An Exploratory Study of the Functional Forms of Export Market Identification Variables

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Abstract:

Exploratory research demonstrates that the import market potential, import market competitiveness, and "barriers-to-imports" variables can be successfully integrated into a shift-share framework for identifying export markets. The authors present managerial implications for global competitive strategy in exporting.

Article:

The export market selection process is acknowledged as one of the most important aspects of export market research (Cavusgil 1985). Craig and Douglas (2000) suggest that companies that systematically explore export opportunities exhibit higher export performance than those that do not. Specific performance-related benefits that stem from better export market selection include the scale and experience effects associated with a larger base of export sales. In addition, the exporter of a given product can benefit from market diversification by addressing the needs of different countries that are in different stages of the product's life cycle (Green and Allaway 1985).

The export market selection process is distinguished from foreign market selection or international market selection (Papadopoulos and Denis 1988) in that the latter pertain to the evaluation of markets for possible entry by means of modes in addition to export (e.g., foreign direct investment). Export market selection consists of three stages: screening, identification, and selection (Kumar, Stam, and Joachimsthaler 1994). In the screening stage, macrolevel indicators, such as political stability and sociocultural factors, are used to rule out countries that do not meet the firm's objectives. One such macrolevel indicator that exporters frequently use in this stage is the convertibility of a potential importing country's currency. Management of the exporting company might rule out any country whose currency is not freely convertible with other currencies.

In the identification stage, management uses variables that are specific to the product-based industry to generate a short list of countries that warrant further investigation in the selection stage. Examples of such variables are size and growth of the import market for the product in the country and competitiveness of the import market with respect to the product. In the final stage of the export market selection process (i.e., the selection stage), management uses firm-specific criteria (e.g., profitability, influence of the foreign market opportunity on the exporting firm's portfolio of exports) to make the final selection of one or more export markets from the short list generated during the export market identification stage.

This article focuses on the second stage of the export market selection process (i.e., the identification stage). Papadopoulos and Denis (1988) describe the approach that we take to export market identification as a "shift-share" approach. They refer to Green and Allaway's (1985) work as the only example of research on export opportunity identification that involves the use of shift-share analysis. Green and Allaway's article has been extolled in the literature as a pioneering work in the area. In their far-reaching review of various segments of the international marketing literature, Douglas and Craig (1992, p. 300) declare that Green and Allaway's work is the "only new approach in identifying new market opportunities."

A careful reading of Green and Allaway (1985) leads to the conclusion that their work does not explicitly address export market identification per se. Rather, it examines the identification both of products that have favorable export prospects and of product-market pairs that have high export potential. The export opportunity evaluations that Green and Allaway address could be viewed as logically preceding the identification of export markets because the output of the application of Green and Allaway's methodology in both of the preceding cases involves the selection of a product for further investigation. In contrast, product selection has already been completed by the time the export market identification process commences.

A concept that underlies Green and Allaway's (1985) methodology, and the concept that we adapt for use in our research, is one that they use in the selection of product-market pairs. This concept indicates that the larger a focal country's import market potential is for a specific product— import market potential for a product is evaluated by the shift-share analysis of country-level imports of the product— the greater is the probability that the associated product-market pair will be selected by the user of Green and Allaway's methodology. We posit that the variable that is created through the use of their method for the evaluation of the import market potential of a country with respect to a specific product is likely to correlate positively with the probability that the country will be chosen in the export market identification process regarding that product. We believe that both Papadopoulos and Denis (1988) and Douglas and Craig (1992) would concur with this because they seem to consider Green and Allaway's shift-share framework, which is a method for selecting product-market pairs, also suitable for accomplishing the identification of export markets.

In this research, we use inferential statistics to determine whether the import market potential variable and two other variables qualify as explanatory variables in their relationship to a dependent variable, which we argue reflects the outcomes of the export market identification process. The importance of this endeavor is confirmed by Russow and Okoroafo (1996), who contend that the output of "global screening models" needs to be subjected to inferential statistical analyses to establish the importance of the independent variables used in such models. To our knowledge, no other researcher has used inferential statistical analyses to validate any given (explanatory) variable as related to the output of any export market identification methodology that uses a shift-share framework.

In addition, we incorporate the import market competitiveness and barriers-to-imports variables into our shift-sharebased export market identification framework. Researchers (e.g., Kumar, Stam, and Joachimsthaler 1994; Wood and Goolsby 1987; Wood and Robertson 2000) have confirmed that these two variables are relevant to export market identification processes. In the "Methodology" section, we present the identities of the specific variables that we use and our justifications for using these variables for this purpose.

Furthermore, we propose an avenue for the validation of the output that our proposed export market identification methodology generates for a specific product in relation to the actual and subsequent market outcomes of the export market identification processes that real-world exporters of the product use. Czinkota (1991, p. 90) indicates that it "would seem worthwhile to further explore linkages between data [that are created by such a process] and ... [subsequent] business decisions." Essentially, Douglas and Craig (1992) voice the same sentiment.

The dependent variable that we use in our methodology is a surrogate variable that, for each specific exporting country, directly reflects the relevant outcomes of the export market identification processes that experienced exporters of specific products use. Thus, we are in a position to determine whether any (combination) of the three focal explanatory variables is related to the real-world outcomes of the export market identification processes that relevant exporters of a specific product use. In addition, we make this determination using inferential statistics in a procedure that is similar to stepwise regression with forward inclusion.

Of critical importance, the use of this procedure enables us to determine the "functional forms" of the three explanatory variables, as each is related to the dependent variable. A useful outcome of this assessment is that we can determine whether the signs associated with significant relationships are consonant with prior

expectations (e.g., a positive relationship between import market potential and the dependent variable, which would likely be posited in the light of Green and Allaway's [1985] work).

