Beyond the Shift-share Model

- A Proposed IMS Model for Export

by

Hong Bin, Chen. B.Sc

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the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of
Master of Management Studies

School of Business

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- A Proposed IMS Model for Export**

submitted by Hong Bin, Chen, B. Sc
in partial fulfillment of the requirement for
the degree of Master of Management Studies

Thesis co-supervisor

Thesis co-supervisor

Director, School of Business

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Abstract

This thesis clarifies some uncertainties over the shift-share model in the IMS (international market selection) context, and develops a new IMS model for export. Empirical tests were conducted within 17 OECD countries in the three selected product categories for both Canada and China. Results show that the model, with proper weighting scheme, has a relatively strong predictive power over the future market development.

This research also provides some exploratory evidence of both country specific and product specific effects on market selection. Preliminary findings have justified the marketing research efforts on a country specific and product specific basis.

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1. Introduction

International trade accounts for about one third of Canada's GDP and plays an important role in economic development. On the one hand, trade liberalization, typically accompanied by privatization and deregulation, signals a single world market and provides Canada with far more opportunities. On the other hand, the world market is becoming more and more complex and Canadian firms are facing keen competition abroad. This shows that globalization has become a problem of "survival" instead of "choice". In the internationalization process of a firm, in most cases, export is the first stage. Export success will help firms accumulate relevant experience and gain confidence. Also, exporting is becoming increasingly important in the world economy as national economies become more involved in supplying and servicing foreign markets. Many studies find that export expansion contributes to national economic growth (Bahmanios, 1993; Rva, 1993; Paul, 1995). The exploration of export opportunities then becomes crucial in enhancing international competitiveness at both the firm and country levels.

The first and most important move in export strategy is market selection. Systematic market selection, as a part of a firm's strategic decisions, contributes to export success, while the wrong choice can put firms in an unfavorable position. Further, for small and medium enterprises (SMEs), due to some inherent limitations, the issue becomes even more important. However, empirical studies show that few firms use systematic approaches in international market selection (IMS).

The purpose of this research is to explore and test an IMS model for firms in a specific exporting country to use to identify product-related export markets. An in-depth review of existing IMS models identifies three general approaches: decision-making, grouping, and estimation models. Some of the drawbacks of these underlying models include the absence of simplicity, generalizability, product specificity, predictive power and longitudinal stability. Papadopoulos (1987) argued that this is why, to a certain extent, all these models failed in real implementation. Among them, the shift-share model (Green and Allaway, 1985) for export market selection, at first, appeared to provide the most promising research area because of its simplicity, product specificity and cross-industry generalizability. However, preliminary mathematical analysis in this research illustrated that the shift-share model was not well grounded theoretically as a predictive tool and thus could be quite misleading in market selection. Further empirical tests in an IMS context confirmed this finding. Based on the relevant theory in mode of entry (MOE), a proposed *potential-barrier tradeoff* model for export market selection was then developed and tested. The proposed model is a product-specific, prescreening model at the country level in a strategic context. It provides a more complete and precise picture in IMS. Empirical tests within 17 OECD countries in three industries showed that the model, with proper weighting scheme, had relatively strong power in predicting the development of import markets. Tests also provided some evidence of both country-specific and product-specific effects on market selection. Findings have justified the marketing research efforts on a product-specific and country-specific basis.

The research will provide benefits both to firms and to academic researchers: for academics, the research has clarified uncertainties about the shift-share model and has explored a new perspective for IMS with some empirical studies. For firms, since the proposed model is simple, inexpensive, product-specific, and proved to be predictive, it should provide a useful and powerful tool that firms can use for preliminary screening of export markets.

The research will start with an exploration of IMS role in the export marketing process and an in-depth review of existing IMS models. Next, it will explore the statistical basis of the shift-share model and will provide some empirical tests in an IMS context. The research will then propose and test a new multi-factor *potential-barrier tradeoff* model, at a country level which can be used for preliminary product-specific export market screening. Discussions and implications of empirical results will be presented later. The final section of the thesis will cover benefits and limitations of the research, and will discuss some directions for the future study.

2. Export Development

2.1 *Globalization of World Trade*

The globalization of markets is one of the major forces impacting on companies worldwide (especially in the 1990's) along with tremendous political changes. Trade liberalization, meaning the opening of many countries to international trade, has led to many new countries joining the global market more actively than before, on both the import and export sides. Government deregulation reduces regulatory activities and aims at allowing market forces more influence. Deregulation is typically accompanied by trade liberalization and the opening of markets for foreign competitors. In addition, privatization, occurring in most countries over the world, invariably leads to further trade liberalization and deregulation. All these effects generate increased opportunities for international companies.

Another important trend is the changing extent of regionalization of international trade. Traditionally, the seven main regions in the world refer to Western Europe, Eastern Europe, North America, Latin America, Asia, Africa and Middle East. Now, there exist many trading blocs within or sometimes beyond one region, NAFTA¹ in North America, EU² and EFTA³ in Europe, etc.. The structure also keeps changing. It seems that more and more preferential trade agreements, which are not always regionally based, have been reached. Regionalism and multilateralism both have been reinforcing and will continue to mutually reinforce international trade in a more liberal direction.

¹ North American Free Trade Agreement

² European Union

³ European Free Trade Association

The nations of the world continue to move toward freer trade as evidenced by the successful conclusion of the Uruguay Round of the General Agreement on Tariffs and Trade⁴. Total world trade in different sectors is expanding greatly and is expected to grow at a fast rate. In 1994, global trade reached US\$ 4184.6 billion, 14% up from that of 1993 (Direction of Trade Statistics, IMF 1995). Rapid growth of all markets, including the formerly socialist East bloc, Latin American countries and other industrialized regions, provides international exporters far more opportunities (Norton, 1994).

These changes have increased the importance of global and international marketing for many firms. Internationalization is important and fast becoming an issue of "survival" rather than "choice". Reasons behind the need to "go international" are related to product development, fleeing recessions, extended product life cycles, the disappearance of protected domestic markets or saturated domestic markets, and so forth (Papadopoulos, 1987).

2.2 Exports in the Firm's Internationalization Process

Export marketing refers to the integrated marketing of goods and services which are produced in a foreign country (Keegan, 1974). Export entry modes can be divided into direct and indirect methods. Markets can be accessed through a domestically located (in the exporter's country of operation) intermediary. The approach is called indirect exporting. The common types of intermediaries are brokers, combination export managers, and manufacturers' export agents (Jansen, 1993). A company may engage in

⁴ Now WTO (World Trade Organization)

direct exporting when it exports through intermediaries located in foreign markets. The exporter may select from two major types of intermediaries: agents and merchants. The exporting company may also establish its own sales subsidiary as an alternative to independent intermediaries, or sell direct to end-customers.

It is argued that decisions on how to penetrate into a foreign market are based on an evaluation of alternative entry methods (Fayerweather 1969; Keegan 1974; Terpstra 1972). Exporting is generally regarded as the dominant mode of entry. As shown in *Figure 1*, export marketing is the first stage on a firm's internationalization process, with the lowest commitment and risk exposure. Exporting allows a company to centrally manufacture its products for several markets and therefore to obtain economies of scale. The marginal profitability of exports tends to be high. In addition, in the face of factors such as foreign political instability, the company also retains the flexibility of switching the geographic direction of its operations with minimal disruption (Leontiades, 1985).

Figure 1 Global Market Entry Strategies

There are two somewhat opposing views concerning a firm's foreign market entry mode decisions: the internationalization (gradual involvement) view and the contingency (strategy/selective choice) view. The rationale of the gradual internationalization model is based on a firm's desire to minimize risk. A firm is likely to enter a particular foreign market initially by a low resource commitment entry mode, to minimize the risk of foreign market involvement. This choice is also attributed to the lack of experiential knowledge by the firm and the uncertainty associated with the decision to internationalize (Johanson and Vahlne, 1977; Leontiades, 1985). Carlson (1975) suggests that the firm more-or-less follows a learning curve in the internationalization process. Johanson and Vahlne (1975), Kwon and Konopa (1993) also argue that internationalization can best be understood as an adoption of innovation-type behavior. Johanson and Wiedersheim-Paul (1975) identify internationalization stages as "no regular export activities", "export via independent representative", "establishment of an overseas sales subsidiary" and "overseas production". Although recently it has been argued that the entry decision in the globalization stage is likely to be more selective and strategic (Anderson and Gatignon, 1986; Goodnow, 1985; Reid, 1983; Root, 1987), empirical studies show that companies usually initially enter a new country through exporting. Most companies now take an active role in exporting because they have determined that it is to their advantage to pursue export business on an incremental basis.

This is especially true for SMEs. Buckley (1990) postulates that resource scarcity limits smaller firms' ability to reach more advanced stages of internationalization. Smaller

firms may be more risk averse than larger firms due to a lack of information and greater potential loss from an international mistake. Further, some foreign markets have higher growth rate with less competition and some foreign governments are encouraging imports as a way to develop their economies. Associating with foreign business people can help generate new business ideas for use at home. SMEs also have some special advantages over large businesses in exploiting overseas markets. They are more flexible in meeting specific market demands and react more quickly to prevailing market forces (Gumpert, 1979). Bilkey and Tesar (1977) and Cavusgil (1980) empirically validate the sequential internationalization process for SMEs.

2.3 Export in Canadian Context

Given the openness of its economy and its close links to the United States, Canada's role in international trade has been significant. Canada exports about one-third of its GNP and accounts for approximately 4% of world exports. Presently, Canada is undergoing an export boom⁵. Exports grew to \$250 billion in 1995, up from \$68 billion in 1980 and an increase of 55% compared with that of 1994. Manufactured goods have made an increasingly important contribution to Canada's exports. In 1990, manufactured goods represented 47% of Canadian merchandise exports, compared to only 32% in 1980. Canada's globally significant manufacturing industries include transportation equipment, electronic equipment, wood products, paper and allied products. This shows that Canada's international competitiveness is increasing through aggressive export marketing.

⁵ All statistics in this section are extracted from *Directions of Trade Statistics, IMF 1995*, unless otherwise specified

However, Canada relies too much on a small proportion of world markets. In 1994, the US market alone accounted for 82.5% of Canadian exports. Indeed, Canada and the United States maintain the largest two-way volume of trade of any of the world's trading partners. A market of 20 industrial countries accounted for 93% of Canadian exports in 1994. Apart from the US, Canada's principal trading partners are Japan, the United Kingdom, West Germany and South Korea.

Since the 1980s, the international market has entered a multi-actor era. International market structure has been undergoing great changes. Although North America still accounts for one-sixth of the world market and may grow further with the formation of NAFTA (and its possible extension to other Latin American countries in addition to Mexico), many new markets in Asia, Africa and South America are booming. There exist a multitude of regional and international authorities and interest groups. A big hidden problem for Canadian exporters is that Canada may gradually lose world market share due to the intense competition and recession in traditional industrial markets. To survive in the globalized world market, Canadian firms will have to enhance their ability to compete. One strategic question for Canadian firms is how to aggressively and effectively explore potential world export markets instead of concentrating on a few traditional markets.

2.4 Export Marketing Research

The diversity and complexity of the international environment, coupled with the frequent lack of familiarity with foreign countries, underscores the importance of

undertaking research prior to making decisions (Douglas and Craig, 1983). Research can aid in preventing inappropriate market entry strategies and lessen the possibility of losing opportunities. Research provides guidelines for a firm's marketing strategy and resource allocation among markets and products (Wind, 1978).

To summarize: globalization is a major force for a firm's internationalization. Export, in most cases, is the first stage on a firm's internationalization process. Export plays an important role in the Canadian economy and export success is crucial in enhancing a firm's international competitiveness. Export marketing research will help export success in a complex international marketing environment.

3. Literature Review

3.1 IMS in Exporting Process

Source: V. Kirpalani, *International Marketing* (Random House 1985)

Figure 2 Strategy in International Marketing

Practical and theoretical models of exporting have placed the focus on a number of decision steps in the exporting process. The choice of foreign markets represents one of the central decisions in such models (Reid, 1981). As shown in *Figure 2*, market selection is the first major decision that firms have to make after they decide to go international.

3.1.1 IMS Definition

International market selection (IMS) for export is defined as a decision process which involves identifying, from a considered set of entry markets, what can be regarded as the total market space available for future export activity (Reid, 1981). The IMS process would normally follow a firm's decision to start or expand international

operations, and precede the final in-depth assessment of a specific market just prior to entry.

3.1.2 Importance of IMS

IMS decisions are the strategic decisions which international companies must make frequently and are critical on the path towards internationalization. Ayal and Zif (1978), Davidson (1983) and Cavusgil (1985) all suggest that the competitive choice of territorial markets is particularly important for firms that operate in the international arena.

Papadopoulos (1987), and Papadopoulos and Denis (1988), based on relevant literature in this field, provide a good summary of the importance of the IMS process, especially for SMEs.

First, IMS is, in effect, a question of competitive positioning, in the physical or geographic sense. Correct market selection, as an integral part of competitive strategy, helps firms to develop opportunities or to counter competitive threats. Second, global market structure is changing rapidly. Selecting "right" markets is becoming increasingly important in view of the rise of international trading blocs such as the EU. In most cases, companies, which have an operating base within the trading bloc, are better positioned. Third, errors in IMS can be costly, in both monetary and psychological terms. Wrong market choice results in "real costs" (unsuccessful attempts to enter the wrong market) and "opportunity costs" (no attempt to enter markets where the product might have been successful), and thus leading to failure to penetrate a given market. In turn, this may result in dampening the firm's export enthusiasm (Welch and Wiedersheim-Paul, 1980).

3.1.3 IMS and Export Success

Aaby and Slater (1989), in their framework for export performance, identify market selection as a strategic decision that contributes to export success. Chetty and Hamilton (1993), based on export studies published between 1978-1991, have similar findings. Many empirical studies also illustrate the important role of market selection for export success (Gronhaug and Lorensen, 1982; Tesar, 1982; Bilkey, 1985; Cooper and Kleinschmidt, 1985; Reid, 1986; Christensen et al., 1987; Denis and Depelteau, 1985; Diamantopoulos and Inglis, 1988). Cooper and Kleinschmidt (1985) suggest that exporters with a world orientation, as opposed to reliance on a close neighbor, realize a more rapid growth rate in export sales. Denis and Depelteau (1985) find that slow growth exporters place greater emphasis on less developed countries while higher growth exporters place relatively greater reliance on industrialized markets. Similarly, Christensen et al. (1987) state that successful Brazilian exporters rely more on industrialized markets.

3.2 Real Firm Practices in IMS Process

IMS, as a part of export strategy, is crucial to export success and in establishing a firm's international competitiveness. This raises an interesting question: what are the actual IMS practices in the business world?

Many studies show that export market research is generally more subjective and less precise than domestic market research (Papadopoulos, 1987). Reasons include the limited experience of managers in conducting export market research and the difficulties encountered in gathering relevant, accurate, and timely information.

As Cavusgil (1980) points out, markets are usually chosen “without much rational analysis or deliberate planning”. Personal interviews with 70 companies in Wisconsin and Illinois showed only 14% of respondents employed quantitative techniques, such as regression or econometric forecasting, in analyzing foreign market data (Cavusgil, 1985). In most cases, foreign markets are selected based on psychological convenience, or other ad hoc factors, rather than a methodological approach (Papadopoulos, 1983). There is sufficient evidence to show that early expansion moves involve exporting to psychologically, culturally or geographically “near” countries (Sethi 1971; Carlson 1975; Johanson et al. 1976; Johnson and Vahlne 1977; Kaynak and Stevenson 1982), and then extends progressively to countries that are psychologically more and more distant (Linder, 1961; Wiedersheim-Paul, Welch and Olsen, 1978; Johanson and Vahlne, 1975). In this case, initial choices are often limited to the exporter’s immediate neighbors, since geographic proximity likely reflects “cultural similarity, knowledge about the foreign market and greater ease in obtaining information” (Papadopoulos, 1983).

For SMEs, there is ample evidence that the majority, in the early stages of internationalization, do not approach the international market selection systematically (Papadopoulos and Denis, 1988; Cavusgil 1980; Kothari 1978; Bilkey and Tesar 1977; Cavusgil and Nevin 1981). The empirical studies carried out by Sinai (1970), Tesar (1975) and Carlson (1975) also conclude that small firms are more influenced by psychological distance than are large firms. Sheridan (1988) finds that IMS decisions in technology-intensive firms are similar to those in non-technology firms; that is, most smaller firms tend to decide which international market to enter in an intuitive manner, most often as a

response to an unsolicited order (Bilkey, 1978). Little information is available on application of systematic methods in IMS process in large corporations, but it seems these nonsystematic approaches to IMS are not necessarily limited to SMEs.

3.3 Systematic IMS

Approaching market choice in an intuitive rather than methodical manner can generate problems regarding the coordination of international activities (Young and Hood, 1976). As Sethi (1971) points out, these approaches do not consider the different determinants of buying decisions and processes; furthermore, they ignore varying capacities of different firms to take advantage of these factors in different countries. Therefore, an export strategy based on entry into a least “psychologically distant market” should be critically examined. It is found that it would be far more profitable to export to those countries “either where the firm has the greatest comparative advantages”, as measured by the composition of exports from the firm’s home country to the importing country or where “economic development strategies exist that create an appropriate product fit” (Bilkey, 1987).

The world marketplace is large and complex; it contains approximate 200 individual countries or markets. Since market choice can clearly affect later market success, the decision needs to be based on careful analysis. The company needs to systematically evaluate the entire world market on a regular basis to be sure that company assets are directed toward the countries offering best opportunities.

For SMEs, limited resources reduce their ability to meet global challenges effectively, and therefore the export market selection becomes even more critical. A systematic approach to market selection is essential because of the vast diversity that exists across the international marketplace.

The realities of today's business environment require that foreign markets be sought systematically and continuously. Systematic export market research can facilitate successful international business involvement (Plank, 1985). Papadopoulos (1987) also argues that foreign market selection in a systematic manner can have two significant side-effects: one is the "cross-fertilization" effect, i.e. the firm may apply experiences gained in certain markets to other countries with similar conditions; the other is the more easier and effective international activity coordination once the company has expanded beyond its "first handful of foreign markets".

IMS is the first step after a firm decides to go international. IMS is critical in the exporting process and contributes to export success. All these findings reinforce the need for the development of a systematic IMS model in exploring export opportunities. However, empirical studies show that most firms, especially SMEs, do not use systematic approaches in IMS. The following section presents an in-depth review of existing IMS models.

3.4 A Review of Existing IMS Models

The existing international marketing literature suggests three general approaches:

(i) decision-making models (ii) grouping models and (iii) estimation models. These approaches are represented schematically in *Figure 3*.

Source: Adapted from Papadopoulos and Denis, *International Marketing Review*, Autumn 1988

Figure 3 Inventory and Taxonomy of IMS Approaches

Decision-making models

Decision-making models are similar to those described by Papadopoulos and Denis (1988) as “qualitative approaches”, including global screening and other hierarchical decision-making process models. Over the past three decades, a variety of multi-stage screening procedures have been developed. Kramer (1964), Robin (1967) and Deschampsneufs (1967) suggest a similar sequential selection procedure, starting from general market factors (e.g. market size, population) to company-specific and product-specific factors.

Walwood (1980) develops a filter model to screen out countries:

- Filter 1: Macrolevel research (preliminary opportunities)
- Filter 2: General market relating to the product (possible opportunities)
- Filter 3: Microlevel research (specific factors affecting the product-probable opportunities)
- Filter 4: Target markets (corporate factors influencing implementation – country priority listings)

Papadopoulos (1983) also establishes a conceptual model with three steps: first, a general environmental analysis, then a detailed market assessment specifically for the product in question, and finally, a qualitative analysis, on the basis of factors that are not easily quantifiable to correct or refine the results of the previous two stages.

More recent studies of Cavusgil (1985) and Root (1987) describe a three-stage sequential process which involves preliminary screening, determining industry market potential, and estimating company specific sales. Beliveau (1987) develops a four-phase

model for government agencies to match potential export market opportunities and potential exporters.

