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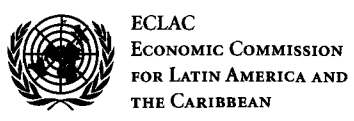
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# TradeCAN

**Database and Software  
for a Competitiveness  
Analysis of Nations**

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**User Guide**  
1999 Edition



76630

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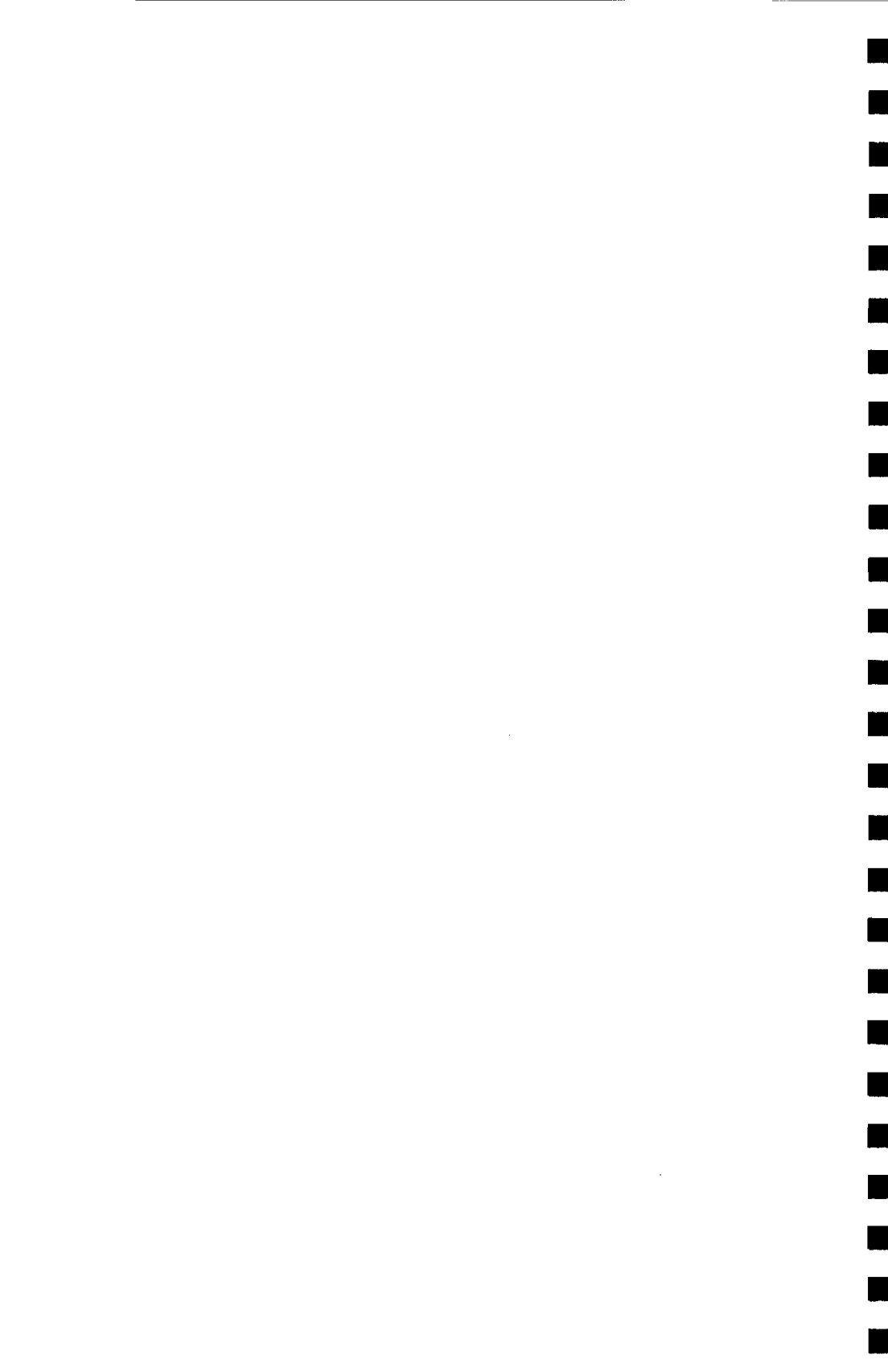
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## **Acknowledgments**

TradeCAN\* is the product of a cooperative venture of the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) and the World Bank. It is an updated and upgraded version of earlier CAN databases and software programs developed by UNECLAC. Ousmene Mandeng, a former researcher at UNECLAC, created the original version of TradeCAN.

TradeCAN was programmed by a group of technicians headed by Zaida Soto. Rudolf Buitelaar at UNECLAC prepared the User Guide.

Michael Mortimore and Wilson Peres at UNECLAC and Andrew Stone with Manjula Luthria, under the supervision of R. Shyam Khemani, at the World Bank oversaw the development of TradeCAN and were responsible for it overall.<sup>1</sup>

## **About TradeCAN**

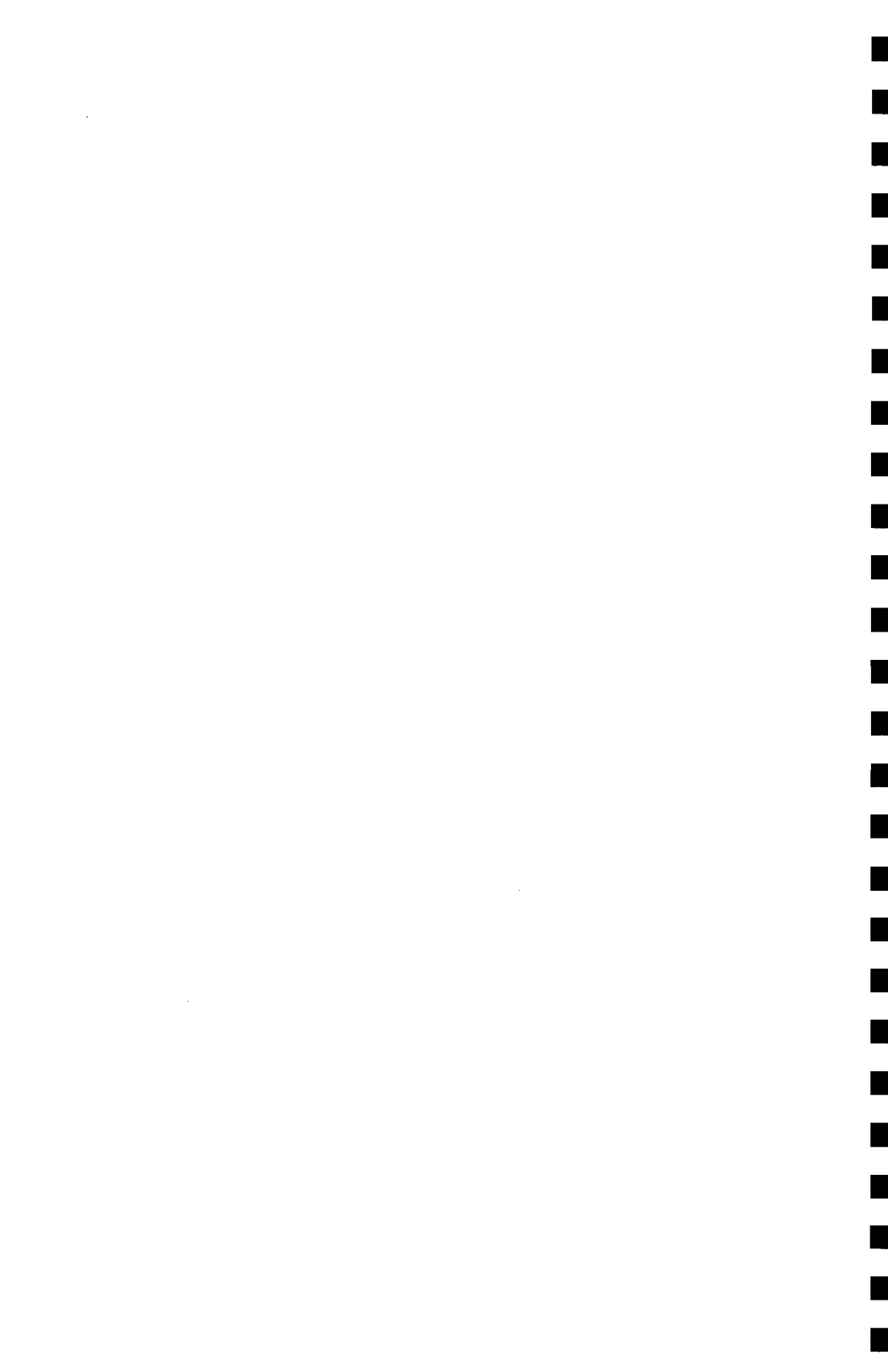
TradeCAN is programmed in Delphi 3.0 and is compatible with Windows 95, 98, and Windows NT 3.x or later. It is available from authorized distributors of World Bank publications in countries throughout the world.

## **Disclaimer**

Neither UNECLAC nor the World Bank is responsible for any errors contained in the database, software program, or manual. Neither institution is responsible for the consequences of any use or interpretation of TradeCAN. Country denominations and other CAN terminology do not imply any value judgment whatsoever from UNECLAC or the World Bank, and do not imply the recognition of any legal status of countries, regions, authorities, their borders or limits.

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\*CAN stands for "Competitiveness Analysis of Nations."





# Foreword

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**T**RADECAN IS DESIGNED TO ANALYZE national and regional competitiveness in commodities and manufactured exports. It allows users to calculate market shares for each three- or four-digit SITC export between 1985 and 1996 and to plot changes in market share and market structure. There are two reasons for focusing on manufactures. First, while unprocessed resource exports are often important, the thrust of competitiveness policy is to add value to these exports and to diversify into a broader base of products, with more stable and sustainable prices (this definition of “manufactures” includes processed resources). Second, while it is important for domestic industry to compete with imports (particularly given trade liberalization), it is difficult to get data on import penetration. Manufactured exports remain good indicators of evolving competitiveness.

Export competitiveness is assessed in part by export values and by the technological pattern of exports, which are important because they show the underlying competitive base and its evolution over time. The CAN software allows products to be grouped into appropriate technological categories.

TradeCAN also helps calculate market positioning—which is drawn from the business literature and intends to show how a country is placed for growth in world markets. It relates product-level market shares to the dynamism of exported products in world trade. A country is considered competitive in products in which it is increasing its world market share, and an export product is considered dynamic in world trade if it is growing faster than the average for all products. This yields a simple matrix (see Table 1).

It is ideal for the highest share of exports to be Rising Stars, where the country is gaining market share in fast-growing products. Lost Opportunity is the least desirable, since market share is lost in dynamic products. Falling Stars are undesirable, since market shares are rising but not in the dynamic products.

TABLE 1 *Matrix of Market Positioning*

<i>Share of country's export in world trade</i>	<i>Share of product in world trade</i>	
	<i>Rising (dynamic)</i>	<i>Falling (stagnant)</i>
Rising (competitive)	"Rising Stars"	"Falling Stars"
Falling (noncompetitive)	"Lost Opportunity"	"Retreat"

Finally, Retreat may be desirable if the movement away from stagnant products is accompanied by growth in dynamic products. The underlying reasoning for applying this matrix is that competitive structures, which are path-dependent, are difficult to change quickly, and that the ability to adapt is unevenly distributed. To the extent that changes in the export structure can be induced by policy, it is important to analyze flexibility and benchmark it against competitors.

Table 2 shows the positioning of some major exporters to illustrate the range of different outcomes. Pakistan is an example of very weak positioning, compared, for instance, with China, with which it shares a high reliance on low-technology exports. For Rising Stars, Pakistan is the lowest and India is only slightly better. Malaysia and Singapore have the largest percentages of

TABLE 2 *Market Positioning (Percent of Total Manufactured Exports)*

<i>Country</i>	<i>Rising Stars</i>	<i>Falling Stars</i>	<i>Lost Opportunity</i>	<i>Retreat</i>
Korea	41.6	39.7	8.9	9.8
Taiwan	50.9	20.6	20.1	8.4
Singapore	68.6	15.2	5.3	10.9
Malaysia	72.7	23.8	0.6	2.8
Indonesia	34.7	47.4	16.3	1.6
Thailand	54.1	37.8	2.8	5.3
China	47.4	46.5	0.7	5.4
India	19.3	65.6	7.6	7.6
Pakistan	14.6	71.0	5.0	9.4

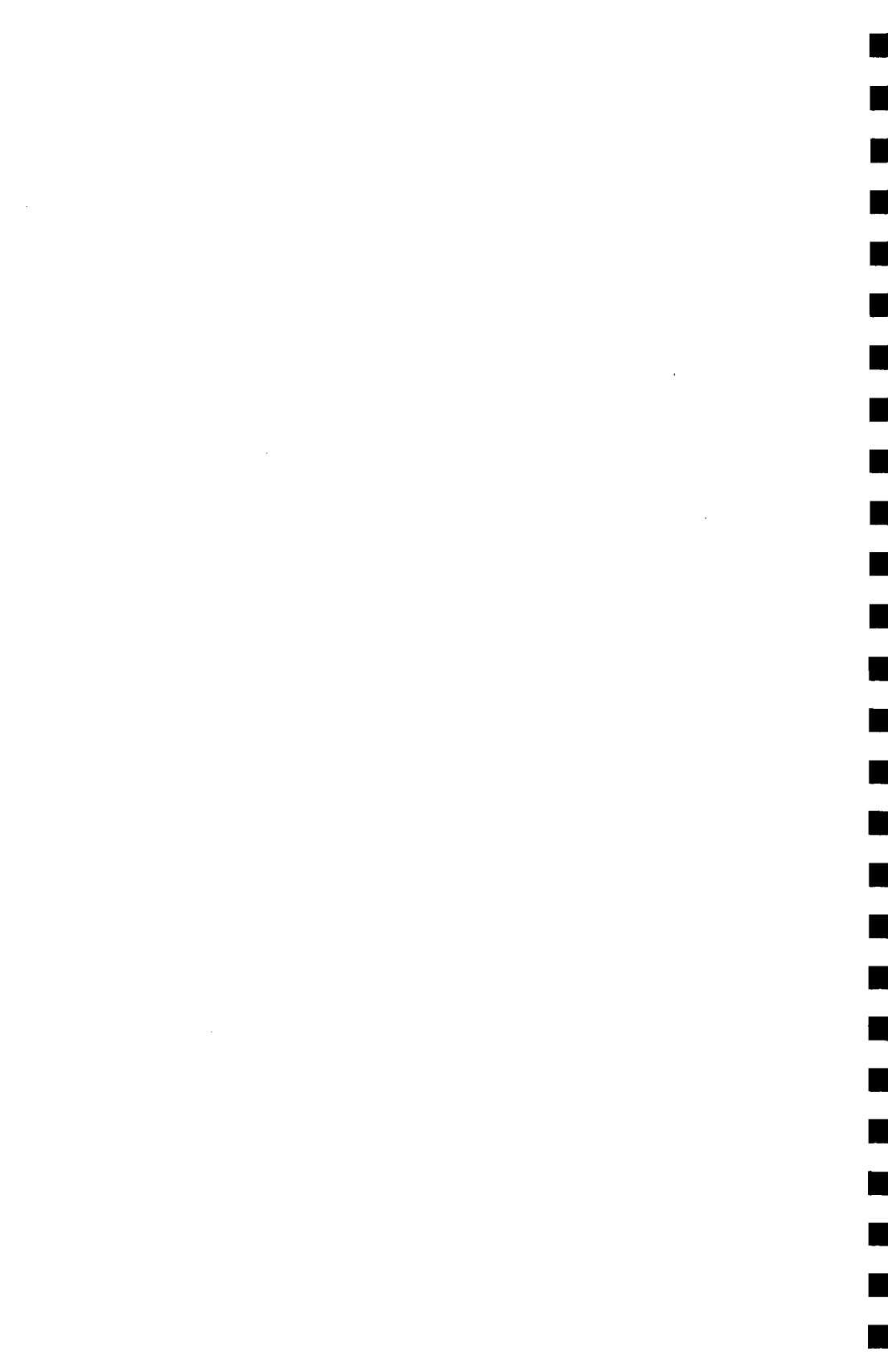
Note: Market positioning calculated for exports data for 1990–95.

total manufactured exports in the Rising Stars category. Taiwan and Indonesia have the highest share of Lost Opportunities, where they are losing market share in dynamic products; less than 1 percent of Malaysian and Chinese exports falls into this category.