To illustrate the use of the methodology that we specify herein in an exploratory context, we apply our procedure to an analysis of data for two product categories, yarn-spinning products (Standard International Trade Classification [SITC] 7244) and weaving products (SITC 7245), and from the perspectives of two exporting countries, Germany and Japan. This application enables us to determine whether the methods that exporters implicitly use to evaluate the three explanatory variables in identifying export markets differ systematically according to the type of product being exported or the identity of the exporting country. Thus, we perform four separate analyses.

Given both the methodologically intensive nature of this exploratory research and Papadopoulos and Denis's (1988) statement about the relative paucity of articles in the literature that use the shift-share method to identify export markets, we do not provide a separate literature review. Instead, we reference the literature throughout the balance of the article. Following a discussion of the results and their limitations, we present implications for export managers, which lie primarily in the domain of global competitive strategy in export marketing. Finally, we state the main conclusion of the article, discuss several specific contributions of the research, and present some associated implications for further research.

METHODOLOGY

We detail the methodology used to perform this exploratory research in the following four subsections. First, we verbally describe the method for performing shift-share analyses in this research, and we present it mathematically. Second, we describe the source and character of the data we analyze and justify the choice of the product-based industries and exporting countries that we use in this exploratory research. Third, we discuss the method for the creation of each of the variables, paying particular attention to the possible functioning of the import market competitiveness and barriers-to-imports variables as possible "moderators" (Sharma, Durand, and Gur-Arie 1981) of the relationship between import market potential and the outcomes of the export market identification process. We conclude the methodology section with a model-building subsection, which details the statistical analyses we perform and discusses how models should be built as a result of the performance of the analyses. These models reflect the role of each of the three explanatory variables in influencing the outcomes of the export market identification processes in the four analyses.

Shift-Share Analysis

The shift-share methodology was first introduced into the marketing literature by Huff and Sherr (1967), who present this methodology as a tool for creating a variable that captures aspects of sales volume growth that are related to both absolute sales measures (stated in terms of dollars of sales revenues) and relative measures (stated in percentage terms). We subsequently present the mathematics that Huff and Sherr use in the creation of variables involved in the performance of shift-share analyses. The presentation culminates in the formulation of the "percentage net shift" variable, which, according to Green and Allaway (1985), gives the most meaningful view of changes in growth among members of a group.

In this exposition, there are m markets (corresponding to the number of trading countries), and the sales volume for each market is designated by V_i, where i ranges from 1 to m. The sum of all sales volume figures for each member of the market is presented as follows:

$$\sum_{i=1}^{m} V_i. \tag{1}$$

If it is specified that the beginning time period used in a shift-share analysis is t – 1 and the end time period is t, it is possible to compute the growth rate in sales volume of all markets taken as a whole, k, over the time period used as follows:

$$k = \frac{\sum_{i=1}^{m} V_{i,t}}{\sum_{i=1}^{m} V_{i,t-1}}. \quad (2)$$

The expected growth figure for a given market as of time period t is computed as follows:

$$E(V_{i,t}) = kV_{i,t-1}. \quad (3)$$

The net shift, Ni, for a given country market i is equal to the actual growth figure for country market i in the final time period, t, less the expected growth figure for country market i in time period t. The result is as follows:

$$N_i = V_{i,t} - E(V_{i,t}). \quad (4)$$

At this point, note that the sum of all positive and negative net shift figures equals zero and that the absolute value of the sum of the negative net shift figures equals the sum of the positive net shift figures. The total absolute net shift, S, is equal to the sum of the positive net shift figures (or the absolute value of the sum of the negative net shift figures):

$$S = \sum_{j=1}^{u} N_j^+, \quad (5)$$

where there are u country markets (taken from the overall total of m markets) that have positive net shift figures, N_j^+ .

The percentage net shift for a given country market, i, is calculated by the following:

$$R_i = \frac{N_i}{S} \times 100\%. \quad (6)$$

Note that the sum of the negative percentage net shift figures is equal to –100% and that the sum of the positive percentage net shift figures is +100%.

United Nations Export and Import Global and Bilateral Trade Data

We obtained the Personal Computer/Trade Analysis System (PC/TAS) CD-ROM, which has trade data for the years 1995– 1999, from the United Nations Conference on Trade and Development in Switzerland. The data in this CD-ROM were extracted from the Comtrade database that is maintained by the United Nations Statistical Division. We selected global and bilateral export and import trade data for product categories SITC 7244 and SITC 7245 for further analysis.

We chose these specific years on the basis of Green and Allaway's (1985) guidance and the content of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT). The Uruguay Round was formally agreed to by approximately 124 signatory countries on December 16, 1993, and was brought into enforcement by the creation of the World Trade Organization on January 1, 1995. Green and Allaway indicate that shift-share analysis is particularly useful when the years of selected data reflect the impact of a specific and influential economic event. We believe that the Uruguay Round of the GATT qualifies as such an event.

Of the one-, three-, four- and five-digit levels of SITC-based data that we could have chosen for analysis, we selected the four-digit level, in line with the advice of researchers such as Green and Allaway (1985), Green and Larsen (1986), and Gillespie and Alden (1989). According to Gillespie and Alden (p. 102), the five-digit level of aggregation "was considered too fragmented without providing much additional information." In addition, they rule out the three-digit SITC level of data, indicating that "the 3-digit approach ... was abandoned due to that level's aggregation of consumer and industrial goods under [individual] product categories" (p. 102).

Our choice of product-based industries for analysis (i.e., SITC 7244: yarn-spinning products; SITC 7245:

weaving products) reflects the notion that the global textile industry would be particularly affected by the passage of the Uruguay Round (Deng 1998). The Uruguay Round dismantles textile-based trade agreements between developing countries and developed countries. A politically visible example of such an agreement is the Multifiber Agreement, which to some extent protected U.S. textile producers from foreign competition until January 1, 2005 (Deng 1998). The choice of Germany and Japan as our exporting countries stems from the notion that these two countries were considered dominant exporters of the two product types when the magnitudes of relevant PC/TAS export trade flows by country were visually evaluated.

