

A GUIDE TO  
DIRECTION OF  
TRADE  
STATISTICS



1993

INTERNATIONAL MONETARY FUND

**A GUIDE TO  
DIRECTION OF  
TRADE  
STATISTICS**

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Prepared by the Real Sector Division, IMF Statistics Department

John B. McLenaghan, Director, Statistics Department

Chandrakant A. Patel, Assistant Director in charge of the  
Real Sector Division

For information related to this publication, please:  
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International Monetary Fund  
Attention: Publication Services  
Washington, D.C. 20431  
U.S.A.  
Telephone (202) 623-7430  
Telefax (202) 623-7201

ISSN 0252-306X  
ISBN 1-55775-334-X

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## Preface

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The *Guide to Direction of Trade Statistics* (the *Guide*) deals with the compilation and presentation of export and import data by partner country as published by the International Monetary Fund (IMF or the Fund) in *Direction of Trade Statistics (DOTS)*. The *Guide* is primarily intended for users of the Fund's direction of trade statistics data base. National compilers of statistics on trade by country may also derive some benefit from the *Guide*.

In 1987, a draft of the *Guide*, in English, was circulated to correspondents in member countries who provide information for *International Financial Statistics (IFS)* and *DOTS* to the Fund's Statistics Department. Since then, the data base for direction of trade statistics (the data base) has been converted to an upgraded data management system with new features and capabilities. In addition, direction of trade statistics publications have been modified in periodicity and expanded in coverage. The 1993 revision of the *Guide* encompasses these new developments.



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# 1. Introduction

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## 1.1 Purpose

Statistics on exports and imports by partner country are maintained in the data base and disseminated through publications and magnetic tapes. The *Guide* describes the collection, compilation, and dissemination of these statistics; discusses the concepts, methodology, coverage, and reliability of data for trade by partner countries; and provides information for accessing the data base.

## 1.2 Background

Publication of *DOTS*—by the United Nations, the World Bank, and the Fund—began in 1950 and continued through 1963. From 1964 through April 1976, *DOTS* was published by the World Bank and the Fund. In May 1976, the Fund assumed sole responsibility for *DOTS* publication.

Since inception, *DOTS* has undergone many changes. The initial issue (entitled *Direction of International Trade*) presented, for the first three months of 1950, data on nearly 100 countries.<sup>1</sup> Coverage subsequently expanded so that, in 1992, the yearbook included data on more than 160 countries, and the quarterly issues, which replaced monthly issues in early 1991, included data for about 135 countries.

Along with the expansion in coverage came an expansion in external demand for *DOTS* itself. During the more than 40 years that *DOTS* has been published, the external user/subscriber list has grown to include other international organizations, governments, central banks, universities, major international banks, other financial institutions, multinational companies, universities, and students throughout the world. Annual circulation has increased from a modest number of issues to approximately 8,000 copies of the *DOTS* yearbook and quarterlies. Since tapes became available in 1972, the number of tape subscribers—some of which provide access to clients through their time-sharing facilities—has increased to approximately 100.

The direction of trade statistics data base has also undergone changes. In April 1990, it was converted to an upgraded data management system with new features and

capabilities. Because of the matrix nature and the extensive standardization and computerization of the data base, which is a subsystem of the Statistics Department's Economic Information System (EIS), it became possible to provide supplementary estimates whenever reported trade data were not available or current. Thus, the latest monthly data for all countries could be obtained with a delay of four or fewer months. The availability of current trade data and estimates for individual countries, in turn, facilitated the compilation of up-to-date world and regional aggregates.

In 1993, the Fund's data base for direction of trade statistics is one of the most comprehensive and current of its type. It contains—and users have regular access to—recent monthly, quarterly, and annual statistics for trade by partner country for individual countries that do not compile and publish (or do so only after substantial delay) such data themselves. While a number of other international agencies (United Nations Statistical Office, Organization for Economic Co-operation and Development, EUROSTAT) provide similar data, such information is—by comparison—restricted in coverage or less up-to-date.<sup>2</sup>

## 1.3 Uses of the Data

Trade-by-country statistics published in *DOTS* are supplemental to, and comparable to, data on total exports and imports published in lines 70 and 71 of *IFS*. (The latter are typically compiled on a customs basis.)

Trade-by-country statistics can be used for a number of purposes, including analysis of economic trends, balance of payments, national accounts, regional trade patterns and trade shares, and for checking the accuracy and reliability of trade data.

Fund-wide, staff regularly use direction of trade statistics data to analyze individual countries' external trade flows for inclusion in "Recent Economic Developments," analyze patterns of global and regional trade and weights of country aggregates for compilation of tables in *World Economic Outlook*, and calculate countries' effective exchange rates for Fund operational use.

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<sup>1</sup>In this publication, the term *country* does not always refer to a territorial entity defined by international law and practice as a state. *Country* also refers, in this *Guide*, to some territorial (nonstate) entities for which statistical data are maintained and provided internationally on a separate and independent basis.

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<sup>2</sup>The OECD and EUROSTAT data bases cover OECD and EEC countries, respectively, as reporters. The UNSO data base (COMTRADE) covers volume as well as value data with commodity detail (in terms of SITC classification).

Staff of the Fund's Statistics Department frequently use the data to estimate the value of exports and imports of a country that does not report (or does so only after substantial delay) trade data. For those countries that are late reporting for *IFS*, for example, staff may supplement reported data on total exports and imports with estimates from *DOTS*. In other cases where a country's reported data are considered unreliable or when the user is seeking indications of under- or overinvoicing of exports and imports, staff may check the data base to compare the country's trade data with the data of its partner countries.<sup>3</sup> If large discrepancies between the two sets of data appear, then the data may need to be reviewed and necessary corrective measures taken. (For example, a discrepancy might be due largely to inadequate recording of government imports in the custom-based trade statistics of the importing country.)

## 1.4 Current Methodology and Practice

Users of international trade statistics are aware of discrepancies that arise in the comparison of these trade statistics and in the reconciliation of trade flows between partner countries. To address the question of the comparability of international trade statistics, this section presents recommendations for standard concepts and definitions for external trade statistics, outlined by the United Nations (UN),<sup>4</sup> and discusses implications of country practices that differ from these principles.

### 1.4.1 Coverage

According to UN guidelines, the coverage of international trade statistics should be sufficiently broad to encompass all merchandise entering or leaving a country from or to another country, except goods being transported through a territory (i.e., transit trade). In effect, goods that add to or subtract from the material resources of a country should be included in the country's export or import statistics.

The guidelines distinguish between three categories of goods: goods to be included in the statistics, goods to be recorded separately (relating mainly to the improvement and repair trade), and goods to be excluded:

<sup>3</sup>However, data from partner countries may also be underreported or overreported.

<sup>4</sup>United Nations, "International Trade Statistics: Concepts and Definitions," *Statistical Papers*, Series M, No. 52, Rev. 1 (New York, 1982). Attempts have also been made to harmonize customs procedures. The latest attempt is the Kyoto Convention (International Convention on the Simplification and Harmonization of Customs Procedures), Customs Cooperation Council, Kyoto, May 1973.