Further, looking at the technological characteristics of each country's Rising Stars can show how vulnerable they are to easy entry by competitors and substitution by other products. For instance, a high proportion of low-tech products in Rising Stars may be less desirable than one with mainly high-tech products.

The analysis above suggests several ways in which export competitiveness could be assessed on a cross-country basis. All such measures should be handled with care and circumspection. Aiming at an export structure given by some notional ideal is neither possible nor desirable. Not every country can be a high-tech or high-fashion exporter. The essence of comparative advantage lies in the ideas that different countries have different specializations, and that exports emerge from their own evolving factor endowments and entrepreneurial talents.

Nonetheless, not all export structures are equally desirable, and none are "given" (apart from obvious endowments of natural resources). Technology-based and skill-based advantages are created by investments in technical effort and human capital and can be improved by enhancing the appropriate bases, institutions, and policies. Entrepreneurial response remains outside the purview of policy, but the government can do much to remove bureaucratic and legal obstacles to such response and provide the wherewithal to extend its scope and depth. The essence of competitiveness strategy lies in looking at a range of relevant performance benchmarks and drawing the right lessons, given each country's economic, political, and social situation.



# **Before You Get Started**

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## **What TradeCAN Is**

**T**RADECAN IS MORE THAN A GLOBAL TRADE DATABASE—it is a set of databases on the imports of goods of industrialized and developing countries, by commodity and country of origin, that you can customize. TradeCAN includes a query form that allows you to ask questions and quickly obtain customized information. The software also contains several versatile tools for analyzing data and an interface for preparing reports rapidly.

TradeCAN enables you to analyze the export structure and performance of countries in eight world markets. Another common use is to examine the market structure and dynamism of a particular product's imports. In any market, one must know the competitor countries, and which are gaining and losing market share. TradeCAN quickly helps answer these questions.

TradeCAN provides a useful starting point for economic research by presenting facts and tendencies in an analytically useful manner. However, TradeCAN is not a model. It does not contain hypotheses or explanations, or imply value judgments about structures, tendencies, performances, countries, or products.

## **Why Use TradeCAN?**

Whereas data are hard to come by in some fields of economic analysis, their availability in the field of foreign trade is overwhelming. There are few types of data so readily available and solid as foreign trade data. Researchers have to spend precious time just to learn how to manipulate the enormous amount of trade information. Often they come with cumbersome trade statistics manuals. Transposing the data often leads to errors.

Researchers at UNECLAC interested in foreign trade and international competitiveness designed TradeCAN to automate routine tasks of data

manipulation and standard calculation programming and to provide quick results. They shared their research tool with colleagues in universities, governments, and private sector organizations. With the collaboration of the World Bank, it now has become a tested software package ready for distribution to a broad group of analysts of international competitiveness. TradeCAN frees researchers from routine data manipulation and allows them to spend more time on creative reasoning.

There are some useful things to know about trade data before the creative process can begin.

## **World Imports: A Note on Data Characteristics**

TradeCAN data come from the COMTRADE database, the official trade database maintained by the United Nations Statistical Office. The raw data extracted from COMTRADE are the current dollar values of imports per year, per commodity and country of origin as reported by each importing country.

### **The Country Coverage of the Database**

An effort has been made to extract import data from every country in the world. Since the mid-1980s, a continuous time series of annual import data has been available for a significant number of countries. Thus, the time series in TradeCAN started in 1985 in some countries and in 1986 in others. There are 82 reporting countries (see Annex I).<sup>2</sup> They report on the imports from 193 countries of origin. Some of these countries no longer exist; others did not yet exist in 1985. The 193 countries of origin account for more than 96 percent of the total value of the imports of the 21 industrialized reporting countries (1996). This is \$3.4 trillion (all dollar amounts in this guide are U.S.) as reported in the COMTRADE database. The 193 countries of origin account for 98 percent of the total value of 61 developing countries' imports (1996) or \$1.3 trillion. Together, TradeCAN incorporates well over 90 percent of world trade.

### **Imports Valuation**

Imports are expressed in current dollar values for each year, in most cases using the cost, insurance, and freight (CIF) value.<sup>3</sup> These import values may differ from those concerning the same trade flow (same year, product, country of origin, and country of destination) as registered by the exporting country, which is often measured using the free on board (FOB) definition.

## The Construction of Regional Aggregates (Import Markets)

Original COMTRADE data are processed in two ways before entering the TradeCAN databases. First, regional aggregates are calculated. TradeCAN offers two broad aggregates: imports of both the industrialized and the developing world. The industrialized world's imports are then separated into the imports of North America, Europe, and Japan. Japan is the only country for which TradeCAN offers information on an individual country's imports. The developing world's imports are separated into the imports of developing America, developing Africa, and developing Asia.

## Three-Year Moving Averages

The second way in which data are processed before entering TradeCAN is the calculation of three-year moving averages. Only the last year (currently 1996) of the dataset is a two-year average. Working with three-year moving averages (instead of more usual annual data) avoids sharp cyclical fluctuations and emphasizes structural changes. TradeCAN is therefore a dataset and analytical software program that facilitates the analysis of structural tendencies of longer-term, not cyclical, competitiveness.

It is important to remember a few things. First, data refer to current dollar values. What this implies for analytical purposes may be illustrated by the relative importance of oil in world trade. In industrialized countries, crude oil (Standard International Trade Classification, or SITC 333) accounted for 9.93 percent of total imports in 1985 (which corresponds, in fact, to the average of 1984–86). In 1996 (which is average 1995–96), the same sector accounted for only 4.67 percent of total imports. Clearly, this drop in relative weight should be explained by a change in the price of oil relative to other imports, more than by volume fluctuations. The TradeCAN database itself, however, does not provide such information on price and volume changes.

Second, data represent gross production value as defined by the CIF principle. This means that when a good crosses more than one border, its import value will be recorded more than once in the TradeCAN database. An example of this may be found when analyzing the industrialized world's coffee imports. It is not surprising that Colombia had the largest market share in industrialized countries' coffee imports—16.14 percent—in 1996. Brazil was second, with a 14.46 percent market share. But the third country may be more difficult to guess. It is Germany, which held a 5.68 percent market share. Industrialized countries also import coffee from Germany, which is a case in point of goods passing several borders (sometimes after a process of transfor-

mation) before they reach the consumer. In these cases, the world's main competitor countries are not always the world's most important producers or manufacturers of a product.

## Trade Classifications

Trade data can be arranged in many classifications,<sup>4</sup> each serving a specific purpose. TradeCAN uses SITC Revision 2, which was designed in 1976 to facilitate economic analysis by end use of external trade statistics. It has since been updated to SITC Revision 3 and was replaced eventually by the harmonized system. TradeCAN uses the SITC Revision 2 scheme because it allows the construction of a longer time series than Revision 3 or the harmonized system.

## Aggregation Levels

SITC Revision 2 distinguishes 786 subgroups of commodities. This four-digit level (so called because each commodity is assigned a four-digit code) is the most detailed level of commodity aggregation available in TradeCAN. The subgroups are summarized in 233 groups (three-digit level), which is a frequently used aggregation level in analysis of international trade. The groups are assembled into 63 divisions (two-digit level) and the divisions are consolidated into 10 sections that divide the trade aggregate according to broad economic categories. TradeCAN allows the analysis on any of these four aggregation levels.

## Getting Started

You will need the following to operate TradeCAN:

- Windows 95, 98, or NT 3.x or later
- CD-ROM drive
- 20 megabytes of free disk space
- 120 MHz Pentium processor or better.

## Installation

Insert the TradeCAN CD-ROM in your compact disc drive. Your system should automatically present the installation program. Click the Setup button. (If the installation program is not activated automatically, run the *setup.exe* program from the compact disc by selecting Run on the Windows



start menu and typing in the path to the setup program on the TradeCAN CD-ROM.) The setup program will guide you through the installation procedure. When the system asks for the serial number, type TradeCAN 1.0. If you do not select any special options, setup will create two subdirectories on your hard disk—TradeCAN 1 and TradeCAN 2—each with its own icon. You may start TradeCAN by clicking on one of these icons.

## The Difference between TradeCAN 1 and TradeCAN 2

For technical reasons, data on industrialized countries' imports have been stored separately from data on developing countries' imports. TradeCAN 1 represents the industrialized countries' markets and TradeCAN 2 represents the developing countries' markets. Apart from the dataset, there are no other differences between TradeCANs 1 and 2, and the rest of this manual treats them as one program.

## The Cover Screen: Basic Settings

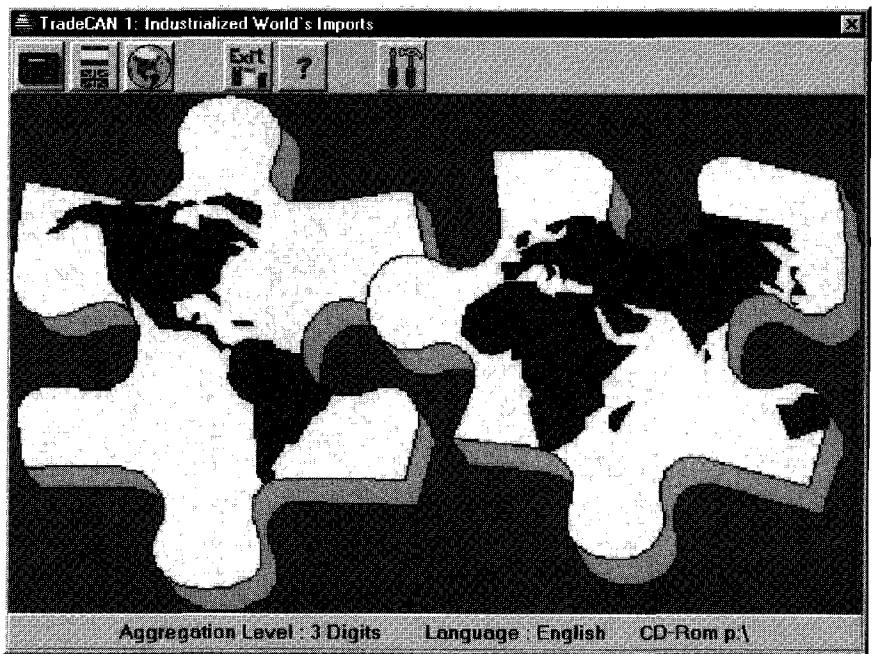
The first screen is used to define some basic settings:

- **Language**—This toggle changes the program language between English and Spanish.
- **Level of commodity aggregation**—This toggle sets the system to work at either the three- or four-digit SITC level (also see “trade classifications”). Both levels allow you to perform analyses at less detailed levels of aggregation (one and two digits).
- **CD-ROM drive**—The tools button allows you to change the letter assigned to the CD-ROM drive. Please make sure the letter corresponds to the one assigned by your system to the CD-ROM drive.

After choosing the basic settings, click the query button to start your TradeCAN session. Please note that TradeCAN cannot calculate trade shares without having the CD-ROM in the appropriate drive.

## Error Messages

TradeCAN contains several self-evident error messages. There are, however, a number of possible errors in parameter specifications that are hard to foresee. In unforeseen cases, the system will show the default error message, which says that you should check the letter assigned to your CD-ROM drive. You will then have to return to the cover page and specify your query from the beginning.



**Cover Screen**

# How to Obtain Data, or Define Your Query

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**T**HE QUERY BUTTON ON THE COVER PAGE gives access to the query form. Here, you define the parameters of your search for data and the report specifications by selecting the four compulsory parameters: the import market, the exporter country, the commodity, and the time period. These four basic parameters are all you need to select to have TradeCAN process your query and present a report. As you will see in other chapters, TradeCAN offers many more options to define queries, process information, and structure the report, if you wish.

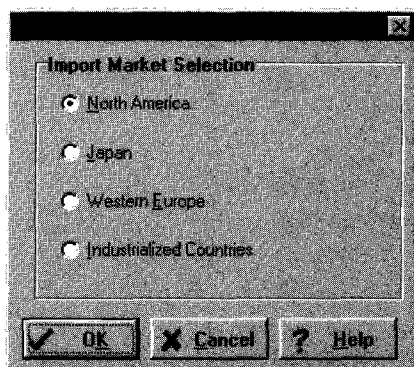
The screenshot shows a window titled "Query Form" with a dark background. It contains four horizontal input fields stacked vertically, labeled "Import market", "Exporter Country", "Commodity", and "Time period". Below these fields is a row of six buttons: "Filters", "Matrix", "Reports", "OK" (with a checkmark icon), "Cancel" (with an 'X' icon), and "Help" (with a question mark icon). At the bottom of the window, there is a status bar with the text "Aggregation Level: 9 Digits", "Language: English", and "CD Rom p1".

**Query Form**

## The Import Market

You first need to define the database you want to consult. Click on *Import market* for the following selections:

- In TradeCAN 1, you may choose *North America*, *Japan*, *Western Europe*, or the aggregate *Industrialized Countries* market.
- In TradeCAN 2, you may choose *Africa*, *Developing America*, *Developing Asia*, or the aggregate *Developing Countries* market.



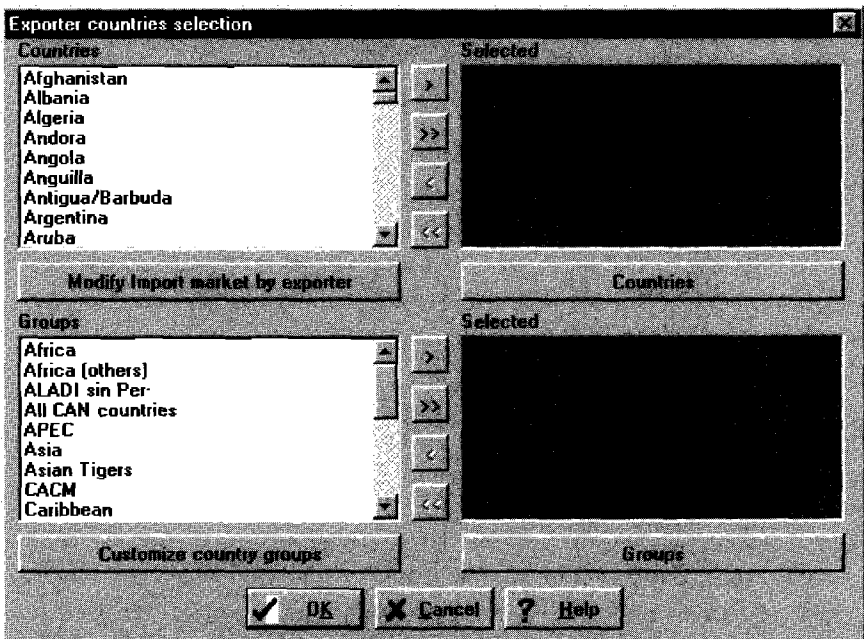
**Import Market Selection Screen**

Remember, TradeCAN does not give information on individual countries' imports. The TradeCAN database does not tell, for example, what the United States imports from Jamaica, because the information on U.S. imports is consolidated with Canada to form the North American market. TradeCAN only offers information on imports by regional markets, which by their nature are country aggregates (excepting Japan).