Creation of Variables for Analysis

Global export and import trade data for the product categories SITC 7244 and SITC 7245 for 1995–1998 for all countries whose trade in these products is reflected in PC/TAS were exported to Excel worksheets. We calculated the global import data value for a country with respect to a specific product by summing into one figure all imports of the specified product coming into the focal country from all relevant exporting countries. Similarly, we calculated the global export data value for a country with respect to a specific product by summing into one figure all of that country's exports of the focal product, measured across ultimate country destinations for the focal country's exports of that product.

Import Market Potential Variable. We calculated the import market potential variable by performing a shift-share analysis of global imports of each of SITC 7244 and SITC 7245 products, using the mathematical procedure specified previously for all countries that import these products and that have the results of these transactions reflected in PC/TAS. The beginning year for the shift-share analysis is 1995, and the end year is 1998. Given the absence of guidance in this domain in the literature, the choice of a three-year interval of data (rather than a two-year interval or a four-year interval, and so on) is arbitrary. The lack of guidance stems from the notion that, historically, shift-share analyses have been used for descriptive purposes only. Finally, as we described previously, we transform the raw dollar import net shift figures into percentage net shift figures.

Import Market Competitiveness Variable. There is widespread agreement among researchers that the competitiveness of a foreign market is an important factor to consider when an exporter is identifying export markets (see, e.g., Evirgen, Bodur, and Cavusgil 1993; Koh, Chow, and Smittivate 1993; Mohamed, Ahmed, and Honeycutt 2001). A key contention is that, all else being equal, the more competitive an import market is, the less appealing the market is to an exporter. For example, the more competitive an import market is, the greater the pressure will be on profit margins experienced by exporters that serve the import market.

In the literature, there are grounds for disagreement about the functional form of the relationship between the competitiveness of an import market and the outcomes of the export market identification process. Mohamed, Ahmed, and Honeycutt (2001) suggest that the "market conditions" (import market competitiveness) variable is separate and distinct from the "market attractiveness" (import market potential) variable in influencing the exporter's identification of one or more foreign markets. This tends to indicate that the import market competitiveness variable functions only in a "main effect" capacity in influencing the outcomes of the export market identification process.

In contrast, other researchers suggest that the import market competitiveness variable is related to the import market potential variable because the latter influences the outcomes of the export market identification process, and thus it should be presented as an integral part of the import market potential variable in this context. For example, in their taxonomic presentations, Wood and Goolsby (1987), Wood and Robertson (2000), and Cavusgil (1985) signify that the competitiveness of an import market is a component of the potential of an import market. Gupta and Govindarajan (2000, p. 48) provide insight into the functional form of the relationship between the import market competitiveness variable and the outcomes of the export market identification process when they state, "The ability to exploit [the potential of] a market is a function of two factors: the height of entry barriers, and the intensity of competition in the market."

This suggests that in some way, the competitiveness of an import market moderates (Cohen and Cohen 1983;

Sharma, Durand, and Gur-Arie 1981) the relationship between the potential of an import market and the outcomes of the export market identification process. If this logic is applied to the interpretation of the taxonomic presentations of Wood and Goolsby (1987), Wood and Robertson (2000), and Cavusgil (1985), it might be concluded that the competitiveness of an import market is an integral part of the market potential variable because it directly influences the ability of an exporter to exploit potential in a foreign market. Our treatment of the competitiveness of an import market in this research enables us to determine whether the import market competitiveness variable moderates the relationship between the import market potential variable and a variable that reflects the outcomes of the export market identification process.

We evaluate the competitiveness of an import market for a specific product through the creation of a surrogate variable that involves the shift-share analysis of country-level global export market data. We surmise that the more globally competitive export firms located in a given country (Country A) and exporting a given product are, the fiercer the competition will be for firms that are foreign to Country A and that want to serve Country A's import market for the product. This position is consonant with that of Root (1994), who uses the outcomes of the shift-share analysis of a group of countries' exports of a given product as relevant to evaluations of the attractiveness of each exporting country in the group as an import market for the focal product. In addition, the evaluation of the competitiveness of an import market in precisely this manner is justified and accomplished in the work of Williamson and colleagues (2005).

The import market competitiveness variable is created in a manner that is analogous to the method used in the creation of the import market potential variable. The beginning year for the shift-share analysis is 1995, and the end year is 1998. Remember that to derive the surrogate variable that directly reflects the competitiveness of an import market, we evaluate countries' global exports of the SITC 7244 and SITC 7245 products. We transform the raw dollar export net shift figures into percentage net shift figures.

Barriers-to-Imports Variable. We create the four-level barriers-to-imports categorical variable that we used in this research with a classification scheme that draws on the work of Balasubramanyam, Salisu, and Sapsford (1996). These authors classify developing countries as having either "import-substituting" or "export-promoting" trade regimes on the basis of whether the exchange rate used in a given developing country (as of the time of their research) to secure foreign exchange for importing goods is biased against imports (import-substituting country) or is trade neutral (export-promoting country). In the latter case, the exchange rate used to import goods is the same exchange rate used in the developing country's export sector. A third classification of an importing country in the four-level barriers-to-imports variable, which we created for the current research, consists of developed countries and is labeled as such. This classification consists of Western countries, such as the United States, Canada, Australia, Japan, and so forth. The fourth classification, which we also developed for the current research, is "other"; this classification consists largely of former Eastern European countries and non–Eastern European countries that were formerly in the Soviet Bloc.

