30*
D_1	1965	-.15	.00	.14
	1966	-.15	.00	.14
	1967	-.15	.00	.14
$D_1 \times F_{21}$	1965	.62*	.10	-.66*
	1966	.62*	.10	-.66*
	1967	.62*	.10	-.66*
$(F_{18})^3$	1965	-.69*	-.12	.73*
	1966	-.69*	-.12	.74*
	1967	-.70*	-.11	.76*
$(F_{12})^4$	1965	-.73*	-.12	.78*
	1966	-.74*	-.12	.79*
	1967	-.74*	-.12	.79*

*$P < .05$

TABLE G-3

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE FIRST-ORDER FACTOR MODEL. CRITERION VARIABLE = U.S. FOREIGN DISTRICT INVESTMENT

		Residual value		
Predictor variable	Year	1965	1966	1967
D_2	1965	-.04	-.16	.20
	1966	-.04	-.16	.20
	1967	-.04	-.16	.20
$F_5 \times F_{18}$	1965	.22	.42*	-.63*
	1966	.23*	.44*	-.63*
	1967	.25*	.46*	-.63*
$D_1 \times F_{18}$	1965	.26*	.42*	-.63*
	1966	.26*	.43*	-.63*
	1967	.26*	.43*	-.65*
$D_1 \times F_{21}$	1965	-.25*	-.40*	.61*
	1966	-.25*	-.40*	.61*
	1967	-.25*	-.40*	.61*
$(F_7)^2$	1965	.04	-.06	.03
	1966	.04	-.06	.03
	1967	.04	-.06	.03

*P < .05

TABLE G-4

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

		Residual value		
Predictor variable	Year	1965	1966	1967
S_1	1965	-.20	.14	.08
	1966	-.19	.14	.08
	1967	-.20	.14	.08
$(S_2)^4$	1965	-.11	.05	.11
	1966	-.11	.04	.12
	1967	-.12	.02	.12

TABLE G-5

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE SECOND-ORDER FACTOR MODEL. CRITERION VARIABLI =

		Residual value		
Predictor variable	Year	1965	1966	1967
S_1	1965	-.08	.01	.01
	1966	-.06	.02	.01
	1967	-.04	.04	.00
D_1	1965	-.07	.04	.04
	1966	-.07	.04	.05
	1967	-.07	.04	.05
D_2	1965	.07	-.03	-.07
	1966	.07	-.03	-.07
	1967	.07	-.03	-.07
$D_1 \times S_1$	1965	-.22	.07	.13
	1966	-.23*	.07	.13
	1967	-.24*	.07	.13
$D_1 \times S_4$	1965	.03	-.02	-.04
	1966	.03	-.02	-.03
	1967	.03	-.01	-.01
$D_3 \times S_6$	1965	-.06	.02	.03
	1966	-.06	.02	.03
	1967	-.06	.02	.03
$D_3 \times S_2$	1965	.17	-.01	-.18
	1966	.17	-.02	-.20
	1967	.16	-.04	-.21
$(S_2)^4$	1965	.23*	.00	-.36*
	1966	.25*	.00	-.39*
	1967	.25*	.03	-.38*

*P < .05

TABLE G-6

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE SECOND-ORDER FACTOR MODEL, CRITERION VARIABLE = U.S. FOREIGN DIRECT INVESTMENT

		Residual value		
Predictor variable	Year	1965	1966	1967
S_1	1965	.04	.04	.04
	1966	.04	.34*	-.34*
	1967	.04	.33*	-.34*
S_2	1965	.17	.02	-.11
	1966	.17	.02	-.11
	1967	.17	.02	-.11
D_1	1965	.12	.10	-.16
	1966	.12	.10	-.16
	1967	.12	.10	-.16
$S_1 \times S_6$	1965	.19	.20	-.28*
	1966	.20	.20	-.29*
	1967	.20	.20	-.30*
$D_1 \times S_1$	1965	.29*	.42*	-.56*
	1966	.30*	.44*	-.57*
	1967	.32*	.45*	-.59*
$D_1 \times S_6$	1965	.14	.14	-.21
	1966	.14	.14	-.21
	1967	.14	.14	-.21
$D_2 \times S_2$	1965	-.08	-.03	.07
	1966	-.07	-.04	.08
	1967	-.07	-.04	.08
$D_3 \times S_1$	1965	-.01	.14	-.12
	1966	-.02	.14	-.13
	1967	-.02	.14	-.13

*$P < .05$

TABLE G-7

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = INDEX OF FOREIGN MARKET SERVICE STRATEGIES

		Residual value		
Predictor variable	Year	1965	1966	1967
$D_2 \times E_7$	1965	.28	-.20	-.11
	1966	.28	-.20	-.11
	1967	.28	-.20	-.11

TABLE G-8

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = U.S. EXPORTS

		Residual Values		
Predictor variable	Year	1965	1966	1967
E_6	1965	-.09	.02	.04
	1966	-.08	.03	.04
	1967	-.08	.03	.05
$E_3 \times E_6$	1965	-.08	.02	.01
	1966	-.07	.03	.01
	1967	-.04	.05	.02
$D_1 \times E_2$	1965	-.25*	.06	.17
	1966	-.25*	.07	.18
	1967	-.25*	.07	.18
$D_1 \times E_6$	1965	-.27*	.07	.17
	1966	-.27*	.08	.18
	1967	-.28*	.09	.20
$D_1 \times E_7$	1965	.31*	-.10	-.20
	1966	.31*	-.10	-.20
	1967	.31*	-.10	-.20
$D_2 \times E_3$	1965	.00	-.01	-.03
	1966	.01	.00	-.02
	1967	.02	.02	-.01

*$P < .05$

TABLE G-9

CORRELATIONS BETWEEN OBSERVATIONS OF PREDICTOR VARIABLES AND RESIDUAL VALUES FOR THE ENVIRONMENTAL FACTOR MODEL. CRITERION VARIABLE = U.S. FOREIGN DIRECT INVESTMENT

		Residual values		
Predictor variable	Year	1965	1966	1967
$E_2 \times E_6$	1965	.24*	.37*	-.52*
	1966	.24*	.38*	-.52*
	1967	.25*	.39*	-.52*
$D_1 \times E_2$	1965	.27*	.38*	-.54*
	1966	.28*	.39*	-.54*
	1967	.29*	.39*	-.55*
$D_1 \times E_6$	1965	.22	.39*	-.55*
	1966	.23	.38*	-.51*
	1967	.25*	.42*	-.55*
$D_1 \times E_7$	1965	-.25*	-.42*	.55*
	1966	-.25*	-.42*	.55*
	1967	-.25*	-.42*	.55*
$D_2 \times E_7$	1965	.05	-.12	.08
	1966	.05	-.12	.08
	1967	.05	-.12	.08
$D_3 \times E_7$	1965	.02	-.06	.05
	1966	.02	-.06	.05
	1967	.02	-.06	.05

*$P < .05$

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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