- Phase I: Market opportunity generation and benchmark study
- Phase II: Evaluation of foreign market opportunities and identification of present and potential exporters
- Phase III. Matching domestic exporters with foreign market opportunities
- Phase IV: Refinement of competitive and market knowledge and development of appropriate market penetration strategies

Papadopoulos (1987) develops a multi-stage decision-making framework for SMEs with established thresholds at each stage for potential markets. Leontiades (1988) applies screening procedure to the problem of international site location. The model takes into consideration both the general attractiveness of a market and the ability of the company to compete.

Jain (1990) describes a three-stage analysis to identify and assess markets which exhibit export potential. The preliminary stage focuses on general environmental factors. Subsequent stages are designed to address the issues of market access, product potential, forecasts of sales volume, landed cost, cost of internal distribution, etc..

Decision-making models establish the decision-making process leading to foreign market selection. These models take into account the objectives, strategies, strengths and weaknesses of one individual firm and apply some criteria to develop a target market shortlist from a complete set of markets.. A comparatively small number of potential markets will be selected for further systematic analysis (Stobaugh 1969; Douglas and Craig, 1982). These models all proceed from the collection of little external information

about many potential markets to the gathering and analysis of detailed data about a small number of markets. Although the approach is systematic, subjective assessments can be largely inaccurate and open to “professional bias” (Piper 1971; Vogel 1976). Another problem lies in the fact that these models require a manager’s experience to be sufficient to eliminate a large number of markets systematically prior to any formal data collection. As suggested by Papadopoulos (1986), this requirement may be unrealistic and increases the likelihood of rejecting potentially fertile markets.

All decision-making models start with an initial screening based on general environmental analysis. The initial screening narrows down the number of markets needing further investigation which will be conducted by detailed firm/ target market/ product analysis. However, the process involves a complex set of interrelated, yet separate steps at different screening levels. Threshold selection criteria are different from product to product. In addition, different models have different stages and different evaluation criteria for each stage. All these make decision-making models difficult in implementation and lack generalizability. Most of these models apply to all modes of entry and are not specific to export market selection.

Grouping models

Grouping models borrow ideas from market segmentation in domestic marketing research and cluster countries on the basis of similarity. The pioneering study, in the “macro-segmentation” category, was developed by Liander, Terpstra, Yoshino and Sherbini (1967), who used cluster analysis to group countries with similar levels of

industrial development, or relative levels of development within regions. This study has been criticized by several reviewers (Sethi and Holton, 1969; Sethi, 1971) due to methodological flaws; however, it has also been acknowledged as a pioneering contribution to the literature (Sethi, 1971; Papadopoulos and Denis, 1988).

Since then, many attempts of this kind have been made. Improvements include grouping variables into meaningful categories via factor analysis and using more variables rather than industrial development as a grouping factor (Sethi, 1971; Sethi and Curry, 1973; Doyle and Gidengil, 1977). Vogel (1976) also suggests clustering countries on the basis of the perceptions of a firm's marketing managers. However, the major concern of this model relates to the accuracy of these perceptions. The Temperature Gradient model, developed by Litvak and Banting (1968), groups countries into "hot", "moderate" and "cold", based on seven environmental dimensions: political stability, market opportunity, economic development and performance, cultural unity, legal barriers, physiographic barriers and geocultural distance. Empirical studies, both in the American and Canadian contexts, validate the model (Goodnow and Hansz, 1972; Papadopoulos and Jansen, 1992).

All these macro-grouping methods group countries based on a wide variety of general social, economic and political factors, so that they lack product specificity (Papadopoulos and Denis, 1988). No attempt was made at measuring demand level. Yet, social and economic indicators do not necessarily reflect market development (Douglas 1971). An empirical study of the beer market in EU countries by Papadopoulos (1983)

shows that country rankings differ dramatically depending on whether general or product-specific indicators are used.

Macro-grouping models try to solve problems by identifying all relevant variables in the IMS process and aim to provide a list of attractive markets for all products. However, the real market is complicated and is influenced by many factors. Cross-industry, cross-product and cross-market differences make any attempt of this kind impossible. In fact, the main problem with these models is defining the relevant variables and measuring them. Until now, there has been no universally accepted listing of the relevant variables in the existing literature.

Other "micro-segmentation" methods in grouping models are based on situation-specific variables such as consumer lifestyle and attitudes (Wind and Douglas, 1972). Cross-country secondary data are often unavailable, which makes multi-country comparisons impossible.

Estimation models

Instead of trying to find a universal solution to the market selection problem, estimation models differentiate countries by order of preference using a relatively small number of variables to estimate market potential, in the hope of attaining a simple, but usable, representation of the real market. Estimation models can be further subdivided into two categories, namely the total demand and the import demand models.

Total demand models include the method of multiple factor indices (Liander et al., 1967) and the econometric method (Armstrong, 1970; Lindberg, 1982). Macro multi-

factor analysis shares one major weakness with the macro-grouping models, namely that it also lacks product specificity. In addition, many of the indicators used are redundant (Denis 1978). To remedy this, Wind, Lemaire and Douglas (1972) suggest an approach in which macro-indicators and situation-specific factors are weighted in terms of managers' judgment and experience. A similar conceptual model is applied in a case of beer market selection by Papadopoulos (1983). One problem with this model is that it lacks conceptual constructs for guiding indicator selection.

Econometric methods, on the other hand, identify independent variables with substantial predictive power through regression analysis, which is mostly suitable for mature products (Douglas and Craig, 1983). An empirical study by Singh and Kumar (1971) also identifies high inconsistencies of selected independent variables if different methods or countries used.

The import demand subcategory, as its name suggests, focuses on import statistics. It consists of the multiple criteria model (UNCTAD, 1968), econometric models (Alexandrides, 1973; Alexandrides and Moschis, 1977) and the shift-share model (Green and Allaway, 1985).

Multiple criteria models evaluate the market in terms of wealth, size, growth and competition by assigning rejection levels to each criterion. Econometric models, when applied to international trade data, develop an estimate for the import demand of a specific product.

The **shift-share** analysis (Green and Allaway, 1985) identifies growth differentials based upon the changes that have occurred in market shares over time, in contrast to most

other forms of trend analysis, which express growth in terms of absolute or percentage changes in import. The analysis starts with the collection of product-specific *import data* at the beginning and end of a specific time period for each country. *Expected import potential* for each country is then calculated based on the *average growth rate* of all countries in the group. Next, each country's *expected import* level is compared with its *actual import* level at the end of the time period. The difference, the *net shift*, represents the difference between each country's actual import and the import level it would have achieved at average growth rate of the entire group. Positive net shifts mean a country has gained market share over expected during the time interval. Finally, *percent net shift* for each country, which represents the percentage of market share gain or loss, is obtained by dividing its net shift by the total positive net shift and multiplying by 100. Countries are ranked according to their *percent net shift*. Countries with high positive *percent net shift* are identified as attractive product export markets.

The main problem with import demand models lies in the fact that they focus only on the import component of the total demand. They don't address the market potential which is "available to exporters who may be able to compete against domestic producers, or to generate new customers by stimulating primary demand" (Papadopoulos and Denis, 1988). Other concerns deal with the delay in publication of data, and volatility of import data over time.

Conclusions

As can be seen from the above, decision-making models involve many steps. It is difficult to select threshold criteria for different stages tailored to different products. Further, qualitative data are subject to bias.

On the other hand, both grouping and estimation models, described as “quantitative approaches” by Papadopoulos and Denis (1988), use more formalized statistical analyses. Both grouping and estimation models reduce subjectivity, allow the firm to consider markets beyond its immediate neighbors and make it possible to screen significantly large numbers of markets. However, the main weakness of both grouping and estimation models rests with the limitations of secondary data (comparability, reliability, availability). Other weaknesses of both models involve determination of indicators relevant to the product being reviewed, assignment of importance weights to various indicators, prediction power and the longitudinal instability of country rankings or groupings because of the changing value of many indicators over time (Etemad, 1981; Papadopoulos and Denis, 1988).

In addition, grouping models try to find a cure-all solution for all problems which is theoretically and practically infeasible. These models usually involve a large number of factors and are very complicated in implementation. “Macro-segmentation” methods in this category also lack product specificity.

Models listed under the estimation category also have problems: for example, macro multiple-factor models lack product specificity, and econometric models require different criteria for different products, thus making generalizability difficult. However, the

shift-share model, takes into account both a country's import size and relative growth rate. It can be used to reduce a large number of product/market export alternatives to a relatively small set for intensive analysis. The model appears to be simple, inexpensive, product-specific (classified by SITC code), flexible (for available data on countries, regions or trading blocs) and effective (a ranking system which allows for scanning a large number of countries). Green and Allaway (1985) suggest that the method can be used in conjunction with large trade data bases in preliminary export opportunity identification. In spite of its weakness in using import demand as a single basis, the model is worthy of a further exploration for market selection.

Appendix A summarizes all models described above by providing a brief comparison of IMS models in terms of simplicity, generalizability, cost, product specificity, data availability, predictive power, etc..

4. Research Question

Systematic IMS is important for exporting. The main concern of this research is how to develop a model to identify effectively and efficiently product-specific export opportunities for firms in international markets. Comparisons among all existing IMS models in the literature show that the shift-share model is a promising candidate for further exploration. However, so far no effort has been made to explore its underlying statistical basis as a predictive tool nor to provide any empirical validation in the marketing context. On the other hand, the model is limited to import data only, and therefore does not examine the whole set of strategic or environmental dimensions in IMS (Papadopoulos and Denis, 1988). The range and variety of marketing decisions suggest that any attempt to use a single basis for IMS may result in incorrect marketing decisions as well as a waste of resources (Wind, 1978). The deficiencies of a single index tip the scale in favor of multiple indices (Liander et.al, 1968). Therefore, this research will:

- Assess the effectiveness of the shift-share model through statistical analysis and empirical testing
- Develop an effective multi-factor IMS model beyond the shift-share model for exploring product specific export opportunities in a strategic context

5. Research Methodology

5.1 *A Review of the Shift-share Model*

5.1.1 Historical Applications and Critiques of the Shift-share Model

The shift-share model has been widely used in regional economics (Brown 1969; Cahill and Cromwell-Cain 1979; Franklin and Hughes 1973; Hellman 1976; Herzog and Olsen 1977; Miller 1974; Reynolds 1980). In the marketing context, however, the shift-share technique has received limited applications. Huff and Sherr (1967) pioneered in this field, using the technique as a method of determining regional retail market growth in 48 US states. Yandle (1978) employs shift-share analysis to assess brand performance. Kerin, Mahajan, and Peterson (1980) use the technique as a diagnostic tool to appraise product performance. In the international marketing context, even less attention has been paid so far, the exceptions being Vitali (1990) and Green and Allaway (1985). Vitali (1990) divides the net shift into three parts, namely a trend component, a market component and a competitive component. This approach allows for the effects that market composition and the exporting firms' competitiveness have on changes in the export figures to be subdivided. A descriptive analysis of OECD countries in the machine tools industry illustrates that Japanese firms possess the most aggressive penetration strategy in international markets. This is characterized by their choice of fast-growing markets and by a high degree of competitiveness. As noted in *Section 3.4*, Green and Allaway (1985) adopt the shift-share technique to identify potential products and attractive product/market pairs for export.

In regional studies, the shift-share model is widely used as a predictive tool in spite of both theoretical shortcomings and some empirical evidence of unreliability. In fact, there are many disputes over its usefulness and accuracy as a predictive tool. James et al. (1975), in a test of regional employment using shift-share analysis, found that in a simple majority of cases, the model was in fact a superior forecasting technique to the simple growth model. However, this superiority did not adequately offset a potentially large inaccuracy in a small minority of cases. Brown (1969), when using this technique in regional economic growth, arrived at opposite findings. His results even raised substantial doubts about the ability of the technique to describe economic growth. Hellman (1976) had similar findings in his regional employment projection. While criticizing this technique, Williams (1980) suggested some modifications and found that, with modifications, the shift-share model could be the most accurate of several simple alternatives.

In marketing research, some problems are also identified:

- (1) The value of the analysis can be biased if base years are chosen which include the effects of outside economic forces (Green and Allaway, 1985)
- (2) The model only identifies relative opportunities within the analysis group and the time frame used. The result may fluctuate greatly when including new, extreme data (Green and Allaway, 1985)
- (3) It purports to aid current decision making through the use of historical data, a limitation common to all trend analysis (Root, 1982)

Model improvements suggested by Green and Allaway (1985) include choosing an appropriate set of base years with an interval long enough for life-cycle

changes to occur but not so long as to conceal meaningful trends within the life cycle, and selecting an appropriate SITC level without masking or overestimating opportunities.

5.1.2 Statistical Basis of the Shift-share Model as a Predictive Tool

In an IMS context, the distinguishing feature of the shift-share method (Green and Allaway, 1985) is its ability to measure the relative gains and losses in imports of individual market areas compared with the total market. Suppose there is a set of I mutually exclusive markets. A measure of value for imports is given for each of these markets for two time periods. Let $V_{i,t}$ ($i = 1, 2, \dots, I$) represent imports for market i at the end of time period t , and let $\Delta V_i = V_{i,t} - V_{i,t-1}$ be the actual change in market i over the specified period of time. The total imports for all markets at the beginning of the time period is equal to the sum of the values for each of the individual markets, that is $\sum V_{i,t-1}$, where the summation is taken over $i = 1, \dots, I$. The average growth rate for all markets, k , is equal to the ratio of the total imports at the end of time period to the corresponding imports at the beginning of time period, i.e.

$$k = \sum V_{i,t} / \sum V_{i,t-1} \quad (1)$$

If a given market had grown at the average rate for all markets, the expected imports for market i at the end of time period would be the product of the actual imports for this market at the beginning of time period times the rate of change for all markets, that is $E(V_{i,t}) = kV_{i,t-1}$. The difference between the actual change and the expected change for market i is the "net shift".

$$N_i = V_{i,t} - E(V_{i,t}) = V_{i,t} - kV_{i,t-1} \quad i = 1, 2, \dots, I \quad (2)$$

It can be seen from equation (1) that the sum of the net shifts for all markets is zero. In other words, the sum of all positive net-shifts must equal the sum of the absolute value of all negative net shifts, i.e.

$$\sum N_i^+ = -\sum N_i^- = \sum |N_i^-| \quad (3)$$

Let S represent the total sum of the positive net shifts, that is

$$S = \sum |N_i^+|$$

The relative gain or loss in the value of imports for a particular market i, in a given time period, is defined as the “*percent net shift*”

$$P_i = N_i / S (100\%)$$

It can be seen that the sum of the percent net shifts for all markets is zero. The sum of the positive percent net shifts is one hundred, and the sum of the negative percent net shifts is minus one hundred. The percent net shift reflects the relative size of the gain or loss of each market.

There is an underlying assumption in the shift-share model: the future follows past trends and the model can be used as a predictive tool. The simple linear regression model for prediction in this case would be specified as:

$$V_{i,t} = \beta_0 + \beta_1 V_{i,t-1} + e \quad (4)$$

It can be seen that the shift-share model explored by Green and Allaway (1985), as explained above, is closely related to a special case of this model obtained by forcing β_0 to equal zero. From the statistical theory of the linear regression model, it is known that the model with β_0 equal to zero is not necessarily a good fit (Stevens, 1992). The most flexible model for prediction is a model which includes β_0 , i.e. a model that minimizes the

sum of the squared residuals $(V_{i,t} - \beta_0 - \beta_1 V_{i,t-1})^2$. If the shift-share technique is applied to the basic linear regression model, we get *net shift percent* from the best prediction model as follows:

$$P_i^R = N_i^R / S^R \text{ }^6 (100\%) \quad (5)$$

where $N_i^R = V_{i,t} - \beta_0 - \beta_1 V_{i,t-1}$, the regression residual errors, which take the place of the “net shifts” of equation (2).

Let us assume for a moment that the regression coefficients β_0 and β_1 are known. Then the *percent net shift* P_i^R of equation (5) will be proportional to the N_i^R , which are equal to the random errors e_i . When the regression model is the true model, these errors are usually assumed to have an independent normal distribution with mean zero and common variance σ^2 . Thus it can be seen that applying the shift-share methodology under a known regression model is equivalent to ranking uncorrelated normal random variables with common variance σ^2 , i.e. to ranking noise. In practice, the regression coefficients will be estimated by least squares, yielding estimates $\hat{\beta}_0$ and $\hat{\beta}_1$, and regression residuals $N_i^{*R} = V_{i,t} - \hat{\beta}_0 - \hat{\beta}_1 V_{i,t-1}$. The estimated net shift will again be proportional to these residuals, which, according to linear regression theory, will be normally distributed with mean zero. Unlike the e_i , the estimated residuals N_i^{*R} are correlated, but these correlations will be small for moderate to large samples. Their variance will depend on $V_{i,t-1}$, with the largest variance associated with those observations (countries) whose values of $V_{i,t-1}$ are furthest from the mean value of $V_{i,t-1}$. However, the information in their variances can be regarded as second order, given that the expected values of the residuals are all zero. In general

⁶ R superscripts to separate the regression model from shift share model

regression situations, the effect of correlation between residuals is usually negligible, except when the ratio $(n-p)/n$ (number of degrees of freedom in residuals)/(number of residuals) is quite small (Anscombe and Tukey, 1963). Thus, the previous argument still applies in the practical case when the regression coefficients are estimated from the data: *the ranking of observations (countries) according to the percent net shift philosophy is equivalent to ranking essentially uncorrelated random variables which all have a mean of zero.*

Other technical criticisms can be leveled at the shift-share approach. For example, even if the model with $\beta_0 = 0$ is adopted, i.e. it is assumed that the regression line should “pass through the origin”, the shift-share estimate (k) of the parameter β_1 is inefficient. Least squares, which provides the optimal linear estimate of β_1 , yields the estimate

$$\hat{\beta}_1 = \frac{\sum V_{i,t} V_{i,t+1}}{\sum V_{i,t}^2} \quad (6)$$

However, the most serious criticism remains that the shift-share philosophy amounts to ranking random noise and not real differences. Thus, a shift-share ranking can be quite misleading. Clearly, the ability of the shift-share approach in prediction and even in description is open to serious doubts.

5.1.3 Empirical tests and findings of the shift-share model in an IMS context

This section provides some empirical tests of the shift-share model in an IMS context. The same procedure and evaluation criterion (net shift percent), as suggested by Green and Allaway (1985), was adopted. Three products, i.e. reaction engine (SITC 7144), paper product machine (SITC 7252) and nitro-phos fertilizer (SITC 56292), were

randomly selected from the *International Trade Statistical Yearbook* 1994. For each product, all importing countries among the top 50 in the world for this product, with available import data of 1986-1993, were finally chosen. To test the model validity, for each product, correlation tests were conducted between country rankings by *net shift percent* during 1986-1990 and rankings during two other overlapping time periods. Correlation between country rankings in overlapping time periods tested both the longitudinal stability and the predictive power of the model. As explained before, the results demonstrated the effect of unreliable country rankings by ordering random errors. An analysis of country rankings over time identified by two other models (simple size and simple growth models) was also conducted. In addition, a comparison between country rankings identified by the shift-share model and the simple growth model over the same time period, was also carried out. All results are summarized as per Tables 1-15 in **Appendix B**.

Reaction Engines (SITC 7144)

Twenty three countries were chosen. Country rankings by *net shift percent* in three time periods, i.e. 1986-1990, 1989-1993 and 1990-1993, are shown in Table 1. Negative correlations were found between country rankings of 1986-1990 and those of two other time periods, as shown in Table 2. Take US for an example, it was identified as the top candidate during 1986-1990, however, it turned out to be the 15th among 23 countries during 1990-1993.