Note that unlike the other two explanatory variables, which address issues in the competitive environment, the barriers-to-entry variable is not product specific, and it addresses issues in the regulatory environment. The barriers to imports that concern the manipulation of exchange rates to retard the inflow of imports are erected at the level of the economy of the country. Thus, any significant empirical results that involve the barriers-to-imports variable cannot shed light on the influence of import barriers that are specific to the relevant product categories (SITC 7244 and SITC 7245).

The Dependent Variable. The dependent variable we use in this research measures how much an importing country's share of the exporting country's (e.g., Japan's) portfolio of export markets for the focal product (e.g., SITC 7244) changes (increases or decreases) between 1998 and 1999. Such a computation involves measuring the exporting country's dollars of export revenues generated per importing country and transforming these revenue figures into proportions. When an importing country gains share in such a portfolio between 1998 and 1999, this presumably indicates that the importing country made the short lists generated in the export market identification processes by (in this example) Japanese exporters of SITC 7244 products more times in 1999 than

in 1998, compared with other foreign markets in the Japanese portfolio of export markets for this product. Thus, we present the change between 1998 and 1999 in an importing country's share of an exporting country's export portfolio for a given product as a metrically defined surrogate measure of the change between 1998 and 1999 in the probability that the focal importing country will make the short list of attractive export markets of any given exporter of the focal product from the specified exporting country, compared with similar probabilities for other importing countries in the identified exporting country's portfolio of export markets for the focal product.

Model Building

In this section, our objective is to determine the roles, if any, of each of the explanatory variables empirically addressed in this research in influencing the outcomes of the export market identification process. The role of an explanatory variable in this domain can be inferred from an evaluation of the functional form of the relationship between the explanatory variable and the dependent variable. In the context of this research, the "functional form" of a variable as it relates to the dependent variable has two dimensions: The first dimension pertains to whether the variable explains variation in the dependent variable as a main effect entity or as a part of an interaction effect with one or both of the other explanatory variables. The second dimension pertains to the sign of the parameter associated with the variable in an effect that is significantly related to the dependent variable.

Whereas the role of an explanatory variable as a main effect entity can typically be explained directly, the same is not necessarily true for an explanatory variable that is part of a significant interaction effect. To simplify discussions about significant interaction effects, we introduce the concept of moderator variables (Cohen and Cohen 1983; Sharma, Durand, and Gur-Arie 1981). A moderator variable is a variable that influences the relationship between two other variables. A moderator variable can be classified as either a "pure" or a "quasi" moderator variable, depending on whether the moderator variable is independently related to the dependent variable (Sharma, Durand, and Gur-Arie 1981). A pure moderator variable influences the relationship between an independent variable and a dependent variable but has no direct influence on the dependent variable. In contrast, a quasi moderator variable not only influences the relationship between an independent variable and a dependent variable but also has a direct and independent influence on the dependent variable.

Formulation of the Import Market Competitiveness Variable as a Two-Level Ordinal Variable. To explore and characterize clearly how the import market competitiveness and barriers-to-imports variables influence (1) the relationship between the import market potential variable and the dependent variable and/or (2) the dependent variable (as possible pure or quasi moderator variables), the import market competitiveness and barriers-to-imports variables need to be formulated as multilevel variables. Such formulations enable us to establish both the significance and the sign of the relationship between the import market potential variable and the dependent variable at each level of any interaction effect that is significantly related to the dependent variable and that involves the import market potential variable and at least one of the two moderator variable candidates (to determine the circumstances under which a moderator variable candidate that is a continuous variable should not subsequently be transformed into a discrete, multilevel variable for analysis, consult Baron and Kenny 1986).

Because the barriers-to-imports variable is already a four-level categorical variable, no further reformulation is necessary for that variable. The reformulation of the import market competitiveness variable involves the creation of a two-level ordinal variable. To hedge against a possible small cell size problem, we create the two-level variable by using the sample median of the import market competitiveness variable rather than the sample mean. If there were any material skewness in the values of the metrically defined import market competitiveness variable, possibly caused by a small number of countries either gaining or losing significant share of the global export market for the product, use of the sample mean of the import market competitiveness variable would lead to a small cell size problem for one level of the resulting two-level ordinal variable.

Guidance in the Literature for Establishing the Functional Forms. The only guidance that we found in the literature for establishing the functional forms of the independent variables as they explained variance in the dependent variable was a model reduction procedure (Anderson-Cook 2001). This procedure entails having as a

starting point a model that includes all of the main effects and interaction effects that can possibly be made with relevant, metrically defined explanatory variables. The procedure calls for the stepwise elimination of each effect whose deletion would not significantly reduce the fit of the model until the point is reached when the elimination of any of the remaining effects would significantly reduce the fit of the model.

A problem with this procedure in our situation is that there are more than 20 parameters associated with the seven possible effects (three main effects, three two-way interaction effects, and one three-way interaction effect) that could serve as the starting point. Because it is likely that we will have far fewer than five country observations per parameter to be estimated when evaluating data for either of the SITC 7244 (yarn spinning) or SITC 7245 (weaving) product-based industries, we would encounter problems establishing the estimates of each of the parameters in the resulting models if we were to use Anderson-Cook's (2001) methodology.

Our Procedure for Establishing the Functional Forms. We developed a procedure for establishing the functional forms of the relationships between each of the three explanatory variables and the dependent variable while accommodating the characteristics of our situation. Our procedure is similar to stepwise regression with forward inclusion. However, unlike stepwise regression with forward inclusion, which typically involves the addition of metrically defined explanatory variables for evaluation of the unique explanatory power of each, we test the explanatory power of each of the seven effects (main and interaction) whose creation involves all possible combinations of one metrically defined explanatory variable (import market potential) and two multilevel explanatory variables (import market competitiveness and barriers to imports).