## The Exporter Country

After choosing the import market—the receiving end (or destination)—you must define where the commodity comes from. To choose the country (or countries) of origin, click on the second bar, *Exporter Country*. This opens the exporter countries selection screen.

In the upper left-hand window is a list of countries of origin, in alphabetical order. To select a country, double click on it, or use the arrows to choose it. Once selected, the name of the country will appear in the upper *Selected* window. You may select as many countries as you wish. TradeCAN will provide separate information on each country you select—unless you select a group (see the next section). To select all countries—for example, if you want to study a particular commodity—it is easiest to use the double arrow. To deselect a country, double click its name in the *Selected* window or use the back arrows.



**Exporter Countries Screen**

### Selecting a Group of Exporter Countries

The lower left-hand window, *Groups*, presents a series of country groups. For information on the exporter group as a whole, select the group in the lower right-hand window. For information on each of the countries included in the group, drag the group name to the upper right-hand window.

### Selecting the World as an Exporter Country Group

If you want to see information on the world in aggregate, select *All CAN countries* from the lower left-hand window so it appears in the lower *Selected* window.

### Customizing an Exporter Country Group

If you want to create your own country group from those in the TradeCAN databases, select *Customize country groups* under the lower left-hand window.

Name your group, select the countries or regions, and press *OK*. The group selection and its new name will be stored on your hard disk. If you wish to erase a customized group, select *Erase customized group*.

## Selecting a Rival Exporter Country

TradeCAN can directly compare the market share of two exporters. It will calculate a market share relative to a rival when you select an exporter country (or region) and a rival. Press the bar under one of the right-hand windows and the exporter selection window transforms into a rival country selection window.

## Modifying the Import Market by Exporter

The exporter selection window has a special feature that reduces the universe that is the object of your query. This is a far-reaching option and its results require special interpretation.

You may not want to consult your import market imports from all possible countries of origin. Say, for example, that you only want to analyze the competitive matrix of European imports from Africa, and you do not want your data to be influenced by trends outside the Europe-Africa trade flow. To limit your European import market database to imports of African origin, select *Modify Import market by exporter*. Here you are presented with a list of regions from which you would select Africa (or whichever region you wanted to limit your query to).

Remember, the *Modify Import market by exporter* option reduces the coverage of the TradeCAN data to a different (smaller) universe. For example, instead of having results for total imports in Europe, you are now analyzing total European imports from Africa. Market share is now defined solely in terms of the percentage an exporter absorbs from total European imports from Africa. It clearly does not make sense to ask about the market share of Mexico in this universe, and TradeCAN will not let you perform this query. But use caution, because TradeCAN does not automatically disable all senseless queries.

## The Commodity

After selecting an import market and an exporter country, you can select a commodity or a combination of commodities you want information on. Just click the third bar on the query form, *Commodity*, and the commodity selection window will pop up. It works like the exporter selection window: you

click commodity codes in the left-hand window to select them, and they appear in the right-hand window.

### Selecting a Commodity

In the upper left-hand window is a list of commodity names in numerical order by SITC code. This list may be at the three- or four-digit level, depending on what you selected on the cover page. In other words, it may be the list of groups or subgroups of the SITC Revision 2. Double click on a commodity, or use the arrows to choose it, and it will appear in the upper *Selected* window. You may select as many commodities as you wish. TradeCAN will provide separate information on each selected commodity, unless you select a group (see the following section) or specify otherwise in the filters and reports options (see the corresponding sections below).

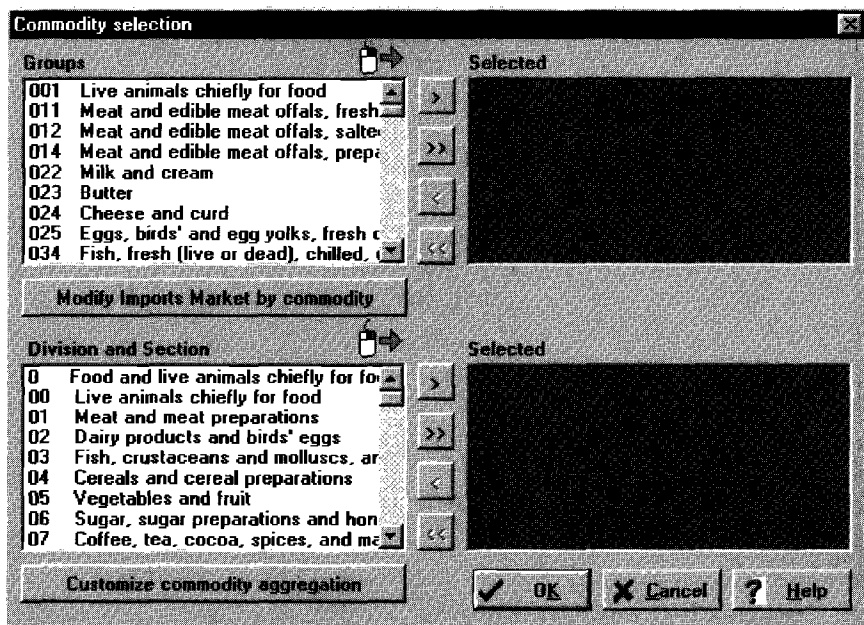
### Selecting a Combination of Commodities

You may want consolidated information on a combination of SITC codes. To this end, you can choose from the *Division and Section* box at the bottom left—just click, and your selection will appear to the right in the *Selected* box. Or, you may drag your selection to the upper right-hand window to obtain information on the constituent groups or subgroups, depending on the aggregation level you are working on.

### Selecting All Commodities

There are several ways to select all commodities, and they are not the same for all analytical purposes. The difference is the level of aggregation, and some analyses are sensitive to this. Selecting all commodities is the usual option if you want to analyze the competitive situation of a country—for example, using a competitiveness matrix (this is discussed later in this manual).

One way is to use the double arrow between the upper windows. Depending on your cover page settings, this will place all three-digit or four-digit codes in the upper right-hand window. TradeCAN will perform calculations on every commodity group and prepare reports according to your specifications. Another way is to select the commodity group labeled *TOD All sectors* (TOD stands for total developing countries) from the lower left-hand window and drag it to the upper *Selected* window. Then you will see a complete list of SITC groups or subgroups. You also may obtain the consolidated information on all commodities by selecting *TOD All sectors* and clicking the single arrow to the lower right-hand window.



**Commodity Selection Window**

The third way is to select divisions or sections from the lower left-hand window. In this window, you will find both the one-digit and two-digit codes. Be careful not to make the mistake of using the double arrow between the lower windows and thinking you have selected the complete SITC. In fact, you would have selected it several times, once at the division level and again at the section level, plus the *TOD All sectors* option and your customized groups. TradeCAN results on this query may become quite confusing. You may, however, select all of the one-digit codes (there are 10) and perform your analysis at the one-digit level. The competitiveness matrix and other TradeCAN calculations will not be exactly the same as the analysis at another level of aggregation. You may also select all two-digit codes (there are 63). Our suggestion is to use the double arrow to move the whole list to the lower right-hand window, and then deselect the one-digit codes, the *TOD All sectors option*, and your customized groups. This leaves you with just the 63 SITC division codes.



Please remember that some TradeCAN calculations—in particular the competitiveness matrix and type-related ones—are very sensitive to the aggregation level.

### **Customizing a New Commodity Combination**

There may be times you want to analyze a relevant combination of SITC codes. For example, you may want to look at a production chain including wood and furniture, or wool, cloth, and apparel. This is possible by choosing *Customize commodity combination* at the bottom of the commodity selection box. This will bring you to a window that allows you to select a number of subgroups, groups, divisions, or sections—and create and name your own combination. The selection and its new name will be stored on your hard disk. To erase a customized combination, select *Erase customized combination*.

### **Modifying the Import Market by Commodity**

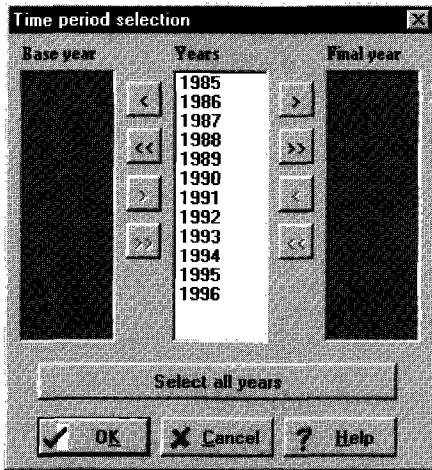
The commodity selection window offers also a special feature to modify the universe of commodities under consideration. This is again a far-reaching option and should be handled and interpreted with special care.

It may happen that you are interested in analyzing only a reduced universe of commodity imports. Perhaps you want to analyze Asian imports of food. You want to perform your competitiveness analysis within this subuniverse, and you do not want your data contaminated by trends in commodity imports other than food. To limit your Asian imports database to food only, select *Modify import market*. Here you are presented with a list of divisions and sections from which to choose.

Another frequent use of this option is to eliminate certain commodities from the universe of SITC codes (for one TradeCAN session only, of course). For example, say you wish to analyze the dynamics of world imports by commodity without the disturbing oil trend. You would use the double arrow feature to move all groups or subgroups to the right-hand window, then deselect the groups or subgroups you do not wish TradeCAN to consider—in this case, 333 (crude petroleum oils).

### **The Time Period**

TradeCAN is designed to perform comparative analyses across two points in time. Therefore, you must select a *Base year* and a *Final year*. From *Time period* on the query form, select a year and click the left arrow for your base year,



**Time Period Selection Screen**

then click another year and click the right arrow for the final year. You may select as many pairs of years as you wish. To select the whole time series in one query, click *Select all years*.

## Exercises

Thus far, we have covered the four compulsory parameters—import market, exporter country, commodity, and time period—and TradeCAN is ready to process your information. Let us do some exercises and look at the results.

### Exercise 1: Total Value of Imports on an Import Market

Let us examine the total value of imports in developing countries from 1990 to 1996. (Remember, they are three- and two-year moving averages, respectively). First, select the TradeCAN 2 icon to access developing countries.

For this exercise, the level of aggregation is irrelevant. We suggest you use the three-digit version for quicker results. Make sure the CD-ROM drive is adequately directed and start the TradeCAN session by clicking the query button.

In the *Import market* selection box, choose *Developing Countries*. In the exporter countries section, go under *Groups* and choose *All CAN countries*. In the *Commodity* selection box, choose *TOD All sectors* in the lower left-hand window. In the *Time period selection* box, choose 1990 as the base year and 1996 as the final year.

Next, click *OK* on the query form to process the data. A bar will appear, showing how far (in a percentage) the system has come toward finishing your query. When it is finished, TradeCAN presents the report panel (see “How to Read a Report”).

The report panel shows the market share of the CAN countries in total developing countries’ imports: 98.47 percent in 1990 and 97.78 percent in 1996. Now click the *Show as Table* button to see the information in a spread-

Output

Report Specification: SITC classification; Minimum value: Base year 0; Final year 0; Results: Detailed;

Import market: Developing Countries

99999	All CAN countries	1990	1996	Variation
	Market share	98.47	97.78	-0.70
	Percentage of exports	100.00	100.00	0.00
	Specialization	1.00	1.00	0.00

TOD	All sectors	1990	1996	Variation
	Percentage of imports	100.00	100.00	0.00

### Exercise 1 Report Panel

sheet-type table. We will call this the report table to distinguish it from the report panel. Move to the right of the sheet using the arrow. The final two columns provide interesting additional information: total developing country imports more than doubled in five years, in current dollar terms, from close to \$600 billion average per annum from 1989 to 1991 to \$1.3 trillion during 1995–96. Note that any TradeCAN report table will show total value of imports on an imports market in its final two columns.

### Exercise 2: One Exporter, One Commodity

Let us say we want to know something about Europe's imports of cocoa from Ghana. What can TradeCAN do for us on this one?

First, start your TradeCAN session by clicking on the TradeCAN 1 icon. On the cover page, make sure you work with a four-digit, English-language version. Check the specification of your CD-ROM drive and open the query form.

Set the compulsory parameters. The import market is Western Europe; the exporter country is Ghana. But what is the commodity? Suppose you are not sure if Ghana exports cocoa beans, cocoa powder, or cocoa butter. Search for the 072 SITC code in the lower left-hand window and drag it to the upper right-hand window. Now you have selected all three subgroups, and TradeCAN will provide information on each. Next select the time period. Suppose we choose 1990 as the base year and 1996 as the final year. Remember, 1990 is a three-year average and 1996 a two-year average. Press *OK* on the query form.

TradeCAN shows the report panel for the first of three selected SITC codes. You may browse through the three separate report panels using the arrows. You may also print the report panel—just select the *Print report* button to access the printer dialogue. TradeCAN will print the report with the information on each of the three SITC codes selected.

TradeCAN 1: Industrialized World's Imports 9/1/1999 1:33:01 PM Page 2

Countries: 16280

Sectors: 0721, 0722, 0723

Periods: 1990,1996;

SITC classification, Minimum value: Base year 0; Final year 0; Results: Detailed;

Import market: Western Europe

16288	Ghana		1990	1996	% variation
16288	Ghana		1930	1996	
		Market share	13.35	15.26	14.29
		Country export structure	22.91	29.21	27.49
		Specialization	261.26	292.51	11.96
0721	Cocoa beans, whole or broken, raw or roasted				
		Market import structure	0.09	0.10	13.87
16288	Ghana		1990	1996	% variation
		Market share	0.39	0.10	-73.35
		Country export structure	0.06	0.02	-73.03
		Specialization	7.52	1.98	-73.90
0722	Cocoa powder, unsweetened				
		Market import structure	0.01	0.01	3.33
16288	Ghana		1990	1996	% variation
		Market share	3.73	4.61	23.93
		Country export structure	4.39	6.57	48.54
		Specialization	73.01	92.20	26.30
0723	Cocoa butter and cocoa paste				
		Market import structure	0.06	0.07	18.40

Page 2 of 2

**Exercise 2 Print Preview Screen**

You will see that Ghana holds a significant and increasing market share on the Western European market for cocoa beans (whole or broken, raw or roasted, SITC 0721). It was 13.35 percent in 1990 and 15.26 percent in 1996. This commodity accounted for almost 30 percent of Ghana's total exports to Europe in 1996, as the row *Percentage of exports* shows. The degree of specialization (or revealed comparative advantage) is extremely high (292.51). This means that Ghana's market share on the Western European market of cocoa beans is almost 300 times its market share on the overall imports market of Western Europe. The subgroup absorbs one-tenth of a percent of total European imports.