As shown in Table 3, tests of country rankings by *import size* and *import growth rate* in different time periods also arrived at some findings. On the one hand, country rankings by *import size* showed great stability over time. All correlation coefficients were larger than 0.79 at a significance level smaller than 0.01. On the other hand, negative correlations were identified between country rankings by *import growth rate* in different time periods. This illustrates that the growth of country imports is quite volatile. In addition, as shown in Table 4, there exist relatively high correlations between country rankings identified by the shift-share model and the simple growth model over the same time period.

Paper Product Machine (SITC 7252)

Thirty three countries were selected. Country rankings by *net shift percent* in three time periods, i.e. 1986-1990, 1988-1992 and 1990-1993, are illustrated in Table 5. Low correlations were identified between country rankings in different time periods, as shown in Table 6. Take Hong Kong for an example, it ranked 22nd from 1986 to 1990, 11th from 1988 to 1992 and 4th from 1990 to 1993.

As shown in Table 7, country rankings by *import size* illustrated stability over time. All correlation coefficients were larger than 0.69 at a significance level smaller than 0.01. On the other hand, correlations between country rankings by *import growth rate* in different time periods, as shown in Table 8, were relatively low. In addition, high correlations were found between country rankings identified by the shift-share model and

the simple growth model. As illustrated in Table 9, all correlation coefficients were higher than 0.82 at a significance level smaller than 0.01.

Nitro-Phos Fertilizer (SITC 56292)

Rankings of eighteen countries by *net shift percent* in three time periods, i.e. 1986-1990, 1988-1992 and 1990-1993, are shown in Table 10. Low and even negative correlations were found between country rankings over time, as shown in Table 11. Take Canada for an example, it was identified as the top candidate from 1986 to 1990, but ranked 14th from 1988 to 1992 and 8th from 1990 to 1992.

As shown in Table 12, correlation tests of country rankings over time by *import size* and *import growth rate* point to some similar findings, as identified in the above-mentioned two product categories. High correlations were identified between country rankings over time by *import size*, but correlations of country rankings by *import growth rate* in different time periods, were relatively low. In addition, relatively high correlations were also found between country rankings identified by the shift-share model and the simple growth model, as shown in Table 13.

Empirical tests in three product categories illustrated some consistent findings. As can be seen, for different products, either at 4 or 5 SITC digit level, within different country groups, correlations between country rankings by *net shift percent* in different time periods, were low and sometimes even negative. This shows that country rankings identified by the shift-share model are quite volatile. Country rankings depend, to a large

extent, on which time period and which base year was selected. Totally different country rankings can be obtained when a different base year is selected. Good performers during one time period (in this case higher ranking by *net shift percent*) can do very poorly in the next few years. In this case, it is clear that country selection for future market planning, based on the shift-share analysis of historical data, can be quite misleading and open to doubt.

Tests of country rankings over time by *import size* and *import growth rate* also led to some findings. Country rankings over time by *import size* were highly correlated. It shows that relative standings of different countries, in terms of absolute import size, remain relatively stable. However, country rankings over time by *import growth rate* were quite volatile. The reasons behind this can be changes in trade policy, market structure, etc..

Another interesting finding is that, in each case, country rankings identified by the shift-share and simple growth models were highly correlated.

Further mathematical analysis shows that for the simple growth model, *growth rate* can be expressed as

$$G = (V_{i,t} - V_{i,t-1}) / V_{i,t-1} \quad (7)$$

and for the shift-share model, *net shift percent* represents

$$P_i = (V_{i,t} - kV_{i,t-1}) / S \quad (8)$$

which can be further partitioned into two parts as $(V_{i,t} - V_{i,t-1}) / S$ and $(1-k) V_{i,t-1} / S$

As explained above, the *import size* of each country is relatively stable over time. In this case, k is close to one and $1-k$ is small. Since S is a constant for a given sample,

the contribution of the effect $(1-k) V_{i,t-1} / S$ can be small. Therefore, in equation (8), P_i will be dominated by the component $(V_{i,t} - V_{i,t-1}) / S$. As it can be seen, G is approximately proportional to P_i and there exists a high correlation between G and P_i . In another word, results of the shift-share model are similar to those identified by the simple growth model.

One of the benefits of viewing the shift-share model in a regression context is that it focuses attention on “outliers”. These are countries, superperformers or underperformers, which grow or decline much faster than other members in the selected group. As shown in Tables 14 and 15, for Reaction Engine (SITC 7144) and Paper Product Machine (SITC 7252), countries identified as outliers by the regression analysis are identical to top or bottom countries identified by the shift-share model during the same time period. No outlier was found for Nitro-phos Fertilizer (SITC 56292). As it can be seen, the rankings of those countries (outliers) also fluctuate greatly over time, so that even export candidates identified via outlier analysis should be subject to further validation.

To summarize, all these findings show that the shift-share model lacks predictive power. Because of its instability over time, the model is not a reliable predictive tool. Further, its high correlation with the simple growth rate technique even renders it redundant. However, the underlying aim of the shift-share approach, namely to develop a simple, inexpensive and flexible model which can utilize massive secondary data at different points in time, provides us with some guidelines in a new model design.

5.2 Proposed Model Development

5.2.1 Effective IMS Model for Export Market Selection

Then, what can be an effective model for IMS?

As Terpstra (1982) states: “many firms need to scan over 100 countries in their international marketing. The challenge is to find an effective and economical way to do that”. The challenge remains today. It is found that none of the existing IMS models described above have been operationalized fully, partly due to the size and complexity of the assessment (Rusow and Solocha, 1993). Other reasons lie in the fact that they lack product specificity, longitudinal stability and/or predictive power. Therefore, the model to be developed aims to help firms to explore efficiently and effectively potential export candidates from a large number of markets.

In order to develop an efficient model, we have to decide at which level (e.g. country/industry level, firm/product level) and at which stage (preliminary screening or detailed market analysis) export opportunities shall be explored. Many IMS studies failed to give a consideration to this question.

First, the major problem in IMS is the bewildering array of countries and markets. Clearly, it is prohibitive to examine all possible markets in depth. Conversely, focusing on only a limited number of countries may result in bypassing some of the most promising international market opportunities. Therefore, the model should include all countries in the initial screening process, or at least a broad and systematically selected group, rather than only an evoked, and usually very small, subset of countries (Papadopoulos, 1983). The solution lies in the adoption of a screening procedure for secondary data which can

determine those countries that should be investigated in depth (Alexandrides and Moschis, 1977; Douglas et al. 1982; Douglas, Craig and Keegan, 1982; Douglas and Craig, 1983; Russow and Solocha, 1993). The purpose of screening is to separate quickly and inexpensively the most attractive from the least attractive alternatives.

Secondly, the country is the most commonly used unit of analysis in international marketing research (Douglas and Craig, 1983). Much data is already collected and available at the country level, for example GNP, population, etc.. Many market reports and industry studies are also conducted on this basis. In addition, companies frequently organize international operations at a given country level. Thus, the country level is appropriate for a preliminary screening procedure.

In addition, concerning SMEs in the IMS process, two extra criteria must be added: the degree of a method's simplicity and its cost (Papadopoulos and Denis, 1988).

To be effective, Denis (1978) argues that a method should not only be able to "assess the suitability of general environmental conditions", but also be "responsive to the specific product under review, and be capable of accounting for the strategic dimensions of markets". It has been found that export profitability can be high in one industry targeted at certain countries, while firms in another industry must export to other countries to secure the same profitability. Another important issue which was often overlooked by most IMS studies is the model's external validity. Since a model is used for future planning, an effective model should have the ability to forecast the real market development. An effective model, in this case, should have the power to predict product-

specific import potential for a specific exporting country, in terms of either absolute *import size* or *import growth*.

Therefore, based on all the criteria described above, this research will attempt to develop and test a simple, and inexpensive preliminary screening model which has predictive power. It will operate at a country level and will be product specific.

5.2.2 Proposed IMS Model

There are few product-specific conceptual frameworks in IMS. Some researchers, however, have suggested procedures which are of use in developing a product-specific framework for country evaluation. Douglas, Lemaire and Wind (1972) suggest three steps:

Step 1: Preliminary Screening Criteria

Step 2: Selecting variables and determining weights for evaluating countries

Step 3: Country evaluation

Dichtl and Koglmayr (1987) develop a similar evaluation method:

Step 1: Determining the relevant criteria and constructing appropriate
measurement scales

Step 2: Specifying the actual scale values

Step 3: Allocating weights to the criteria

Step 4: Set up rules for aggregating and amalgamating individual scale values and
their corresponding weights and transforming these into an overall score.

Procedures similar to those described above will be followed to develop the proposed model. Model development will start with the selection of screening criteria, followed by variable construction, weighting scheme establishment, and selection of external validation criteria.

Relevant Preliminary Screening Criteria

Douglas and Craig (1983) suggest that at the country level, two major factors need to be taken into consideration, namely, risks and opportunities. Risks refer to costs associated with operating in a given national market, while opportunities include the market potential, growth of the country, and the strength of potential competition. Similarly, Alexandrides and Moschis (1977) argue that the selected markets can be ranked according to their sales potential, costs, risks, and return involved.

In the decision-making process of international mode of entry (MOE), decision-makers may compare the alternatives according to *risk-return or cost-control tradeoff effect* (Goodnow, 1985; Anderson and Gatignon, 1986; Root, 1987). The rationale behind the framework is that a firm aims to maximize profit by choosing the optimal entry mode for a foreign market (Grosse, 1985). Since IMS and MOE are an integral part of international marketing (Russow and Solocha, 1993), it can be seen that the basic underlying concept also applies to the IMS decision-making process. The IMS decision requires weighing the level of risk against expected returns. In IMS for exporting a specific product, it is logical to explore the tradeoff between product-specific *demand potential* and *import barriers*.

Another important dimension that is typically neglected is the *strategic nature* of market selection either for the exporting country, socially, politically and economically (Beliveau, 1987), or for firms. The need for strategic considerations in marketing theory has been emphasized by many researchers (Day and Wensley, 1983; Lambkin and Day, 1989; Wind and Robertson, 1983). Firms have treated export markets as strategic as well as economic opportunities. This implies that exporting should be viewed as a firm's strategic response to the interplay of internal and external forces. Papadopoulos (1987) argues that firms with different objectives have different criteria in selecting a market.

Therefore, *market demand potential*, *import barriers* and *firms' strategy* should be taken into consideration in IMS for export opportunities.

Proposed Model

As shown in Figure 4, a proposed IMS framework is developed for preliminary export opportunity screening for a specific product in a strategic context.

Figure 4 Potential - Barrier Tradeoff IMS Model

Variable selection

The need for segmentation of international markets is becoming widely recognized (Day et al., 1988; Douglas and Craig, 1992) and the focus is now switching to the search for the appropriate bases (Day et al., 1988; Jain, 1987). Since different variables would naturally yield different classifications, careful selection of country indicators relevant to the specific product market is crucial to effective country market assessment (Douglas, et al. 1982; Cheron and Kleinschmidt, 1985).

Many studies contribute in this area. However, most studies suffer from three deficiencies: Firstly, as mentioned before, many studies do not specify the appropriate stage and level on which the selection is based, and variables selected for different purposes are mixed. Secondly, a very large set of variables is usually collected, characterizing the countries under consideration along many dimensions. Nachum (1994), in his empirical study, finds that a smaller set of variables can be used without significant loss of explained variance, i.e., there is no need for the larger sets commonly used in the research. Papadopoulos and Denis (1988) also argue that to simplify the process of selecting variables and to make it less costly, the smallest set of variables that account for maximum variance of the selected dependent variable should be found. Similarly, Armstrong (1970) suggests including all important variables while restricting the number of variables to a manageable size. What is manageable depends on one's a priori knowledge. Thirdly, purely environmental variables (geographic, political, economic or cultural variables) are used as bases for international market segmentation. However, groupings based solely on geographic (Berry, 1961), political (Jain, 1990), economic (Berry, 1961; Keegan 1989; Kotler, 1980; Liander et al., 1967; Rostow, 1960) or cultural (Hofstede, 1980; Lagace, 1975) criteria all fail, in varying degrees, to capture product-specific market opportunities. For example, as noted earlier in the literature review, segmentation based merely on geographic proximity of countries is seldom meaningful for marketing strategy unless countries of the same region are homogeneous with respect to relevant marketing characteristics (Liander et al., 1967; Sethi, 1971; Sethi and Holton, 1973). The higher cost of serving nonadjacent markets may be more than offset by the

competitive advantages accruing from the application of effective marketing plans and strategies (Liander et al., 1967). Similarly, segmentation only on basis of political systems also fails as similarity of political regime rarely guarantees market similarity. Many researchers (Day et al, 1988; Jaffe, 1974; Liander et al., 1967; Sethi, 1971; Sethi and Holton, 1973) suggest multi-variable techniques which combine relevant environmental factors to produce more meaningful segments. However, Helsen et al. (1993) argue that the use of such macro-level variables for international segmentation may indeed be questionable when one examines the rather heterogeneous nature of the products and services typically involved in multinational business activities. Accurate strategic decisions may not be possible with such general or macro-level segmentation schemes whose underlying taxonomy may have little effect in explaining or describing differences in specific new products/services. Samli (1977) argues that such an analysis indicates the true market potential for various kinds of products rather than a selected product line. Nachum (1994) also finds that widely used environmental variables, e.g., GNP, population, lack explanatory value for variation in import demand.

In addition, most studies do not focus specifically on export market selection. Exceptions are the studies of Alexandrides (1973), Douglas and Craig (1983), Green and Allaway (1985) and Jain (1990).

In view of the complexity of market selection, no universally-agreed upon list of base variables for market selection has been developed. Wind (1978) comments that there is probably no one best segmentation base for all possible situations, and Bonoma and Shapiro (1983) agree with this assessment. A successful screen-based search then depends

on a close correlation between the screening criteria and the objectives of the search, the cost-effectiveness of the screen (it should be economical of time and effort), and its thoroughness (it should not overlook too many qualified candidates) (Leontiades, 1985).

Several guidelines for variable selection are suggested by many authors:

- (1) Performance as measures of demand of various countries (Wind and Douglas, 1972)
- (2) Frequency of use by marketing researchers as a segmentation basis (Papadopoulos, 1987)
- (3) Data availability and whether or not it is judged to be relevant for research purposes (Papadopoulos, 1987)
- (4) Quantitative variables should be combined with qualitative variables, since neither can, by themselves, give a comprehensive market evaluation (Cooke, 1972).
- (5) Inexpensive and simple, especially for SMEs (Papadopoulos and Denis, 1988)

The above criteria given will be adopted in the following construction of a set of suitable model variables.

Constructs and possible components

As suggested by Armstrong (1970), an a priori procedure will be adopted for variable selection in this research. Since the model explores product-related export opportunities for a specific exporting country based on preliminary country screening, product-specific variables at country level, criteria which measure exporting country

competitiveness, and export specific constraints such as level of trade barriers, will be chosen.

As shown in the *potential-barrier* tradeoff framework (Figure 4), for a specific product export opportunity, three dimensions are proposed, i.e. *demand potential*, *import barriers* and *firms' strategy*.

The following section will explore possible underlying components of these three constructs and their respective operational measurements as summarized in **Appendix C**.

Demand potential

Market demand is one dominating criterion in IMS. Ball and McCulloch (1990) state that estimating the level of potential demand is a necessary condition in selecting markets and therefore, must be included in the screening procedure. All IMS studies are explicitly or implicitly evaluating the demand potential at either the macro level (total demand models, etc.) or the micro level (import demand models, etc.). Demand for products can be measured at two levels: aggregate demand for an entire country and company demand as represented by actual sales (Robin, 1984). In this research, the potential demand will be measured at the country level. Keegan (1971) develops an equation for market potential as

$$\text{Market potential} = \text{Market size} \times \text{Comparative advantage}$$

Therefore, demand potential refers to both product-related market volume of the importing country and competitiveness of the exporting country. Four variables are selected under this category.

Apparent Consumption

Market size or market opportunity is widely identified by researchers (Moyer, 1968; Stobaugh, 1969; Armstrong, 1970; Goodnow and Hansz, 1972; Caves, 1974; Douglas et al. 1982; Goodnow, 1985; Caves and Mehra, 1986; Root, 1987). Traditionally, import data is used for specific product opportunities (Green and Allaway, 1985). However, as noted before, import data does not provide a measure of the market potential that is available to exporters who may be able to compete against domestic producers or to generate new customers by stimulating primary demand (Papadopoulos and Denis, 1988). Further, empirical tests of the shift-share model as illustrated in *Section 5.13*, shows *import growth* over time can be quite volatile. Due to import control (Lord, 1991) and import substitution policy (Ahmad, 1978), especially in less developed countries, import demand is not subject to free market forces and is restricted by government regulations. Instead, Lindberg (1982) and Root (1987) recommend *apparent consumption* as the criterion for market size. The *apparent consumption* of a product is obtained by adding domestic factory production to the value of imports and subtracting the value of exports, i.e.

$$C_j = P_j + M_j - X_j$$

where C_j is the apparent consumption, P_j is domestic production, M_j is imports and X_j is exports of a specific commodity.

As we know, the equation for a commodity balance for industry j can be expressed as

$$P_j + M_j = X_j + C_j$$

Domestic production and imports make up total supply, while exports plus apparent consumption represent total demand. It can be seen that *apparent consumption* takes total demand into account, while import data only cover the import component of total demand.

Import penetration

Import penetration is an important market indicator adopted in both UN and OECD industrial analysis. *Import penetration* refers to a given reporting country's imports of industry j as a percentage of the reporting country's apparent consumption of industry j , i.e.

$$\text{Import penetration} = M_j / C_j$$

where C_j is the apparent consumption, M_j is imports.

Since apparent consumption measures aggregate demand at a country level, *import penetration* indicates the openness of the market and the competitive status of domestic manufacturing in the importing country. Markets served to a significant extent by imported products indicate that local producers either don't exist or are not so well established as to exclude considerable competition from imports (Alexandrides and Moschis, 1977) and thus are considered to be attractive markets (UNCTAD, 1968).

Competitive advantage

The effects of competition on market choice are also widely recognized (Knickerbocker 1973; Ayal and Zif, 1978, 1979; Reid, 1983). It is argued that the number,

size and quality of the competition in a particular country affect a firm's ability to enter and compete profitably.

Alexandrides and Moschis (1977) define competition as the position of the competing countries in relation to the analyst's country in the markets studied. Similarly, Bilkey (1987) measures the *competitive advantage* as the composition of exports from the firm's home country to the importing country. Therefore, at the country level, *competitive advantage* can be measured by the *market share of imports from the exporting country in total imports of the importing country for a specific product*. Exporting countries with a high share in a specific market enjoy a competitive advantage (UNCTAD, 1968). One explanation is that there is evidence that awareness and use of country-of-origin information by consumers is, in fact, growing (Bilkey and Nes, 1982; Papadopoulos, Heslop, Graby and Avlonitis, 1987; Han, 1989). If one exporting country has a relatively higher market share, consumers in importing countries most likely have a positive view of products from this country. Another factor is "critical mass" advantage. When there are many companies from the exporting country in a specific market, the "bank of knowledge" always makes it easy for newcomers from the same country to locate a suitable distributor, search for useful market information and establish trade networks, etc.. At the same time, closer trade relations with the importing country help strengthen mutual understanding, thus increasing the chances of success accordingly.