Two issues need to be brought to light regarding the use in this research of a procedure that resembles stepwise regression. First, Menard (1995, p. 54) indicates that stepwise procedures are appropriate when conducting exploratory research. Second, in this type of exploratory research, when a procedure that is similar to stepwise regression is used to evaluate each effect for possible entry into a given model, the data determine the order of entry of effects, regardless of whether any given effect is a main effect or an interaction effect. In other types of research that are not of an exploratory nature, levying the requirement that only interaction effects (or main effects) need to be considered for entry first might be justified.

We measure the explanatory power of an effect by using the adjusted R-squared criterion, which is particularly useful whenever the sample size is relatively small in relation to the number of parameters to be fitted in the model. The details of our procedure are specified in the following four steps:

1. Formulate all possible main and interaction effects involving the metrically defined import market potential variable, the four-level categorically defined barriers-to-imports variable, and the two-level ordinally defined import market competitiveness variable. (In this case, there are seven possible effects.)

2. Regarding inclusion of the first effect into the model, choose the effect that generates the greatest increase in the adjusted R-squared figure, subject to the inclusion of the effect meeting the .05 significance criterion.

3. For each succeeding effect, include the effect that generates the largest incremental adjusted R-squared figure, while eliminating the influence of each effect that has already been included in the model and ignoring the influence of each effect that has not yet been included in the model, subject to the focal effect meeting the .05 significance criterion.

4. The procedure for including new effects into the model ceases when no effect not already included in the model meets the .05 significance criterion for inclusion into the model.

Step 3 eliminates possible multicollinearity problems in that the evaluation of an effect for possible inclusion into the model involves making an adjustment for the effects that have already been included in the model.

A final issue to consider before we present the results of the statistical analyses pertains to a statement of the

conditions under which a multilevel explanatory variable is established as a moderator variable, regardless of whether the moderator is deemed to be a pure or quasi moderator variable. The relevant statistical test pertains to the evaluation of the "homogeneity of (regression) slopes" (see Sullivan and D'Agostino 2002; Thomas 1993) for the relationship between the import market potential variable and the dependent variable when assessed across the levels of the multilevel variable being tested as some type of moderator. If there is heterogeneity of slopes (using a significance level of .05), whether the multilevel explanatory variable is also significantly related to the dependent variable can be noted to determine whether the moderator variable is a pure or quasi moderator variable (Cohen and Cohen 1983; Sharma, Durand, and Gur-Arie 1981).

RESULTS OF THE STATISTICAL ANALYSES

For our starting sample, we selected only the top 50 countries (as measured in dollars of import revenues) that imported the focal product type (SITC 7244 or SITC 7245) on the basis of the import data for the 1995–1999 period. For each of the two product categories, the value of imports of the 50 largest importing countries as a group exceeded 93% of the total value of world imports of the product. In 1999, the 50 largest importers of SITC 7244 products were responsible for imports valued at $3,167.1 million (the global total was $3,383.1 million). The other 79 importing countries were responsible for $216.0 million in import revenues. Similarly, in 1999, the top 50 importers of SITC 7245 products were responsible for $3,558.6 million (the global import total was $3,814.8 million). The other 85 countries were responsible for $256.2 million in import revenues.

However, some of the import data for key years (1995 and 1998) for several countries for each of the two four-digit SITC codes were missing. We deleted six countries (Belgium, Bangladesh, Saudi Arabia, Ecuador, Egypt, and Russia) for SITC 7244 and four countries (Bangladesh, Nigeria, Slovenia, and Russia) for SITC 7245 because of missing data in either of these two key years. We omitted Japan and Germany as importing countries so that the results would relate to the same set of importing countries in each of the four procedures. In addition, we eliminated Chile in the Germany SITC 7244 procedure because of inadequate cell size considerations. This necessitated the elimination of one of the eight levels of the significant three-way interaction effect, which was the sole effect that qualified for inclusion into the model of German exports of SITC 7244 products (see the "Limitations" section). A summary of the results of the four procedures appears in Table 1.

Before discussing the empirical outcomes of the analyses, we need to interpret the different types of statistical results in Table 1. To achieve this, we must consider the results for German exports of SITC 7244 products in Table 1. There are two different types of results. The most fundamental type of result is the one pertaining to the effect of the interaction among import market potential, competitiveness, and barriers to imports. This three-way interaction effect was the only one of the seven possible effects that qualified for inclusion into the model of German exports of SITC 7244 products. The significance of this interaction in its relationship to the dependent variable is .0175, and the associated F value is 2.91. Note that there are seven levels associated with this three-way interaction effect (as we previously stated, one level was deemed to be inestimable because of inadequate cell size considerations).

In this seven-level interaction effect, there are seven individual estimates of parameters and associated statistics that reflect the character and significance of the relationship between the import market potential variable and the dependent variable at each of the seven individual effect levels. For example, the estimate of this relationship for all countries that both have import-substituting trade regimes and are below the sample median in import market competitiveness is .1508, reflecting a positive relationship between the import market potential variable and the dependent variable at this effect level. The associated t-value, 2.33, has a significance level of .0264. The substantive meaning behind this result is that over the 1998–1999 period, German exporters of SITC 7244 products tended to identify new export markets in direct proportion to their measured import market potential, regarding country markets that were both import substituting and below the sample median in import market competitiveness.

In contrast, the estimate of the relationship between the import market potential variable and the dependent variable for countries that both are "other" countries and are at or above the sample median in competitiveness

is –.2339, with a t-value of –3.55 and an associated significance figure of .0012. This result means that over the 1998–1999 period, German exporters of SITC 7244 products tended to identify new export markets for this group in inverse proportion to their measured import market potential. That is, they tended to avoid the country markets with high measured import market potential and instead identified export country markets with lower measured import market potential.