#### *a. Goods to be included in the statistics*

1. Nonmonetary gold.
2. Government trade (sometimes separately shown), including goods shipped or received under foreign aid programs (civil and military).
3. Military goods (such as ammunition, vehicles, vessels, and aircraft).
4. Sales and purchases of electricity, gas, and water.
5. Postal items (mainly parcel post items coming into or leaving the country).
6. Transactions representing a service installed on a support device (such as a movie on film or videotape, and data or computer programs on computer tape). The recommendation is to value such transactions at the cost of their material support.
7. Trade in marine vessels and aircraft. These are important items of capital equipment but are usually under-recorded, because they do not necessarily cross customs frontiers. Therefore, it is recommended that ships and aircraft be recorded in the trade statistics on the basis of additions and deletions to the national registry.
8. Supplies of bunker fuel and stores to and from ships and aircraft engaged in international traffic, as well as transactions connected with drilling rigs, fishing operations, salvage from and to foreign vessels, and mining operations in international waters. These should, in principle, be recorded. However, sources additional to the customs documents are usually necessary for statistical processing.

#### *b. Goods to be recorded separately*

1. Improvement and repair trade. Treatment of this trade in external trade statistics varies widely from country to country. Conceptually, the movement of a commodity makes possible the purchase of a service. In practice, repair and improvement transactions are sometimes difficult to distinguish, because they cover a very large variety of cases. For this reason it is recommended that the value of goods for repair and improvement be recorded separately.
2. Goods on lease. Guidelines recommend that goods imported on a lease of less than one year be separately recorded.

#### *c. Goods to be excluded*

1. Merchandise moving between a country and its diplomatic representatives and armed forces operating abroad.
2. Temporary trade. The movements of goods of temporary admission are excluded, because they are expected to be reversed within a limited time.
3. Monetary transactions in the form of gold securities, bank notes, and coins. Not regarded as merchandise trans-

actions, these are treated as claims on capital in the balance of payments.

In practice, certain types of goods are sometimes under-recorded in external trade statistics—for example, government trade, goods shipped or received under foreign aid programs, military equipment, ships registered under flags of convenience, and aircraft. Trade coverage differences between partner countries have impacts on the comparison of external trade flows.

### 1.4.2 Territory

Coverage of international trade statistics is related to the concept of statistical territory. For compilation of trade statistics, the following should be considered part of the national territory: territorial seas, exclusive economic zones, the continental shelf, diplomatic posts, and armed forces operating abroad. However, for statistical purposes, the customs points or the customs frontier are generally accepted as the boundary, because that is where the source documents for the exports and imports are validated. In most cases, the customs area of a country coincides with its geographical area. National frontiers or statistical boundaries as defined by individual governments are published by the United Nations in “Customs Areas of the World,” *Statistical Papers*, Series M., No. 30, Rev. 2, 1989.

The definition of statistical territory has implications for coverage of trade statistics of countries belonging to customs unions. For example, in *DOTS* the data for South Africa refer to the South African Common Customs Area (SACCA), which comprises Botswana, Lesotho, Namibia, South Africa, and Swaziland (intertrade data between SACCA members are not recorded and therefore are not reported to the Fund).

### 1.4.3 Valuation

UN guidelines recommend that imports be valued at the c.i.f. (cost, insurance, freight) transaction value at the frontier of the importing country. For exports, the guidelines recommend valuation at the f.o.b. (free on board) transaction value at the frontier of the exporting country. The transaction value is the value in the market existing between exporters in one country and importers in another.<sup>5</sup> Essentially, this means that the value of a coun-

<sup>5</sup>The definition of *transaction value* was set forth in the 1979 GATT Agreement. Article 1 of the GATT agreement states the following: The customs value of imported goods shall be the transaction value, that is the price actually paid or payable for the goods when sold for export to the country of importation . . . provided:

(a) that there are no restrictions as to the disposition or use of the goods by the buyer other than restrictions which (i) are imposed or re-

try's exports is measured at the frontier of the exporting country and that the value of imports, including the cost of freight and insurance, is recorded at the frontier of the importing country.

In practice, although the recommendations on valuation are relatively clear, a wide diversity exists among countries in valuation and definitions used and in methods of obtaining value information. Definitions and practices followed are greatly influenced by customs practices such as duty collection, control procedures, and others. Sometimes an arbitrary valuation is made, particularly in the case of exports of raw materials: The prices at which the commodities will be sold in the importing countries may not be known at the time of export. Alternatively, official standard prices may be used as listed by the customs law even when market prices are known. Valuation problems can also arise from trade transactions under special arrangements (such as grants and defense assistance programs), trade flows between branches/subsidiaries of multinational corporations, and goods shipped under counter trade arrangements. Problems may arise as well from deliberate over- or underinvoicing of exports or imports to transfer funds illegally or to reduce the payment of duties.

Guidelines for valuation also cover conversion of currency during processing of customs statistics. Customs documents accompanying imports usually list the value of goods in U.S. dollars or in the exporting country's currency, and this must be converted to the currency of the importing country. According to UN guidelines, the conversion rate to be used is that in effect at the time of export or import, as provided by each contracting party. (The customs authorities normally convert trade value denominated in foreign currencies into national currencies at a rate prevailing on the date of customs processing).<sup>6</sup>

quired by law or by the public authorities in the country of importation, (ii) limit the geographical area in which the goods may be resold, or (iii) do not substantially affect the value of the goods;

(b) that the sale or the price is not subject to some condition or consideration for which a value cannot be determined with respect to the goods being valued;

(c) that no part of the proceeds of any subsequent resale, disposal or use of the goods by the buyer will accrue directly or indirectly to the seller . . . ; and

(d) that the buyer and seller are not related, or where the buyer and seller are related, that the transaction value is acceptable for Customs purposes.

Articles 2 through 7 of the agreement give guidelines for determining the transaction value when the conditions of Article 1 are not met. Article 8 also provides guidelines in cases where the price does not include certain elements considered part of the transaction value for customs purposes.

For customs purposes some countries still use the current domestic value as the method of valuation, which is based on the 1928 Convention Relating to Economics Statistics of the League of Nations. This system of valuation refers to the value in the domestic market in the country of origin of the commodity.

<sup>6</sup>For a discussion of related issues and country practices, see Dev K. Kar, “Currency Invoicing and Exchange Conversion in International Trade” (PIFS/86/1, IMF, unpublished).

### 1.4.4 *Timing*

According to the United Nations' *A System of National Accounts (SNA)* (New York, 1993) and the Fund's *Balance of Payments Manual* (Washington, 1993), imports and exports should be recorded at the moment ownership of the relevant goods changes from residents to nonresidents. While this guideline is conceptually valid, the UN guidelines on trade also recognize the practical limitations. International trade statistics are based on records of the physical movement of goods across country boundaries, and customs procedures largely determine the actual dates that exports and imports are recorded (usually the dates that goods are passed by customs). Moreover, some countries may use the shipping dates for arrivals and departures as the criteria for determining the time of recording. In addition, the date that an export is recorded and the date that an import is recorded can be separated by substantial intervals, owing to the time that goods are stored in warehouses abroad, the length of customs clearance procedure, the nature of shipment, or the transit lag.

Transit lag in trade represents the time it takes a recorded export to be recorded in the importing country. This lag depends upon various factors, such as geographical location of the countries in question, mode of transport used, distance traveled, or type of merchandise. Occasionally, the transit lag is deliberately increased or decreased to take advantage of change in market condition. Because trade growth is marked by trends and fluctuations and the transit lag itself varies between countries and over time, trade differences from time lags can create inconsistencies in the comparison of trade flows between partner countries.

### 1.4.5 *Trade systems*

There are two recognized systems of recording external trade statistics—the **special system** and the **general system**. The difference between the two systems lies mainly in their timing of recording: the special system records the movement of goods after customs clearance, whereas the general system records the movement of goods across national boundaries. Therefore, the special system may record goods sometime after actual importation, whereas the general system, using the national boundary as the statistical frontier, records all goods entering or leaving the country at the time of import or export regardless of customs clearance.