Market similarity

Market similarity refers to the degree of likeness between a foreign market and a firm's home market. Similarity to the home market can be expected to stimulate market

selection because of supply, demand, and uncertainty effects (David, 1983). Scale economies can be achieved in supplying such markets because existing resources such as brand names, packaging, and product design, can be readily transferred to similar markets. On the demand side, consumers in similar markets will buy products which have been designed for needs similar to their own. Managers will also prefer similar markets so that they may adopt similar domestic marketing strategies. The demand-effect model developed by Linder (1961) and Vernon (1966) suggests that demand for a product will tend to be high in markets similar to those in which the product was originally developed. Empirical findings also support this. Davidson (1983), in his analysis of market selection for 954 new products, finds that firms exhibit a significant preference for markets similar to the home market. Using cluster analysis of 29 variables in 91 countries, Sethi (1971) identifies four categories in market similarity: aggregate production and transportation, personal consumption, health and education, and trade. In this thesis research, 4 out of 29 variables will be selected, with one variable from each of Sethi's category, namely, *electricity production* from "aggregate production and transportation", *GNP per capital* from "personal consumption", *life expectancy* from "health and education" and *import as percentage of GDP* from "trade" category. These four variables are selected on the basis of their high correlations with other indicators in the same category (Sethi, 1971). *To get an overall score for market similarity, these four variables will be standardized⁷ first and then weighted by their respective loading on the first principal component identified by principal component analysis (PCA).*

⁷ Divided by standard deviation

Market barriers

Goods do not flow freely from country to country. There are a host of impediments to the smooth flow of trade. The importing country can take a number of actions to slow down, block or make importing unprofitable. Product related market barriers refer to risks and costs associated with operating in a given country. The presence of high or low barriers has a strong effect on export success and provides directions in market selection. Four components are selected under this category.

Tariff and nontariff barriers

In the export context, the main barriers have to do with market access restrictions. Market access restrictions (Alexandrides and Moschis, 1977) refer to tariff and nontariff barriers including import duties, import restrictions or quotas, and other regulations.

Tariffs are taxes on goods moving across an economic or political boundary. They tend to raise the price of imported goods and thereby protect domestic industries from foreign competition. *Tariff barriers* can be measured as *yearly weighted mean average tariff rate*. *Non-tariff barriers* include quotas, voluntary export restrictions and other trade restrictions, such as packaging regulations, performance requirements, etc.. More often than not, *non-tariff barriers* are more important than tariff barrier and have considerable impact on foreign competition. *Non-tariff barriers* can be measured by *weighted non-tariff barrier incidence*. All non-tariff barrier items existing in each country will be listed. Each item will be *weighted by its frequency of occurrence* within all countries in the group to get an overall score for non-tariff barrier incidence.

Many researchers (Moore 1978; Porter 1980; Pustay, 1985; Beatty et al 1985; Dixit and Kyle 1985; Grabowski and Vernon, 1986) identify government policy as one of the most influential entry barriers. It is argued that a host country's trade policy, such as high tariffs or rigid quotas, is the most important business environment variable that has deterred exporting and thereby encouraged foreign production (Caves, 1971; Goodnow and Hansz 1972; Horst, 1971; Lipsey and Weiss, 1981; Root, 1987; Smith, 1987). Cooke (1972) also identifies import duties, regulations and safety as important parts in market selection. It is argued that regulatory factors prevent customers from being able to satisfy their demands, thus reducing the effective market demand (Robin, 1984).

Geographical Distance

Transportation costs are directly related to the *geographical distance* of moving export goods from a home country to a foreign country (Alexandrides and Moschis, 1977). Different transportation costs may require adjustment in export product pricing. Aksoy and Kaynak (1994) suggest that long transport distances put a heavy burden on exporters. *Geographical distance* will be measured as *the sea distance between main ports of exporting and importing countries*.

Exchange rate

Another important factor in costs is *exchange rate*, since international trade involves exchange between different currencies. Exchange rate fluctuations distort prices among countries for many products that otherwise would sell at similar prices. According

to international finance theory, depreciation of one country's currency lowers its relative export price and thus promotes exports which strengthens its international competitiveness. The exchange cost will be measured as the *percentage in depreciation or appreciation of annual official average exchange rate in year t compared to the annual official average exchange rate in the previous year*.

Firms' strategy

It is argued that IMS decision-making should contribute to the implementation of a firm's objectives. Therefore, whatever the approach used, the congruence of the rank ordering of countries with initial management objectives should be evaluated (Baalbak and Malhotra, 1993). Papadopoulos (1987) identifies three general objectives for export: survival, long-term growth and volume. For survival, firms explore short term easy markets and look for future potential as well. For long-term growth, firms focus on markets with high future growth rate. For volume, firms are simply interested in short term easy markets without long-term considerations. Firms with different objectives have different strategies. Ayal and Zif (1978) identify two competitive strategies of the firm, i.e. offensive vs. defensive. A firm with an offensive strategy will seek to grow at the competitor's expense. On the other hand, a firm with a defensive strategy will focus on how to prevent competitors from making present or future inroads on its market share. This is a dichotomous representation of a continuous variable. To simplify, the study will adopt this *two-state representation* in a conceptual framework.

Establishing a weighting system

It can be expected that firms with a defensive strategy focus more on easy markets. Therefore, to minimize expected risks, these risk-averse firms will attach more importance to market barriers than market potential. On the contrary, firms with an offensive strategy are willing to put more efforts into difficult markets for long-run benefits. They focus more on market potential rather than barriers. Taking a firm's strategies into consideration, "barrier" and "potential" should have different weights in market selection.

In addition, different variables may have different weights in consideration of different product characteristics, such as consumer durable product, consumer non-durable product and industrial product.

For the purpose of model illustration, hypothesized subjective weighting schemes will be adopted in this research. The first design has equal weights on each individual indicator, the second puts more weight on indicators under the "potential" category, and the third puts more weight on indicators under the "barrier" category.

External Validation Criteria

As explained before, an effective model should have the power to predict future market development. For exploring export markets, future import demand, in terms of either absolute size or growth rate, is still of most interest. In this study, *product specific import size from the exporting country, product specific import market share of the exporting country and relative growth rate in both import size and market share* will be used as external criteria in model validation.

5.3 Testing Methodology

5.3.1 Country, Product and Year Selection

The limitations on country selection for this research mainly lie in the data availability on *tariff* and *non-tariff barriers*, *apparent consumption* and *import penetration*. For model illustration, countries whose data are either available or whose data may be estimated from historical data or other sources, are selected. In this case, 17 OECD importing countries are chosen, listed in Appendix D. *Each country will be given a unique number which will identify it in all later data analysis and discussions.* For exporting countries, to make cross comparisons possible, Canada (developed country) and China (developing country) are selected.

It is argued that data at the most detailed level of the classification may contain relatively large errors, and should be used with caution (UN Statistics Bureau, 1994). The Bureau also suggests that using higher-level data will eliminate errors or at least reduce their relative importance. On the other hand, data on *apparent consumption*, *import penetration* and *non-tariff barriers* are only available at three and four digit ISIC⁸ level (equivalent to two or three SITC⁹ level) for most countries. Therefore, in this research, the product analysis will be based on the two or three digit SITC level. Three different product categories are chosen, i.e. furniture (ISIC 332), beverages (ISIC 313) and aircraft (ISIC 3845). First, there is a good match between ISIC and SITC codes for these three categories. ISIC 332, ISIC 313 and ISIC 3845 are equivalent to SITC 821, SITC 11 and SITC 792 respectively, thus improving data comparability and reliability. Second, these

⁸ International Standard Industry Classification

⁹ Standard International Trade Classification

three products are representative of consumer durable, consumer non-durable and industrial products respectively. Last, international trade statistics also show that Canada and China play relatively important roles in exports in these fields, the exception being China in aircraft (only 0.26% of world aircraft exports in 1993). In 1993, Canada accounted for about 3.1% of world exports of aircraft; Canada and China accounted for 5.1% and 3.2% respectively of world exports of furniture and approximately 3% and 2.8% respectively of beverage exports (International Trade Statistics Yearbook, Volume I, 1993).

The year 1988 is selected as the base year because of data availability of *tariff* and *non-tariff barriers*, and years from 1989 to 1994 are chosen as the reference years.

5.3.2 Data Collection

Secondary data are a key source of information for conducting international marketing research (Douglas and Craig, 1983). They are particularly useful in evaluating country or market environments with which management has little familiarity, such as developing countries. This is in part due to their ready availability, relatively low cost versus the high cost of collecting primary data and the ability to assess specific data problems. Secondary data can be used to screen, on a systematic basis, market potential, market risks, and the likely costs of operating in different countries throughout the world. Those countries that appear to offer the most potential and are prime candidates for in-depth investigation can be identified. In this research, for each of three selected products, base year (1988) data on individual indicators, and data on *total import size* and *country-*

specific import size from China and Canada in later years (89-94), are collected from several tertiary sources, such as UN publications, shown in **Appendix C**. In order to explain the effects of a firm's strategies and different product characteristics, as mentioned before, three different plausible sets of weights are assigned to different indicators. Sensitivity testing of different sets of weights is conducted in later data analysis.

5.3.3 Data Analysis

Base year country scaling

To assess quantitatively the overall relative standings of countries, countries are numerically scaled by direct scoring on selected components on two dimensions. Procedures are as follows:

- (1) for each variable, the lowest value is subtracted from the highest and the difference is divided by ten, forming ten equal scale intervals.
- (2) each country is assigned the score that corresponds to its absolute value, from 10 to 0, with 10 as the highest value.
- (3) the scores of each country for four corresponding variables under each dimension (*demand potential* and *import barrier*) are averaged to generate a total score for each dimension.

Next, countries are plotted along two dimensions, i.e. *potential* and *barrier*, and will be grouped into meaningful clusters. The technique is similar to the BCG¹⁰ matrix in marketing analysis. Since two dimensions in market selection are theoretically identified, the scaling procedure is mathematically well grounded. This two-dimensional approach

¹⁰ Boston Consulting Group

was previously used by Almond et al. (1960), Hagen (1962) and Liander et al. (1967).

Later, scales of two dimensions and individual indicators under each dimension are further weighted by different weighting schemes to generate an overall score for each country. Leontiades (1985) also has a similar national rating scale, in which the national rating for each criterion is multiplied by the weight to arrive at its score.

The overall country scaling generates a scale for each country in terms of overall attractiveness. Instead of providing discrete country rankings, the procedure allows different countries to have similar scores. Overall country scales identify the relative differences between countries within one group. In addition, country scales on individual indicators allow firms to identify their relative strengths and weaknesses in exporting to a specific market.

The approach is simple and flexible in implementation. It enables factors to be added or subtracted easily without affecting other indicators. It also allows for flexibility in adding or deleting target countries, which have no extreme data, without changing country scales.

Model Validation

The technique described above is also applied to scaling countries using import statistics (absolute size, market share and their growth rates) of years from 1989 to 1994. Correlation tests are conducted between the country scales in each successive year from 1989 to 1994 and the base year (1988) country scales. *Correlation coefficient* is adopted as the criterion for evaluating the model's predictive power. If a high correlation is found

between year t and the base year, the model will be regarded as having predictive power for year t . Time series correlation tests may also identify the time interval over which the model displays predictive power. In addition, to explore the possible influence of different firms' strategies and different product characteristics, a sensitivity analysis with different weights is conducted.

The next section will provide some empirical tests and discussions of the proposed model. As mentioned before, for simplification, *country number* listed in **Appendix D** will be adopted for later analyses.

6. Empirical Results and Discussions

6.1 Data recording

The first step was the preparation of a data matrix for 17 OECD countries in 1988 in which the values of individual indicators or subcomponents were recorded from several tertiary sources as shown in **Appendix C**. To get around the difficulty of territorial coverage of international statistics, Belgium and Luxemburg(3) were regrouped into one larger trading entity for later analysis.

Some preliminary data editing was done for missing data. Data on *life expectancy* in the “market similarity” category in 1987 were used for all countries instead of 1988 data. These statistics were found to be quite stable over time, so that data in 1987 should be similar to those in 1988. All four variables in the “market similarity” category were first standardized, and then weighted by their respective loading on the first component identified by principal component analysis (PCA) as shown in **Appendix E.1**. Two factors were identified by PCA analysis, and the first component accounted for 45% of total variance. In addition, data on *tariff* and *non-tariff barriers* in year 1989 was used for USA(17), instead of 1988 data. No big changes were found in US trade policy in the three selected product categories during the period 1988-1989. Instead of the *annual weighed average tariff rate*, the *annual simple average tariff rate* was used for Australia(1) and Finland(5). The *non-tariff barrier* was measured by means of **weighted non-tariff barrier incidence**. The latter was obtained by weighting each non-tariff barrier item by its frequency of occurrence, and summing, to generate an overall score. A list of all non-tariff

barriers and their respective frequency of occurrence within 17 OECD countries is provided in **Appendix E.2**.

Some adjustments were also made to the *import penetration* data. Generally, *import penetration* lies between 0-1. However, several countries were identified as having *import penetration* larger than 1 in the *aircraft* industry. Exports can exceed production only if some imports are being exported in their untransformed state. Thus final destination of these imports in such cases must be another country. Therefore, values of *import penetration* which were larger than one were treated as one.

Next, time series (1989-94) data on *total import size* and *country-specific import size* from Canada and China in three product categories were recorded from importing countries in the *Commodity Statistics Yearbook*. Some adjustments were also made to these data. All import data in 1994 in the three selected product categories for Austria(2) were missing. These figures were imputed by regression analysis using import statistics from 1989 to 1994 within other 16 countries. In a few cases, when abnormal import data were found, i.e. import data in a specific year were five times larger or smaller than that in the previous year, export data from corresponding exporting countries were checked and adjustments were made accordingly to improve the data consistency. In addition, it is customary for all countries to report a portion of their trade as being with regions or aggregated groups of countries rather than with specific trading partners, whenever imports from a specific trade partner are less than \$100,000 annually. In some cases, where imports from Canada were not reported by the importing country, they were estimated as the difference between imports under the "North America developed" and

“US” categories. However, since “Asia,n.e.s.”¹¹ includes many countries, it is impossible to allocate the imports under this category to an individual country. Therefore, all imports from China, which were less than \$100,000. (i.e. no record in international statistics), were treated as zero, most such cases being in the *aircraft* industry.

6.2 Country scales on individual indicators

As given in *Section 5.3.3*, for each individual indicator, the lowest value was subtracted from the highest value, and the difference was divided by ten, thus forming ten equal scale intervals. Next, each country was assigned a corresponding scale from 0 to 10 on each individual indicator according to its absolute value. A high score corresponds to a high *demand potential* or a low *market barrier* respectively. A summary of scales of 17 OECD countries on eight individual indicators for China and Canada, in three selected product categories, is illustrated in **Appendix F**.

6.3 Two-dimensional Approach

6.3.1 Two-dimensional scaling and country plotting

As explained before, two dimensions were proposed in market selection, one reflecting the *demand potential*, and the other providing a measure of *market barrier*. Each dimension consists of four indicators. To quantitatively assess the overall and relative standings of countries on these two different dimensions, the scale values of the

¹¹ Asia countries not elsewhere specified

four indicators along the same dimension were averaged to generate an overall country score on both dimensions, namely *demand potential* and *market barrier*.

Next, as shown in Figures 5-10 in **Appendix G**, 17 OECD countries were plotted along these two dimensions, in three different product categories, for Canada and China respectively. Values of *demand potential* were plotted on the vertical axis, and values of *market barrier* were plotted on the horizontal axis. In the same manner of BCG matrix used in market analysis, this chart can be evenly divided into four levels of potential-barrier matches, as shown below, i.e. high potential / low barrier, high potential / high barrier, low potential / low barrier and low potential / high barrier.

Accordingly, countries were clustered into four groups by their overall values along these two dimensions. The countries comprising the upper right level of the chart, i.e. high potential/low barrier area, offer the best export opportunities. In contrast, countries which lie in the lower left end of the chart, i.e. low potential / high barrier area, provide the least chance for export success. How to choose countries which fall within the range of high potential/high barrier or low potential/low barrier area may largely depend

on a firm's objective in penetrating a country. Identified country groups for Canada and China in three selected product categories are illustrated in Tables 16 and 17.

Table 16 *Two-dimensional solutions for Canada in three product categories*

Product	Beverages (11)	Aircraft (792)	Furniture (821)
1. High potential - Low barrier	17	1, 2, 5, 12, 14, 17	4, 6, 7, 10, 12, 15, 17
2. High potential - High barrier	6, 10	4, 7, 9, 10	
3. Low potential - Low barrier	1, 2, 5, 7, 8, 11, 12, 15	15	3, 8, 9, 14, 16
4. Low potential - High barrier	3, 4, 9, 13, 14, 16	3, 6, 8, 11, 13, 16	1, 2, 5, 11, 13

Table 17 *Two-dimensional solutions for China in three product categories*

Product	Beverages (11)	Aircraft (792)	Furniture (821)
1. High potential - Low barrier	8, 17	2, 11, 14	10, 12
2. High potential - High barrier	3, 10, 13, 16	3, 4, 7, 10, 13, 17	3, 13, 17
3. Low potential - Low barrier	1, 2, 5, 11, 12, 15	1, 5, 8, 12, 15	4, 7, 8, 14, 15, 16
4. Low potential - High barrier	4, 6, 7, 9, 14	6, 9, 16	1, 2, 5, 6, 9, 11

* Country list as per Appendix D

6.3.2 Findings and Discussions

Product effect

Target countries perform quite differently in different product categories for the same exporting country.

For Canada, as shown in Table 16, with the exception of the US(17), which is the dominating country in all cases, other OECD countries offered different market opportunities in different product categories. For example, Australia(1), Austria(2) and

Finland(5) were identified as attractive *aircraft* markets with high potential and low import barriers. However, these three countries were perceived as low potential-low barrier markets in the *beverage* industry, and as inferior export markets for *furniture* with low potential and a high barrier.

For China, as shown in Table 17, Norway(12) was identified as an attractive *furniture* market with high potential, but it offered low *demand potential* in the *aircraft* or *beverage* industry. Similarly, Austria(2) and New Zealand(11) were identified as high potential-low barrier export markets for *aircraft*. But they were classified as low potential-low barrier markets for *beverage* and as low potential-high barrier markets for *furniture*.

All these indicate that the market opportunity differs from product to product for the same country. This agrees with findings showing that export profitability can be high in one industry that is targeted at certain countries, while firms in another industry must export to other countries to secure the same profitability.

Country effect

As it can also be seen from Tables 16 and 17, target countries offer different market opportunities for different exporting countries in the same product industry.

In the *beverage* industry, Japan(8) was identified as an attractive market for China with high potential and low barrier, whereas, it represented a low potential-low barrier market for Canada. France(6) was identified as a high potential market for Canada, but as a low potential market for China.

In the *aircraft* industry, Australia(1) and Finland(5) offered high *demand potential* for Canadian exports, but they represented low potential markets for China. Similarly, while France(6) was a good *furniture* market for Canada with high potential and a low barrier, it was a poor candidate for China with low potential and a high barrier.

All these findings illustrate the fact that a good market for Canadian firms is not necessarily a good market for Chinese firms. In the same industry, different countries should explore different export markets. This finding validates the necessity for export-country specific marketing research. Most previous studies, however, direct all exporting countries to same selected markets in a specific industry.

Individual indicator effect

Countries within the same potential/barrier group may have different marketing implications for exporting firms.

In the *beverage* industry, Japan(8) and Sweden(15) both represented low potential-low barrier markets for Canada. However, as illustrated by the scale values of the individual indicators shown in **Appendix F**, Japan(8) had relatively high scores on *apparent consumption*, *competitive advantage*, but lower scores on *import penetration*, *tariff and non-tariff barriers*. This showed that Japan was a large market and Canada had higher import market share in Japanese markets, thus having advantages in competing with other exporting countries. However, domestic manufacturers in the Japanese market were strong and market entry barriers were high. Sweden(15), on the other hand, had high scores on *import penetration* and *tariff, non-tariff barriers*, showing that market entry barriers were low and domestic manufacturers were weak in competing with exporters.

However, it had low scores on *apparent consumption* and *competitive advantage*, illustrating that Sweden was a small market and that Canada was disadvantaged compared with other exporting countries because of its low import market share. It is obvious that firms which wish to penetrate Japanese and Swedish markets should have different marketing strategies. The main focus in penetrating the Japanese market should be how to compete with Japanese domestic manufacturers and how to overcome trade barriers set by the Japanese government. To enter the Swedish market, the focus should be put on how to enhance export competitiveness.

Similarly, for the Canadian *aircraft* industry, Denmark(4) and Italy(9) belonged to the same group, but the scale values of the individual indicators showed that Italy(9) had relatively high market volume and that Canada had competitive advantage compared with other exporting countries in the market. But Canada faced strong competition from domestic manufacturers. Denmark(4), for Canada, on the other hand, offered a market characterized by low market volume, weak domestic manufacturers and strong competition from other exporting countries.

For the Chinese *furniture* industry, Denmark(4) and Japan(8) belonged to the same group. Scales on individual indicators showed that in the Japanese market, China might take advantage not only of geographical proximity, but also of higher market presence compared with other exporting countries. However, firms would meet strong resistance from domestic manufacturers. The data on Denmark(4), however, showed that China might compete effectively with domestic manufacturers, but was disadvantaged compared with other exporting countries.

The scale values of individual indicators for target countries help firms to identify strengths and weaknesses for exporting to the target country in question. Similar standings of different countries do not necessarily point to similar marketing strategies. Country-specific strategies should be adopted to overcome weaknesses and to fully capitalize on the strengths of a firm.

To summarize, the two-dimensional approach has led to several findings. First, firms in different industries in the same country should explore different export markets. Second, in the same industry, different exporting countries should penetrate different markets. Last, countries which provide similar overall opportunities may have different marketing implications for firms. Firms should develop different marketing strategies to overcome their weaknesses and to strengthen their competitiveness.

One problem with the two-dimensional solution is the "boundary effect", namely, some countries with similar scores lie on the boundaries of two areas, and are classified into two different categories. For example, in the *beverage* industry, Germany(7) and The Netherlands(10) offered similar market opportunities for Canada. Germany(7) had overall scores of 3.97 and 3.32 on *potential* and *barrier* respectively, while The Netherlands(10) had 4.08 and 3.37. However, Germany(7) belonged to the low potential-high barrier group, while The Netherlands(10) belonged to the high potential-high barrier group. In some cases, it is difficult to differentiate the real differences between countries. As suggested in some improvements of the BCG matrix approach, more detailed divisions may be adopted to improve the accuracy in country classifications.

6.4 Overall Country Scales and Model Validation

6.4.1 Overall country scales

To effectively assess the overall country standing, scales on individual indicators were weighted, and then summed, to generate an overall composite score for each target country. Hierarchical weighting schemes were designed. First, different weights were assigned to the two proposed dimensions, i.e. *potential* and *barrier*, the sum of the two weights being equal to one. Next, each individual indicator along each dimension was further assigned a corresponding weight, with these weights also summing to one.

As an illustration of the model, three specific weighting schemes were selected, denoted W_0 , W_1 and W_2 respectively in **Appendix H**. For W_0 , the two proposed dimensions, i.e. *potential* and *barrier*, and each individual indicator along each dimension, were all equally weighted. For W_1 , first, more weight was put on *potential* category. Since 17 OECD countries are quite similar in *market structure*, *geographical distance* from either China or Canada (most of 17 countries are in Europe), and *tariff* and *non-tariff barriers* (9 out of 17 countries are EU members), these indicators may not be as important as other indicators. Next, under the *potential* category, *market similarity* was further downweighted, and under the *barrier* category, *geographical distance*, *tariff* and *non-tariff barrier* were all downweighted. On the other hand, for W_2 , in order to make it diverse from W_1 , more weight was put on *barrier* category and those indicators which were downweighted in W_1 . The values of the composite country scales generated by these three different weighting schemes are also shown in **Appendix F**.

Meanwhile, the same scaling technique, as given in *Section 6.2*, was applied to the external validation criteria, namely country-specific *import size*, *import market share* and their *respective growth rate*. For Canada and China, in three selected product categories, each target country was assigned corresponding scales from 0 to 10, according to its absolute values of the external criteria in successive years from 1989 to 1994. A value of 10 corresponds to the highest value within the 17 countries and 0 to the lowest. Since China had zero exports to many OECD countries in the *aircraft* industry in 1988, the analysis of *import growth rate* and *import market share growth rate* for China in the *aircraft* industry was omitted.

6.4.2 Model validation

As explained in *Section 5.2.3*, to test the predictive power of the model, correlation tests were conducted. The composite base year country scales corresponding to the three weighting schemes, i.e. W_0 , W_1 and W_2 , were correlated with the country scales in each successive year from 1989 to 1994 for the external criteria given above. *Correlation coefficient* is adopted as the criterion for evaluating the model's predictive power. A summary of correlation tests for Canada and China in the three selected product categories is shown in Tables 18-29 respectively.

Two different flagging systems were adopted for Tables 18-29. For some tables, since most coefficients were highly significant ($\alpha < 0.01$), only coefficients which were not highly significant ($\alpha > 0.01$) were marked. A highlighted coefficient represents a relatively low correlation between the composite base year country scales given a specific weighting

scheme and corresponding country scales for the given external validation criteria in a given year. For other tables, a traditional flagging system was adopted, in which coefficients which were significant ($\alpha < 0.10$) were marked. A highlighted coefficient now represents a relatively strong correlation.

Beverages (SITC 11)

Table 18 *Correlation coefficients with import size (beverages)*

	89	90	91	92	93	94
WV	0.7063	0.7042	0.7053	0.7070	0.7082	0.7097
WC	0.8762	0.8672	0.8685	0.8737	0.8761	0.8832
WV	0.6266	0.6280	0.6287	0.6285	0.6290	0.6275
WC	0.6381	0.6229	0.6033	0.6196	0.5486*	0.6066
WV	0.9084	0.8966	0.898	0.8996	0.8903	0.8775
WC	0.4838*	0.4668**	0.4449**	0.4635**	0.3869**	0.4489**

* 0.01 < α < 0.05 ** 0.05 < α < 0.10 - others α < 0.01

Table 19 *Correlation coefficients with import growth (beverages)*

	89	90	91	92	93	94
WV	0.0166	-0.5529*	-0.2142	0.0617	0.2641	-0.0543
WC	-0.0218	-0.3866	-0.1889	0.1459	0.3656	-0.1938
WV	0.0346	-0.5450*	-0.1673	0.0117	0.1840	-0.0108
WC	-0.1172	-0.5185**	-0.3741	0.0647	-0.7669	0.2186
WV	-0.1613	-0.3585	-0.5106	0.3468	-0.4319	0.0177
WC	-0.1557	-0.5448**	-0.2970	0.0129	-0.8502	0.2752

* 0.01 < α < 0.05 ** 0.05 < α < 0.10 - others α > 0.10

Table 20 *Correlation coefficients with market share (beverages)*

	89	90	91	92	93	94
	0.7530	0.7575	0.7572	0.7624	0.7639	0.7573
	0.9079	0.8771	0.8740	0.8875	0.8961	0.9024
	0.6691	0.6881	0.6893	0.6893	0.6875	0.6752
	0.6344	0.5793*	0.5410*	0.5631*	0.4089***	0.4816**
	0.8366	0.8108	0.7862	0.7939	0.7313	0.7216
	0.4930*	0.4331**	0.3984***	0.4244**	0.2625***	0.3496***

* 0.01 < α < 0.05** 0.05 < α < 0.10*** α > 0.10- others α < 0.01Table 21 *Correlation coefficients with market share growth (beverages)*

	89	90	91	92	93	94
	0.0629	-0.5721*	-0.1829	0.0907	0.1676	-0.0534
	0.0388	-0.369	-0.1404	0.1372	0.2984	-0.1752
	0.0725	-0.5697*	-0.1492	0.0398	0.096	-0.0146
	-0.3036	-0.4982**	-0.2355	0.1902	-0.7904*	0.1119
	-0.3379	-0.3291	-0.4082	0.3187	-0.4313	-0.0567
	-0.3223	-0.5298**	-0.1532	0.1879	-0.8779*	0.1593

* 0.01 < α < 0.05** 0.05 < α < 0.10- others α > 0.10

Aircraft (SITC 792)

Table 22 Correlation coefficients with import size (aircraft)

	89	90	91	92	93	94
WC	0.4614**	0.4557**	0.4455**	0.4422**	0.4141**	0.4478**
WCO	0.8082	0.8014	0.8003	0.7939	0.7636	0.7868
WCE	0.4018***	0.3964***	0.386***	0.3827***	0.3577***	0.3932***
WCF	0.2208***	0.2207***	0.1504***	0.1163***	0.1974***	-0.2595***
WCG	0.8185	0.8154	0.7496	0.7266	0.7929	0.2175***
WCH	0.124***	0.1248***	0.0465***	0.0182	0.0962***	-0.3006

** 0.05 < α < 0.10*** α > 0.10- others α < 0.01

Table 23 Correlation coefficients with import growth (aircraft)

	89	90	91	92	93	94
WC	0.0433	0.1845	-0.2041	-0.2730	0.2457	-0.3846
WCO	0.1605	-0.1307	0.162	-0.1844	-0.0053	-0.1754
WCE	0.0207	0.2107	-0.2446	-0.2892	0.2829	-0.3839

- all α > 0.10

Table 24 Correlation coefficients with market share (aircraft)

	89	90	91	92	93	94
WC	0.5487*	0.5983*	0.5145*	0.5018*	0.5863*	0.6037
WCO	0.8781	0.8878	0.8772	0.8469	0.8222	0.7195
WCE	0.4808**	0.5360*	0.4459**	0.4418**	0.5408*	0.5759*
WCF	0.1863***	0.2083***	0.0384***	0.0438***	0.2384***	-0.37***
WCG	0.7917	0.7871	0.4394**	0.619	0.8009	-0.1514***
WCH	0.0924***	0.1199***	-0.0313***	-0.0437***	0.1391***	-0.3585***

* 0.01 < α < 0.05** 0.05 < α < 0.10*** α > 0.10- others α < 0.01

Table 25 Correlation coefficients with market share growth (aircraft)

	89	90	91	92	93	94
	0.2657	0.0935	-0.388	-0.2181	0.2448	-0.1856
	0.235	-0.111	-0.0216	-0.1131	0.0076	-0.0709
	0.2514	0.0994	-0.4163*	-0.2269	0.2788	-0.1835

* $\alpha < 0.10$ - others $\alpha > 0.10$ *Furniture (SITC 821)*

Table 26 Correlation coefficients with import size (furniture)

	89	90	91	92	93	94
	0.5263*	0.5279*	0.5299*	0.5283*	0.5279*	0.5274*
	0.8042	0.8054	0.8064	0.8052	0.8050	0.8050
	0.4411**	0.4426**	0.4448**	0.4432**	0.4428**	0.4421**
	0.155***	0.08***	0.0913***	0.0829***	0.1529***	0.1805***
	0.6454	0.5833*	0.5916*	0.5803*	0.6387	0.6531
	0.0128***	-0.045***	-0.0314	-0.0369	0.0213***	0.0448***

* $0.01 < \alpha < 0.05$ ** $0.05 < \alpha < 0.10$ *** $\alpha > 0.10$ - others $\alpha < 0.01$

Table 27 Correlation coefficients with import growth (furniture)

	89	90	91	92	93	94
	-0.3745	0.2317	-0.068	0.1906	-0.1637	-0.0556
	-0.2982	0.1889	-0.198	-0.03	0.0755	0.0582
	-0.3313	0.1943	0.0195	-0.2208	-0.3647	-0.3706
	-0.1706	-0.0349	0.1537	0.3997	0.4262*	-0.1350
	-0.2076	-0.2461	0.0123	0.3733	0.4685*	-0.1123
	-0.1370	0.0438	0.2441	0.4068	0.3929	-0.1179

* $\alpha < 0.10$ - others $\alpha > 0.10$

Table 28 *Correlation coefficients with market share (furniture)*

	89	90	91	92	93	94
Country						
WC	0.5005*	0.4996*	0.5096*	0.5117*	0.503*	0.5095*
WE	0.79	0.7904	0.7953	0.7951	0.7903	0.7948
VE	0.4104***	0.4082***	0.4193**	0.4225**	0.4127**	0.4195**
Country						
WC	-0.149***	-0.2369***	-0.2771***	-0.1851***	-0.0068***	0.0893***
WE	0.0753***	0.0246***	-0.0028***	0.1279***	0.2944***	0.3922***
VE	-0.2991***	-0.3871***	-0.4280**	-0.3483***	-0.1786***	-0.0755***

* 0.01 < α < 0.05** 0.05 < α < 0.10*** α > 0.10- others α < 0.01Table 29 *Correlation coefficients with market share growth (furniture)*

	89	90	91	92	93	94
Country						
WC	-0.3703	0.1783	-0.0292	0.049	-0.389	0.0862
WE	-0.2945	0.2247	-0.1742	-0.0347	-0.3252	0.2629
VE	-0.3269	0.1043	0.0545	0.0601	-0.3438	-0.0038
Country						
WC	0.0447	-0.0769	-0.0678	0.4095	0.3511	-0.0879
WE	0.0035	-0.2205	-0.0877	0.4843*	0.1478	-0.1654
VE	0.07	-0.0306	-0.0511	0.3476	0.4326*	-0.0168

* α < 0.10- others α > 0.10

Testing results showed a great degree of consistency. On the one hand, for all weighting schemes, as shown in Tables 19, 21, 23, 25, 27 and 29, correlations between the base year composite country scales and scales in each successive year on country-specific import growth and market share changes, were very low, many of them even negative.

This showed that relative growth of country-specific imports or market share were quite volatile and impossible to forecast. The finding was similar to that obtained from the previous empirical test of the shift-share model.

On the other hand, the base year composite country scales generated by weighting scheme W_1 , were highly correlated with the scales in reference years (89-94) on country-specific *import size* and *market share*, as shown in Tables 18, 20, 22, 24, 26 and 28. Except for a few cases, the correlation coefficients between the composite base year scales and the time series country scales on *import size* were all above 0.75. Similarly, the correlation coefficients between composite base year country scales and the country scales on *import market share* in each successive year, were also very high, the exception being those in the *furniture* industry for China. The correlation performance of the other two weighting schemes, W_0 and W_2 , however, showed great inconsistencies in prediction in different cases, and was always lower than that of W_1 .

Weighting scheme effect

The results indicated that not surprisingly the relative standings of 17 OECD countries varied with different weights on individual indicators. However, it is very interesting to note that the overall performance of the model based on weighting scheme W_1 was quite good. This weighting scheme consistently yields accurate market prediction in different product categories, which contradicts the previous expectation that different indicator weighting schemes are required for different product characteristics and different firms' strategies.

Essentially, this finding shows that some variables may be more important in selecting export markets. As W_1 puts more weight on indicators under the *potential* category, this illustrates that consideration of *demand potential* may dominate *market barriers* in decision-making process for export market selection. As explained before, it is possible that the 17 OECD countries show high resemblance in *market structure*, *tariff*, *non-tariff barriers* (9 of 17 countries are EU members), and *geographical distance* (most of 17 countries are European countries). Therefore, country scales on these indicators are very close and other indicators become dominant in directing market selection. Other reasons may lie in the fact that most firms are aggressive in market penetration, and consequently weight *market potential* higher in market selection. It may also show that offensive strategy leads to more successful market selection.

Product (industry) effect

For each country, export development of a product in a given country may experience four stages - *introduction*, *growth*, *maturity* and *decline*. Ratios of total imports of 17 OECD countries from Canada and China in 1994 to those in 1988 in the three selected product categories are illustrated as follows:

Country/Product	Beverage	Aircraft	Furniture
Canada	1.39	1.35	1.80
China	1.35	14.00*	6.86*

As it can be seen, imports in three industries from Canada were all relatively stable, showing exports of Canada to 17 OECD countries were at maturity stage in these three product categories. However, while imports from China in the *beverage* industry remained

stable, imports from China in *aircraft* and *furniture* industries were growing rapidly. Import statistics (Commodity Trade Statistics, 1989-1994) showed that in the *aircraft* industry, China concentrated on only a few markets with relatively low exports and had approximate zero exports in other markets during this period. This suggested that exports in the *aircraft* industry for China were still in the introductory stage, which was characterized by small volume, high market concentration and rapid growth. On the other hand, imports from China in the *furniture* industry were relatively large across many countries with high growth. *Furniture* exporting for China could be identified as being in the growth stage. For China, exports in *aircraft*, *furniture* and *beverage* industries from 1989 to 1994, represented three different stages in export life cycle- introduction, growth and maturity. As illustrated in Tables 18, 20, 22, 24, 26 and 28, except for imports in the *furniture* industry for China, the correlation coefficients between base year country scales and the *import size* and *market share* scales in each successive year, were all quite high, especially for mature industries, e.g., the *beverage* industry for both Canada and China, *aircraft* and *furniture* industries for Canada. For these industries, even scales based on the other two weighting schemes, W_0 and W_2 , exhibit reasonable predictive power, although much lower than that of W_1 . This showed that predictive power of the model for export industries at the maturity stage might not be very sensitive to the weighting scheme. For products at the introductory stage, e.g., the *aircraft* industry for China, different weighting schemes yielded totally different results. While W_1 still showed high predictive power in case of both *import size* and *market share*, W_0 and W_2 failed to perform well. The sharply dropping predictive power of W_1 for the *aircraft* industry in 1994 shown in Tables 22 and

24, also illustrated the difficulty of prediction when the introductory stage was transformed to the growth stage. Consistent results on both *import size* and *market share* also illustrated that high *market share* in one specific market was often accompanied by large *import size*. This confirms that market size and country competitiveness are an integrated part of *market potential*.

The predictive power of the model for products at the growth stage, e.g., the Chinese *furniture* industry was relatively low. Although correlations between base year country scales and the *import size* scales in successive years were still relatively high with average of 0.6 (significance level 0.05), they were much lower than those in other industries. Correlations between base year scales and scales on *market share* were very low for all weighting schemes. This shows, that for an export industry in the growth stage, high market share does not necessarily relate to large imports at first. However, country-specific import size in target countries in which the exporting country has relatively high competitiveness is likely to grow faster. When product exports are gradually approaching the maturity stage, the market will evolve into a structure of coexistence of high volume and high market share. The phenomenon may be identified by increasing correlation coefficients between base year scales and scales on *market share* over the time period 1989-1994, in the *furniture* industry for China, as shown in Table 28. Import statistics of *furniture* from 1989 to 1994 showed that China enjoyed greater export growth in USA(17), UK(16), Japan(8), Italy(9) and Sweden(15), countries in which China had relatively higher market share in 1988.

Country effect

As shown in Tables 18 and 20, the model showed similar high predictive power for both Canada and China in the *beverage* industry. Similar results were found in the *aircraft* industry except for a few cases in 1994. In the *furniture* industry, a large difference in predictive power between Canada and China, was found. As explained above, discrepancies in the *furniture* industry could be attributed to different export stages for Canada and China in this industry. Therefore, excluding the product effect, the model has relatively similar predictive power for both countries. However, as noted by Keegan (1974), in the context of the international trade product life cycle, exports of many products go through a cycle in which the high income countries are initially exporters, who then lose export markets to other advanced countries, who in turn lose markets to less developed countries. It is likely that exports of the same product for different countries are usually in different stages in the export cycle, especially in the case of developed and developing countries. In this case, the model will be expected to display different predictive power for different countries.

Time-range for planning

Except for a few cases, the overall predictive power of this model over time is strong with high correlations between base year country scales and country specific *import size* and *market share* scales in each successive year from 1989-1994. This suggests that the model can be used for short-term to medium-term business planning in market selection, provided the market does not suffer large external shocks. However, as

explained above, the model should be used with caution if the product export is in its growth stage.

To summarize, the overall performance of the model is good when weighting scheme W_1 was used. Except for a few cases, high correlations were found between base year country scales and scales on country-specific *import size* and *market share* in each successive year from 1989 to 1994. It indicates that the model may be used for short-term to medium-term market planning. One weighting scheme consistently dominates in market prediction, showing that some variables are more important in market selection irrespective of different product characteristics and firms' strategies. Some discrepancies in model prediction were also found between different industries for different countries. It shows that the model is not as powerful in predicting product exports in the growth stage. Excluding the product effect, no significant difference of model power over two different exporting countries was found, showing that the model may be used for different exporting countries.

6.4.3 Solution of overall country scaling

Since one weighting scheme (W_1) consistently points to a more accurate forecast of import market development, market selection can be based on the overall country scales generated by W_1 . Target countries were clustered into four groups by their overall scales: Group 1 (high opportunity with value larger than 6), Group 2 (relative high opportunity with value between 4-6), Group 3 (medium opportunity with value between 3-4) and

Group 4 (small opportunity with value smaller than 3). Relative standings of 17 target countries for Canada and China in three different product categories are illustrated in Tables 30 and 31.

Table 30 *Relative market standings for Canada in three product categories*

	Beverages (11)	Aircraft (792)	Furniture (821)
Group 1 (> 6)	17	17	17
Group 2 (4-6)	8	2	8, 10
Group 3 (3-4)	15, 16, 10, 3	1, 14, 12, 5, 7, 10, 4, 3, 16	15, 12, 7, 16, 6, 4
Group 4 (< 3)	7, 4, 6, 9, 1, 12, 11, 5, 14, 13, 2	15, 11, 13, 8, 9, 6	9, 3, 14, 1, 2, 5, 13, 11

* ordered by overall score

Table 31 *Relative market standings for China in three product categories*

	Beverages (11)	Aircraft (792)	Furniture (821)
Group 1 (> 6)	8		
Group 2 (4-6)	17	17	8, 17
Group 3 (3-4)	3	1, 14, 2, 5, 12, 3, 7, 4	10, 15, 12, 16, 7, 6, 4
Group 4 (< 3)	16, 10, 15, 1, 7, 6, 4, 9, 11, 13, 12, 2, 5, 14	11, 13, 10, 8, 16, 15, 6, 9	3, 9, 11, 14, 1, 13, 2, 5

* ordered by overall score

Product effect

As can be seen from Tables 30 and 31, target countries offer different market promises for the same country in different product categories. For Canada, Austria(2) fell within Group 2 as an attractive *aircraft* market, while it offered fewer opportunities in either the *beverage* or the *furniture* industry. On the other hand, Japan(8) was identified as a good market in both *beverage* and *furniture* industries, but not as a good candidate in the *aircraft* industry. For China, Belgium-Luxemburg(3) was among the top three

countries in the *beverage* industry, but it represented a market that offered fewer opportunities in the *furniture* industry. Similarly, Japan(8) was identified as the top candidate for exporting *beverage* and *furniture* products, but it offered fewer market opportunities for *aircraft*.

Country effect

Japan(8) was identified as the best market for China in both *beverage* and *furniture* industries, while the US(17) was the dominating market for Canada in all cases. However, the relative standings of the other target countries showed great consistencies for Canada and China. The order of country preference by overall country scales was very similar. It is a surprising finding, which may suggest that a good market for one country is likely to be a good market for another country. One possible explanation can be that country-specific advantages of Canada and China in those target countries other than US(17) and Japan(8) may not be diverse enough to differentiate these countries. Therefore, the market which provides the most promising market potential with lower entry barriers in this industry shows up as a good candidate for both countries. If this is the case, results of marketing research for developed countries whose data are always available, may be transferred for developing countries' use. However, since the analysis was only conducted within 17 OECD countries, further empirical studies with large samples are required to validate the finding. Even if the above is the case, the model is still of much help in identifying the different top markets for different countries.

Individual indicator effect

As shown in Table 30, in the *beverage* industry, The Netherlands(10) and UK(16) offered similar market opportunities for Canada. However, scales on individual indicators in **Appendix F**, showed that The Netherlands(10) had a higher score on *import penetration* but lower scores on *apparent consumption* and *competitive advantage*. This illustrated that The Netherlands(10) was a small market with weak domestic competition, and that Canadian firms would meet strong competition from other exporting countries. On the other hand, UK(16) had a higher score on *apparent consumption*, but a relatively lower score on *import penetration*. This showed that UK(16) was a large market with strong domestic competition. It is apparent that firms who wished to penetrate the UK(16) and The Netherlands(10) markets should adopt different marketing strategies.

Similarly, in the *aircraft* industry, Denmark(4) and UK(16) were in the same group with respect to Canada. However, Denmark(4) was characterized by small market size and weak domestic competition, while UK(16) represented a relatively larger market with keen domestic competition.

In the *furniture* industry, US(17) and The Netherlands(10) were identified as the #2 and #3 candidates out of 17 OECD countries respectively for China. However, US(17) had higher scores on *apparent consumption* and *competitive advantage*, but a lower score on *import penetration*. This showed that US was a large market with keen domestic competition, but China took advantages over other exporting countries with higher import market share. On the contrary, The Netherlands(10) had a higher score on *import penetration*, but low scores on *apparent consumption* and *competitive advantage*.

showing that The Netherlands(10) offered a small market with weak domestic industry, but China had to compete fiercely with other exporters.

All these findings show that countries which offer overall market opportunities don't necessarily direct to similar market strategies in penetrating these markets.

To summarize, target countries offered different market opportunities in different product industry for the same country. In addition, similar overall market opportunities may have different marketing implications for firms. Firms should have different marketing strategies to penetrate these markets. These findings are similar to those identified by previous two-dimensional analysis. However, except for a few top countries, which were different from country to country, the relative standings of target countries other than top countries, were found to be relatively consistent across two countries. This finding is different from that obtained by the two-dimensional approach. It shows that a market list for one country may provide guidelines in market selection for another country. However, future studies with more countries are required.

6.5 A comparison of two-dimensional approach and overall country scaling

As shown in Tables 16, 17, 30 and 31, some inconsistencies have been found between the two-dimensional and overall country scaling approaches, the exception being the US(17) which is the dominating country in all cases for Canada.

In the *beverage* industry, France(6) was identified by the two-dimensional approach as a high potential/high barrier market for Canada, while the overall country scales showed that France(6) offered fewer market opportunities. For China, a similar case was identified with Portugal(3).

In the *aircraft* industry, Italy(9) represented a high potential/high barrier market in the two-dimensional solution for Canada, but the overall country scales put it as the second last market. Similarly, for China, New Zealand(11) was identified as a high potential/low barrier market by the two-dimensional approach, while it was treated as a market with fewer opportunities by overall country scales.

In the *furniture* industry, Norway(12), Sweden(15) and France(6) were identified by the two-dimensional approach as attractive markets with high potential and low barriers. However, these three countries were viewed as having only medium opportunities by overall country scales. For China, Norway(12) and The Netherlands(10) were identified as the top two candidates by the two-dimensional approach, while the overall country scaling identified Japan(8) and US(17) as best markets.

As illustrated before, different weighting schemes yielded quite different results. Therefore, inconsistencies may result from different weighting designs used in two methods. In the two-dimensional approach, each indicator was equally weighted, while W_1 was adopted for overall country scaling. To make possible comparisons, the same relative weights¹² as in W_1 was assigned to each indicator to generate a weighted overall scale for *potential* and *barrier* respectively. The *furniture* industry for China was taken as an

¹² potential-market share(0.33), apparent consumption(0.33), import penetration(0.27), market similarity(0.07)
barrier- tariff barrier (0.20), non-tariff barrier (0.20), geographical distance (0.20), exchange rate (0.40)

example. Weighted scales of 17 OECD countries on *potential* and *barrier* are illustrated as in Table 32 below.

Table 32 Weighted potential and barrier of 17 OECD countries (furniture)

country	potential	barrier
1	2.93	6.48
2	1.52	4.65
3	2.03	5.50
4	2.34	5.66
5	1.31	4.76
6	2.53	5.22
7	2.64	5.80
8	5.92	9.00
9	2.63	4.89
10	3.38	5.79
11	4.24	5.99
12	2.60	6.20
13	1.81	4.08
14	1.09	6.56
15	2.91	6.37
16	2.15	7.37
17	4.69	4.55

17 OECD countries were then plotted along these two dimensions according to their respective weighted overall scores on *potential* and *barrier*, as shown in *Figure 11* below.

Figure 11 *Weighted demand potential vs. market barrier for China (Furniture)*

Similarly, countries were clustered into four groups as shown in Table 33. A comparison between Table 31 and Table 33, then illustrated a great degree of consistency between the weighted two-dimensional approach and the overall country scaling. Japan(8) was identified as the top market in both cases. Countries in the low potential/high barrier area, identified by the weighted two-dimensional approach, were also identified by overall country scaling either as having fewer market opportunities (Group 4) or last few candidates in Group 3 with weak medium opportunities.

The result shows that if a proper weighting scheme is adopted, both methods point to similar conclusions. On the one hand, it emphasizes the importance of weighting schemes in market selection in either case. On the other hand, Liander et.al (1967) argues that consistent results of two methods may be said to confirm the validity of both methods. However, the overall country scaling not only identifies the relative differences

between target countries in terms of overall market opportunities, but also differentiates countries by order of preferences. It is easy to implement and more accurate than the two-dimensional approach which is subject to "boundary effect" bias.

Table 33 *Weighted two-dimensional country standings for China (furniture)*

Product	Furniture (\$21)
1. high potential - low barrier	8
2. high potential - high barrier	11, 17, 10
3. low potential - low barrier	16, 15, 12, 14, 1
4. low potential - high barrier	2, 3, 4, 5, 6, 7, 9, 13

6.6 Conclusions and Implications

Except for a few cases, the performance of the overall country scaling model is good. With proper weighting scheme, high correlations were found between overall base year country scales and individual scales on both country specific *import size* and *market share* in each successive year from 1989 to 1994. This shows that, in most cases, large imports are accompanied by high market share. The model shows some differences in predictive power for products at different export stages. Product exports in each country may experience four stages - introduction, growth, maturity and decline. The model illustrates higher predictive power for product exports in the maturity stage. However, it suggests that the model should be used with caution for product exports at the growth stage, especially in predicting country specific market share. It shows that initially in the growth stage, large imports are not necessarily related to high market share. Excluding the

product effect, no significant differences of model power over the two exporting countries, Canada and China, were identified. This suggests that the model may be used for both developed and developing countries. In addition, in most cases, the model shows no sign of sharply declining predictive power over the period from 1989 to 1994. The model can be used for short-term to medium-term market planning.

Different weighting schemes yielded different results. The same weighting scheme (W_1 in this case) consistently generated more accurate market selection forecasts in all selected product categories. This shows that the weighting scheme is crucial for the model and that some variables may be more important than others in market selection. Further studies are required. When the same relative weights as in W_1 were applied in the two-dimensional approach, a high degree of consistency was found between the two-dimensional and overall country scaling approaches. This may confirm the validity of both methods in market selection.

Two-dimensional approach and overall country scaling presented some consistent findings. First, firms in different industries from the same country should explore different suitable export markets. Second, countries which offer similar overall market opportunities may require different marketing strategies. Firms should adopt different marketing strategies in penetrating these markets, to overcome their weaknesses and to fully capitalize on their strengths. However, the two-dimensional approach and the overall country scaling offered deviating conclusions on country-specific market opportunities. The two-dimensional approach showed that, in the same industry, the same target market offered different marketing opportunities for different exporting countries. On the other

hand, while overall country scaling suggested that top candidates were different from country to country, it showed that other target countries other than top candidates provided more or less consistent opportunities for different countries. The latter finding is very surprising, in the sense that similar markets can be explored by different countries in the same industry. If this is the case, the model is still of help in identifying the top markets for different countries, and meanwhile, marketing research for developed countries may be applied to developing countries, a major benefit since research for these countries is hard to do because of problems in data availability, etc.. However, since the research was conducted only within 17 countries, future study with larger set of countries is necessary to validate the finding.

Empirical tests described above provide some exploratory evidence of both country specific and product specific effects on market selection. The findings have justified marketing research efforts on a product-specific and country-specific basis.

6.7 Two extensions in model application

6.7.1 Extreme Observations

One problem of such a scaling technique is the influence of extreme data. Because of the way each variable is standardized, a country exhibiting extreme data may define the scale in such a way that other markets appear very similar and hence can not be differentiated and identified.

One solution to this problem lies in the adoption of a two-step process. At the first step, the method will follow the procedure in the model starting with all selected markets, and will exclude these dominating countries, be they superperformers or underperformers. At the next step, the method will repeat the procedure for the remaining countries. In this way, opportunities in other markets can be differentiated given that the influence of extreme data has been removed.

Another suggestion can be a multi-strata strategy. First, the method will cluster a large number of countries into several similar groups in terms of market size, etc.. Next, the method will follow the procedure within each identified group, and will select corresponding markets within each group. Last, the method will compare identified markets from each group. Since countries in the same group are more homogeneous, influence of extreme data can be largely reduced.

An example of the two-step method was illustrated for Canada in the *beverage* industry. As shown in the two-dimensional plot in *Figure 5* in **Appendix G**, US(17) and Portugal(13) were identified as dominating markets for Canada, US(17) being a superstar and Portugal(13) being an underperformer respectively. Next, excluding US(17) and Portugal(13), the analysis was done within the 15 OECD countries remaining. Adjusted country scales on eight individual indicators and corresponding overall country scales based on W_0 , W_1 and W_2 were illustrated as **Appendix I**.

Results of correlation tests, as shown in Tables 34-37, also showed a high correlation between overall country scales generated by W_1 and scales in each successive year from 1989 to 1994 on *import size* and *market share* (although the predictive power

for market share was somewhat lower). Similarly, countries were categorized into four groups by their overall country scales, as shown in Table 38. A comparison with results within 17 OECD countries in Table 30 shows that Japan(8) is now more separated from other countries as a good market. However, the relative standings of the other countries remain quite stable in their previous orders. This suggests that the influence of extreme data in identifying relative market opportunities may be not so large as previously expected.

Beverages (SITC 11) - Canada (15 importing countries)

Table 34 Correlation coefficients with import size (beverages) - Canada/ 15 countries

	89	90	91	92	93	94
WC	0.5972*	0.4845**	0.4242***	0.5454*	0.539*	0.5859**
W	0.9240	0.8603	0.8044	0.8976	0.8962	0.9126
WG	0.4080***	0.2875***	0.2288***	0.3508***	0.3416***	0.3952***

* $0.01 < \alpha < 0.05$ ** $0.05 < \alpha < 0.10$ *** $\alpha > 0.10$ - others $\alpha < 0.01$

Table 35 Correlation coefficients with import growth (beverages) - Canada/ 15 countries

	89	90	91	92	93	94
WC	-0.1325	-0.5549*	0.0737	0.1071	-0.0507	0.091
W	-0.0997	-0.414	-0.0551	0.3471	0.358	-0.1497
WG	-0.107	-0.5634*	0.1465	-0.0066	-0.2036	0.1693

* $\alpha < 0.05$ - others $\alpha > 0.10$

Table 36 Correlation coefficients with market share (beverages) - Canada/ 15 countries

	89	90	91	92	93	94
Group 1 (>6)	0.6855	0.4789**	0.4697**	0.5854*	0.6005*	0.671
Group 2 (4-6)	0.8260	0.4118***	0.3576***	0.5711*	0.6619	0.7707
Group 3 (3-4)	0.5605*	0.4528**	0.4627**	0.5281*	0.5138*	0.5575*

* $0.01 < \alpha < 0.05$ ** $0.05 < \alpha < 0.10$ *** $\alpha > 0.10$ - others $\alpha < 0.01$

Table 37 Correlation coefficients with market share growth (beverages) - Canada/ 15 countries

	89	90	91	92	93	94
Group 1 (>6)	-0.2001	-0.5373*	0.1237	0.2811	-0.1159	0.0487
Group 2 (4-6)	-0.1277	-0.4149	-0.0493	0.4395	0.3219	-0.1624
Group 3 (3-4)	-0.1812	-0.5430*	0.1941	0.1768	-0.259	0.1222

* $\alpha < 0.05$ - others $\alpha > 0.10$

Table 38 Relative market standings for Canada (beverages/ 15 countries)

	Beverages (11)
Group 1 (>6)	8
Group 2 (4-6)	
Group 3 (3-4)	16
Group 4 (<3)	15, 3, 1, 7, 10, 9, 4, 11, 6, 5, 12, 14, 2

* ranked by order

6.7.2 Optimal Weighting Scheme

Preliminary empirical tests showed that the weighting scheme was crucial in model application. As we know, the linear combination of different variables that maximally

correlate with the validation variable is given by the regression coefficients resulting from the regression of the validation variable on the predictor variables. In other words, the “best” weights are given by the regression coefficients.

In this research, since only a small sample of 17 countries is involved, regression analysis can’t reliably identify the best weights for eight individual indicators. For purposes of illustration, two weighted¹³ composite scales on *potential* and *barrier* may be treated as independent variables in running a regression model. Country scales on country-specific *import size* in each successive year were used as dependent (validation) variables. Then, the best weights for *potential* and *barrier* can be identified by the regression analysis.

Regression analyses were conducted in different industries for different countries, as shown in Tables 39 and 40 below. The results point to some findings which should be taken into consideration when using the regression model in identifying best weights.

1. If time series data are adopted as dependent variables, each regression model in separate year will generate different set of regression coefficients. As shown in Table 39, regression coefficients identified in 1989 and 1990 were quite different for the *furniture* industry in China. In this case, then “best” weights could be taken to be the simple average or a weighted average of the separate sets of coefficients identified in each separate model. The weighted average could be obtained by a generalized least square regression of the type proposed by Zellner (1962).

2. As also shown in Table 39, for different countries, the same product category yielded similar regression coefficients, confirming that product characteristics instead of country characteristics influence the weighting scheme.

¹³ as per W_i

Table 39 Regression coefficients in the furniture industry for both Canada and China

	89	90	91	92	93	94
Adjusted R ²	0.99	0.99	0.99	0.99	0.99	0.99
Potential	28.7	28.65	28.63	28.64	28.65	28.66
Residual	-9.9	-9.1	-8.7	-8.9	-9.2	-9.1
Adjusted R ²	0.76	0.7	0.7	0.7	0.73	0.74
Potential	1.79	1.56	1.55	1.53	1.7	1.78
Residual	-0.54	-0.75	-0.75	-0.8	-0.64	-0.54

3. Regression coefficients are very sensitive to outliers. As shown in Table 40, in the *beverage* industry, regression coefficients within 17 countries and those identified within 15 selected countries for Canada were extremely different. Residual statistics show that US(17) is an extreme outlier (Cook's distance larger than 10).

Table 40 Regression coefficients in the beverage industry for Canada (15 and 17 countries)

	89	90	91	92	93	94
Adjusted R ²	0.9208	0.857	0.802	0.8941	0.8927	0.91
Potential	1.432	1.436	1.496	1.44	1.45	1.42
Residual	0.512	0.446	0.439	0.485	0.49	0.52
Adjusted R ²	0.91	0.9	0.91	0.91	0.91	0.92
Potential	1.07	0.97	0.97	0.98	0.98	0.99
Residual	-0.07	-0.074	-0.073	-0.067	-0.064	-0.054

4. Regression coefficients are different from product to product. A comparison between the *beverage* industry and the *furniture* industry for Canada, as shown in Tables 39 and 40 respectively, showed that the best weights were quite different across products. Within 17 target countries, the best weights in the *beverage* industry for *potential* and

barrier were approximately 1 and 0.01 respectively, while in the *furniture* industry, the best weights were approximately in a ratio of 3 to -1.

It seems that regression analysis can only be run to identify best fits for an individual case. In most cases, it is not applicable to other cases. A comparison between W_1 as shown in Tables 18, 26 and 34 and coefficients identified by the regression model in three selected product categories, shows no great drop in predictive power of W_1 . The multiple R (correlation coefficient) of W_1 , in most cases, was above 0.8 for different industries and countries. Compared with multiple R's for the "best" regression weights, though W_1 is clearly not optimal, it can be argued that it does not lead to a drastic loss of efficiency. The use of W_1 can be justified because it leads to a great simplification in model application. It is better for a user to have a weighting scheme which is insensitive to influential data, product effects and year effects and still yields reasonable predictive power than to have to generate different weights for each separate case. On the other hand, for individual cases, where the user is prepared to do the additional work, a regression analysis can always be run to identify the best weights for each individual variable.

7. Benefits and Limitations

7.1 *Benefits*

This research has several theoretical and practical benefits. From the theoretical point of view, the research has clarified confusions relating to the shift-share model and, at the same time, has provided some empirical tests of model validity. In addition, the research provides a useful theoretical framework for IMS. Although the research focuses only on export opportunity exploration at a preliminary stage, the concept applies to IMS with other entry modes such as direct investment and joint-venture. The model also allows for product opportunity exploration at a more detailed level. The only difference lies in the fact that priorities are different for different purposes, therefore different variables under the “potential” and the “barrier” categories shall be chosen for different MOE or at different levels of analysis. For example, for an in-depth assessment, indicators such as detailed product characteristics and competitor information should be taken into consideration.

The model can be viewed as a mixture of quantitative and qualitative techniques which combines subjective and objective criteria. It provides a new perspective for IMS. More importantly, the research sets some guidelines in developing and validating an effective IMS model. Empirical tests of the model also have provided some exploratory evidence of both country-specific and product-specific effects on market selection.

Wind (1978) points out that the more specific the basis for segmentation, the less stable the segment. He suggests appropriate levels of preliminary screening. The research

emphasizes a reasonable level for analysis, which is conducted at SITC 2 or 3 digit level. On the one hand, it reduces or even eliminates some inherent errors in higher-level secondary data. On the other hand, since all variables are still product-related, this is a big step forward compared with general environmental analyses.

The model has been proven to have relatively strong power in import market forecasting. For businesses, especially for SMEs, the research will then provide a systematic, inexpensive and powerful method for scanning a large numbers of markets for their products. The model can be used for short-term to medium term market planning.

Instead of providing a universal list of hot markets across all products for all countries (which are misleading in most cases), the model identifies unique market opportunity for a specific exporting country in a specific industry. The framework is also flexible in taking firms' strategies into consideration. In addition, compared with discrete country rankings, overall country scaling illustrates the relative differences between countries. It may guide firms in decision-making on how to allocate firm resources more efficiently. Overall country scales help firms to identify the overall attractiveness of different countries in terms of a tradeoff between *potential* and *barrier*. Meanwhile, country scales on individual attributes also help firms to identify the strengths and weaknesses in exporting to a specific country. As suggested by Terpstra (1987), export marketing strategy can be formulated in such a way as to match a firm's strengths with market opportunities and neutralize a firm's strategic weaknesses, or to overcome market threats.

7.2 Limitations

The main limitations lie in inherent deficiencies of secondary data. Cavusgil and Nevin (1981), Douglas and Craig (1983) argue that the accuracy and reliability of secondary data are often open to some questions.

Data comparability and reliability

With regard to international trade, the biggest challenge is the different coding systems for different statistics. The basic problem is that there is no one-to-one conversion from one system into another, i.e. The Standard International Trade Classification (SITC) coding system, International Standard Industry Classification (ISIC) coding system and Harmonized Commodity Description and Coding System (HS). In addition, SITC codes have been revised three times since 1965 and at present different countries still report to the UN by different systems. There is also no one-to-one match between SITC revision 1, 2 and 3. Similar mismatches also exist between the national industrial classifications and the ISIC codes. Various ad hoc solutions have to be adopted. Other problems concern the definition of production, the coverage of small establishments in different countries, and errors which stem from conversion of values from national currencies into US dollars. All these affect the comparability and reliability of data.

However, it should be noted that only a minority of SITC codes are multi-industry, and that most commodities can be unambiguously allocated to ISIC industries. There is also a conversion table between the three different coding systems developed jointly by the United Nations Statistical Office and the World Bank, which provides reliable guidelines

for code matching. As for currency exchange, this can be done by means of currency conversion factors based on official exchange rates or weighted average exchange rates specially calculated for this purpose.

Several techniques are adopted in this research to improve data comparability and reliability. First, the research makes an analysis at an appropriate level, which reduces the importance of some errors. Second, there are good matches between SITC and ISIC codes for the three selected products in this research. Last, all secondary data are collected from tertiary sources, such as UN publications, which have already improved data comparability.

Data availability

The data available for making export screening decisions tends to be years old by the time it is published. Information on many countries can be either unavailable or unreliable, especially for developing countries.

Data of *apparent consumption* and *import penetration* are not available for most countries in the world. That is why the number of countries analyzed is relatively small in this research. To allow for scanning of large numbers of countries, as suggested by many studies, proxy variables may be used for estimation. However, empirical tests need to be conducted to test the correlation between proxy indicators and selected variables. For example, ratio of imports in a specific industry vs. total GDP may be used to estimate *import penetration* in this specific industry. Empirical tests within eighteen OECD countries in industry ISIC 332, 383 and 351 (OECD STAN Database for Industrial Analysis, 1993) validate the preposition. As shown in Table 41 in **Appendix J**,

correlations between the ratio and *import penetration* are relatively high in all cases. As illustrated in **Appendix K**, it can also be proven that there is no effect on country scaling if two variables are highly correlated. In addition, it is expected that with the rapid development of information systems all over the world, compatible data for many countries will be soon available.

Sampling

Since only a small sample of the 17 OECD countries is included in this research, model generalizability to other countries is subject to further examination. It is argued that greater changes over time may be expected in developing countries due to changing market structure, governmental policy, etc.. All these may reduce the predictive power of the model or lessen the time range over which the model has predictive power.

Country as unit of analysis

Country is widely used as a basis in international marketing. However, countries may, in many cases, give an illusion of homogeneity and mask the existence of diversity between regions within the country. Papadopoulos and Denis (1988) argue that boundary lines do not reflect a similar separation in buyer characteristics among the people on either side of the border. Now, instead of relying on geographic differences, more attention has been paid to ideological, socioeconomic, psychological, or lifestyle differences that link people together regardless of where they live. In other words, international segmentation is beginning to look much more like segmentation in domestic markets (Cannon and

Yaprak, 1993). However, the great difficulty lies in the absence of vitally needed data on a regional or subnational basis, this is a major justification for the use of nation state as the basic unit of analysis throughout this research. On the other hand, cross-national segmentation fits more in an in-depth analysis.

Subjective variable selection

An a priori procedure is adopted in this study for selecting relevant variables. Although the subjective choice of variables by the researcher may be considered intuitive, this is not an entirely fair criticism. The procedure does provide a means for utilizing knowledge built up through previous research and experience. Some criteria have been formed through a thorough synthesis of previous studies. In addition, some external validation criteria are adopted in this research to test the relevance of variables. The model also leaves a space for including new variables.

Product level

Because of data availability, this research was done at 2 or 3 digit SITC level. Vague product classification may overestimate or underestimate market opportunities for a more specific product.

Export opportunity only

The model focuses on exploring export opportunities only, and the outcome of assessment is a list of potential markets suitable for export, rather than a list of potential

markets. Companies may have more than one alternative in one country. The model can not be used for other entry modes in its current configurations.

Other Comments

It should also be noted that statistics are only half the story. Diverse business decisions and complex business environments require intuition and common sense.

Another thing is that the model is a preliminary screening model which narrows down attractive markets from a large number of countries. Further detailed sales potential analysis (Robin, 1984) should be followed before a final decision. An in-depth review needs to be conducted at firm-specific and market segment/product level. Cavusgil and Zou (1994) suggest that firm characteristics and detailed product characteristics need to be taken into consideration. Many studies also suggest marketing-mix variables (product-related, promotion-related, price-related and distribution-related) be included in detailed market analysis.

Further, since data are always years late, a monitoring system should be established for identifying recent great changes in different countries.

8. Future Study

Since the research was only conducted within a small number of importing countries in three selected product categories for two exporting countries, namely Canada and China, further studies are required. For example, as the model was tested within 17 OECD countries in this research, it is only applicable to developed countries. To examine the possible differences of model power over different countries, future studies should be conducted within a larger sample set including both developed and developing countries.

Model stability over time is important in IMS (Wind 1978; Etemad 1981). In this research, only year 1988 was used as the base year in model testing. For future studies, if data are available, different base years may be adopted to test the longitudinal stability of the model. In addition, this research is only based on SITC 2 or 3 digit product level, further analysis at a more detailed level can be conducted to test model stability across different product levels.

Variables are building blocks in model construction. Since an a priori procedure is adopted in this research in variable selection, selected variables are subject to biases. One problem deals with the vague measurement of "market similarity". In this research, for simplification, only 4 out of 29 variables were selected from Sethi's study (1971) for *market similarity*. Therefore, the indicator may overestimate or underestimate the real market resemblance between countries. A more detailed analysis of *market similarity* may be required. Empirical tests in this research also show that there exists relative importance of different indicators. Since the model is flexible in adding or deleting individual variables, future testing can be conducted to identify more reliable and relevant criteria or variables.

In a larger sample, confirmatory factor analysis in LISREL program can also be conducted to validate two-dimensions proposed in IMS framework, *potential* vs. *barrier*.

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Appendix A Cross Comparison of Existing IMS Models

Model		Generali- zability	Cost	Simple	Product- specific	Data availability	Longi- tudinal stability	Strategy factor	Producting power
Qualitative	Import demand				X	X		X	
	Import demand								
Quantitative	Import demand								
Multiple Indices	Macro	X				X	X		
	Micro				X				
Econometric	Multiple Indices	X				X			
	Macro				X	X			
	Micro				X	X			
Shift-share	Econometric		X	X	X	X			
	Multiple Criteria		X	X	X	X			
	Shift-share	X	X	X	X	X			Possible
	Econometric		X	X	X	X			

* Import demand (import statistics used as a single basis)

Appendix B Empirical Tests of the Shift-share Model

Reaction Engine (SITC 7144)

Table 1 Country rankings by net shift percent in different time periods (SITC 7144)

Country	1986-1990	1989-1993	1990-1993
UK	23	23	23
JAPAN	22	21	21
SWITZERLAND	21	6	4
ITALY	20	16	14
NORWAY	19	7	8
BELGIUM-LUXEMBURG	18	10	20
AUSTRIA	17	5	6
FINLAND	16	9	10
AUSTRALIA	15	19	18
DENMARK	14	3	2
ICELAND	13	8	9
SWEDEN	12	11	12
GREECE	11	4	3
PORTUGAL	10	12	11
TURKEY	9	13	7
FRANCE	8	1	1
THE NETHERLANDS	7	18	5
NEW ZEALAND	6	14	13
CANADA	5	15	17
SPAIN	4	17	19
GERMANY	3	22	22
IRELAND	2	20	16
USA	1	2	15

Table 2 Correlation between country rankings by net shift percent in different time periods (SITC 7144)

Net Shift Percent	1989-1993	1990-1993
1986-1990	-0.0198 (P = 0.929)	-0.0227 (P = 0.918)

Table 3 Correlation of country rankings by import size or import growth rate in different time periods (SITC 7144)

Size	1989	1990	1993	Growth	1989-1993	1990-1993
1986-1990	0.8004	0.7945	0.8043	1986-1990	-0.2204	-0.0672
1989	---	---	0.8804		(P = 0.312)	(P = 0.761)
1990	---	---	0.8992			

Table 4 Correlation between country rankings by import growth rate and net shift percent in the same time period (SITC 7144)

	Net Shift Percent 1986-90	1989-93	1990-93
1986-90	0.5620 (P= 0.006)	---	---
1989-93	---	0.4298 (P=0.041)	---
1990-93	---	---	0.4733 (P= 0.023)

Paper Product Machine (SITC 7252)

Table 5 Country rankings by net shift percent in different time periods (SITC 7252)

Country	1986-1990	1988-1992	1990-1993
USA	33	6	1
FRANCE	1	31	33
GERMANY	5	20	32
UK	31	33	2
ITALY	3	19	31
JAPAN	6	26	30
CANADA	24	32	28
SPAIN	2	10	29
THE NETHERLANDS	30	16	22
BELGIUM-LUXEMBURG	10	12	24
SWEDEN	13	28	27
SWITZERLAND	16	29	20
AUSTRALIA	32	30	7
AUSTRIA	29	5	23
FINLAND	17	27	25
HONG KONG	22	11	4
DENMARK	28	4	11
PORTUGAL	11	18	26
SINGAPORE	12	3	8
ISRAEL	23	22	10
THAILAND	8	7	3
TURKEY	27	14	9
NORWAY	25	24	16
MALAYSIA	4	1	19
NEW ZEALAND	26	25	12
BRAZIL	7	9	17
IRELAND	14	23	21
GREECE	21	15	18
INDONESIA	9	2	6
ARGENTINA	20	13	5
VENEZUELA	19	17	14
EGYPT	18	21	13
TUNISIA	15	8	15

Table 6 Correlation between country rankings by net shift percent in different time periods (SITC 7252)

Net Shift Percent	1986-90	1988-92
1986-92	0.13 (P= 0.471)	---
1990-92	-0.5434 (P= 0.001)	0.3319 (P= 0.059)

Table 7 *Correlation between country rankings by import size in different time periods (SITC 7252)*

Size	1988	1990	1992	1993
1988	---	0.9271	---	0.6932
1990	---	---	0.8610	---
1992	---	---	---	0.7711

Table 8 *Correlation between country rankings by import growth rate in different time periods (SITC 7252)*

Growth	1986-90	1988-92
1986-90	0.3453 (P= 0.049)	---
1988-92	-0.3429 (P= 0.051)	0.2848 (P = 0.108)

Table 9 *Correlation between country rankings by import growth rate and net shift percent in the same time period (SITC 7252)*

Growth	Net Shift Percent		
	1986-90	1988-92	1990-93
1986-90	0.8249	---	---
1988-92	---	0.8867	---
1990-93	---	---	0.8366

Nitro-Phos Fertilizer (SITC 56292)

Table 10 Country rankings by net shift percent in different time periods (SITC 56292)

Country	1986-1990	1988-1992	1990-1992
CANADA	1	14	8
SPAIN	2	7	14
FRANCE	3	10	15
JAPAN	4	16	10
BELGIUM-LUXEMBURG	5	3	17
AUSTRALIA	6	4	18
PORTUGAL	7	12	9
UK	8	15	6
GREECE	9	5	5
NEW ZEALAND	10	2	2
INDONESIA	11	8	12
TURKEY	12	9	16
DENMARK	13	6	11
THE NETHERLANDS	14	11	7
USA	15	1	1
IRELAND	16	17	13
GERMANY	17	13	4
ITALY	18	18	3

Table 11 Correlation between country rankings by net shift percent in different time periods (SITC 56292)

Net Shift Percent	1988-1992	1990-1992
1986-1990	0.1352 (P = 0.593)	-0.0898 (P = 0.723)

Table 12 Correlation of country rankings by import size or import growth rate in different time periods (SITC 56292)

Size	1988	1990	1992	Growth	1988-1992	1990-1992
1986	---	0.8287	---	---	---	---
1988	---	---	0.9835	---	---	---
1990	---	---	0.9794	---	---	---
1992	---	---	---	---	---	---
1986-1990	---	---	---	---	0.3478	0.162
1988-1992	---	---	---	---	(P = 0.157)	(P = 0.521)

Table 13 Correlation between country rankings by import growth rate and net shift percent in the same time period (SITC 56292)

	Net Shift Percent		
	1986-90	1988-92	1990-92
Growth	0.7358	---	---
1986-90	---	---	---
1988-92	---	0.8989	---
1990-92	---	---	0.8453

Outlier Analysis

Table 14 Ranking of outliers by net shift percent in different time periods (SITC 7144)

Outlier	1986-1990	1989-1993	1990-1993
UK	23	23	23
FRANCE	22	21	21
USA	1	2	15

Table 15 Rankings of outliers by net shift percent in different time periods (SITC 7252)

COUNTRY	1986-90	1988-92	1990-93
USA	33	6	1

Appendix C Indicators and Secondary Data Sources

1. Demand potential

- a. Apparent consumption - (ISIC 3 or 4 digit industry level, in US\$)

$$C_j = P_j + M_j - X_j = M_j / \text{Import Penetration}_{ij}$$

C_j - apparent consumption P_j - domestic production
 M_j - imports X_j - exports

Source: Commodity Trade Statistics 1988
 The OECD Stan Database For Industrial Analysis 1974-1993

- b. Import penetration - Import as percent of apparent consumption in
 industry j, i.e. M_j / C_j

Source: The OECD Stan Database For Industrial Analysis 1974-1993

- c. Competitive Advantage - Import from a specific exporting country as a
 percent of total import of Country i in industry j

Source: Commodity Trade Statistics 1988
 International Trade Statistics Yearbook 1993 Vol. II

- d. Market Similarity - The degree of likeness between a foreign market and
 a firm's home market

X_{d1} . *Electricity production index*

Source: Energy Statistics Yearbook 1988

X_{d2} . *Gross National Product Per Capital*
 X_{d3} . *Life Expectancy at birth*

Source: World Tables 1995
 World Factbook 1994

X_{d4} . *Import as a percent of GDP*

Source: International Financial Statistics Yearbook (IMF), 1995

2. Import barrier

a. Tariff rate - Taxes on goods moving across an economic or political boundary.
Indicator: Weighted mean average tariff rate

b. Nontariff barriers:
 - Include quotas, voluntary export restrictions and other trade restrictions, such as packaging regulations, performance requirements, etc.

Indicator: Weighted nontariff barrier incidence (each barrier item is weighted by its frequency of occurrence)

Source: Trade Policy Review, GATT

c. Geographical distance - Distance (in kilometers) between main ports of importing and exporting country (if no port, capital or main city will be selected)

Source: Direct-line Distances (International Edition), Fitzpatrick, G.L. and Modlin, M. J , 1986

d. Exchange rate - Annual average official exchange rate

Indicator: % in depreciation or appreciation compared with that of previous year

Source: International Financial Statistics Yearbook (IMF), 1995

3. Weighting system (hypothesized weights)

a. Strategy: *Defensive versus Offensive*

b. Different product categories

Weight designs: equal weights (W_0) and other 2 weighting schemes (W_1 & W_2)

4. External criteria - *Market development*

Indicator: time series imports from specific exporting country or import market share of specific exporting country in industry j

import market share =
$$\frac{\text{imports from a specific exporting country}}{\text{Total imports}}$$

Source: Commodity Trade Statistics 1989-1994

Appendix D List of 17 OECD Countries

1. Australia	2. Austria
3. Belgium-Luxemburg	4. Denmark
5. Finland	6. France
7. Germany	8. Japan
9. Italy	10. The Netherlands
11. New Zealand	12. Norway
13. Portugal	14. Spain
15. Sweden	16. United Kingdom
17. USA	

Appendix E

E.1 Principal Component Analysis of "Market Similarity"

	Factor 1 (45% variance)	Factor 2 (33% variance)
Life-expectancy	0.76995	0.51893
GNP per capital	0.86678	0.31020
Electricity production	0.47976	-0.71994
Import/GDP ratio	-0.47487	0.68025

E.2 Frequency of Occurrence of Non-tariff Barriers (17 OECD Countries)

Nontariff barrier

	Total counts	Percentage(%)
1 - Import prohibition or embargo	1	0.8928
2 - Subsidies (export refunds)	17	15.178
3 - Marking/labeling/packing requirements	16	14.286
4 - Variable components requirement	10	8.928
5 - Global quota (include. tariff quota)	9	8.036
6 - Non-automatic licensing	5	4.464
7 - Countervailing charges	9	8.036
8 - Excise taxes	12	10.714
9 - Sanitary regulation	8	7.143
10 - Import licensing	4	3.571
11 - Permit system	1	0.8928
12 - Import tax	5	4.464
13 - State-trading control	4	3.571
14 - Surcharge	1	0.8928
15 - Import price surveillance	2	1.786
16 - Export restriction	2	1.786
17 - Offsets requirement	1	0.8928
18 - Local content requirement	1	0.8928
19 - Marketing standard & regulation	2	1.786
20 - Tax unspecified (include. industrial duties)	<u>2</u>	<u>1.786</u>
	112	100%

Appendix F Summary of Country Scales

appco -	apparent consumption	mks -	competitive advantage
imptr -	import penetration	mk -	market similarity
<i>poten</i> -	overall score for demand potential (simple arithmetic mean)		
	* $poten = (appco + mks + imptr + mk) / 4$		
tr -	tariff barrier	ntm -	non-tariff barrier
geodis -	geographic distance	ex -	exchange rate
<i>barr</i> -	overall score for market barrier (simple arithmetic mean)		
	* $barr = (tr + ntm + geodis + ex) / 4$		
W_0 -	Overall country scales (equal weights on each indicator)		
W_1 -	Overall country scales (weighting scheme 1)		
	$(appco*0.25 + mks*0.25 + imptr*0.2 + mk*0.05 + ex*0.1 + tr*0.05 + ntm*0.05 + geodis*0.05)$		
W_2 -	Overall country scales (weighting scheme 2)		
	$(appco*0.1 + mks*0.1 + imptr*0.1 + mk*0.15 + ex*0.1 + tr*0.15 + ntm*0.15 + geodis*0.15)$		

- Detailed explanation of W_0 , W_1 & W_2 as per Appendix H

Beverages (SITC 11) - Canada

C	appco	mks	imptr	mk	poten	tr	ntm	geodis	ex	barr	W_0	W_1	W_2
1	0.81	0.23	0.71	8.74	2.62	4.49	6.5	0	9.43	5.1	3.86	2.33	4.08
2	0.37	0.02	0.49	6.36	1.81	5.42	6	5.75	3.33	5.12	3.47	1.7	3.95
3	0.46	0	10	3.2	3.41	1.37	2.33	6.35	2.72	3.19	3.3	3.05	3.31
4	0.15	0.07	7.03	8.52	3.94	1.37	2.33	6.19	2.77	3.17	3.55	2.66	3.76
5	0.12	0.23	0.6	8.5	2.36	0	10	5.96	5.17	5.28	3.82	1.95	4.28
6	1	0.03	5.36	10	4.1	1.37	0.83	6.02	2.27	2.62	3.36	2.47	3.6
7	4.51	0.04	1.84	9.5	3.97	1.37	2.33	6.27	3.3	3.32	3.64	2.81	3.89
8	7.04	3.32	0	3.51	3.47	0.4	4.5	3.28	10	4.55	4.01	4.17	3.79
9	3.84	0.18	1.61	9	3.66	1.37	2.33	5.9	1.3	2.73	3.19	2.39	3.48
10	0.46	0.04	8.86	6.96	4.08	1.37	2.33	6.37	3.39	3.37	3.72	3.09	3.83
11	0.09	0.1	2.44	5.13	1.94	3	5.17	1.12	8.77	4.51	3.23	2.13	3.3
12	0.13	0.11	1.93	9.61	2.95	9.47	3.83	6.6	4.02	5.98	4.46	2.32	5.05
13	0	0.03	6.88	0	1.73	1.37	0.83	6.54	0	2.19	1.96	1.82	2
14	1.57	0.05	0.65	6.88	2.29	1.37	0	6.09	5.78	3.31	2.8	1.83	2.96
15	0.24	0.77	4.82	8.8	3.66	10	7.5	6.14	4.08	6.93	5.29	3.25	5.86
16	2.89	0.19	4.32	6.89	3.57	1.37	2.33	6.55	7.48	4.43	4	3.24	4.06
17	10	10	1.84	3.73	6.39	5.99	8.17	10	1.61	6.44	6.42	6.92	6.53

Beverages (SITC 11) - China

C	appco	mks	imptr	mk	poten	tr	ntm	geodis	ex	barr	W ₀	W ₁	W ₂
1	0.81	0.7	0.71	4.7	1.73	4.49	6.5	3.85	9.43	6.07	3.9	2.44	4.1
2	0.37	0.65	0.49	6.14	1.91	5.42	6	3.23	3.32	4.49	3.2	1.73	3.6
3	0.46	0.31	10	8.06	4.71	1.37	2.33	2.75	2.72	2.29	3.5	3.19	3.53
4	0.15	0	7.03	4.83	3	1.37	2.33	3.44	2.77	2.48	2.74	2.32	2.79
5	0.12	0	0.6	4.84	1.39	0	10	4.28	5.17	4.86	3.13	1.62	3.46
6	1	1.5	5.36	3.94	2.95	1.37	0.83	2.27	2.26	1.68	2.32	2.34	2.27
7	4.51	0.15	1.84	4.24	2.69	1.37	2.33	3.11	3.29	2.53	2.61	2.42	2.64
8	7.04	10	0	0.01	4.26	0.4	4.5	10	10	6.23	5.24	6.01	4.94
9	3.84	1.26	1.61	4.54	2.81	1.37	2.33	2.56	1.29	1.89	2.35	2.27	2.42
10	0.46	0.17	8.86	5.78	3.82	1.37	2.33	2.85	3.39	2.48	3.15	2.88	3.14
11	0.09	0	2.44	6.89	2.35	3	5.17	2.41	8.76	4.83	3.59	2.26	3.75
12	0.13	0	1.93	4.17	1.56	9.47	3.83	3.39	4.01	5.18	3.37	1.86	3.74
13	0	0	6.88	10	4.22	1.37	0.83	1.1	0	0.83	2.52	2.04	2.68
14	1.57	0.13	0.65	5.83	2.05	1.37	0	1.95	5.77	2.27	2.16	1.59	2.18
15	0.24	0	4.82	3.21	2.07	10	7.5	3.91	4.08	6.37	4.22	2.66	4.61
16	2.89	0.12	4.32	5.82	3.29	1.37	2.33	2.54	7.5	3.43	3.36	2.97	3.29
17	10	1.87	1.84	0.14	3.46	5.99	8.17	0	1.61	3.94	3.7	4.21	3.68

Aircraft (SITC 792) - Canada

C	appco	mks	imptr	mk	poten	tr	ntm	geodis	ex	barr	W ₀	W ₁	W ₂
1	0.23	0.88	6.69	8.74	4.13	10	9.62	0	9.43	7.26	5.7	3.98	5.98
2	0.02	3.95	10	6.36	5.08	9	5.77	5.75	3.33	5.96	5.52	4.67	5.76
3	0.06	0.58	10	3.2	3.46	2.6	3.46	6.35	2.72	3.78	3.62	3.21	3.68
4	0.04	0.02	10	8.52	4.65	2.6	3.46	6.19	2.77	3.76	4.2	3.33	4.4
5	0.06	0.34	6.36	8.5	3.82	10	10	5.96	5.17	7.78	5.8	3.61	6.36
6	1.57	0.1	2.23	10	3.48	2.6	3.08	6.02	2.27	3.49	3.48	2.18	3.87
7	1.14	0.33	8.77	9.5	4.94	2.6	3.46	6.27	3.3	3.91	4.42	3.54	4.63
8	1	0.48	2.89	3.51	1.97	5.8	0	3.28	10	4.77	3.37	2.58	3.33
9	0.34	0.75	5.41	9	3.87	2.6	3.46	5.9	1.3	3.32	3.59	2.53	3.92
10	0.16	1.52	8.57	6.96	4.3	2.6	3.46	6.37	3.39	3.96	4.13	3.44	4.27
11	0.04	0.03	5.57	5.13	2.69	0	10	1.12	8.77	4.97	3.83	2.82	3.88
12	0.07	0.17	7.42	9.61	4.32	10	9.23	6.6	4.02	7.46	5.89	3.72	6.48
13	0	0	10	0	2.5	2.6	3.46	6.54	0	3.15	2.83	2.63	2.89
14	0.16	0.04	10	6.88	4.27	2.6	10	6.09	5.78	6.12	5.19	3.9	5.43
15	0.19	0.69	3.04	8.8	3.18	10	10	6.14	4.08	7.55	5.37	2.98	6.04
16	0.86	0.99	4.64	6.89	3.35	2.6	3.46	6.55	7.48	5.03	4.18	3.11	4.32
17	10	10	0	3.73	5.93	6.4	10	10	1.61	7	6.47	6.67	6.68

Aircraft (SITC 792) - China

C	appco	mks	imptr	mk	poten	tr	ntm	geodis	ex	barr	W ₀	W ₁	W ₂
1	0.23	0	6.69	4.7	2.91	10	9.62	3.85	9.43	8.22	5.56	3.75	5.86
2	0.02	0	10	6.14	4.04	9	5.77	3.23	3.32	5.33	4.68	3.54	4.95
3	0.06	0	10	8.06	4.53	2.6	3.46	2.75	2.72	2.88	3.71	3.13	3.81
4	0.04	0	10	4.83	3.72	2.6	3.46	3.44	2.77	3.07	3.39	3	3.43
5	0.06	0	6.36	4.84	2.82	10	10	4.28	5.17	7.36	5.09	3.26	5.53
6	1.57	1.69	2.23	3.94	2.36	2.6	3.08	2.27	2.26	2.55	2.46	2.08	2.56
7	1.14	0.23	8.77	4.24	3.6	2.6	3.46	3.11	3.29	3.12	3.36	3.1	3.36
8	1	0	2.89	0.01	0.97	5.8	0	10	10	6.45	3.71	2.62	3.76
9	0.34	0	5.41	4.54	2.57	2.6	3.46	2.56	1.29	2.48	2.53	1.95	2.68
10	0.16	0	8.57	5.78	3.63	2.6	3.46	2.85	3.39	3.07	3.35	2.83	3.42
11	0.04	0	5.57	6.89	3.12	0	10	2.41	8.76	5.29	4.21	2.96	4.33
12	0.07	0	7.42	4.17	2.92	10	9.23	3.39	4.01	6.66	4.79	3.24	5.17
13	0	0	10	10	5	2.6	3.46	1.1	0	1.79	3.4	2.86	3.57
14	0.16	0	10	5.83	4	2.6	10	1.95	5.77	5.08	4.54	3.64	4.65
15	0.19	0	3.04	3.21	1.61	10	10	3.91	4.08	7	4.3	2.42	4.8
16	0.86	0	4.64	5.82	2.83	2.6	3.46	2.54	7.5	4.03	3.43	2.61	3.46
17	10	9.98	0	0.14	5.03	6.4	10	0	1.61	4.5	4.77	5.98	4.64

Furniture (SITC 821) - Canada

C	appco	mks*	imptr	mk	poten	tr	ntm	geodis	ex	barr	W ₀	W ₁	W ₂
1	0.55	8.94	1.15	8.74	2.83	4.69	5	0	9.43	4.78	3.81	2.46	3.97
2	1.05	0.04	2.48	6.36	2.48	5.86	7.5	5.75	3.33	5.61	4.04	2.37	4.51
3	0.99	0.12	4.13	3.2	2.08	9.32	10	6.35	2.72	7.1	4.59	2.79	5.12
4	0.11	0.46	6.52	8.52	3.8	9.32	10	6.19	2.77	7.07	5.43	3.32	6.05
5	0.23	3.16	2.25	8.5	2.82	9.18	0	5.96	5.17	5.08	3.95	2.29	4.34
6	2.31	0.25	4.93	10	4.32	9.32	10	6.02	2.27	6.9	5.61	3.56	6.25
7	4.35	0.27	2.72	9.5	4.15	9.32	10	6.27	3.3	7.22	5.68	3.72	6.3
8	8.73	1.34	0.15	3.51	3.13	10	5	3.28	10	7.07	5.1	4.34	5.17
9	3.81	0.63	0	9	3.22	9.32	10	5.9	1.3	6.63	4.92	2.81	5.65
10	0.59	0.23	10	6.96	4.39	9.32	10	6.37	3.39	7.27	5.83	4.12	6.3
11	0.06	1.93	1.63	5.13	1.75	0	10	1.12	8.77	4.97	3.36	2.08	3.5
12	0.22	0.29	8.2	9.61	4.51	9.59	10	6.6	4.02	7.55	6.03	3.89	6.62
13	0	0	4.13	0	1.03	9.32	10	6.54	0	6.46	3.75	2.12	4.29
14	0.56	1.02	1.62	6.88	2.29	9.32	10	6.09	5.78	7.8	5.04	2.68	5.65
15	0.25	0.59	8.54	8.8	4.41	9.76	10	6.14	4.08	7.49	5.95	3.93	6.5
16	2.81	2.71	2.62	6.89	3.15	9.32	10	6.55	7.48	8.34	5.74	3.68	6.23
17	10	100	2.15	3.73	6.47	9.55	10	10	1.61	7.79	7.13	7.25	7.37

* mks/10 is actual country scales

Furniture (SITC 821) - China

C	appco	mks	imptr	mk	poten	tr	ntm	geodis	ex	barr	W ₀	W ₁	W ₂
1	0.55	6.4	1.15	4.7	1.76	4.69	5	3.85	9.43	5.74	3.75	2.38	3.91
2	1.05	0.21	2.48	6.14	2.43	5.86	7.5	3.23	3.32	4.98	3.7	2.23	4.1
3	0.99	0.07	4.13	8.06	3.3	9.32	10	2.75	2.72	6.2	4.75	2.86	5.3
4	0.11	0.62	6.52	4.83	2.88	9.32	10	3.44	2.77	6.38	4.63	3	5.08
5	0.23	0.86	2.25	4.84	1.85	9.18	0	4.28	5.17	4.66	3.25	1.96	3.52
6	2.31	0.48	4.93	3.94	2.81	9.32	10	2.27	2.26	5.96	4.38	3.08	4.78
7	4.35	0.53	2.72	4.24	2.84	9.32	10	3.11	3.29	6.43	4.64	3.31	5.04
8	8.73	9.09	0.15	0.01	2.45	10	5	10	10	8.75	5.6	4.69	5.73
9	3.81	3.19	0	4.54	2.17	9.32	10	2.56	1.29	5.79	3.98	2.48	4.51
10	0.59	0.23	10	5.78	4.1	9.32	10	2.85	3.39	6.39	5.24	3.89	5.59
11	0.06	10	1.63	6.89	2.39	0	10	2.41	8.76	5.29	3.84	2.43	4.04
12	0.22	0.05	8.2	4.17	3.15	9.59	10	3.39	4.01	6.75	4.95	3.46	5.32
13	0	0	4.13	10	3.53	9.32	10	1.1	0	5.1	4.32	2.35	4.98
14	0.56	0.18	1.62	5.83	2.01	9.32	10	1.95	5.77	6.76	4.38	2.4	4.86
15	0.25	0.9	8.54	3.21	3.02	9.76	10	3.91	4.08	6.94	4.98	3.54	5.33
16	2.81	0.32	2.62	5.82	2.82	9.32	10	2.54	7.5	7.34	5.08	3.37	5.45
17	10	2.43	2.15	0.14	3.13	9.55	10	0	1.61	5.29	4.21	4.13	4.35

Appendix G Two-dimensional Country Plotting

Figure 5 Demand Potential vs. market barrier for Canada (Beverages)

Figure 6 Demand potential vs. market barrier for China (Beverages)

Figure 7 Demand potential vs. market barrier for Canada (Aircraft)

Figure 8 Demand potential vs. market barrier for China (Aircraft)

Figure 9 Demand potential vs. market barrier for Canada (Furniture)

Figure 10 Demand potential vs. market barrier for China (Furniture)

Appendix H Establishing a Weighting Scheme

$$Y = a_1X_1 + a_2X_2 \quad (1)$$

Y - Overall country scale
 X_2 - Scale on barrier
 a_2 - Weights on barrier

X_1 - Scale on potential
 a_1 - Weights on potential

$$X_1 = a_{11}X_{11} + a_{12}X_{12} + a_{13}X_{13} + a_{14}X_{14} \quad (2)$$

X_{11} - Scale on apparent consumption
 X_{13} - Scale on import penetration
 a_{11} - Weights on apparent consumption
 a_{13} - Weights on import penetration

X_{12} - Scale on competitive advantage
 X_{14} - Scale on market similarity
 a_{12} - Weights on competitive advantage
 a_{14} - Weights on market similarity

$$X_2 = a_{21}X_{21} + a_{22}X_{22} + a_{23}X_{23} + a_{24}X_{24} \quad (3)$$

X_{21} - Scale on tariff barrier
 X_{23} - Scale on geographical distance
 a_{21} - Weights on tariff barrier
 a_{23} - Weights on geographical distance

X_{22} - Scale on non-tariff barrier
 X_{24} - Scale on exchange rate
 a_{22} - Weights on non-tariff barrier
 a_{24} - Weights on exchange rate

Weights	W_0	W_1	W_2
	0.5	0.75	0.45
	0.5	0.25	0.55
	0.25	0.33	0.22
	0.25	0.33	0.22
	0.25	0.27	0.22
	0.25	0.07	0.34
	0.25	0.2	0.27
	0.25	0.2	0.27
	0.25	0.2	0.27
	0.25	0.4	0.19

equivalent to

$$W_0 = 0.125 * (X_{11} + X_{12} + X_{13} + X_{14} + X_{21} + X_{22} + X_{23} + X_{24})$$

$$W_1 = 0.25 * (X_{11} + X_{12}) + 0.2 * X_{13} + 0.05 * X_{14} + 0.05 * (X_{21} + X_{22} + X_{23}) + 0.1 * X_{24}$$

$$W_2 = 0.1 * (X_{11} + X_{12} + X_{13}) + 0.15 * X_{14} + 0.15 * (X_{21} + X_{22} + X_{23}) + 0.1 * X_{24}$$

Appendix I Country Scales of 15 Target Countries in Beverage Industry for Canada

Beverages (SITC 11) - Canada (15 countries)

C	appco	mks	imptr	mk	tr	ntm	geodis	ex	W ₀	W ₁	W ₂
1	1.03	0.71	0.71	7.07	4.49	6.5	10	9.34	2.91	5.29	4.98
2	0.41	0.05	0.49	7.37	5.42	6	1.29	2.33	1.45	3.34	2.92
3	0.53	0	10	8.48	1.37	2.33	0.37	1.64	2.92	3.1	3.09
4	0.09	0.23	7.03	8.77	1.37	2.33	0.62	1.7	2.31	2.87	2.77
5	0.05	0.68	0.6	9.63	0	10	0.97	4.45	1.78	3.67	3.3
6	1.31	0.1	5.36	8.53	1.37	0.83	0.88	1.12	2.12	2.53	2.44
7	6.36	0.13	1.84	7.67	1.37	2.33	0.51	2.3	2.81	2.84	2.81
8	10	10	0	2.01	0.4	4.5	5.03	10	6.6	4.79	5.24
9	5.4	0.54	1.61	7.35	1.37	2.33	1.06	0	2.41	2.57	2.46
10	0.53	0.12	8.86	7.66	1.37	2.33	0.35	2.41	2.76	2.95	2.95
11	0	0.3	2.44	0	3	5.17	8.3	8.58	2.24	3.6	3.47
12	0.06	0.33	1.93	4.29	9.47	3.83	0	3.12	1.68	3.18	2.88
14	2.14	0.15	0.65	2.71	1.37	0	0.77	5.15	1.46	1.54	1.62
15	0.22	2.34	4.82	2.4	10	7.5	0.7	3.19	2.95	4.15	3.9
16	4.03	0.57	4.32	2.61	1.37	2.33	0.07	7.1	3.04	2.56	2.8

* Countries 13 & 17 excluded

Appendix J Proxy Variable Test

Correlation between Import Penetration and Import/GDP Ratio for Specific Industry

Year 1985	Import/GDP		
	821	562	383
Import Penetration	0.6957	---	---
821	(17, P = 0.002)		
562	---	0.8177	---
		(12, P = 0.001)	
383	---	---	0.7417
			(18, P = 0.000)

Appendix K Country Rankings by Proxy Variable

Assume $Y = KX + B$
 Y -- proxy variable of X

$$\text{Country ranking using } X \text{ (for country } i) = \frac{X_i - X_{\min}}{(X_{\max} - X_{\min})/10}$$

$$\begin{aligned} \text{Country ranking using } Y \text{ (for country } i) &= \frac{Y_i - Y_{\min}}{(Y_{\max} - Y_{\min})/10} \\ &= \frac{(KX_i + B) - (KX_{\min} + B)}{\{(KX_{\max} + B) - (KX_{\min} + B)\}/10} \\ &= \frac{X_i - X_{\min}}{(X_{\max} - X_{\min})/10} \end{aligned}$$