A: Japanese Exporters[a]

SITC	Source	d.f.	Sums of Squares	Mean Squared	F Value	*p* > F	Parameter	Estimate	SE	t-Value	$p > \lvert t \rvert$
7244											
	P × B	4	.0053	.0013	12.14	<.0001					
R^2 = .57; adjusted R^2 = .53											
							Intercept	–.0003	.0017	–.19	.8494
							P (IS)	.0141	.0393	–.36	.7221
							P (EP)	–.1672	.0390	–4.29	.0001
							P (DC)	–.1437	.0312	–4.61	<.0001
							P (Ot)	–.1535	.0547	–2.81	.0079
7245											
	P × C × B	8	.0151	.0019	16.74	<.0001					
R^2 = .79; adjusted R^2 = .75											
							Intercept	–.0000	.0018	–.00	.999
							P (IS × L)	–.0932	.0973	–.96	.3451
							P (EP × L)	.9009	.1853	4.86	<.0001
							P (DC × L)	.1484	.1514	.98	.3338
							P (Ot × L)	–.0016	.5993	–.01	.9919
							P (IS × G)	–.0154	.0676	–.23	.8212
							P (EP × G)	–.3758	.0468	–8.04	<.0001
							P (DC × G)	–.3903	.0633	–6.17	<.0001
							P (Ot × G)	.0058	.0264	.22	.8280

Table 1.
Results of Procedures When Applied to Exporters of SITC 7244 and SITC 7245 Products

B: German Exporters[b]

SITC	Source	d.f.	Sums of Squares	Mean Squared	F Value	p > F	Parameter	Estimate	SE	t-Value	p > |t|
7244											
	P × C × B	7	.0031	.0004	2.91	.0175					
R^2 = .38; adjusted R^2 = .25											
							Intercept	–.0019	.0022	–.89	.3816
							P (IS × L)	.1508	.0649	2.33	.0264
							P (EP × L)	–.0230	.0467	–.049	.6254
							P (DC × L)	.1603	.3757	.43	.6723
							P (Ot × L)	–.0229	.5212	–.04	.9651
							P (IS × G)	–.1228	.0721	–1.70	.0982
							P (DC × G)	–.0155	.0375	–.41	.6815
							P (Ot × G)	–.2339	.0659	–3.55	.0012
7245											
	P	1	.0010	.0010	9.53	.0036					
R^2 = .19; adjusted R^2 = .17											
							Intercept	.0008	.0015	.51	.6157
							P	–.0576	.0187	–3.09	.0036

[a]Dependent variable: An importing country's change in share of Japan's portfolio of SITC 7244 (or 7245) exports between 1998 and 1999.
[b]Dependent variable: An importing country's change in share of Germany's portfolio of SITC 7244 (or 7245) exports between 1998 and 1999.
Notes: P = potential of the import market for SITC 7244 (7245) products, measured by the shift-share analysis of the country's imports of SITC 7244 (7245) products over the 1995–1998 period. C = competitiveness of the import market for SITC 7244 (7245) products, measured by the shift-share analysis of the importing country's exports of SITC 7244 (7245) products over the 1995–1998 period (levels: L = below the sample median in competitiveness of the import market; G = at or above the sample median in competitiveness of the import market). B = barriers to imports of products coming into the importing country. The type of country is evaluated with a characterization of the importing country's trade policy (levels: IS = developing countries with an import-substituting trade policy; EP = developing countries with an export-promoting trade policy; DC = developed countries; and Ot = other countries).

Table 1. Continued

DISCUSSION OF THE RESULTS

First, the results show why any incipient shift-share-based literature about the use of import market potential as the sole explanatory variable for identifying export markets has been essentially dormant for 20 years. The results do not provide any evidence in support of a key relationship that Green and Allaway (1985) would likely

have hypothesized to exist. This hypothesized relationship is a positive relationship between the import market potential variable as a standalone, main effect entity and the dependent variable. The negative result tends to discredit the prospects for identifying export markets with a shift-share framework that uses only one explanatory variable (i.e., the import market potential variable).

Second, there is a prevalence of interaction effects among the significant effects. In each of the four procedures, only one effect is identified as meeting the criteria for inclusion into the model (for a discussion of these criteria, see the "Methodology" section). Three of the four significant effects are interaction effects involving the import market potential variable, and two of the three significant interaction effects are three-way interactions. The results tend to confirm Gupta and Govindarajan's (2000) implied presentation of the import market competitiveness and barriers-to-imports variables as moderator variables of the relationship between import market potential and the dependent variable. Only Brasch (1979) explicitly predicts that the three focal explanatory variables would combine interactively to explain variation in a similar dependent variable. These results are a reminder of the importance of Russow and Okoroafo's (1996) previously stated warning that when countries are screened in this fashion, it is important to test for the possibility that two or more of the explanatory variables are related to each other. Such an outcome requires the export market analyst to treat the variables in each significant interaction effect jointly rather than separately (i.e., as main effects).

There is evidence in the literature that appears to explain the prevalence of interaction effects in the results. For example, such evidence is found in a review article that examines the integration of knowledge about the export marketing information system (Leonidou and Theodosiou 2004). In characterizing the utilization of export information as the most important dimension of export information behavior, Leonidou and Theodosiou (2004, p. 29) state that "there are many contingency factors that determine which export information is taken into consideration, and in what way." We contend that the results we present herein provide support for this statement and that the import market competitiveness and barriers-to-imports variables are excellent examples of the contingency factors to which Leonidou and Theodosiou allude.

Third, there is wide variation in the explanatory power of the significant effects across the four procedures. The adjusted R-squared figures for the resulting four models range from .17 to .75. The figures for the models of the Japanese exporters (.53 and .75) tend to be higher than those for the models of the German exporters (.17 and .25). There is at least one possible reason that might be used to explain this: German exporters of SITC 7244 and SITC 7245 products may exhibit greater heterogeneity than their Japanese counterparts in responding to relevant changes in the competitive environment (e.g., import market potential and competitiveness) when they identify export markets. Substantiation for this contention can be found in the work of Grein, Craig, and Takada (2001), who conduct empirical research on the strategies that Japanese and European (including German) automobile manufacturers use. Their results show that Japanese manufacturers use more homogeneous strategies than do their European counterparts, suggesting that Japanese firms react to market conditions in more similar ways than do their European competitors.