This difference between the two times of recording by the two systems has particular implications for data on goods moving through customs-bonded storage areas (e.g., warehouses, export processing zones, or free areas). The two systems define and cover these goods differently:

The special system defines **special imports** as those imports recorded only after they are cleared by customs for home consumption (upon release from bonded warehouses or after arrival from overseas). That is, if the goods are routed through bonded warehouses, they are not recorded until they are withdrawn for home consumption. **Special exports** consist of goods made in the country and goods previously imported as special imports. On the other hand, the general system records goods placed in bonded warehouses at the time of import, even if those goods are cleared through customs for home consumption at a later date. Those exports of goods that have previously been imported are called **re-exports**.

Coverage of these goods moving through customs-bonded storage areas differs between the two systems as well. The general system covers **entrepot trade**, whereas the special system does not. Entrepot trade refers to goods that are entered into bonded warehouses and then re-exported. Therefore, they are excluded from recordation by customs and completely omitted from the trade statistics of the special system. These goods often are held only for temporary storage, division, repacking, or modification before they are dispatched to their final destination. Entrepot trade is an important activity in such countries as the United Kingdom, the Netherlands, Singapore, and Hong Kong. Other countries, such as former Yugoslavia and Mexico, have large export processing zones.

These differences in the times of recording goods moving through customs-bonded storage areas and in the coverage of entrepot trade could in many cases seriously affect the comparability of trade statistics between countries, particularly between data on special trade imports with corresponding export figures from partner countries.

While one system is not recommended as superior to the other, it is recognized that adoption of the general system facilitates the reconciliation of trade flows between partner countries and the compilation of balance of payments and national accounts statistics.

### 1.4.6 *Partner country*

For compilation of external trade statistics, the following definitions of partner country have been adopted by the UN Statistical Commission.

*Country of origin:* Country in which the goods have been produced or manufactured, according to the criteria laid down for the application of the customs tariff of quantitative restrictions or of any other measure related to trade.

*Country of consumption:* Country known at the time of dispatch as the country in which the merchandise is intended to be consumed, utilized, or further processed.

*Country whence consigned/country of provenance:* Country from which goods were initially dispatched to the

importing country without any commercial transaction taking place in the intermediate countries.

*Country of destination:* Country known at the time of dispatch to be the final country where goods are to be delivered.

*Country of purchase:* Country where importer's co-contractor is domiciled or has his business.

*Country of sale:* Country where exporter's co-contractor is domiciled or has his business.

UN guidelines recommend that countries use only two of these definitions—*country of origin* and *country of destination*: The *country of origin* basis should be used by countries to compile import data, and the *country of last known destination* basis should be used by countries to compile export data. (Countries could collect data for country of consignment only for additional information.)

This method of recording data only for the country of origin/country of destination shows the direct relationship between the producing country and the importing country (and adequately describes triangular transactions). It avoids the problems for the reconciliation of trade flows between trading partners that the recording of different partner country definitions can lead to, such as the hypothetical case in which goods from country A are sent through country B en route to country C. If export value of country A is based on the country of destination (C) but import value of C is based on the country of consignment (B), the two flows will not correspond.

Despite the use of the country origin/country of destination method, some difficulties will remain for the determination of (1) the exact origin of some imports (e.g., raw materials and semi-manufactured goods), (2) sometimes, changes of final destination before the goods are landed, and (3) the final destination of exports shipped from landlocked countries. For example, the final destination for landlocked country A's exports is country C (not country B that shipped country A's exports from its ports).

In addition, there remain special problems (mentioned in section 1.4.1) with transactions involving coverage of ships and aircraft, especially those registered under flags of convenience. While they often are recorded by the country of export, they are not usually recorded as imports by their country of registration.

Finally, the coverage of partner countries in trade statistics may not be comprehensive because of confidentiality. Some countries are reluctant to publish trade data that would throw light on confidential transactions in some kinds of commodities or on transactions with some partner countries or a group of countries. Therefore, some bilateral trade flows may be omitted from the trade statistics and grouped under the heading "Other Countries" and "Special Categories."

### 1.4.7 Discrepancies and asymmetries in trade statistics

Although some of the most interesting uses of trade-by-country statistics are based on a trade matrix framework, their use assumes the comparability of trade flows between trading partners. That is, in the absence of problems of valuation, timing, and coverage, the value of trade flows recorded in an exporting country would be equal to the corresponding trade flows recorded in the importing countries. However, despite efforts of international statistical organizations and national compiling agencies, international trade statistics are sometimes not comparable. A comparison of Parts A and B of the world tables in the *Direction of Trade Statistics Yearbook* indicates the degree to which the recording of trade flows for the world is symmetrical and accurate. Exports of the world to the individual countries shown in Part A, plus freight and insurance, should correspond to imports of the countries from the world shown in Part B and vice versa.

These figures for trade flows between partner countries differ for several basic reasons—namely, unavoidable reasons like different bases of valuation and time lags; different national systems of recording trade, including conversion practices; and errors in recording of trade data:

#### a. Bases of valuation

Unavoidable differences between export and import figures arise because most exports are recorded on an f.o.b. basis and most imports on a c.i.f. basis. The difference represents the cost of international freight and insurance.

#### b. Time lags

Differences in recording of exports and imports are caused by the time lag between the departure of exports from the country of origin and their arrival as imports (and recording) in the receiving country (see section 1.4.4). Time lags are unavoidable; at any given time, an important part of world trade is in transit. Therefore, because imports and exports are recorded only at the time they cross the frontiers of the exporting and importing countries, this means that a part of world trade has been recorded by the exporting country but not yet reported by the importing country.

The value of this share of world trade in transit may be estimated in absolute terms. Assumed to be proportional to the scale of trade, on a worldwide average it may be estimated to be three to four weeks worth of exports. However, there may be large variations around this estimate, depending on specific bilateral transit lag factors such as geographical location of the countries in question, the

mode of transport utilized, distance traveled, type of merchandise, and differences in recording procedures in the exporting and importing countries.

Furthermore, the share of trade in transit may also fluctuate proportionally to changes over time in the scale of world trade or to specific factors like the U.S. dollar exchange rate or changes in the oil trade. An analysis of recent developments in world trade has shown that when world trade increases or decreases rapidly, the transit asymmetry fluctuates widely; when trade increases little or not at all, the proportion of trade in transit remains relatively constant.

Particularly since 1980, fluctuations in the U.S. dollar exchange rate have been a factor in discrepancies between recordings of exports and imports related to the transit lag. An appreciation or depreciation of the U.S. dollar against other currencies, from the time of recording by the exporting country to the time of recording by the importing country, might increase or decrease the U.S. dollar value of trade invoicing in other currencies.

Because oil trade represents an important part of world trade, fluctuations in oil inventories held at sea are also believed to be a source of discrepancy related to the transit lag, particularly since 1979. As the amount of these stocks varies through the use of idle tankers for storage purposes or variation of the speed of vessels, the variations trigger fluctuations in the amount of oil in transit recorded by the exporting country but not recorded by the importing country.

### *c. National systems of recording trade*

Discrepancies between export and import figures from different systems of recording trade are caused by four factors:

1. The use of the general trading system by some countries and the special trading system by others, as already explained in section 1.4.5.

2. Differences in the definition of partner countries. While most countries record imports as coming from the producing country, some countries show them as coming from countries of consignment. In the case of exports, it is quite common to regard the countries of consignment as partner countries (see section 1.4.6.).

3. The exclusion by some countries, and the inclusion by others, of certain goods from the trade data. Different approaches are often found for military equipment, gold, second-hand ships and aircraft, electricity, and repaired goods that are subsequently returned to the owners.