Ghana holds a significant share of the market of cocoa butter and cocoa paste (SITC 0723) as well, but it is noticeably smaller than the first commodity analyzed: 3.73 percent in 1990 and 4.81 percent in 1996. However, as the *Variation* column on the report panel shows, this is a 28.93 percent increase in market share, higher than the increase with cocoa beans (14.29 percent).

The report also shows that Ghana virtually does not participate on the Western European market of cocoa powder (SITC 0722).

Now ask TradeCAN to display the results as a table and look at the columns labeled  $M_{ij,1}$  and  $M_{ij,2}$  to observe the values. European imports of cocoa beans from Ghana increased from an annual average of \$182 million in the 1989–91 period to \$314 million in the 1995–96 period (all in U.S. dollars). Cocoa powder exports are negligible, and the European imports of cocoa butter and cocoa paste from Ghana increased from \$35 million around 1990 to \$71 million around 1995–96. You may wish to store this information in a Lotus file, which is easy to read in your spreadsheet program.

### Exercise 3: A Rival

Let us see how Ghana compares with Côte d'Ivoire in its market share in Western Europe's imports. Working with the same basic settings as in Exercise 2 (TradeCAN 1, English, four digits, import market: Western Europe), select Ghana as the exporter country. Then, select Côte d'Ivoire as the rival: under the *Exporter country* selection window, change the country bar to a rival bar and select Côte d'Ivoire in the window. In the *Commodity* selection window, choose 0721, cocoa beans. Use the same time period settings (base year 1990, and final year 1996). Perform the query.

The report panel will show the results of an additional variable—a market share relative to rival that shows that Ghana's market share was 0.34 times the market share (or one-third) of that of Côte d'Ivoire. In 1996, this relative share

had declined to 0.3 times. Ghana has lost market share relative to Côte d'Ivoire on the imports market of Western Europe.

Output

Report Specification: SITC classification; Minimum value: Base year 0; Final year 0; Results: Detailed;

Import market: Western Europe

	1990	1996	Variation
<b>16288 Ghana</b>			
Market share	13.35	15.26	14.29
Percentage of exports	22.91	29.21	27.49
Specialization	261.26	292.51	11.96
<b>0721 Cocoa beans, whole or broken, raw or roasted</b>			
Percentage of imports	0.09	0.10	13.87
<b>16384 Côte d'Ivoire</b>			
Market share relative to rival	0.34	0.30	-14.06

**Exercise 3 Report Screen**

# Report Options and Commodity Analysis

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IN A TYPICAL DATA REQUEST FROM TRADECAN, all countries (individually considered) or all commodities (individually considered) are selected. In other words, you will use the double arrow between the upper windows on the exporter country selection screen or the commodity selection screen. To handle the enormous amount of information these queries generate, TradeCAN offers a powerful report design form. At the bottom of the query form, click on the *Reports* button, which calls up the report design screen.

The report design form consists of the following features:

- Sort option
- Sort variable
- Minimum value
- Maximum number of commodities (or countries—see Exercise 4)
- Report destination
- Detailed or consolidated report and adaptability index.

This chapter discusses the first four features. The fifth—the report destination (screen, printer, or file)—is self-evident, and the last feature is covered in “The Competitiveness Matrix and Country Analysis.”

Let us explain how to use the report design form with the help of an example. We will carry out research at the three-digit level on Developing Asia’s imports from Thailand. In TradeCAN 2, select Developing Asia as the import market, Thailand as the exporter, and all of the three-digit codes in the commodity selection screen (use the double arrow between the upper windows). Define 1985 and 1991 as base years, with 1990 and 1996 as their respective final years.

This query produces information on 233 commodities for each of the two periods. We want to know what Thailand’s main exports to Developing Asia are, which are the fastest growing, and in what commodities Thailand is most specialized. We can get this information quickly if we specify our report options correctly.

**Report Design**

**Sort Options**

- SITC classification
- Variation
- Final Year value

**Results:**

- Detailed
- Consolidated
- Adaptability index

**Send report to**

- Screen
- Printer
- File

**Sort variable**

- Market share
- Percentage of exports
- Specialization
- Percentage of imports
- Market share relative to Final

Number of commodities:

Minimum value:

Base year:

Final year:

### Report Design Form

## The Sort Option

The default commodity sort option is the SITC code. At the three-digit level, reports start with commodity 001, then 011, and so on. However, this is of no use if you want to answer the type of question we have in this example. Two other sort options are available: final year value and variation.

When you select *Final Year value* as your sort option, TradeCAN will sort commodities with a static criterion. It will present a commodity list in descending order of the final year absolute value.

When you select *Variation* as your sort option, TradeCAN will sort commodities with a dynamic criterion. It will present a commodity list in descending order of the change between the base year and the final year. The change is expressed as a percentage of the base year value.

Remember that TradeCAN sorts commodities, not countries. There is only one exception to this general rule (see Exercise 4).

When you select *Final Year value* or *Variation* under sort option, you can then select a sort variable.



## The Sort Variable

You may specify commodity sort criteria (other than the SITC code) on these five CAN variables (also see the section on formulas):

1. Market share—The value of exports of a commodity from a country to an import market is given as a percentage of total value of imports of the commodity in the import market.
2. Percentage of exports—The value of exports of a commodity from a country to an import market is given as a percentage of total value of exports of the country to the import market.
3. Specialization—This compares the market share of a country for a commodity with the country's overall market share. If the commodity market share is higher than the overall market share, the country is said to be specialized in the commodity.
4. Percentage of imports—The value of imports of a commodity on an import market is expressed as a percentage of the total value of imports in the import market.
5. Market share relative to a rival—Compares the market share of a country with the market share of another country.

To select the sort variable on the report design screen, first select either *Final Year value* or *Variation* as your sort option.

Let's see how this works with our example of Thailand on Developing Asia's import market. First, let's ask what Thailand's main export commodities to Developing Asia are. To do this, sort by percentage of exports and use the static sort option *Final Year value*.

The answer for the final year of the first period (1985–90), as shown on the report panel, is rice (SITC 042). Rice accounted for 8.86 percent of Thailand's exports to Developing Asia in 1990. The column labeled Contri2 (see "The Report Table") shows the commodities sorted by percentage of exports in the final year. But look closely: the report first shows the results of the first period, and next shows the results for the second period (1991–96). You have to browse through more than 200 observations to see the results for the second period. Thailand's most important export commodity in 1996 was parts for office machines (SITC 759, which includes automatic data processing [ADP] machines). This accounted for almost 12 percent of Thailand's exports in 1996. Rice, by then, came in fourth place with almost 6 percent of Thailand's exports.

## Number of Commodities

To answer the example question we wish to address, it would be cumbersome to have to browse through a report with almost 500 panels or rows. Therefore, if you are interested in only a few commodities, you may want to specify this on your report design screen. The *Number of commodities* window will accept any whole positive number and present exactly this number of commodities on your report. If your query produces information on fewer commodities, the report will show all commodities.

Return to the query (click *Return to query* on your report panel) and select the report design form again. Use the *Number of commodities* option on the report design form to obtain information only on the first few commodities. In this example, let's enter *two* in the appropriate window.

The second question is what Thailand's fastest growing export commodities to Developing Asia are. On your report design screen, change from *Final Year value* to *Variation* using the same sort variable *Percentage of exports*.

The answer for the first period (1985–90) is musical instruments (SITC 898). In this commodity, the percentage of exports has changed more than 3,000 percent, from 0.01 to 0.37. For the second period (1991–96), it is ingots and other primary forms of iron and steel (SITC 672). This commodity reports a 2,282 percent increase over a base year market share of 0.01. Note that commodities with a very low percentage of exports in the base year are prone to increase their percentage at a high rate. To control for this tendency, let us go back and define the query again.

## Minimum Values

Many queries in TradeCAN will result in reports with a great number of commodities, most of which present almost negligible import values. You may specify on your report design screen that only significant commodities are to be included in your report. What is considered significant is entirely up to you. The *Minimum values* window on your report design screen accepts positive numbers, including decimals (for example, 0.1, 1, and 1.54). The report will include only those commodities that show at least the specified value on the sort variable in the selected year—either the base or final year.

Please note that the minimum value option operates only on absolute values, not on variation. In other words, you may ask TradeCAN to include only commodities with at least a 2 percent market share of exports or imports. If

you use either *Specialization* or *Market share relative to Rival*, your minimum value will be a quotient rather than a percentage. You may not ask TradeCAN to include commodities with a minimum variation on the selected variable.

Let us assume for a moment that a commodity having 0.5 percent of the total value of Thailand's exports in the base year would qualify as being significant. Type 0.5 in *Minimum values: Base year*. Run the query again.

Among the commodities that have at least a 0.5 percent percentage of exports in the base year, parts of office machines (SITC 759) were the fastest growing commodity over 1985–90, with an increase of 154 percent. Over the second period, ADP machines (SITC 752) augmented their percentage of exports from 2.76 percent to 9.21 percent and were the fastest growing commodity, with an increase of 234 percent.

The third question asks in which commodity Thailand is most specialized. Here you would use specialization as the sort variable. Observe that market share as the sort variable would produce the same result, as specialization and market share are related (see the section on formulas). Use *Market share* or *Specialization* as the sort variable and *Final Year value* as the sort option. The answer for the first period is again rice, where Thailand held an almost 48 percent market share (half the value of rice imports in Developing Asia) and exhibited a degree of specialization of 40. You may check the report table to review the sort: the list follows, in descending order, the *Parmer2* column (market share in final year) and the *Especi2* column (specialization in final year). In the second period, rice (with a market share of 43 percent and a specialization of 24) was still the Thai export commodity with the highest market share in Developing Asia.

## Exercises

### Exercise 4: A Commodity Analysis—The Case of ADP Machines (SITC 752)

One of the most interesting possibilities in TradeCAN is to analyze the rivalry between exporter countries on certain import markets for one particular commodity. Let us take, for example, SITC code 752, automatic data processing machines. Suppose we want to analyze exporter country rivalry on the industrialized countries' import market for computers.

Enter TradeCAN 1 and select the three-digit aggregation level. Enter the query form and select *Industrialized countries* as your import market; all

countries individually considered as your exporter countries (use the double arrow between the upper windows); and *SITC 752* as your commodity. Let us stay with two time periods, 1985–90 and 1991–96.

To perform this analysis, enter the report options screen and use the static sort option *Final Year value* on the variable market share relative to rival. To avoid two sets of 193 answers, please specify a maximum of five observations per time period. TradeCAN will give you 10 observations—one set of five for each of the time periods selected.

Note: this is a trick to get TradeCAN to rank countries by their market share of exports in this commodity. No rival has been defined, so there is no market share relative to a rival. TradeCAN uses this undefined variable to sort by exporter—its only possibility. The sort variable is, in fact, market share.

Run the query and print the report. You will see that the first five countries in terms of market share on the industrialized countries imports market for commodity *SITC 752* in 1990 are the same as in 1996. The United States holds the highest market share in 1996 (14.54 percent, down from 22.34 percent in 1990). The United States is followed by Singapore (14.36 percent, up from fourth place with 8.09 percent in 1990), Japan (14.05 percent, down from 19.60 percent in 1990), the United Kingdom (steady with around 8.5 percent), and Taiwan, (China), with a stable 8 percent of the market. The degree of market concentration (measured by the market share of the top five) has fallen a bit.

## **Exercise 5: The World's Most Important and Dynamic Commodities**

In this exercise, we will look at the industrialized countries' import markets for:

- The most important four-digit commodity in 1996 (which we shall find is passenger motor cars [7810], with 5.92 percent of imports in 1996)
- The fastest growing four-digit commodity over 1990–96 (which we shall find is railway and tramway passenger coaches [7914], with a 291 percent increase in imports between 1990–96—a significant increase over a base year percentage of almost nothing).

Note: this query requires you to select the *Industrialized Countries* imports market and all four-digit *SITC* codes (use the double arrow between upper windows in the commodity selection screen). It also requires you to establish 1990 as the base year and 1996 as the final year. However, it does not matter

whether you select an exporter country (say, Germany or Andorra) or the group of all TradeCAN countries—the result is the same. For that reason, the percentage of imports variable on the report panel is shown separately from those that depend on the exporter country.

It is important to select *Final Year value* as your sort option for the first question and *Variation* for the second question. For both questions, select *Percentage of imports* as your sort variable. You may want to limit your report to one commodity.

### Exercise 6: Where Do Latin America's Imports Come From?

Suppose we want to know if Latin American exporter countries are gaining or losing market shares on the Latin American imports market. In other words, is intraregional trade in Latin America more or less dynamic than interregional trade?

To answer this question, enter the TradeCAN 2 database and select the three-digit aggregation level. Enter the query form and select *Developing America* as your import market. On the exporter country screen, choose Latin America, North America, Asia, Africa, Western Europe, and Eastern Europe as your exporter countries. Select them as groups—that is, place the names in the lower right-hand window.

On the commodity selection screen, choose *TOD all sectors* as a group and place it in the lower right-hand window. For time period, choose the years 1986–90 and 1991–96.

On the report options screen, select the sort option *Final Year value* combined with the sort variable *Market share relative to rival*. Run the query and print the report.

The information from TradeCAN is presented below.

#### *Developing America's Imports by Exporter Region, Market Shares, Selected Years.*

	1986	1990	1991	1996
North America	35.39	41.29	44.57	45.43
Western Europe	25.70	23.43	21.83	19.38
Latin America	17.00	16.59	16.26	18.49
Asia	11.67	11.90	12.19	13.05
Africa	2.50	1.53	1.34	1.31
Eastern Europe	0.61	0.43	0.33	0.29

# The Competitiveness Matrix and Country Analysis

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IN THE PREVIOUS CHAPTERS, we have presented TradeCAN as a comprehensive database consisting of several import markets, a powerful query form, and a useful report. We have discussed the basic TradeCAN variables—market share, percentage of exports and imports, specialization, and market share relative to a rival. But TradeCAN is more than a database—it is also an ambitious tool for analysis. This chapter presents the core analytical concepts and TradeCAN typology of competitive situations. TradeCAN can help to calculate market positioning—an idea drawn from the business literature that helps to show how countries (or their industries) are placed for export growth in the world markets.

Click *Matrix* on your query form. The matrix selection window seems simple, but has the most far-reaching consequences. You may select one of three matrices—simple schemes of two axes and two positions on each axis.

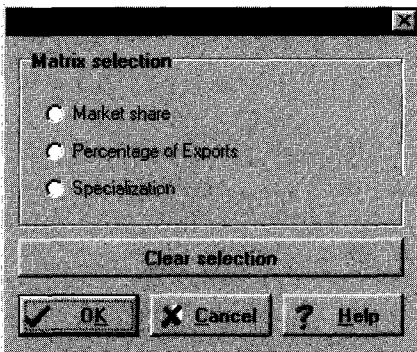
## One Fixed Element: Change in Percentage of Imports

All three matrices use the same variable on the horizontal axis. This is the change in percentage of imports—a variable that depends solely on the import market, the aggregation level, and the time period (see “Formulas”). It

does not depend on the exporter country and is identical for each one.

The change in percentage of imports (between the base year and the final year) may be positive or negative. Commodities with a positive change over time are called dynamic commodities. The share of a dynamic commodity on the import market has increased between the base year and the final

**Matrix Selection Screen**



year. Imports of this commodity have increased faster than total imports (of all commodities or the commodity average of import growth).

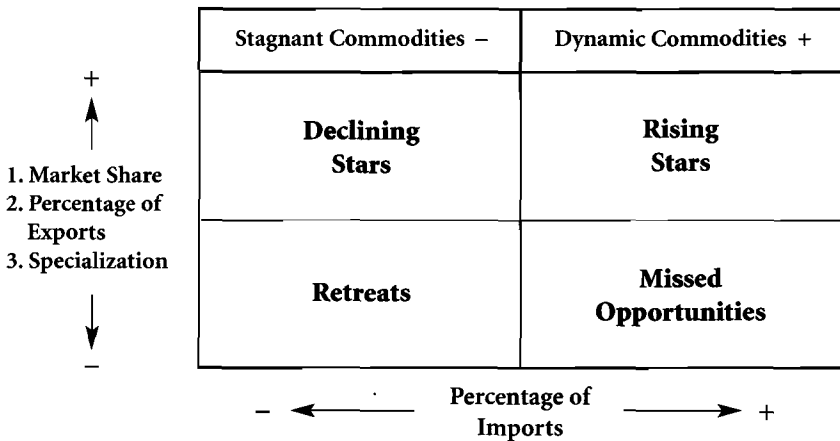
Commodities with a negative change over time (or no change) in percentage of imports are called stagnant commodities. It is, of course, the demand for the commodity on the import market that is stagnant. The share of a stagnant commodity on the import market has decreased between the base year and the final year. Imports of this commodity have increased at a slower rate than total imports (of all commodities, or the commodity average of import growth).

The three competitiveness matrices differ because the variables used on the vertical axis differ. The three options are:

- Change in market share
- Change in percentage of exports
- Change in specialization.

Each of these variables defines one of two possible positions on the vertical axis. In each case, the change may be positive or negative. The meaning of a positive or negative change depends on the variable. Each variable depends on the import market, the aggregation level, the exporter country, and the time period. Results vary when one of these parameters changes.

The four situations on the competitiveness matrix are represented in the following graph.



## The Market Share Competitiveness Matrix

Use change in market share on the vertical axis (that is, select *Market share* in the *Matrix* selection window). A positive result indicates a gain in market share (for this particular exporter, commodity, import market, and time period), and a negative result indicates a market share loss.

The variable on the horizontal axis (change in percentage of imports) separates dynamic commodities from stagnant commodities. The variable on the vertical axis (change in market share) separates market share gains from losses. The combination of both variables opens four possibilities that constitute what we call the CAN typology of competitive situations.

Type analysis uses the distinction among Rising Stars, Declining Stars, Missed Opportunities, and Retreats.

### *The Competitiveness Matrix on Market Share*

	<i>Stagnant commodities –</i>	<i>Dynamic commodities +</i>
Market share gains +	Declining Stars	Rising Stars
Market share losses –	Retreats	Missed Opportunities

Here are the competitive situations in this case:

- Rising Star—an exporter gains market share in a dynamic commodity market.
- Declining Star—an exporter gains market share in a stagnant commodity market.
- Missed Opportunity—an exporter loses market share in a dynamic commodity market.
- Retreat—an exporter loses market share in a stagnant commodity market.

## The Percentage of Exports Competitiveness Matrix

If we instead use *change in percentage of exports* on the vertical axis, a positive result indicates a percentage of exports increase (given the exporter, com-



modity, import market, and time period), and a negative result indicates a percentage of exports decrease.

The following table shows what we get when we use *change in percentage of exports* on the vertical axis.

***The Competitiveness Matrix on Percentage of Exports***

	<i>Stagnant commodities</i>	<i>Dynamic commodities</i>
Percentage of exports increase	Declining Stars	Rising Stars
Percentage of exports decrease	Retreats	Missed Opportunities

The variable on the horizontal axis (change in percentage of imports) separates dynamic commodities from stagnant commodities. The variable on the vertical axis separates increases from decreases in the variable percentage of exports for any commodity, exporter, import market, and time period. The combination of both variables again opens four possibilities, but now with an entirely different meaning. The terminology of the CAN typology does not change, however; the same four terms simply indicate four different competitive situations.

Here is analysis of types using change in percentage of exports:

- Rising Stars—commodities that increase their percentage of countries’ exports and are in dynamic demand on the import market.
- Declining Stars—commodities that increase their percentage of countries’ exports and are in stagnant demand on the import market.
- Lost Opportunities—commodities that decrease their percentage of countries’ exports and are in dynamic demand on the import market.
- Retreats—commodities that decrease their percentage of countries’ exports and are in stagnant demand on the import market.

**The Specialization Competitiveness Matrix**

If we use *change in specialization* (another name for revealed comparative advantage) on the vertical axis, we may say that a positive result indicates an

increasing specialization (given the commodity, exporter, import market, and time period), and a negative result indicates a decreasing specialization.

Let us look at the competitiveness matrix when we use *change in specialization* on the vertical axis:

### *The Competitiveness Matrix on Specialization*

	<i>Stagnant commodities</i>	<i>Dynamic commodities</i>
Increasing specialization	Declining Stars	Rising Stars
Decreasing specialization	Retreats	Missed Opportunities

The variable on the horizontal axis (change in percentage of imports) separates dynamic commodities from stagnant commodities. The variable on the vertical axis (change in specialization) separates increasing specialization from decreasing specialization for any commodity and any exporter. The combination of both variables again opens four possibilities, again with a third and entirely different meaning.

Here is a type analysis using change in specialization:

- Rising Stars—commodities an exporter is specializing in and that are in dynamic demand on the import market.
- Declining Stars—commodities an exporter is specializing in and that are in stagnant demand on the import market.
- Missed Opportunities—commodities an exporter is unspecializing in and that are in dynamic demand on the import market.
- Retreats—commodities an exporter is unspecializing in and that are in stagnant demand on the import market.

## **The CAN Typology: Interpretation**

A remark is merited on the interpretation of the three possible competitiveness matrices. Undoubtedly, the CAN type of analysis is highly normative. It was designed when the late Fernando Fajnzylber was director of the Industry and Technology Division at UNECLAC. He intended it to provide an operational proxy to measure competitiveness and technological progress.

In Fajnzylber's view, there are distinct ways of being competitive, one more and the other less conducive to development in the sense of growth with social equity. The export drive conducive to development (authentic competitiveness) would be based on the incorporation of technological progress. Export drives less conducive to development (spurious competitiveness) would be based on the lowering of real wages, the depredation of natural resources, or subsidizing exporting firms.

Fajnzylber tried different proxies of the degree of "incorporation of technological progress." The macro photo (see "The Macros") reminds us of one attempt to construct such a proxy: the distinction between manufactures based on, and not based on, natural resources.<sup>5</sup> The CAN typology is another attempt, and uses the idea that commodities that incorporate technological progress have a more dynamic demand than commodities that do not. Competitive success (gain in market shares) in dynamic commodities would be qualitatively different from success in stagnant commodities.

Fajnzylber built on the same idea to develop the concepts of efficiency and positioning.<sup>6</sup> A country that, on average, gains market shares is considered efficient, and a country that exports mostly dynamic commodities is called well positioned. The ideal situation is to be both efficient and well positioned—that is, to have a high percentage of exports in Rising Stars. A situation of vulnerability represents an export drive based on increasing market shares in stagnant commodities—in other words, to have a high percentage of exports in Declining Stars.

Whether the distinction between commodities, based on a notion of incorporation of technological progress, is useful and feasible is unclear. The value of TradeCAN does not depend on its answer. The interpretation of the results of a CAN type analysis may or may not use insights derived from Fajnzylber's work. The CAN typology is transparent because it is based on algebraic formula and public data. Every researcher is completely free to interpret the results of CAN type analyses in the way he or she sees fit.

We suggest that you do not interpret each competitiveness matrix or CAN type individually, but look at the results in a comparative perspective. You might look at the differences between countries and say that some look better than others on the competitiveness matrix. For one country, analyze several time periods for changes, then see whether you would qualify them as improvements. Usually there is more than one way to look at the results, and a TradeCAN session offers more starting points for research than conclusive answers.

## The Case of Madagascar

Let us clarify the use of the competitiveness matrix as an analytical tool with the help of an example. Suppose you know exports from Madagascar to the industrialized countries were stagnant between 1985 and 1990 at around \$300 million, and you also know the country's exports doubled from \$300 million to almost \$600 million in the first half of the 1990s. The country's global market share on the industrialized countries' import market fell 44 percent in the second half of the 1980s and increased 42 percent in the first half of the 1990s. What information can we obtain from TradeCAN on Madagascar's export drive in the early 1990s?

Using a three-digit aggregation level in your TradeCAN 1 database, choose the *Industrialized Countries* import market in your TradeCAN 1 database. Select Madagascar as your exporter country. On the commodity selection screen, select the one-digit codes—one by one—in the lower left-hand window so they appear in the lower right-hand window. You must end up with 10 codes in the lower right-hand window. Select two time periods: 1985–90 and 1991–96. Select the *Market share* matrix in the matrix selection window. On the report options screen, select *Final Year value* as your sort option and *Percentage of imports* as your sort variable. Press *OK* on the query screen to start the query.

Print the report. It will first present the Rising Stars, then the Declining Stars, then Missed Opportunities, and finally the Retreats. Within each type, TradeCAN sorts by the absolute value of percentage of imports in the final year.

### From 1985 to 1990

In the first period, 1985–90, we find that Madagascar has one Rising Star: It is section 8 (miscellaneous manufactured articles), which holds 14 percent of industrialized countries' imports in 1990 (up from 11.2 percent). Madagascar holds a market share of less than 0.005 percent, which is why TradeCAN reports a market share of 0.00. But the market share is increasing, as we deduce from the 759 percent growth (if you must know the market share with greater precision, save the report file and let Excel calculate  $M_{ij}/M_i$ ). The section absorbs 4.5 percent of Madagascar's exports to the industrialized countries (in 1990). Thus, with percentage of imports up from the base year and market share up, this commodity falls in the category of Rising Stars.

There is one Declining Star (section 4, animal and vegetable oils and fats) where Madagascar increases its market share but the percentage of imports falls.

Four out of 10 commodities were classified as Missed Opportunities. Those are the sections with an increase in percentage of imports: sections 6, 5, 7, and 1, in that order. Madagascar's market share is very low and the country does not specialize in any of the above sections.

The last three commodities are retreats. Madagascar is specialized in two of those sections: 0 (food and live animals) and 2 (crude materials except fuels). They are stagnant commodities and Madagascar's market share is falling. They accounted for more than 90 percent of Madagascar's exports to the industrialized countries in 1985 and more than 85 percent in 1990.

### **From 1991 to 1996**

Considering the number of Rising Stars in the second period, the situation seems to have improved from the first period. Now there are three—sections 9, 4, and 5. However, together, they absorb just slightly more than 3 percent of Madagascar's exports to the industrialized countries. This is hardly a significant percentage, and less than the 4.5 percent that section 8 absorbed in 1990.

Even more significant, let us see what happened to Declining Stars. There was one in the first period, and not even an important one for Madagascar, at that. The second period has three Declining Stars—and what is more important, they account for more than 85 percent of Madagascar's exports to the Industrialized Countries. Section 8 (formerly a Rising Star, but the demand dynamics have changed) now accounts for 26 percent of exports, up from 6.13 percent in 1991. Madagascar continues to gain market shares and has now reached a degree of specialization (greater than one) in section 8.

Another interesting change is in section 0. It was a Retreat in the first period, but became a Declining Star. The section continues to be a stagnant commodity, but Madagascar turned the market share trend from a decline to a gain.

Only one section is a Missed Opportunities, and two quite important sections for Madagascar are Retreats (6, which used to be a Missed Opportunity, and 2).

### **Consolidated Results**

Let us examine the consolidated competitiveness matrix. Return to the query and choose *Consolidated* on the report options screen. Run the query and print the report.

Now you see the competitiveness matrix as it was intended, with the total percentage of exports of all commodities of the same type. We may present it as follows:

**Madagascar: Market Share Competitiveness Matrix, 1985–90 and 1991–96, One-Digit Level, Percentage of Final Year Exports**

	<i>Stagnant commodities:</i> First period 84.75% Second period 96.03%	<i>Dynamic commodities:</i> First period 15.15% Second period 3.19%
Market share gains First period 4.54% Second period 88.19%	Declining Stars First period 0.07% Second period 85.09%	Rising Stars First period 4.47% Second period 3.10%
Market share losses First period 95.46% Second period 11.03%	Retreats First period 84.68% Second period 10.94%	Missed Opportunities First period 10.78% Second period 0.09%

The most striking result from the competitiveness matrix analysis is the change from percentage of exports in losses to gains between the two time periods. In the first period, Madagascar lost market share in 95.5 percent of its exports. In the second period, it gained market share in 88.2 percent of its exports. At the same time, the export structure was very dependent on stagnant sectors (85 percent in the final year of the first period), a dependence that increased in the second period (96.03 percent). Thus, the overall situation of Madagascar seems to be one good performance on stagnant commodity markets.

### **A Two-Digit Analysis**

Let us repeat the exercise, but at the two-digit level. Return to the query form and choose *Consolidated* on your report design form. On the commodity selection screen, use the double arrow between the lower windows to deselect the original one-digit selection. Now use the other double arrow to select all codes in the lower windows, and deselect the one-digit codes, the TOD (all commodities) option, and eventual customized commodity combinations—one by one. This should leave you with the 63 divisions of SITC Rev. 2 in the lower right-hand window. Run the query and print the results. The Madagascar competitiveness matrix should look like the table below.

When the competitiveness situation of 63 commodities (divisions) instead of 10 (sections) is analyzed, the overall situation becomes, logically, a bit more diverse. But the broad picture is confirmed. Madagascar reverted from a situation where most exported commodities lost market share (77 percent of exports in the final year of the first period) to one where most gained market

**Madagascar: Market Share Competitiveness Matrix, 1985–90 and 1991–96, Two-Digit Level, Percentage of Final Year Exports**

	<i>Stagnant commodities:</i> First period 58.56% Second period 71.58%	<i>Dynamic commodities:</i> First period 41.02% Second period 26.02%
Market share gains First period 22.57% Second period 64.80%	Declining Stars First period 10.94% Second period 62.89%	Rising Stars First period 11.63% Second period 1.91%
Market share losses First period 77.01% Second period 32.80%	Retreats First period 47.62% Second period 8.69%	Missed Opportunities First period 29.39% Second period 24.11%

shares (65 percent of exports in the final year of the second period). The country's dependence on stagnant commodities is intensified: from 59 percent of exports in stagnant commodities at the end of the first period to 72 percent at the end of the second period.

## The Adaptability Index

It is now easy to understand the adaptability index. Go back to the query form, enter the report options screen, and select *Adaptability index*. Run the query and print the report.

It presents totals for dynamic and stagnant commodities. We have already seen that in 1990 (the final year of the first period), 41.02 percent of the countries' exports were in dynamic commodities against 58.56 percent in stagnant commodities. (This does not necessarily have to add up to 100 percent, as Madagascar does not participate in all SITC two-digit codes). The adaptability index report adds that the country's degree of specialization was 0.56 in dynamic commodities and 7.66 in stagnant commodities, as we could have known if we had selected the specialization matrix instead of the market share matrix.

The last row on your printed report shows the adaptability index in its proper sense: it calculates ratios of each of the CAN variables in dynamic commodities (in the numerator) versus stagnant commodities (in the denominator). Thus, market share and specialization in dynamic commodities were both 0.07 times the market share and specialization in stagnant commodities in 1990, and so on. The comparison with the second period is interesting:

TradeCAN 1: Industrialized World's Imports 9/1/1999 3:35:18 PM Page 2  
 Countries: 16450

Sectors: 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 41, 42, 43, 61, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 87, 88, 89, 91, 92, 93, 94, 95, 97, 98, 99

Periods: 1985 1990, 1991 1996

Final Year value, Percentage of exports, Minimum value, Base year 0, Final year 0; Results: Adaptability index;

Matrix: Market share; Import market: Industrialized Countries

16450	Madagascar		1985	1990	
16450	Madagascar		1985	1990	% variation
		Market share	0.01	0.01	-8.20
		Country export structure	21.02	41.02	95.16
		Specialization	0.33	0.56	68.14
	Increasing sectors				
		Market import structure	63.48	73.68	16.08
16450	Madagascar		1985	1990	% variation
		Market share	0.18	0.10	-46.30
		Country export structure	77.63	58.66	-24.77
		Specialization	7.96	7.66	-3.74
	Declining sectors				
		Market import structure	9.78	7.65	-21.85
16450	Madagascar		1985	1990	% variation
		Market share	0.04	0.07	74.67
		Country export structure	0.27	0.70	159.42
		Specialization	0.04	0.07	74.67
	Adaptability index				
		Market import structure	8.49	9.64	46.52

### Adaptability Index Report

while the adaptability index on *Market share* and *Specialization* improves from 0.07 in the first period to 0.31 in the second period, the adaptability index on percentage of exports declines from 0.70 to 0.36.

Remember that the matrix is not a compulsory parameter. Do not specify a matrix unless you want to perform a competitiveness analysis using CAN typology. The type analysis, the competitiveness matrix, and the adaptability index are sensitive to the level of aggregation. These analytical tools are best understood in a comparison between two time periods.

## Exercise

### Exercise 7: The Specialization Matrix

Consider a four-digit analysis of the competitive position of the Dominican Republic on the North American import market during the periods 1985–90,



1991–93, and 1994–96. Use the specialization matrix and request consolidated information. After that, request information on the first five commodities of each type by percentage of exports. What would you say are the main differences in the Dominican Republic's competitiveness matrix between the three time periods? What might the explanation be?

These types of questions do not have a single correct answer. However, in essence, the exercise shows a deteriorating competitiveness and a return to reliance on comparative advantage based on natural resources.

In the first period, we observe a significant increase in Rising Stars. These are defined as dynamic commodities in which the country increases its degree of specialization. The country's market share also increases with regard to these commodities—from 0.55 percent to 1.25 percent. They account for 62.5 percent of exports in 1990 compared with 23.19 percent in 1985. It is a typical picture of strong growth.

The second period shows a consolidated and favorable situation, with Rising Stars (dynamic commodities in which the country increases the degree of specialization) accounting for 55 percent of exports in the final year. Some important commodities seem to have changed to Missed Opportunities, however. These are dynamic commodities in which the country decreases its degree of specialization. This type was not very important in the first period, but accounted for one fourth of exports in the second period. Taken together, dynamic commodities accounted for 71 percent of Dominican exports in the final year of the first period, compared with 79 percent in the final year of the second period. This is a positive trend. But in the second period, the country lost market share in significant commodities, whereas in the first period it only gained market shares. This is a sign of a deteriorating competitive situation.

The third period looks worse. Rising Stars are not very significant. The country is specializing in a few, not very important, dynamic commodities. Most of Dominican exports now are Missed Opportunities. The country loses specialization in the big export commodities, and the demand dynamics also seem to be less favorable. More than 50 percent of Dominican exports are now in stagnant sectors. Notice the specialization trend: in the first period, the country specialized in Rising Stars. In the second period, the country maintained a high specialization in Rising Stars, but also specialized in Retreats. In the third period, the specialization pattern is quite negative—the lowest in Rising Stars, the highest in Retreats.

Now take a look at the commodities. In the first period, five quite diverse commodities sustained the boom: trousers, parts of footwear, sugar, other

garments, and jewelry. Each one accounted for a higher percentage of exports than the most significant Declining Star, Missed Opportunity, or Retreat. The only significant missed opportunity was ferro-alloys. Coffee and cocoa were the retreats.

In the second period, three of five Rising Stars were the same as in the first period—mostly apparel products. The competitiveness situation seems sustained. But some important commodities, such as sugar and ferro-alloys, are now Retreats.

In the third period, there are no apparel commodities in the top five of the Rising Star category. The country does not increase its specialization in apparel products. Cigars and tobacco are among the top five, together with ferro-alloys, silver, and molasses. The country is specializing again in natural resource-based exports. The big apparel items are now found in the Missed Opportunities category, and some, including parts of footwear, are in the Retreat category.

We may conclude that the tale of Dominican competitiveness is, to an important degree, a tale of apparel exports. The country increased its specialization in these commodities until the early 1990s. Around the mid-1990s, the degree of specialization started to decline. We would have to look at the countries that increased their degree of specialization in this period. We would probably find a steep increase in specialization in Mexican apparel exports (due to NAFTA benefits) and those from some less expensive newcomer countries, such as Honduras.

Stiffer competition from Mexico after NAFTA on the North American apparel imports market may be the single most important explanation. But parts of footwear and jewelry also participate in the downward trend. By definition, there are other commodities in which the country increases the degree of specialization—agricultural and mineral resource-based exports.

# For More Specific Questions: Using Filters

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**T**RADERCAN OFFERS A USEFUL TOOL called *Filters* that can single out the criteria you specify. Use filters cautiously and only when you are sure you need it.

You will find the *Filters* button at the bottom of your query form. Click on it to call up the filter definition screen, which enables you to select the specific commodities you wish to process in your query.

## Filter Definition Screen

The screenshot shows a window titled "Filters" with a grid of filter options. Each option includes radio buttons for "Increasing" and "Decreasing", and a text input field for "Minimum value in final year".

Filter Category	Options
Market share	<input type="radio"/> Increasing <input type="radio"/> Decreasing Minimum value in final year: <input type="text"/>
Market share relative to rival	<input type="radio"/> Bigger <input type="radio"/> Smaller
Percentage of exports	<input type="radio"/> Increasing <input type="radio"/> Decreasing Minimum value in final year: <input type="text"/>
Market share relative to rival	<input type="radio"/> Faster growth <input type="radio"/> Slower growth
Specialization	<input type="radio"/> Increasing <input type="radio"/> Decreasing Minimum value in final year: <input type="text"/>
Specialization	<input type="radio"/> Specialized in Final Year <input type="radio"/> Not Specialized in Final Year
Percentage of imports	<input type="radio"/> Increasing <input type="radio"/> Decreasing Minimum value in final year: <input type="text"/>
Clear all filters	
OK Cancel Help	

## The Filter Variable

You may specify commodity selection criteria on any of the five CAN variables:

- Market share
- Percentage of exports
- Specialization
- Percentage of imports
- Market share relative to a rival.

## The Filter Options

You may specify filter options in several ways, depending on your filter variable. On all variables, you can operate a static (*Final Year value*) and a dynamic (*Variation*) selection.

## Static and Dynamic Filter Options

Static filter options are very much like the *Final Year value* sort option in the report screen. They have the form of establishing a minimum value that your commodity should satisfy in the final year. This option is available for all but one variable—market share relative to a rival.

The specialization and market share relative to a rival variables offer another static option. On specialization, you may select commodities with specialization levels higher (or lower) than one. TradeCAN will include only commodities in which a country is “specialized” or “not specialized” in the report.

The static filter option on market share relative to a rival selects commodities with levels higher (or lower) than one. In other words, TradeCAN will include in the report only commodities with a market share “bigger than rival” or “smaller than rival.”

The dynamic options are a lot like the variation sort option on the report screen. They require the commodities to satisfy the criterion of an increase (or decrease) of the filter variable over the time period. For example, if market share is your filter variable, TradeCAN selects commodities with increasing (or decreasing) market shares. On market share relative to a rival, the dynamic filter option selects commodities in which your exporter country’s market share has grown faster (or slower) than the market share of the rival.

## *A Guide to Using Filters*

	<i>Variable</i>	<i>Criterion</i>
Rising Stars on Market Share	Market share <i>and</i> Percentage of imports	Increasing Increasing
Declining Stars on Market Share	Market share <i>and</i> Percentage of imports	Increasing Decreasing
Missed Opportunities on Market Share	Market share <i>and</i> Percentage of imports	Decreasing Increasing
Retreats on Market Share	Market share <i>and</i> Percentage of imports	Decreasing Decreasing
Dynamic commodities	Percentage of imports	Increasing
Stagnant commodities	Percentage of imports	Decreasing
Market share gains	Market share	Increasing
Market share losses	Market share	Decreasing

To get the type analysis on specialization or percentage of exports, just substitute the variable of your choice for market share.

## **Simultaneous Filters**

You may choose more than one variable at a time, and TradeCAN will perform queries with several commodity selection criteria simultaneously. But keep in mind that the more complex your selection criteria are, the less transparent your query results. It is best to start with one commodity selection criterion at a time.

# How to Read a Report

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**T**RADECAN PROVIDES A NUMBER OF REPORT OPTIONS, which are discussed in this section.

## The Report Panel

The on-screen report panel shows a series of eight buttons and up to 22 windows.

The functions of the eight buttons are as follows, from left to right:

1. Go back to first observation
2. Go one observation back
3. Go forward to last observation
4. Go one observation forward
5. Print
6. Save
7. Show report as table/panel toggle
8. Return to query

The windows are (from top to bottom, left to right):

1. Filter specifications (optional)
2. Report options
3. Matrix selection (optional)
4. Exporter country code
5. Exporter name
6. Base year
7. Final year
8. Market share base year
9. Market share final year
10. Variation in market share

11. Percentage of exports base year
12. Percentage of exports final year
13. Variation in percentage of exports
14. Type (optional)
15. Specialization base year
16. Specialization final year
17. Variation in specialization
18. Commodity code
19. Commodity name
20. Percentage of imports base year
21. Percentage of imports final year
22. Variation in percentage of imports

The report panel is a little different in print from the screen version. Although it has the same structure as the screen version, the printed version provides more complete information on the specifications of the query.

### The Report Panel

Report Specification: Final Year value; Market share relative to Rival; Minimum value; Base year 0; Final year 0; Results: Det

Matrix: Market share; Import market: Industrialized Countries

	1985	1990	Variation
16450 Madagascar	0.00	0.07	1432.64
Percentage of exports	0.09	3.08	3427.83
Rising stars Specialization	0.19	5.31	2647.22
034 Fish, fresh (live or dead), chilled, dried or frozen	0.45	0.58	28.41
Percentage of imports	0.45	0.58	28.41
33076 Brazil	0.01	0.26	2065.86
Market share relative to rival	0.01	0.26	2065.86

# The Report Table

TradeCAN can provide you a report with the following information—both onscreen and in a .wkl file.

Please note that variable abbreviations are a souvenir from the past, when TradeCAN was available only in Spanish. Changing the variable names (identical to the field names in the database) would change the entire program. In the next release, TradeCAN's variable names will be changed.

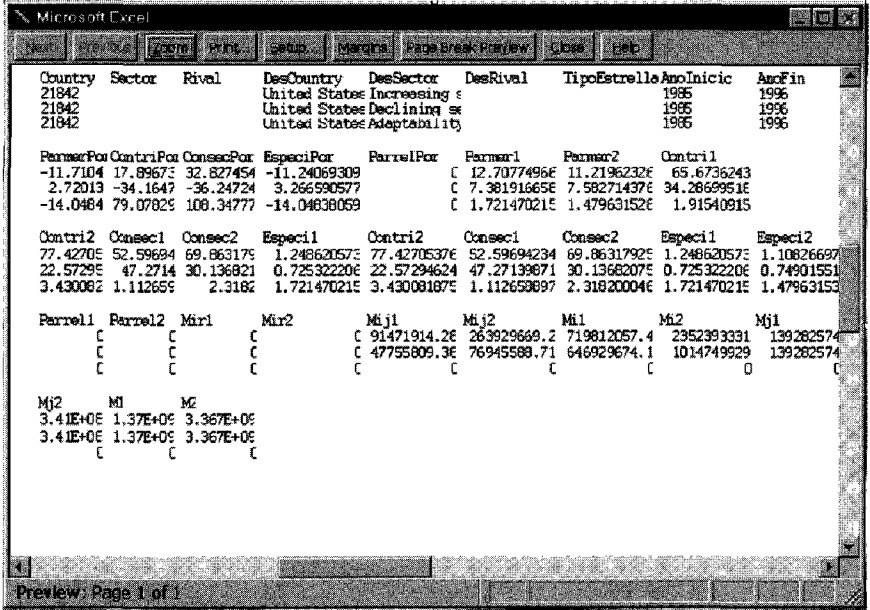
The information on the screen and in the file is organized in columns headed by the field names in the database. The following table gives translations.

## Translation Table

Column header	Translation	Observation
1. Country	Exporter code	
2. Sector	Commodity code	Blank in consolidated reports and adaptability index.
3. Rival	Rival country code	
4. DesCount	Exporter name	

(Table continued on next page)

## Report table





(Translation table continued)

5. DesSector	Commodity name	In consolidated reports, it says consolidated sector. In adaptability reports, it says increasing sectors, decreasing sectors, and adaptability index.
6. DesRival	Rival name	
7. TipoEstr	Type	
8. AnoInicio	Base year	
9. AnoFin	Final year	
10. ParmerPor	Market share change	Variation over base year. May say incalculable value when base year value is nonexistent or zero. Says >10,000 if variation is greater than 10,000.
11. ContriPor	Change in percentage of exports	Same as in 10.
12. ConsecPor	Change in percentage of imports	Same as in 10.
13. EspeciPor	Change in specialization	Same as in 10.
14. ParrelPor	Change in market share relative to the rival	Same as in 10.
15. Parmer1	Market share in base year	In percentage.
16. Parmer2	Market share in final year	In percentage.
17. Contri1	Percentage of exports in base year	In percentage.
18. Contri2	Percentage of exports in final year	In percentage.
19. Consec1	Percentage of imports in base year	In percentage.
20. Consec2	Percentage of imports in final year	In percentage.
21. Especi1	Specialization in base year	In percentage.
22. Especi2	Specialization in final year	In percentage.
23. Parrel1	Market share relative to the rival, base year	In percentage.
24. Parrel2	Market share relative to the rival, final year	In percentage.
M <sub>ir</sub> 1	Value of imports, per commodity from rival, base year	In thousands of U.S. dollars.
M <sub>ir</sub> 2	Value of imports, per commodity from rival, final year	In thousands of U.S. dollars.
M <sub>ij</sub> 1	Value of imports, per commodity from exporter, base year	In thousands of U.S. dollars.
M <sub>ij</sub> 2	Value of imports, per commodity from exporter, final year	In thousands of U.S. dollars.
M <sub>i</sub> 1	Value of imports per commodity (all exporters), base year	In thousands of U.S. dollars.
M <sub>i</sub> 2	Value of imports per commodity (all exporters), final year	In thousands of U.S. dollars.
M <sub>j</sub> 1	Value of imports per exporter (all commodities), base year	In thousands of U.S. dollars.
M <sub>j</sub> 2	Value of imports per exporter (all commodities), final year	In thousands of U.S. dollars.
M1	Value of imports (all commodities, all exporters), base year	In thousands of U.S. dollars.
M2	Value of imports (all commodities, all exporters), final year	In thousands of U.S. dollars.

# The Macros

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**R**ESEARCHERS AT UNECLAC HAVE FOUND it useful to elaborate macros in Excel 95 to prepare reports.

A macro can be helpful if you want to perform a number of identical query sequences (say, the same sequence for many countries) and use the results to prepare a spreadsheet-based report.

## How to Use UNECLAC Macros

Here is what to do if you want to use one of our macros instead of making your own:

Copy the file *TradeCANMacros.xls* from the CD-ROM (subdirectory macros) to your hard disk drive in the subdirectory `c:\Program Files\Microsoft Office\Office\`.

- Create the following subdirectories on your hard disk drive:
  - `c:\PaisCanwin\Datos`
  - `c:\PaisCanwin\DatosFoto`
  - `c:\PaisCanwin\Formato1`
  - `c:\PaisCanwin\Formato2`
  - `c:\IetWcan`
- Copy the files *FormaWinIng.xls* and *FormaFoto4.xls* from your CD-ROM (subdirectory) to `c:\PaisCanwin\Formato1`.
- Copy the files *4BasesIngI.xls* to `C:\PaisCanwin\Formato2`, and *Esp6grawcanI.ppt* to `c:\PaisCanwin`.

Now you can use the macros described in the following sections.

## The Photo

The Photo macro produces a table that presents a general overview of the situation of an exporter country. You may specify the import market and the time period.

The Photo presents the information on the export structure and performance of a country by way of a classification in vogue at UNECLAC that distinguishes natural resource-based commodities (agriculture, energy, textile fibers, and minerals) from manufactured commodities (both based on, and not based on, natural resources). The Photo presents market share and percentage of exports for each group of commodities. Furthermore, it presents—at a glance—the situation of the top 10 exported commodities in the final year (market share and its evolution, and whether it is among the 50 most important imported commodities).

To use the Photo, use *MacroFotowinIng.xls*. You will have to perform queries in TradeCAN and store the retrieved information on your hard disk drive. The steps for retrieving information for the macros are contained in the *read.me* file on your hard disk drive.

Be careful, because an error in one of the queries will result in erroneous information in the reports prepared by way of macros. While this is true for any TradeCAN query, the macros may compound this type of error.

## IET

The IET macro was developed by Alcorta and Peres for their paper “Innovation Systems and Technological Specialization in Latin America and the Caribbean.” IET provides the main tables and graphs presented in the paper: high-technology exports as a percentage of total exports, market shares, and index of technological specialization. Open the *readme IETWCAN.doc* file in the \macro subdirectory of your TradeCAN CD-ROM for further instructions.

# Formulas

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The following notations are adopted:

- $M$ —the value of imports on the import market in time period  $t$ .
- Subscript  $i$ —the commodity.
- Subscript  $j$ —the exporter.
- Subscript  $r$ —the rival.
- $M$ —total import value.
- $M_j$ —the value of imports originated in exporter country  $j$ . In TradeCAN it is supposed to be equal to the total exports from exporter country  $j$  to the import market.
- $M_r$ —the value of imports originated in rival (export) country  $r$ .
- $M_i$ —the value of imports of commodity  $i$ .
- $M_{ij}$  is the value of imports of commodity  $i$  originated in exporter country  $j$ .

## The Basic CAN Variables

Here are the basic CAN variables:

- Market share (MS):  $M_{ij}/M_i$ .
- Percentage of exports (PE):  $M_{ij}/M_j$ .
- Specialization (SP):  $(M_{ij}/M_i)/(M_j/M)$ .
- Percentage of imports (PI):  $M_i/M$ .
- Market share relative to a rival (RR):  $(M_{ij}/M_i)/(M_{ir}/M_i)$ .

## The CAN Typology

*FY* denotes final year and *BY* indicates base year.

The CAN typology depends on the variable on the vertical axis of the competitiveness matrix, as follows.

With market share on the vertical axis, a Rising Star meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ M_{ij}/M_i \cdot (FY) > M_{ij}/M_i \cdot (BY).$$

A Declining Star meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ M_{ij}/M_i \cdot (FY) > M_{ij}/M_i \cdot (BY).$$

A Missed Opportunity meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ M_{ij}/M_i \cdot (FY) < M_{ij}/M_i \cdot (BY).$$

A Retreat meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ M_{ij}/M_i \cdot (FY) < M_{ij}/M_i \cdot (BY).$$

With percentage of exports on the vertical axis of the competitiveness matrix, CAN typology is as follows.

A Rising Star meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ M_{ij}/M_j \cdot (FY) > M_{ij}/M_j \cdot (BY).$$

A Declining Star meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ M_{ij}/M_j \cdot (FY) > M_{ij}/M_j \cdot (BY).$$

A Missed Opportunity meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ M_{ij}/M_j \cdot (FY) < M_{ij}/M_j \cdot (BY).$$

A Retreat meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ M_{ij}/M_j \cdot (FY) < M_{ij}/M_j \cdot (BY).$$

With specialization on the vertical axis of the competitiveness matrix, CAN typology is as follows.

A Rising Star meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ (M_{ij}/M_i)/(M_j/M)(FY) > (M_{ij}/M_i)/(M_j/M)(BY).$$

A Declining Star meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ (M_{ij}/M_i)/(M_j/M)(FY) > (M_{ij}/M_i)/(M_j/M)(BY).$$

A Missed Opportunity meets the criteria:

$$M_i/M(FY) > M_i/M(BY) \text{ and} \\ (M_{ij}/M_i)/(M_j/M)(FY) < (M_{ij}/M_i)/(M_j/M)(BY).$$

A Retreat meets the criteria:

$$M_i/M(FY) < M_i/M(BY) \text{ and} \\ (M_{ij}/M_i)/(M_j/M)(FY) < (M_{ij}/M_i)/(M_j/M)(BY).$$

## The Adaptability Index

The adaptability index is contained in a special report that delivers the following indicators.

Consider DC to be a dynamic commodity and SC to be a stagnant commodity. DC is defined as a commodity that satisfies the criterion:

$$M_i/M(FY) > M_i/M(BY).$$

SC is defined as a commodity that satisfies the criterion:

$$M_i/M(FY) < M_i/M(BY).$$

Now, the adaptability indexes are:

- On market share:  $MS(DC)/MS(SC)$ , or the combined market share of selected dynamic commodities divided by the combined market share of selected stagnant commodities;
- On percentage of exports:  $PE(DC)/PE(SC)$ , or the total percentage of exports of dynamic commodities divided by the total percentage of exports of stagnant commodities;
- On specialization:  $SP(DC)/SP(SC)$ , or the degree of specialization in dynamic commodities divided by the degree of specialization in stagnant commodities; and

- On percentage of imports:  $PI(DC)/PI(SC)$ , or the total percentage of imports of dynamic commodities divided by the total percentage of imports of stagnant commodities.

Remember that the classification of commodities into dynamic and stagnant commodities depends on the time period, the level of aggregation, and the import market. It does not, however, depend on the exporter country.

Also keep in mind that the adaptability index is the same for any matrix. You have to select a matrix, but the adaptability index provides information on market share, percentage of exports, and specialization in one report. Any of the three selected matrices will provide the same information on the adaptability index report.

# **Annex I: Reporter Countries**

## **TradeCAN 1—Industrialized World**

### **Western Europe 1985–95**

<i>Country</i>	<i>Code</i>	<i>Country</i>	<i>Code</i>
Austria	53040	Belgium/Luxembourg	53058
Denmark	53208	Finland	53246
France	53251	Germany	53280
Greece	53300	Iceland	55352
Ireland	53372	Italy	53381
Netherlands	53528	Norway	55579
Portugal	53620	Spain	53724
Sweden	53752	Switzerland	55757
United Kingdom	53826		

### **Japan 1985–95**

Japan	41392		
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### **North America 1985–95**

Canada	21124	United States	21842
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## **TradeCAN 2—Developing World**

### **Africa 1985–95**

<i>Country</i>	<i>Code</i>	<i>Country</i>	<i>Code</i>
Algeria	13012	Egypt	13818
Kenya	16404	Madagascar	16450



Malawi	16454	Mauritius	16480
Morocco	13504	Réunion	16638
Senegal	16686	Seychelles	16690
South Africa	11711	Tunisia	13788
Zimbabwe	16716		

#### Developing America 1986-95

<i>Country</i>	<i>Code</i>	<i>Country</i>	<i>Code</i>
Argentina	33032	Barbados	35052
Bolivia	33068	Brazil	33076
Chile	33152	Colombia	33170
Costa Rica	34188	Dominican Rep.	35212
Ecuador	33218	El Salvador	34222
French Guiana	36254	Grenada	35308
Guadeloupe	35312	Honduras	34340
Jamaica	35388	Martinique	35474
Mexico	33484	Nicaragua	34558
Panama	36591	Paraguay	33600
Peru	33604	St. Lucia	35662
Trinidad/Tobago	35780	Uruguay	33858
Venezuela	33862		

#### Developing Asia 1985-95

<i>Country</i>	<i>Code</i>	<i>Country</i>	<i>Code</i>
Bangladesh	45050	China	45156
Cyprus	44196	Fed. of Malaysia	45458
Hong Kong	45344	India	45699
Indonesia	45360	Jordan	44400
Korea, Rep. of	45410	Macao	45446
Muscat and Oman	44512	Nepal	45524
Neutral Zone	44634	Pakistan	45586
Philippines	45608	Saudi Arabia	44682
Singapore	45702	Sri Lanka	45144
Syrian Arab. Rep.	44760	Thailand	45764
Turkey	44792	United Arab Emirates	44784

# **Annex II: Groups (Standard International Trade Classification [SITC], Revision 2, 3 Digits)**

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(Descriptions have been abbreviated)

- 001 Live animals chiefly for food
  - 011 Meat and edible meat offals, fresh, chilled, or frozen
  - 012 Meat and edible meat offals, salted, in brine, dried, smoked
  - 014 Meat and edible meat offals, prepared or preserved, NES
- 01@ Meat and meat preparations
- 022 Milk and cream
- 023 Butter
- 024 Cheese and curd
  - 025 Eggs, birds, and egg yolks, fresh or preserved
- 02@ Dairy products and birds' eggs
- 034 Fish, fresh (live or dead), chilled, dried, or frozen
- 035 Fish, dried, salted, or in brine; smoked fish
  - 036 Crustaceans and molluscs, whether in shell or not
  - 037 Fish, crustaceans, and molluscs, prepared or preserved, NES
- 03@ Fish, crustaceans, and molluscs, and preparations thereof
- 041 Wheat (including spelt) and meslin, unmilled
- 042 Rice
- 043 Barley, unmilled
- 044 Maize (corn), unmilled
  - 045 Cereals, unmilled (other than wheat, rice, barley, maize)
  - 046 Meal and flour of wheat and flour of meslin
- 047 Other cereal meals and flours
  - 048 Cereal preparations and preparations of flour, starch
- 04@ Cereals and cereal preparations

054 Vegetables, fresh, chilled, frozen, or simply preserved  
 056 Vegetables, roots, and tubers, prepared or preserved  
 057 Fruit and nuts (not oil nuts) fresh or dried  
 058 Fruit, preserved, and fruit preparations  
 05@ Vegetables and fruit  
 061 Sugar and honey  
     062 Sugar confectionery (except chocolate), other sugar prep.  
 06@ Sugar, sugar preparations, and honey  
 071 Coffee and coffee substitutes  
 072 Cocoa  
     073 Chocolate, other food preparations containing cocoa, NES  
 074 Tea and maté  
 075 Spices  
     07@ Coffee, tea, cocoa, spices, and manufactures thereof  
     081 Feeding stuff for animals (excluding unmilled cereals)  
 091 Margarine and shortening  
 098 Edible products and preparations, NES  
     09@ Miscellaneous edible products and preparations  
 0@@ Food and live animals chiefly for food  
 111 Nonalcoholic beverages NES  
 112 Alcoholic beverages  
 11@ Beverages  
 121 Tobacco, unmanufactured; tobacco refuse  
 122 Tobacco, manufactured  
 12@ Tobacco and tobacco manufactures  
 1@@ Beverages and tobacco  
 211 Hides and skins (except furskins), raw  
     212 Furskins, raw (including astrakhan, caracul, Persian, etc.)  
 21@ Hides, skins, and furskins, raw  
 222 Oil seeds and oleaginous fruit, whole or broken, for soft oils  
 223 Oil seeds and oleaginous fruit, whole or broken, for other oils  
 22@ Oil seeds and oleaginous fruit  
 232 Natural rubber latex; natural rubber and similar, natural gums  
 233 Synthetic rubber latex; synthetic and reclaimed rubber  
 23@ Crude rubber (including synthetic and reclaimed)  
 244 Cork, natural, raw and waste  
 245 Fuel wood (excluding wood waste) and wood charcoal  
 246 Pulpwood (including chips and wood waste)

- 247 Other wood in the rough or roughly squared
- 248 Wood, simply worked, and railway sleepers
- 24@ Cork and wood
- 251 Pulp and waste paper
- 25@ Pulp and waste paper
- 261 Silk
- 263 Cotton
- 264 Jute and other textile bast fibers, NES
  - 265 Vegetable textile fibers (excluding cotton and jute)
- 266 Synthetic fibers suitable for spinning
  - 267 Other man-made fibers suitable for spinning
  - 268 Wool and other animal hair (excluding wool tops)
  - 269 Old clothing and other old textile articles; rags
  - 26@ Textile fibers (other than wool tops) and their wastes
- 271 Fertilizers, crude
- 273 Stone, sand, and gravel
- 274 Sulphur and unroasted iron pyrites
- 277 Natural abrasives, NES (including industrial diamonds)
- 278 Other crude minerals
- 27@ Crude fertilizers and crude minerals
- 281 Iron ore and concentrates
- 282 Waste and scrap metal of iron or steel
- 286 Ores and concentrates of uranium and thorium
- 287 Ores and concentrates of base metals, NES
  - 288 Non-ferrous base metal waste and scrap, NES
  - 289 Ores and concentrates of precious metals, waste, scrap
- 28@ Metalliferous ores and metal scrap
- 291 Crude animal materials, NES
- 292 Crude vegetable materials, NES
  - 29@ Crude animal and vegetable materials, NES
- 2@@ Crude materials, inedible, except fuels
- 322 Coal, lignite, and peat
  - 323 Briquettes; coke and semi-coke of coal, etc.
- 32@ Coal, coke, and briquettes
  - 333 Petroleum oils, crude, also from bituminous minerals
- 334 Petroleum products, refined
- 335 Residual petroleum products, NES
  - 33@ Petroleum, petroleum products, and related materials

- 341 Gas, natural and manufactured
- 34@ Gas, natural and manufactured
- 351 Electric current
  - 3@@ Minerals fuels, lubricants, and related materials
- 411 Animal oils and fats
  - 423 Fixed vegetable oils, soft, crude, refined, or purified
  - 424 Other fixed vegetable oils, fluid or solid, crude, etc.
- 42@ Fixed vegetable oils and fats
  - 431 Animal and vegetable oils and fats, processed and waxes
  - 43@ Animal and vegetable oils and fats, processed and waxes
  - 4@@ Animal and vegetable oils and fats, processed and waxes
- 511 Hydrocarbons, NES, and their derivatives
  - 512 Alcohols, phenols, phenol-alcohols, and their derivatives
- 513 Carboxylic acids and their derivatives
- 514 Nitrogen-function compounds
  - 515 Organo-inorganic and heterocyclic compounds
- 516 Other organic chemicals
- 51@ Organic chemicals
  - 522 Inorganic chemical elements, oxides, and halogen salts
  - 523 Other inorganic chemicals; organic and inorganic compounds
- 524 Radioactive and associated materials
- 52@ Inorganic chemicals
  - 531 Synthetic organic dyestuffs, etc., natural indigo, color lakes
  - 532 Dyeing and tanning extracts and synthetic tanning materials
  - 533 Pigments, paints, varnishes, and related materials
- 53@ Dyeing, tanning, and coloring materials
- 541 Medicinal and pharmaceutical products
  - 551 Essential oils, perfume, and flavor materials
  - 553 Perfumery, cosmetic, and toilet preparations
  - 554 Soap, cleansing and polishing preparations
  - 55@ Essential oils and perfume materials; toilet, polishing and cleaning
- 562 Fertilizers, manufactured
- 572 Explosives and pyrotechnic products
  - 582 Condensation, polycondensation and polyaddition products
  - 583 Polymerization and copolymerization products
  - 584 Regenerated cellulose; cellulose nitrate, etc.
  - 585 Other artificial resins and plastic materials
  - 58@ Artificial resins and plastic materials, cellulose esters/ethers

- 591 Disinfectants, insecticides, fungicides, etc.
- 592 Starches, inulin, and wheat gluten, etc.
- 598 Miscellaneous chemical products, NES
- 59@ Chemical materials and products, NES
- 5@@ Chemicals and related products, NES
- 611 Leather
  - 612 Manufactures of leather, parts of footwear, etc.
- 613 Furskins, tanned or dressed
  - 61@ Leather, leather manufactures, NES, and dressed furskins
- 621 Materials of rubber
- 625 Rubber tires, tire cases, tubes, treads, etc.
- 628 Articles of rubber, NES
- 62@ Rubber manufactures, NES
- 633 Cork manufactures
- 634 Veneers, plywood, reconstituted wood, etc.
- 635 Wood manufactures, NES
  - 63@ Cork and wood manufactures (excluding furniture)
- 641 Paper and paperboard
  - 642 Paper and paperboard, cut to size or shape, articles of
  - 64@ Paper, paperboard, and articles of paper pulp, of paper
- 651 Textile yarn
- 652 Cotton fabrics, woven
- 653 Fabrics, woven, of man-made fibers
  - 654 Textile fabrics, woven, not cotton or man-made fiber
- 655 Knitted or crocheted fabrics
  - 656 Tullies, lace, embroidery, ribbons, trimmings, etc.
- 657 Special textile fabrics and related products
  - 658 Made-up articles, wholly or chiefly of textile materials
- 659 Floor coverings, etc.
  - 65@ Textile yarn, fabrics, made-up articles, NES, and related products
- 661 Lime, cement, and fabricated construction materials
- 662 Clay construction materials; refractory materials
- 663 Mineral manufactures, NES
- 664 Glass
- 665 Glassware
- 666 Pottery
- 667 Pearls, precious and semiprecious stones
  - 66@ Nonmetallic mineral manufactures, NES

- 671 Pig iron, spiegeleisen, sponge iron, ferro-alloys
- 672 Ingots and other primary forms of iron or steel
- 673 Iron and steel bars, rods, angles, shapes, sections
- 674 Universals, plates and sheets, of iron or steel
- 675 Hoop and strip, of iron or steel
  - 676 Rails and railway track construction material
  - 677 Iron or steel wire (excluding wire rod) not insulated
- 678 Tubes, pipes and fittings, of iron or steel
  - 679 Iron and steel castings, forgings, and stampings
- 67@ Iron and steel
  - 681 Silver, platinum, and other metals of platinum group
- 682 Copper
- 683 Nickel
- 684 Aluminium
- 685 Lead
- 686 Zinc
- 687 Tin
- 688 Uranium depleted in U235 and thorium
- 689 Miscellaneous nonferrous base metals
- 68@ Nonferrous metals
- 691 Structures and parts of structures, NES
- 692 Metal containers for storage and transport
  - 693 Wire products (excluding insulated electrical wiring), fencing grills
- 694 Nails, screws, nuts, bolts, rivets, etc.
- 695 Tools for use in the hands or in machines
- 696 Cutlery
- 697 Household equipment of base metal, NES
- 699 Manufactures of base metal, NES
- 69@ Manufactures of metal, NES
  - 6@@ Manufactured goods classified chiefly by material
- 711 Steam and other vapor-generating boilers
  - 712 Steam and other vapor power units (excluding boilers)
  - 713 Internal combustion piston engines, and parts
  - 714 Engines and motors, nonelectric, parts, NES
  - 716 Rotating electric plant and parts thereof, NES
  - 718 Other power-generating machinery and parts, NES
  - 71@ Power-generating machinery and equipment
  - 721 Agricultural machinery (excluding tractors) and parts

- 722 Tractors (other than 744.11 and 783.2)
  - 723 Civil engineering and contractor's plant/equipment
  - 724 Textile and leather machinery and parts, NES
- 725 Paper mill and pulp mill machinery, etc.
  - 726 Printing and bookbinding machinery and parts
- 727 Food-processing machines (excluding domestic)
  - 728 Other machinery and equipment, specialized
  - 72@ Machinery specialized for particular industries
- 736 Machine tools for working metals
  - 737 Metalworking machinery (excluding machine tools)
  - 73@ Metalworking machinery
- 741 Heating and cooling equipment and parts
  - 742 Pumps (including motor and turbo pumps) for liquids
  - 743 Pumps (excluding pumps for liquids), compressors, fans
  - 744 Mechanical handling equipment, and parts
- 745 Other nonelectrical machinery, tools, etc.
  - 749 Nonelectric parts and accessories of machinery
  - 74@ General industrial machinery and equipment, NES
- 751 Office machines
  - 752 Automatic data processing machines, units thereof
  - 759 Parts, NES, of and accessories for 751 and 752
  - 25@ Office machines and automatic data processing equipment
- 761 Television receivers
- 762 Radio-broadcast receivers
- 763 Sound equipment, dictating machines, etc.
- 764 Telecommunications equipment, NES
  - 76@ Telecommunications and sound recording and reproducing apparatus
- 771 Electric power machinery (other than 716)
  - 772 Electrical apparatus for making and breaking electrical circuits
- 773 Equipment for distributing electricity
- 774 Electric apparatus for medical purposes
  - 775 Other household type, electrical and nonelectric equipment
  - 776 Thermionic valves and tubes, and other semiconductors, NES
- 778 Electrical machinery and apparatus, NES
  - 77@ Electrical machinery, apparatus and appliances, NES
  - 781 Passenger motor cars (excluding. public service type)
  - 782 Motor vehicles for the transport of goods/materials



- 783 Road motor vehicles, NES
  - 784 Parts and accessories, NES, of motor vehicles
  - 785 Motorcycles, motor scooters, and other cycles
  - 786 Trailers and other vehicles, not motorized, NES
  - 78@ Road vehicles (including air-cushion vehicles)
  - 791 Railway vehicles and associated equipment
  - 792 Aircraft and associated equipment and parts
  - 793 Ships, boats (including hovercraft), floating structures
- 79@ Other transport equipment
- 7@@ Machinery and transport equipment
  - 812 Sanitary, plumbing, heating and lighting fixtures
  - 81@ Sanitary, plumbing, heating and lighting fixtures and fittings, NES
  - 821 Furniture and parts thereof
- 831 Travel goods (e.g., trunks, suitcases)
  - 842 Outer garments, men's and boys', of textile fabrics
  - 843 Outer garments, women's, and girls', of textile fabrics
  - 844 Under garments, textile fabrics (not knitted/crocheted)
  - 845 Outer garments, other articles, knitted/crocheted
- 846 Under garments, knitted or crocheted
  - 847 Clothing accessories, of textile fabrics, NES
  - 848 Articles of apparel, clothing accessories, not textile fabrics
  - 84@ Articles of apparel and clothing accessories
- 851 Footwear
- 871 Optical instruments and apparatus
- 872 Medical instruments and appliances, NES
- 873 Meters and counters, NES
  - 874 Measuring, checking, analyzing, control instruments
  - 87@ Professional, scientific, and controlling instruments, NES
  - 881 Photographic apparatus and equipment, NES
  - 882 Photographic and cinematographic supplies
  - 883 Cinematograph film, exposed
  - 884 Optical goods, NES
  - 885 Watches and clocks
  - 88@ Photographic apparatus, equipment, and supplies, and optical goods NES
- 892 Printed matter
- 893 Articles, NES, of materials of division 58
  - 894 Baby carriages, toys, games, and sporting goods

- 895 Office and stationery supplies, NES
- 896 Works of art, collectors' pieces and antiques
- 897 Jewelry, goldsmiths' and silversmiths' wares, etc.
- 898 Musical instruments and parts and accessories
- 899 Other miscellaneous manufactured articles
- 89@ Miscellaneous manufactured articles, NES
- 8@@ Miscellaneous manufactured articles
  - 911 Postal packages not classified according to kind
  - 931 Special transactions and commodities not classified
- 941 Animals, live, NES
  - 951 Armored fighting vehicles, war arms, ammunition
  - 961 Coin (other than gold coin), not legal tender
- 971 Gold, nonmonetary
- 999 Compose sector
  - 9@@@ Commodities and transactions not classified elsewhere in the SITC
- @@@@ All sectors developed

# Notes

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1. For additional information, contact Maria Helena Charalamby at mcharalamby@eclac.cl

2. This leaves out mainly the transitional economies' imports as well as the imports from a number of African countries.

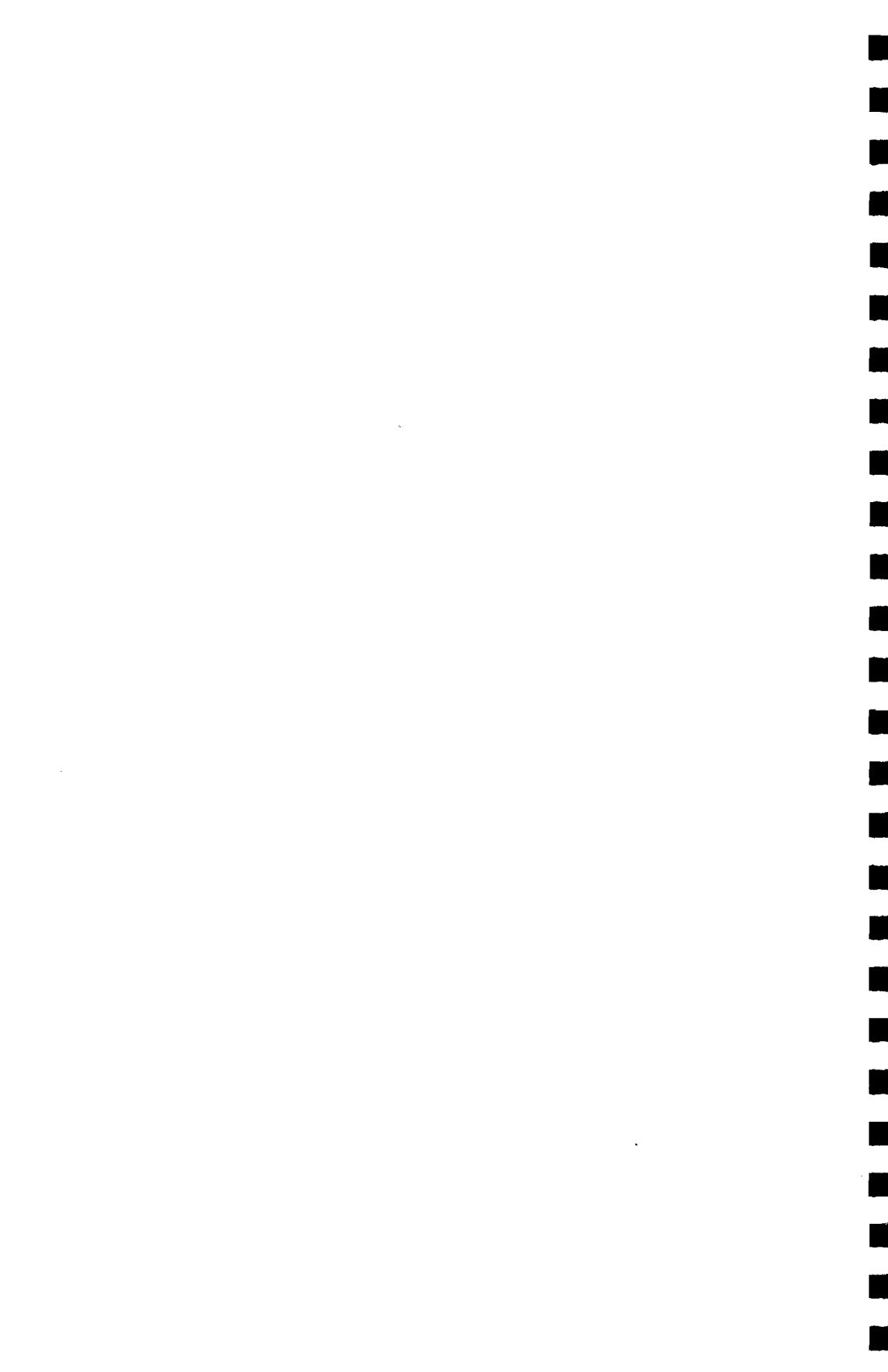
3. The type of information may vary per reporting country. COMTRADE usually registers CIF values. Exceptionally, as in the cases of Mexico and Venezuela, data are in FOB terms. This does not significantly affect the competitiveness analysis of TradeCAN.

4. This is an excerpt from United Nations, Department of Economic and Social Affairs, Statistical Office (1975): "Standard International Trade Classification Revision 2," Statistical Papers Series M, no. 34/Rev 2.

5. See Fajnzylber, F. (1990): "Industrialization in Latin America: From the Black Box to the Empty Box." Cuadernos de la CEPAL 60, Santiago; and CEPAL, (1993): "El comercio de manufacturas de América Latina 1962-1989," *Estudios e Informes* 88, Santiago.

6. See Fajnzylber, F. (1991): "International Insertion and Institutional Renewal," CEPAL Review 44.

7. Alcorta, L., and W. Peres (1995), "Innovation Systems and Technological Specialization in Latin America and the Caribbean," Discussion Paper 9509, INTECH/UNU, Maastricht, the Netherlands.



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### **Installation**

- Insert disk in CD-ROM drive
- Run setup.exe

### **Program Execution**

- Select ECLAC from the Windows Start menu

## **TradeCAN**

### **Database and Software for a Competitiveness Analysis of Nations**

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