Fourth, the import market potential variable exhibits different functional forms in its relationship to the dependent variable in different parts of the analyses that appear in Table 1. We point to specific results in Table 1 in identifying different functional forms of different relationships between the import market potential variable and the dependent variable. In addition, we refer to sources in both the export marketing literature and the more broadly defined international business literature to provide possible explanations for the existence and nature of these relationships.

For example, as a main effect, the import market potential variable is negatively related to the dependent variable. In the results for German exports of SITC 7245 products, there is a negative relationship between import market potential and the dependent variable. Kim and Mauborgne (1988) provide a possible rationale for this result: A company identifying export markets may decide to avoid countries in which margin pressure is greatest. In this case, the margin pressure may have been greatest in countries that exhibited the highest gain in global import market shares (i.e., highest import market potentials) over the relevant (1995–1998) time period.

In addition, the relationship between the import market potential variable and the dependent variable is moderated by the barriers-to-entry variable. In the results for Japanese exports of SITC 7244 products, we observe a negative relationship between import market potential and the dependent variable for all types of countries, except those that had import-substituting trade regimes. Japanese exporters of these products lost share of the global export market over the relevant (1995–1998) period, thus necessitating that they be characterized as relatively uncompetitive in exporting these products as of the end of this period. Such a lack of competitiveness may explain the notion that during the 1998–1999 period, they tended to avoid identifying export markets in which the margin pressure might have been deemed to be excessive, namely, the export markets with the greatest import market potential as measured over the 1995–1998 period.

The lack of a relationship between import market potential and the dependent variable for Japanese export markets having import-substituting trade regimes could have been predicted on the basis of an assessment of the empirical results of Green and Larsen (1986), who perform shift-share analyses on the impact of a disruption in the economic environment on the product import structures of three countries (Brazil, Mexico, and Nigeria) that had import-substituting trade regimes as of 1996 (Balasubramanyam, Salisu, and Sapsford 1996). Green and Larsen conclude (p. 8) that "the import changes which characterized the three nations did not occur under free market conditions" and that "increases and decreases in import share ... essentially represent government decisions with regard to the nature of the imported goods." In light of this result, the lack of a significant relationship between import market potential and the dependent variable regarding import-substituting countries and for Japanese exporters of SITC 7244 products is comprehensible.

Finally, the import market competitiveness variable appears to perform as a "partner" variable for the import market potential variable in its relationship to the dependent variable. In the two significant three-way interaction effects, there are five separate levels of the effects for which there are significant relationships between import market potential and the dependent variable. In each of the three significant effect levels for which the import market is at or above the sample median in competitiveness, there is a negative relationship between the import market potential variable and the dependent variable. Kumar, Stam, and Joachimsthaler (1994, p. 34) shed light on this result, stating that "a country may represent a large market but ... [not be appropriate for further exploration] ... based upon the [high] level of competition." In each of the two significant effect levels for which the import market is below the sample median in competitiveness, there is a positive relationship between the import market potential variable and the dependent variable. Makhija, Kim, and Williamson (1997, p. 705) provide insight into this finding, stating that "import dominated industries may reflect a loss of competitiveness in the industry."

Fifth, the import market competitiveness and barriers-to-imports variables perform as pure moderators of the relationship between import market potential and the dependent variable. Neither the import market competitiveness variable nor the barriers-to-imports variable is viewed as being independently related to the dependent variable in any of the four procedures. Import market potential, a metrically defined explanatory variable, is viewed as having significantly different correlations with the dependent variable at various levels of competitiveness and barriers to imports in the results of three of the four procedures. In other words, competitiveness and barriers to imports tend to influence only the cause-and-effect relationship between the import market potential variable and the dependent variable and appear to have no independent effect on the dependent variable (Cohen and Cohen 1983; Sharma, Durand, and GurArie 1981). From a substantive point of view, competitiveness and barriers to imports are viewed as primarily providing the exporter with "contextual guidance" on how to respond to the apparent potential of an import market when identifying a short list of attractive export markets for further evaluation in the export market selection process.

Sixth, a generalization can be made about results across individual effect levels. The generalization does not pertain to results that are measured across main or interaction effects in their entirety but rather to results that are measured across individual effect levels. This is related to the previous discussion point that the import market competitiveness variable appears to perform as a partner variable for the import market potential variable in its relationship to the dependent variable. The form of the partnering relationship holds for each of

the five significant effect levels in which import market competitiveness is a component variable across both types of products and types of exporting countries.

LIMITATIONS

Our results and discussion are tempered by several limitations. First, the results may be shaped by the arbitrary choice of the specific time interval (1995–1998) of international trade data that we used for the creation of the import market potential and import market competitiveness variables.

Second, the results for the Germany SITC 7244 procedure reflect the deletion of Chile from the sample. This is because Chile was the only country in the sample that both had an export-promoting trade regime and was at or above the sample median in competitiveness of the import market. Thus, the associated parameter could not be estimated because of insufficient observations for that cell.

Third, the explanatory variables used in this research are single-item variables and thus, on the surface, appear to lack the multifaceted richness of similar variables that Wood and Goolsby (1987) and Wood and Robertson (2000) present. This may cause the reader to be wary of overinterpreting the results. A possibly fruitful avenue for addressing this limitation could include a longitudinal study and in-depth qualitative analyses for selected products.

Fourth, our results lack generalizability to foreign market selection and entry with modes other than exporting (e.g., foreign direct investment). Finally, the two industries we chose for empirical investigation (SITC 7244 and SITC 7245) are part of the textiles machinery industrial group, thus potentially limiting the generalizability of the results to other industries.

MANAGERIAL IMPLICATIONS

There are managerial implications of our results in the domain of global competitive strategy. The first implication is directly related to the subject of this article, namely, the identification of export markets. Our framework for analysis can be used by firms that either are new to exporting or are entering into a phase of significant multinational market expansion (Ayal and Zif 1979). Firms that meet either of these two qualifications are going to be involved in adding one or more new export markets to their portfolios. Managements in these firms can use the analytical framework to determine how potential competitors from different countries (e.g., Japan, Germany) are likely to respond to changes in the competitive environment in adding export markets. To illustrate this, Table 2 presents a description of the likely responses of Japanese exporters of SITC 7245 products to changes in the competitive environment that occurred during the 1995–1998 period. Exporters of SITC 7245 products can use this information to "concentrate mass at pivotal positions" (Kotler 2003, p. 260) in selecting countries for additions to their own portfolios.

Type of Country	Level of Competitiveness of Import Market	Likely Response
Export promoting	Low	Will add countries with the highest import market potential.
Export promoting	High	Will avoid countries with the highest import market potential.
Import substituting	Low	No prediction
Import substituting	High	No prediction
Developed	Low	No prediction
Developed	High	Will avoid countries with the highest import market potential.
Other	Low	No prediction
Other	High	No prediction

Table 2. Likely Responses of Japanese Exporters of SITC 7245 Products to Changes in the Competitive Environment

The second implication for management concerns firms that are reallocating resources among country export markets that they already serve. Table 1 presents a summary of how Japanese and German exporters of SITC 7244 and SITC 7245 products reallocated their resources across export markets in 1999 versus 1998 and in response to changes over the 1995– 1998 period in the potential and competitiveness of these markets. A positive sign for a parameter estimate reflects (when the associated relationship is significant) a reallocation of resources across export markets in direct proportion to the measured potential of the import markets. Conversely, a negative parameter estimate indicates a reallocation of resources across export markets in inverse proportion to the potentials of the import markets.

Reallocation of resources away from a market with high potential, even total withdrawal from such a market, is not unusual and does not necessarily reflect weakness. Pauwels and Matthyssens (1999, p. 31) make this point when they indicate that "[a]n international withdrawal may be a proactive decision that optimizes a firm's international market portfolio in response to dramatic environmental changes." Environmental changes that we have addressed in this research are clear (i.e., changes in import market potential and import market competitiveness).

CONCLUSION AND SPECIFIC CONTRIBUTIONS OF THE RESEARCH

The main conclusion of the research is that the potential and the competitiveness of a country's import market with respect to a product and the country's barriers to imports (in general) can be successfully incorporated into a shift-share model that is used to identify export markets. In addition, this research provides insight into how a given country's exporters of a specific product evaluate (some combination of) the three criteria to identify export markets. Russow and Okoroafo (1996) criticize existing methods for identifying potential markets in that these methods do not give guidance on how to evaluate the criteria that they used. In the current research, guidance comes from an assessment of the functional forms of the three explanatory variables in the main and/or interaction effects that explain variation in the dependent variable. These effects give guidance on how a specific country's exporters of a specific product combine (some subset of) the variables to identify export markets. The export analyst can pick and choose from the results of one or more exporting countries in structuring a methodology to identify export markets for the focal product. Note that the export analyst's picking and choosing activities will likely be shaped by the global competitive strategy of the associated exporting firm.

This point leads to another specific contribution of this research; namely, it provides a potential link between the export market identification literature and the global competitive strategy literature. Kumar, Stam, and Joachimsthaler (1994, p. 32) criticize quantitative methods for selecting foreign markets on the grounds that such methods have a "lack of strategic considerations in the foreign market selection process." The "Managerial Implications" section of the current article shows how the methodology we use rectifies this problem and, in doing so, provides a bridge between the export market identification literature and the global competitive strategy literature.

Furthermore, this research establishes the utility of shift-share analysis in an inferential statistical context. Historically, shift-share analysis has been limited to use in descriptive research. In this research, shift-share analysis is used to create variables that can be used to test hypotheses.

Finally, this research potentially reduces the amount of information that exporters must deal with in the identification of export markets. Wood and Goolsby (1987, p. 52) comment on the results of their empirical research, identifying "[i]nformation overload [as the] ... most frustrating aspect of foreign market analysis." Leonidou and Theodosiou (2004) confirm this sentiment. The results of this research tend to ameliorate the problem: As much as 75% of the variation in the export market identification outcomes that we empirically addressed in this research is explained by only three variables.

IMPLICATIONS FOR FURTHER RESEARCH

There are four implications for further research in this area. First, similar research should address a wider

variety of products (e.g., consumer durables) and exporting countries.

Second, further research should address the issue of how variations in the length of time between a relevant major economic event (e.g., the passage of the Uruguay Round of the GATT) and the time period used to reflect changes in the identification of export markets by exporters of a specific product and from a given country influence the strength and character of the empirical results. For example, it could be conjectured that the more distant the decision time period is from the relevant major economic event, the weaker the results will be, as measured by the adjusted R-squared figures.

Third, the issue of export competitiveness of firms in the focal exporting country (e.g., Japan or Germany) can be related to the strength and character of the results that are forthcoming. Although this dimension was not empirically addressed in this research, it could be hypothesized that the more competitive a country's exporters of a specific product are, the greater will be the tendency of those firms to identify foreign markets with high import market potential.

Fourth, research should be done to determine the optimal length of the time interval of export and import trade data to use in the creation of the import market potential and import market competitiveness variables through shift-share analysis. A likely outcome of this determination is the generation of the largest R-squared figures that might result from associating these variables with a dependent variable that reflects the outcomes of the export market identification process.

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