4. Different conversion practices. Either partner (the exporter or the importer) might use different exchange rates or an inappropriate exchange rate for the same consignment.

### *d. Errors in recording of trade data*

Finally, asymmetries may also arise from defective, inconsistent, or unreliable administrative procedures for compiling trade statistics and from deliberate or unintended overstatement or understatement of trade values.

At the level of international organizations, the problem of discrepancies and asymmetries in trade statistics is well recognized, and efforts are made to correct such asymmetries. In the Fund's Statistics Department, attempts are made to correct these discrepancies when they are detected in the *DOTS* source data. Moreover, during technical assistance missions to developing countries, the countries' trade statistics are compared with partner country data and, in cases of serious discrepancies, suggestions are made for the improvement of recording, valuation, conversion, and classification procedures, as appropriate. At the United Nations, the OECD, the EUROSTAT, and the Fund, several methodological and empirical studies designed to facilitate the formulation and adoption of corrective measures have been carried out on the causes and extent of asymmetries in trade statistics.

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## 2. Data Collection

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### 2.1 Basic Data

Customs documents and the foreign exchange control record (exchange record) are the two principal sources of external trade statistics. Most countries use only customs documents, required from importers and exporters when clearing merchandise, as the principal source of external trade statistics. A country's customs administration, sometimes partly in collaboration with the central statistical office, compiles these data.

For some countries, the exchange record is another principal source of trade data. Exchange record statistics comprise all merchandise transactions relating to payments made through the banking system. This source depends for its coverage and accuracy on exchange controls that regulate the classification of transactions in foreign exchange by resident banks. Therefore, the exchange record differs in coverage and timing of recording from customs documents (trade returns), which are based on the physical movements of merchandise. Trade data derived from the exchange record are not as comprehensive, detailed, and conceptually comparable with partner countries as those from the trade returns; consequently, they are not used for the direction of trade statistics data base.

### 2.2 Procedures for Data Collection

According to the Fund's Articles of Agreement, member countries are required to provide the Fund with export and import data by country of destination and country of origin. To assist countries to comply with this requirement, the Fund provides technical assistance to national statistical authorities. The Fund also collaborates with other international institutions to assist countries to develop suitable reporting standards.

The reporting countries are, in principle, Fund members and territories associated with Fund members. However, in practice no reports have been received for the last ten years from Chad, Equatorial Guinea, the Islamic Republic of Iran, Iraq, the Lao People's Democratic Republic, the People's Republic of Mozambique, Sao Tome and Principe, Uganda, and Viet Nam. No reports are received from Albania, Cuba, and the Democratic People's Republic of Korea.

Internationally comparable data on exports and imports by country are received on an ongoing basis by the Statistics Department from designated correspondents in each reporting country. The correspondent is usually an official in a reporting country's statistical office, customs office, or central bank, depending on the country's arrangements for the dissemination of external trade statistics. The data are normally sent by airmail but may be sent by facsimile to reduce mailing delays. Data transmittal reaches a peak during April each year—the cut-off date for the publication of the *DOTS Yearbook*.<sup>1</sup>

### 2.3 Format of Reported Data

There is no standard report form for collection of direction of trade statistics, because current Fund data base procedures process practically all the varieties of formats submitted by the national compilers. This flexibility of format spares correspondents the effort of transcribing the data, enabling them instead to submit data as up-to-date as possible in the form most convenient to themselves, such as national bulletins, printed trade tables, computer printouts, magnetic tapes, and/or typed tables. Staff of the Fund's Statistics Department sometimes find it necessary to consolidate several sets of data to obtain the total trade data for a country.

With respect to format used, countries report data (1) in national currency or in U.S. dollars, (2) on a monthly, quarterly, or annual basis, (3) cumulatively or noncumulatively,<sup>2</sup> (4) with exports on an f.o.b. or customs value basis, (5) with imports c.i.f. or f.o.b., and (6) with differing country codifications.

With respect to currentness and frequency of the data, approximately 40 countries (virtually all industrial countries and about 20 developing countries) report monthly data on a regular and current basis. A few countries report quarterly data on a regular basis. Other countries report data that are less current on a monthly, quarterly, or annual frequency.

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<sup>1</sup>For the preparation of the *DOTS Yearbook* at the beginning of each year, cables are sent to request up-to-date data from all reporting countries whose *DOTS* data are not current.

<sup>2</sup>Cumulative data represent the summation of data over time on a calendar year basis, while noncumulative data represent data for a single period of time (for example, a month).



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## 3. Data Base Processing

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The collected reported data are then processed in the data base for the direction of trade statistics. In turn, the availability of current trade data, supplemented with estimates for individual countries, facilitates the continuous data base update of world and area table aggregates. Section 3.1 explains how the data base reformats reported data to impart uniformity before data are stored, section 3.2 outlines estimation procedures, and section 3.3 reviews data base compilation of aggregates for world and area tables.

### 3.1 Reformatting of Reported Data

*DOTS* source data are processed in the data base for direction of trade statistics on an ongoing basis as data are received; updates to the master file are normally performed every week. After Statistics Department staff review reported data for conceptual validity, the data base performs computerized quantitative and editorial checks (“horizontal” and “vertical”) and validation tests. First, the reported total of exports or imports is compared against (1) the total calculated from the detailed data by partner countries and (2) the data on total exports or imports reported independently for publication in *IFS*. Secondly, the data by an individual partner country are compared for validity against the observations for previous periods of the same year and the same period of previous years.<sup>1</sup> After the reported data have passed the validation checks,<sup>2</sup> the data are modified before storage to conform with common characteristics of the data base—namely, noncumulative monthly, quarterly, or annual frequency, U.S. dollars unit, exports f.o.b. and imports c.i.f. valuation, and a specific classification of countries (the IMF country and partner country codes).

#### 3.1.1 Conversion

The data base converts individual country data, usually reported in national currencies, into U.S. dollars. All data in

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<sup>1</sup>For data processing (e.g., decumulation), validation checks, and archive purposes, a so-called reported data file is maintained. This file contains the data in the same format (with no transformation) as reported by countries.

<sup>2</sup>When data fail the validation test, the data are compared against the source document and alternative publication sources, and judgment is used to accept the data or contact the national *DOTS* correspondent.

the master file for direction of trade statistics are stored in U.S. dollars as the common unit of account in order to ensure international comparability. To convert data, the data base uses exchange rate series *rf* published in *IFS*;<sup>3</sup> series *rf* refers to period averages of market exchange rates (or official rates if market rates are not available). Data are converted at their highest available frequency and subsequently aggregated to longer periods; for example, monthly data are converted to U.S. dollars and then aggregated to quarterly and annual totals. The data are then stored in the master file in millions of U.S. dollars, with one to three decimals, depending on the country.

#### 3.1.2 C.i.f. and f.o.b. valuation

The majority of reporting countries follow the United Nations’ recommendation to record exports on an f.o.b. basis and imports on a c.i.f. basis. A few countries, however, compile and publish imports on an f.o.b. basis,<sup>4</sup> and their data are shown on this basis in the country pages of the *DOTS* quarterly issues and yearbook. In addition, these import data reported f.o.b. are stored in the master file in three categories (see also section 5.1): (1) imports f.o.b. (for publication purposes), (2) imports c.i.f. adjusted on the basis of a 10 percent factor (stored for estimation purposes),<sup>5</sup> and (3) imports c.i.f. adjusted on the basis of the factor used for calculating the world import table in *IFS*. (For the calculation of world and area tables, see section 3.3.)

#### 3.1.3 Partner country codification

The *DOTS* source data are reported under differing partner country classifications (country names or codes). While the majority of countries use country names, several Latin American countries use codes from their own system. European Economic Community members follow a common country classification.

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<sup>3</sup>See Kar, “Currency Invoicing and Exchange Conversion in International Trade,” op. cit.

<sup>4</sup>A few additional countries publish imports on another basis (for example, “valued at site” or customs value basis).

<sup>5</sup>The 10 percent factor is a rough approximation of the value of the costs of insurance and freight. This factor is also used in cases where estimates are derived on the basis of partner data (see section 3.2).

All reported partner country names or codes are automatically converted into the IMF partner country code (see Appendix I), with the help of the so-called dictionary—a special file containing all possible country names and codes as used by the reporting countries. This file is comprehensive; however, problems can occur if a country does not provide an exhaustive list of trading partners.

Special IMF codes are used for “not specified” categories. Some countries report area subtotals in addition to individual country data. When the sum of data for the listed countries does not match the corresponding subgroup total, a residual or area total “not specified” is created by subtraction (for example, “Africa not specified”). More often, the reporting countries themselves report the category “not specified.”

### 3.1.4 Summation and area totals

A country's exports to and imports from countries within areas are aggregated and stored as area totals. Currently stored in the direction of trade statistics data base are 11 area aggregates, in addition to the world total, which is obtained by summing the area totals.

Fund Statistics Department staff calculate area and world totals according to the country classification in *IFS*. The classification distinguishes three main categories: **industrial countries**, **developing countries**, and a third group of countries, summarized as **other countries n.i.e.** (not included elsewhere). The second category, developing countries, is divided into five areas: Africa, Asia, Europe, Middle East, and Western Hemisphere. In the absence of a more suitable term that would conveniently cover the countries included in the third category, they are referred to as other countries n.i.e. This third category comprises Albania, Bulgaria, Cuba, Eastern Germany,<sup>6</sup> Mongolian Republic, North Korea, and the former U.S.S.R., which are not included in the world trade table published in *IFS*. The country composition of each area of the world is listed in Appendix I.

Totals for the subgroups **oil exporting countries**, **non-oil developing countries**, and the **European Economic Community** are also calculated as memorandum items. The country composition of these subgroups is given in Appendix I.

## 3.2 Estimation

Each country reports its trade data to differing degrees of currentness, frequency, and detail. As explained in section 2.3, *DOTS* correspondents in approximately 40 countries

report monthly trade data by partner country on a regular and current basis. These countries, comprising virtually all the industrial countries and about 20 developing countries, have represented in recent years nearly four fifths of the value of recorded world exports and imports. Some other countries may report less current monthly data, or they may compile and make that data available quarterly or annually. Other countries may report data only on total exports and total imports, with no breakdown by partner country. Finally, for other countries, no current trade data may be available.

The data management system for the direction of statistics data base makes it possible to provide supplementary estimates for individual countries, whenever reported data are not current or available in a monthly frequency. Therefore, monthly data for all countries are available with a delay of four or fewer months from the current month.<sup>7</sup> The estimation procedure is tailored for each country depending on the currentness, frequency, and degree of detail of trade data that are reported to the Fund and that are therefore available as benchmark data for estimates.

### 3.2.1 Estimation procedure

This section provides a general description of the estimation procedure. (A more detailed description of the compilation of estimates is given in Appendix III.)

#### *Procedure for generating estimates of a country's trade*

The data management system for the direction of trade statistics data base generates estimates of a country's trade with each of its partner countries, for any month for which that country has not reported data for inclusion in *DOTS*. (Subsequently, when a country reports its own data, then the estimates for its trade with all its partners are removed.) The basis (benchmark) for all estimates is a country's reported data, stored in the Fund's data base, including total exports and imports reported independently and published in *IFS*. The benchmark data used for the estimates are, first, lower frequency (quarterly and annual) trade data by partner country, if available, from the country's own sources; then, monthly data on total exports and imports reported for *IFS*, if available, and finally, a combination of reported and estimated partner country data, and extrapolated data.

The matrix nature of the Fund's data base for direction of trade statistics facilitates the filling of data cells with data

<sup>6</sup>The data for Eastern Germany include figures through June 1990 and cover the area of the former German Democratic Republic.

<sup>7</sup>No estimates are compiled for periods prior to 1981 or based on benchmark data referring to 1980 or earlier.

reported by trade partners; recourse to estimation by extrapolation thus is limited to very small sections of world trade. Moreover, data from countries' own records, even with longer delays, continually broaden the base of reported data, thereby eliminating previously estimated figures.

#### *Procedure for deriving estimates from partner country data*

In those cases where partner data are used to derive estimates, such data are first adjusted by a uniformly applied percentage to allow for the cost of freight and insurance, assumed to be 10 percent of the f.o.b. value of imports. For example, if estimates for country B are based on data reported by country A, then A's data for imports c.i.f. from B, reduced by 10 percent, are taken to be the f.o.b. value of B's exports to A; conversely, A's data for exports to B, augmented by 10 percent, are taken to be the c.i.f. value of B's imports from A. The allocation of 10 percent is a highly simplified estimate used as an overall approximation to the actual cost of freight and insurance, which may vary widely from country to country.<sup>8</sup>

#### *Procedure for extrapolation*

Extrapolation is used in those cases where the derivation procedure cannot be applied, because neither the exporting nor the importing country has reported or estimated data flows for the period in question. In those instances, trade flows are estimated by extrapolating data, reported or estimated as available, for the same month of the previous year. Extrapolation factors are based on an assessment of trade developments in large areas of the world (indicated in available reported data) and are regularly updated and revised.

#### *Breaksigns for estimates*

Breaksigns indicate monthly and consolidated quarterly and annual estimates for individual countries in the data base (see Appendix II for breaksigns). These breaksigns refer only to figures for trade between two partner countries and are not applicable to totals calculated for groups of partner countries, nor are such symbols found in figures for world and area tables.

<sup>8</sup>While ideally there should be a different factor for each individual trade transaction for each time period, the 10 percent factor is a rough approximation of the valuation adjustment. The use of a constant factor has the additional advantage of being simple and manageable. However, the uniform factor has limitations because it may not apply strictly to all bilateral flows.

#### *Timeliness of estimates*

To keep data up-to-date in the *DOTS* data base, with a delay of four months from the current month, estimates are updated each month. They are also revised each time reported data are updated in the master file (normally every week).

### **3.2.2 Limitations in *DOTS* estimates**

Caution should be exercised when using direction of trade statistics estimates, because estimation procedures for each month vary to the extent that data are available for each country. Furthermore, estimation methods are based on assumptions about trade patterns during previously reported periods, about change in trade for reporting countries, and about comparability of international trade flows between partner countries. The following cases of estimation illustrate assumptions about trade:

#### *Limitation in distribution of reported *DOTS* data*

When the data management system for the direction of trade statistics data base automatically distributes lower frequency (quarterly and annual) *DOTS* reported data into months, it uses the monthly pattern displayed by monthly reported partner data, where available. If those data are not available, it bases the monthly pattern for the remaining partner countries on the reported monthly total exports or imports for *IFS*. If *IFS* monthly data are not available, then data are evenly distributed across months. Therefore, although monthly distributed data are constrained to adding up to reported quarterly or annual reported data, the estimated monthly pattern may differ from the actual data.

#### *Limitation in distribution of total *IFS* exports and imports*

When *DOTS* estimates for a country are benchmarked on the monthly total exports and imports reported by the country for *IFS* from the country's own sources (with no breakdown by partner country), the data base management system calculates the partner country pattern on the basis of the most recent annual *DOTS* trade-by-country statistics reported by the country. This method is equivalent to extrapolating export and import figures by partner countries on the basis of the monthly total exports or imports reported by the country. The implicit assumption for the estimates is that the country's geographical trade patterns did not change from previously reported periods. However, in practice, geographical trade patterns may change during short periods, owing to the unstable nature of trade flows.

### *Limitation in estimates derived from partner country data*

When partner data are used to derive estimates, the method presumes the comparability of trade flows between trading partners. In practice, however, figures for trade flows between partner countries differ for several reasons, like unavoidable valuation and time lag differences and methodological differences between national systems for recording trade statistics.<sup>9</sup> Regarding the c.i.f./f.o.b. valuation adjustment, the *DOTS* estimation procedure applies a uniform percentage, assumed to be 10 percent of the f.o.b. value of imports, as a highly simplified approximation of the actual costs of insurance and freight. As for time lags, no adjustment is made, because time lags vary widely between bilateral trade flows and depend on such factors as distance between partner countries and means of transportation. However, differences in timing are unavoidable, particularly for data compiled on a monthly basis.

### *Limitation in estimates based on extrapolation*

When the data management system extrapolates trade flows between two countries, it multiplies the data for the same month of the previous year—reported or estimated as available—by a factor that takes into account trade development in the areas in question. Herein, a limitation in estimates based on extrapolation is illustrated: The implicit assumption is that changes in trade flows between two countries can be represented by changes in trade flows between all countries of the areas in question. Another limitation in this method is that because estimates can be extrapolated over several years the errors may be cumulative.

## **3.3 Compilation of Aggregates for DOTS World and Area Tables**

Once reported trade data for individual countries have been formatted as described in section 3.1 (and supplemented, if necessary, by estimates), they are compiled by the data base system into world and area aggregates, which show flows between an individual country

<sup>9</sup>A more complete discussion on the comparability of trade flows between trading partners is given in section 1.4.7.

and areas of the world, between an area and individual countries, and between areas. Whereas, before the data base was upgraded, these aggregates had been available only *yearly* (in the *DOTS Yearbook* world and area tables), they are now also available *monthly* in the data base, updated and revised at the end of each production cycle for the monthly *DOTS* computer tape.

World and area aggregates are calculated in the data base in two ways, called “Part A” and “Part B,” as published in detail in the *DOTS Yearbook*. Aggregates for Part A present trade flows of areas as a whole with individual countries, as reported and estimated for all countries in that area. Aggregates for Part B present trade flows of individual countries with areas on the basis of the world and area lines shown on the country pages.

Part A shows the country and area distribution of aggregate trade of an area or the world with countries listed in the table for that particular area. This can be visualized by imagining all pages for individual countries in an area placed in a stack and all figures added vertically through to an aggregate table on the top of the stack; the resulting table would be the Part A table for that area.

Part B, the second set of world and area tables, presents the trade of the countries listed in the table with the area covered in that table. The lines for each country in Part B tables are a transcription of the area and world lines for the individual countries, and the area and world lines in Part B are the sums of these transcribed lines. The Part A summary tables focus on the areas’ trade with individual countries; the Part B summary tables focus on individual countries’ trade with areas.

In compiling these tables, the data base system adjusts imports, reported f.o.b. by individual countries, to c.i.f. values by application of the factor used for calculating these countries’ imports c.i.f. for the world imports table and the country pages in *IFS*.<sup>10</sup>

A comparison of Parts A and B indicates the degree of symmetry and accuracy in the recording of trade flows. In the absence of problems of valuation, timing, and coverage, the exports in Part A, plus freight and insurance, should approximate the imports in Part B and vice versa. However, as discussed in section 1.4.7, a number of factors give rise to differences between these trade flows.

<sup>10</sup>See also the c.i.f./f.o.b. factor table in the *IFS* yearbooks.

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## 4. Data Dissemination in DOTS, Magnetic Computer Tapes, and CD-ROM

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Direction of trade statistics are published in quarterly and yearbook issues of *DOTS* and in monthly magnetic tapes;<sup>1</sup> a CD-ROM is planned. All data published in *DOTS* and tapes are drawn from the direction of trade statistics data base, the content of which has been outlined in section 3 of this guide.

### 4.1 DOTS Quarterly Issues

The quarterly issues of *DOTS* present, in order of appearance, (1) a table of country and area codes, (2) an introduction outlining the methodology and content of the publication, (3) three summary tables showing exports and imports aggregated for the world, industrial countries, and developing countries, each as a group, and (4) approximately 135 country pages showing current data or estimates on imports from and exports to each country's most important trade partners.

#### 4.1.1 World, industrial, and developing countries tables

The *DOTS* quarterly issues present three summary tables showing exports and imports aggregated for the world, the industrial countries, and the developing countries, each as a group. Data cover three years, eight quarters, the two most current months, and the corresponding months of the previous year. See section 3.3 for a methodological description of the compilation of these tables.

#### 4.1.2 Country pages

Country pages show imports to and exports from the most important trading partners, selected on the basis of import and export data over the past two or three years, for each country. These country page data may be supplemented by estimates<sup>2</sup> whenever reported data are not current or available in monthly frequency.

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<sup>1</sup>Inquiries on *DOTS* publications and subscriptions should be addressed to: Publication Services, International Monetary Fund, Washington, D.C. 20431 U.S.A., telephone (202) 623-7430.

<sup>2</sup>See section 3.2 for a description of the estimation procedure.

Symbols may appear to the right of figures for trade between two partner countries to indicate sources for individual countries. Figures without symbols are data reported from the respective country's own records. Symbols will not appear for (1) totals calculated for groups of partner countries, (2) the table for the world, or (3) tables for groups of countries. (Explanations for symbols are given in the introduction of the *DOTS* quarterly issues.)

Also on the country pages, the data are aggregated in totals for the area and world. (Classification of countries accords with the IMF country classification shown in Appendix I.) In addition, world totals published in *IFS* for exports and imports are shown on individual *DOTS* country pages for comparison purposes. Area totals for oil exporting countries and non-oil developing countries are shown as memorandum items.

A standard set of seven reference periods is shown for all countries: Two columns relate to the most current months (e.g., with a delay of five months or fewer from the actual publication month), and five columns relate to the most recent quarters (e.g., with a lag of two quarters from the actual publication quarter), allowing the comparison of the data for the most recent quarter with that of the corresponding quarter of the previous year.

### 4.2 DOTS Yearbook

In addition to four quarterly issues, a *DOTS* yearbook is published by the Fund, usually in late June/early July of each year. Besides a country code guide and introduction, the yearbook presents (1) summary and analytical tables, showing trade flows for the world and major areas, and (2) approximately 160 country pages, providing detailed trade-by-country data on exports and imports for the most recent seven years.

#### 4.2.1 World and area summary tables

The *DOTS Yearbook* presents summary tables for the world and 11 areas. The world and area summary tables, calculated from the country data, are shown in two parts: Part A and Part B. The Part A summary tables, on the left-hand pages of the yearbook, focus on the area's trade with individual countries; the Part B summary tables, on the

right-hand pages, focus on individual countries' trade with areas (see section 3.3 for a more detailed description of these tables).

#### 4.2.2 Country pages

The individual country pages present data with all of a country's trading partners (rather than with a shortened list of partners, as in the quarterly issues). Most data are reported by the national authorities before the cutoff date. If reported data are not available, estimates are used (see section 3.2 for a description of the estimation procedure). Estimates are first computed for months, where possible; annual totals are then obtained by summation.

Annual estimates, or any combination of reported data and estimates, are marked with a special symbol following the respective figures for the individual country (these symbols are listed in the introduction to the *DOTS Yearbook*). The world and area totals may thus include reported data and estimates.

The totals for exports and imports as published in *IFS* are shown on the individual country pages for comparison purposes. Area totals for the oil exporting countries, the non-oil developing countries, and the European Economic Community are shown as memorandum items.

A number of analytical lines, included at the end of the tables, are calculated from the value data shown for the respective area or country. One set of lines shows the percentage distribution of the area's or country's exports to and imports from selected areas; the sum of the percentage figures is often less than 100, because the shares for special categories and for unallocated trade are omitted. The other

set shows the annual percentage change in total exports and imports and also in exports to and imports from each of the selected areas.

### 4.3 Tape Subscription and CD-ROM

The Fund offers to users interested in machine readable data a tape subscription to *Direction of Trade Statistics*. A subscription provides 12 tapes a year, issued monthly. Computer tapes contain practically all time series maintained in the direction of trade statistics data base. The data offered on the tapes combine the yearbook's coverage in terms of countries and partner countries with monthly, quarterly, and annual frequency.

Tapes are available in two densities: (1) *DOTS-A* (1600BPI), on which annual entries begin in 1978 and monthly entries begin in 1986, and (2) *DOTS-B* (6250BPI), on which annual entries generally begin in 1948, quarterly entries begin in 1960, and monthly entries begin in 1965, which includes estimates starting in 1981. Each subscriber also receives a COBOL source program, which reformats the series on the tape and extracts three additional programs from the tape for retrieving and printing the time series. General information on this service is available in the Fund's *Publications Catalog*. Detailed information is available in the Fund's *Computer Tape Subscription Documentation*.

The Fund is planning to release *DOTS* on CD-ROM (compact disk—read only memory). Downloading the data will require a CD-ROM reader device to be connected to a microcomputer. The *DOTS* CD-ROM will contain the entire direction of trade statistics data base.

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## 5. Fund Internal Access to the Data Base for Direction of Trade Statistics

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The direction of trade statistics data base is a subsystem of the Economic Information System (EIS) of the Fund's Statistics Department. This section provides information for internal access to the data base.

### 5.1 Structure of the Time Series Key

The EIS name of the direction of trade statistics master file is DTTS. Data are stored in the DTTS master file in time series format. Each trade flow between countries or areas forms a separate time series with a unique identifier.

A time series key is used to access the data. This key is a 13-character alphanumeric code that uniquely identifies each time series. The components of this key include reporting country or area, type of trade flow (exports or imports), and partner country or area. For example, the time series key for France's exports to Argentina is 13270..DZD213, and the key for the United States' imports from Italy is 11171..DZD136. The components of the time series key may be described as follows:

1. The first component is the reporting country (or area) code—a three-position code referring to the IMF country (or area) code (see code lists in Appendix D).
2. The second component is a two-position code identifying exports (70) and imports (71).
3. The third component (..DZD) is a standard five-position code for all *DOTS* time series.
4. The fourth component is the partner country (or area) code (see Appendix D).

For the few countries reporting imports on an f.o.b. basis (see section 3.1.2), three types of import series are stored, identified with the second and first two positions of the third components of the time series key as follows:

- (1) 71.V Imports f.o.b.;
- (2) 71.. Imports c.i.f. adjusted on the basis of a 10 percent factor for the costs of freight and insurance;
- (3) 71B. Imports c.i.f. adjusted on the basis of the factor used for the world imports table in *IFS* (see section 3.1.2).

### 5.2 Retrieving the Data from EIS Terminals

*DOTS* data can be displayed on screens and printed using EIS facilities.<sup>1</sup> The EIS menu can be accessed through terminals and microcomputers connected or networked to the IBM mainframe. After accessing the EIS menu, the user must change the active time series file to DTTS through option 81.3 ("Change Active Select Files").

#### 5.2.1 Displaying the data on screen

*DOTS* data can be displayed on screen in the form of individual time series with EIS option 11 ("View Single Time Series"). Data can also be displayed in the form of linelists with option 13 ("View Linelist"), showing trade flows of a country/area with all its partners or showing partner country trade flows with a country/area, by using \*\*\* in the reporting country or partner country position of the time series key. The following time series keys specified through option 13 provide examples of linelists:

- 132 70..DZD \*\*\* Display France's exports with all its partners.
- \*\*\* 71..DZD 132 Display imports from France by all its partners.

#### 5.2.2 Printouts of *DOTS* data

EIS option 14 ("Time Series Print Menu") provides the facility for printing *DOTS* data from the master file:

- Option 14.4 (DFLIST PRINT) prints single time series.
- Option 14.1 (SET PRINT) prints country tables on reported data supplemented with estimates on exports and imports with all the partner countries. The following parameters must be used:

Set file: DTSEWRK  
Set text: DTSTWRK  
Set ID: ccc70.  
(and/or) ccc71.  
with ccc = country code

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<sup>1</sup>For more detail on EIS online facilities, see the Bureau of Computing Services' *User Guide for the Online Subsystem of the Economic Information System*.

- Option 14.2 (TOPIC PRINT) prints country tables of trade data on the basis of partner country data. The following TOPICID parameter must be used:

70..DZD ccc  
(and/or) 71..DZD ccc  
with ccc = country code

This print shows the exports f.o.b. (or the imports c.i.f.) of all the countries of the world to (from) country ccc. However, users should be aware that the area totals of this print may not add up with the time series for individual countries.<sup>2</sup> Although the bias may be minor, users may want to use the "c-list" procedure (see Appendix IV) which recalculates area totals for partner country tables.

### 5.3 Downloading DOTS Data to AREMOS and Lotus on Microcomputers

AREMOS (Advanced Retrieval and Econometric Modeling System) is the Fund standard data management and econometric software product for microcomputers. Interfaces, through a communication link between the *DOTS* data base and AREMOS, allow users to download *DOTS* data to AREMOS and Lotus.

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<sup>2</sup>Discrepancies may arise, because the area total series for these tables are drawn from the DTTS master file world and area tables, which are updated and revised once a month (see section 3.3), while time series for country's reported data and estimates are updated and revised once a week.

The communication link establishes an interface between AREMOS and the direction of trade statistics data base through the UNISYS mainframe. The *DOTS* file name is DFDOT. Upon successful execution of the LINK command, the RECEIVE command stores the data in an AREMOS bank. More information on retrieving *DOTS* data in AREMOS can be found in the Bureau of Computing Services' *Guide to the Economist's Workstation (EWS)*, Chapter III: "EWS Linkages."

Once the data have been downloaded to AREMOS, they can be transferred directly to and from a Lotus 1-2-3 worksheet. More information on transferring data between AREMOS and Lotus can be found in the Bureau of Computing Services' *Basic AREMOS Capabilities*, Chapter VI: "Interface between AREMOS and Lotus."

The Information Center for Computer Systems of the Bureau of Computing Services provides technical support for the AREMOS and Lotus softwares.

### 5.4 Special Requests

In principle, all time series for individual countries (reported data and estimates) and area tables maintained in the direction of trade statistics data base are accessible.

The Real Sector Division of the Statistics Department and the Systems Production Division of the Bureau of Computing Services provide assistance in accessing and using *DOTS* data.



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## APPENDIX I

### Country and Area Codes

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001	<b>WORLD</b>	642	Equatorial Guinea	516	Brunei
110	<b>Industrial Countries</b>	644	Ethiopia	522	Cambodia
111	United States	646	Gabon	924	China, People's Rep. of
156	Canada	648	Gambia, The	819	Fiji
193	Australia	652	Ghana	887	French Polynesia
158	Japan	656	Guinea	829	Guam
196	New Zealand	654	Guinea/Bissau	532	Hong Kong
122	Austria	664	Kenya	534	India
126	Belgium-Luxembourg	666	Lesotho <sup>1</sup>	536	Indonesia <sup>3</sup>
128	Denmark	668	Liberia	826	Kiribati
172	Finland	674	Madagascar	542	Korea
132	France	676	Malawi	544	Lao, P. D. Rep.
134	Germany	678	Mali	546	Macao
174	Greece	682	Mauritania	548	Malaysia
176	Iceland	684	Mauritius	556	Maldives
178	Ireland	686	Morocco	948	Mongolia <sup>6</sup>
136	Italy	688	Mozambique	518	Myanmar
138	Netherlands	728	Namibia <sup>1</sup>	836	Nauru
142	Norway	692	Niger	558	Nepal
182	Portugal	694	Nigeria <sup>3</sup>	839	New Caledonia
135	San Marino	696	Réunion	564	Pakistan
184	Spain	714	Rwanda	853	Papua New Guinea
144	Sweden	856	St. Helena	566	Philippines
146	Switzerland	716	Sao Tomé & Príncipe	576	Singapore
112	United Kingdom	722	Senegal	813	Solomon Islands
200	<b>Developing Countries</b>	718	Seychelles	524	Sri Lanka
605	<b>Africa</b>	724	Sierra Leone	578	Thailand
612	Algeria <sup>3</sup>	726	Somalia	866	Tonga
614	Angola	199	South Africa <sup>1</sup>	869	Tuvalu
638	Benin	732	Sudan	846	Vanuatu
616	Botswana <sup>1</sup>	734	Swaziland <sup>1</sup>	582	Viet Nam
748	Burkina Faso	738	Tanzania	862	Western Samoa
618	Burundi	742	Togo	598	Asia not specified
622	Cameroon	744	Tunisia	170	<b>Europe</b>
624	Cape Verde	746	Uganda	914	Albania <sup>6</sup>
626	Central African Republic	636	Zaire	911	Armenia <sup>6</sup>
628	Chad	754	Zambia	912	Azerbaijan <sup>6</sup>
632	Comoros	698	Zimbabwe	913	Belarus <sup>6</sup>
634	Congo	799	Africa not specified	918	Bulgaria <sup>6</sup>
662	Côte d'Ivoire	505	<b>Asia</b>	423	Cyprus
611	Djibouti	512	Afghanistan, I.S. of	934	Czechoslovakia
		859	American Samoa	939	Estonia <sup>6</sup>
		513	Bangladesh	816	Faeroe Islands
		514	Bhutan	915	Georgia <sup>6</sup>

823	Gibraltar	474	Yemen, Republic of	278	Nicaragua
944	Hungary	489	Middle East not specified	283	Panama
916	Kazakhstan <sup>6</sup>			288	Paraguay
917	Kyrgyz Republic <sup>6</sup>	205	<b>Western Hemisphere</b>	293	Peru
941	Latvia <sup>6</sup>	311	Antigua & Barbuda	361	St. Kitts & Nevis
946	Lithuania <sup>6</sup>	213	Argentina	362	St. Lucia
181	Malta	314	Aruba	363	St. Pierre & Miquelon
921	Moldova <sup>6</sup>	313	Bahamas, The	364	St. Vincent and the Grenadines
964	Poland	316	Barbados	366	Suriname
968	Romania	339	Belize	369	Trinidad & Tobago
922	Russia <sup>6</sup>	319	Bermuda	298	Uruguay
186	Turkey	218	Bolivia	299	Venezuela <sup>3</sup>
925	Turkmenistan <sup>6</sup>	223	Brazil	376	Windward Islands
926	Ukraine <sup>6</sup>	228	Chile	399	Western Hemisphere not specified
927	Uzbekistan <sup>6</sup>	233	Colombia	898	<b>Country or area not specified</b>
188	Yugoslavia	238	Costa Rica	899	<b>Special Categories</b>
884	Europe not specified	321	Dominica	910	<b>Other countries not in- cluded elsewhere (n.i.e.)<sup>4</sup></b>
405	<b>Middle East</b>	243	Dominican Republic		
419	Bahrain	248	Ecuador	928	Cuba
469	Egypt	253	El Salvador	938	Eastern Germany <sup>5</sup>
429	Iran, Islamic Republic of <sup>3</sup>	323	Falkland Islands	954	North Korea
433	Iraq <sup>3</sup>	326	Greenland	974	U.S.S.R. (former)
436	Israel	328	Grenada	978	U.S.S.R. (former), etc. not specified
439	Jordan	329	Guadeloupe		
443	Kuwait <sup>3</sup>	258	Guatemala		<b>Memorandum Items</b>
446	Lebanon	333	Guiana, French	998	<b>EEC<sup>2</sup></b>
672	Lybia <sup>3</sup>	336	Guyana	999	<b>Oil Exporting Countries</b>
449	Oman <sup>3</sup>	263	Haiti	201	<b>Non-Oil Developing Countries</b>
453	Qatar <sup>3</sup>	268	Honduras		
456	Saudi Arabia <sup>3</sup>	343	Jamaica		
463	Syrian Arab Republic	346	Leeward Islands		
466	United Arab Emirates <sup>3</sup>	349	Martinique		
473	Yemen Arab Republic	273	Mexico		
459	Yemen, P. D. Rep. of	351	Montserrat		
		353	Netherlands Antilles		

<sup>1</sup>The data for South Africa refer to the South African Common Customs Area which includes Botswana, Lesotho, Namibia, South Africa, and Swaziland.

<sup>2</sup>The European Economic Community comprises Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the United Kingdom.

<sup>3</sup>These countries comprise the Oil Exporting Countries grouping, The memorandum item for Non-Oil Developing Countries comprises the remaining Developing Countries.

<sup>4</sup>This group comprises countries not included in the world trade table published in *International Financial Statistics (IFS)*. See also footnote 6.

<sup>5</sup>Data for Eastern Germany include figures through June 1990 and cover the area of the former German Democratic Republic.

<sup>6</sup>The data for these countries are included in the group "Other countries n.i.e." See also footnote 4.

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**APPENDIX II**  
**Breaksigns Used in the DTTs Master File**  
**for Direction of Trade Statistics**

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	Estimated monthly data	Consolidated quarterly and annual data	Reported data
	(Estimation type) <sup>1</sup>		
A	1.1, 3.1, 5.1, and 7.1		Distributed cumulative data
B	1.2, 2, 5.2, and 6		
C			
D	3.2 and 7.2		
E	14		
F	4 and 8		
G		Consolidated quarter with 2 months of reported data	
I	9		
J	10		
L		Consolidated quarter with 1 month of reported data	
M	11		
N	12		
P	13.1.1		
Q	13.1.2		
R	13.1.3		
S		Consolidated annual with 11-6 months of reported data	
T		Consolidated annual with 5-1 months of reported data	
V		Consolidated quarter/annual with data estimated by applying partner data for the entire quarter/year	
X	13.2		
Y		Consolidated quarter/annual with data estimated by other methods than applying partner data for the entire quarter/year	

<sup>1</sup>See Appendix III for a description of the estimation types.

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## APPENDIX III

# The Compilation of Estimates for *DOTS*

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This appendix describes the procedure underlying the compilation of *DOTS* estimates.

### 1. