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MODULE FOR THE ANALYSIS OF GROWTH OF INTERNATIONAL COMMERCE

(MAGIC PLUS)

On 12 September 2006, on the occasion of the launching of the report *Latin America and the Caribbean in the World Economy, 2005-2006,* the Executive Secretary of ECLAC, José Luis Machinea, presented a new version of the software program Module for the Analysis of Growth of International Commerce (MAGIC).

The first version of MAGIC was created by ECLAC Subregional Headquarters in Mexico , to conduct ex post analysis of the competitiveness of countries' exports to the United States market. The new application architecture was made possible thanks to financial support from the Canadian International Development Agency (CIDA) and the Division of Production, Productivity and Management of ECLAC headquarters in Santiago , Chile .

This issue of the FAL Bulletin reviews the progress of MAGIC in the ten years it has been functioning, and the evolution which has made it one of ECLAC's most popular, versatile, and technologically advanced applications.

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1. BACKGROUND

In 1995, ECLAC Subregional Headquarters in Mexico designed a tool for the analysis of international commerce and the competitiveness of countries, products and sectors in the world's largest market, the United States of America . Since the creation of the program, ECLAC has continually sought to improve it both analytically and technologically, introducing modifications and improvements of various kinds. These include the creation of new consultation indicators and a platform change from the original CD-ROM version to a Web-based platform using individual passwords.

The original idea of creating this analytical tool resulted from the interest expressed by many countries in the Central American and Caribbean subregions in evaluating possible deflections of trade which might result from the North American Free Trade Agreement (NAFTA) between the Central American countries and the United States . For that reason, the original version included only the imports of the United States , and was called the Module for United States Import Consultation (MUSIC).

Thus, the analytical and practical application of MAGIC has changed: it has become a valuable tool for the business, government and academic sectors in the Latin American countries, particularly those which are negotiating trade agreements. In addition to its role in numerous empirical and academic studies,[1] it has recently been used extensively by the negotiators of the Central America - United States Free Trade Agreement (CAFTA) during their rounds of trade talks. It is also being used in negotiations for the Andean Free Trade Agreement.

Nonetheless, it was recognized from the beginning that the scope of the system was still broader. Using MUSIC, any country could look at its market share in the imports of the United States, analyse in great detail the contribution of different products, determine which countries were the main competitors for any product or group of products, and compare its own performance with that of others. MUSIC also established the typology of a country's exports in accordance with the criteria developed by the Competitive Analysis of Nations (CAN) system.[2]

MUSIC was subsequently expanded to include other importing countries in addition to the United States ; this brought about a number of modifications. Owing to classification differences in international trade, the categorization of products and product aggregates was significantly simplified. MAGIC, which is the result of various modifications to MUSIC, could in fact accept any product classification, such as the Harmonized Commodity Description and Coding System (HCDCS) or the Standard International Trade Classification (SITC), and any level of aggregation.

At the third stage, the system was modified to include export statistics, and at the fourth and fifth stages, new indicators such as relative unit value and share by volume were included. The sixth stage was a major step forward, with the migration of MAGIC from the DOS operating system to the Windows system, in which the program could be used simultaneously with spreadsheet and word processing applications. Also at this stage, two new indicators were added for the United States database, in order to make use of data provided by that country's Department of Commerce: actual tariff receipts and implicit tariff.

The seventh stage involved a series of modifications in both form and substance. First, the Windows version was improved so that MAGIC could be used entirely via screen icons. Second, the database used by the MAGIC program had previously been organized into five files with different disaggregation levels: two-, four-, six-, eight- and ten-digit. Third, thanks to users' suggestions and the needs detected through constant use, new indicators and consultation options were added, which will be detailed below. Of particular note are the calculation of trade balances, the selection of the order in which lists are displayed, and the disaggregation of specific categories.

At the final and current stage, a new platform has been developed using a Rich Internet Application (RIA) version, whose structure in layers and levels incorporates state-of-the-art technology and architecture. In this way, MAGIC PLUS has become perhaps ECLAC's most advanced and sophisticated database, completely functional on the Web platform.

On the one hand the user interface or "front end" has been developed with Flash ActionScript 2, obtaining high levels of interactivity, ease of use and speed, characteristic of Web 2.0. On the server, or "back end" side, ASP.NET and SQL Server have been used. Communication between the two modules is via Web Services, making intensive use of Extensible Markup Language (XML), a standard for data exchange and dissemination, optimizing response times and minimizing

bandwidth consumption.

The current version of MAGIC uses the United States database, import statistics based on customs value, and export statistics from the Foreign Agricultural Service (FAS) of the United States , based on information provided by the Department of Commerce. The statistics are available for 1990-2005 and are classified according to the Harmonized System.

2. PROGRAM FUNCTIONS

Based on import statistics from the Department of Commerce for 1990-2005 on a year-by-year basis, at two-, four-, six- and ten-digit disaggregation levels[3] in the Harmonized System classification, MAGIC PLUS performs a set of automated calculations to analyse indicators of the share, contribution and ex-post competitiveness of countries' exports, products and sectors as part of the international trade of the United States and its trading partners. It can therefore perform calculations which are very useful in analysing those trading partners' trade policies and export competitiveness. MAGIC PLUS provides the following indicators:

- Value
- Volume, to 10 digits
- Country share
- Contribution
- Product share
- Market share
- Unit value, to 10 digits
- Relative unit value, to 10 digits
- Specialization = revealed competitive advantage
- Actual duty
- Duty rate
- Variation breakdown[4]
- Product typology

On the basis of these indicators, MAGIC shows the variation of specific products' market share, identifies the main competitors in the market, classifies products by their levels of competitiveness and growth and provides for comparison of the tariff conditions in which the same product or sector enters the United States market from different countries, among other available functions and options.

MAGIC PLUS is now part of a group of ECLAC database programs which includes Foreign Trade Data Bank for Latin America and the Caribbean (BADECEL), TradeCAN, Industrial Performance Analysis Program (PADI), and a recent addition, Interactive Graphic System for International Trade Data (SIGCI). The Internet version of MAGIC now has a large number of users worldwide. Although free access has been given to Governments, universities and research centres by means of various agreements, most users pay for subscriptions. The current version offers free access for the general public to obtain two-digit data,[5] and can be accessed online at the following address:

http://www.eclac.org/magic

The significant characteristics of the new version of MAGIC PLUS include the following: (a) Several windows or reports can be open at the same time; (b) It includes the exports and imports of the United States to and from all its trading partners from 1990 to 2005; (c) It can generate various kinds of interactive graphics; (d) It is easy to select options in terms of user profiles, language, punctuation of decimals and thousands, and scale (units, thousands and millions); (e) User country groups can be created, modified and deleted; and (f) Print, graphic, Excel spreadsheet creation and context-sensitive help options are available for each report.

Work is under way on designing the portal and website for MAGIC PLUS. In addition to providing system access, it will contain value-added content with features including users' discussion forums, access to important publications, trade glossaries and dictionaries, support and technical help options, frequently asked questions, news, training activities, organization of events, search engines and a user's manual.

Institutions such as the Inter-American Development Bank (IDB) and the Secretariat for Central American Economic Integration (SIECA) have recently made important contributions to the development of databases and information systems such as the Hemispheric Trade and Tariff Data Base of ALCA[6] and the Market Analysis Services of the International Trade Centre (ITC) of UNCTAD and WTO, including *TradeMap, Market Access Map, Product Map* and *Country Map[7]*. These programs and databases have functions or indicators similar to those of MAGIC PLUS.[8] None of them, however, is a perfect substitute for MAGIC PLUS; they should be seen as complementary tools. In particular, the calculation of product typology, the "specialization" and "revealed competitive advantage" indicators, tariff information and the "variation breakdown" indicator are provided and calculated only by MAGIC PLUS. Furthermore, MAGIC trade figures include the maquila sector, which is not present in other databases. Lastly, MAGIC provides data with a breakdown level of up to 10 digits, which is very hard to find in other comparable programs.

3. DATA MODULES

MAGIC PLUS comprises three data modules for querying statistics on imports to the United States and all its trading partners. These modules are:

(a) Data by country: data on products traded between the reporting country and one or more trading partners

(b) Data by product: data from those countries trading a specific product or group of products with the reporting country

(c) Data by product and country: data on the reporting country's trade exchanges with one or more trading partners in relation to a specific product.

One of the characteristics of MAGIC PLUS is its symmetry, meaning that the same data can be found via different approaches. In the country data module, the user can obtain information on a country's imports from one of its trading partners in particular or from a group of such partners, to be selected from a list of countries displayed on the screen.[9] Three possible queries can be made using this module:

- List of products: provides data on all products traded between the reporting country and the trading partner

- Product typology: products are classified according to the growth of their product contribution and market share

- Breakdown of variation: provides information on the different components of variation in the value of the trade flow between the reporting country and the trading partner(s) during the selected period, distinguishing between market growth, market structure and the competitiveness factor.

The second product data module provides data on a particular product traded between the reporting country and its trading partners. In this case a product is selected from the list, or a group of products can be created. Product searches can be made using the tariff code or the product name. Once the product or group of products has been selected, the "Partner" button displays information on the trading partners in alphabetical order by value, volume, unit value, relative unit value, market share,[10] share by volume, specialization, implicit tariff and effective tariff.

The third and last module provides information on trading in a specific product between the reporting country and a trading partner or group of partners. The trading partner must be selected first, followed by the product. The next screen summarizes data on value, volume, unit value, contribution, market share, actual tariff receipts and tariff rate. The trade breakdown can also be analysed, as in the country information module. As before, the basis year and final year must be selected.

4. FINAL REMARKS

The new version of MAGIC PLUS provides a view of variations in market share for specific products, identifies the main competitors in a market, classifies products by their competitiveness and growth levels, and makes it possible to compare the tariff conditions under which the same product or sector enters the United States market from various countries, with time series for imports and exports from 1990 to 2005. The program is accessible via Internet and, thanks to the work of the users themselves, has migrated to a Web-based version comprising various layers and levels, making it a powerful search tool for analysing the *ex-post* competitiveness of exports.

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[1] See Dussel Peters (2001, 2004), Martínez and Cortés (2004) and Hernández, et al (2006).

[2] The purpose of the CAN system (the current version is TradeCAN 2005) is to provide tools for evaluation of countries' international competitiveness by evaluating the competitive situation in certain international markets. This can be done from a global viewpoint or with detailed analysis of international trade sectors. One country's competitive situation, taken over a particular period, in selected international markets and in chosen sectors of international trade, is determined by relative international market share and by the country's capacity to detect the highest growth sectors and specialize in them. In the CAN system, also designed and developed by ECLAC, a country's exports are classified on the basis of changes over a particular period in its market share (competitiveness) and product share (growth). This gives rise to four categories: the "rising star" (competitive and dynamic sector), the "falling star" (competitive but stagnant sector), the "missed opportunity" (dynamic but uncompetitive sector) and the "retreat product" (sector which is neither competitive nor dynamic). See Fajnzylber (1988) and Mandeng, O. (1991).

[3] Eight-digit data are not available because the original source does not contain data with that level of disaggregation.

[4] The variation breakdown explains the difference in the value traded between a base year and a final year on the basis of three effects. The first is the demand effect, that is, changes in overall demand for the product. The second is the share effect, which explains the variation resulting solely from changes in the product's market share. The third is the interaction effect, which explains variations caused by the combination of the above two effects.

[5] For further information on registration and subscription pricing, see: http://www.eclac.org/magic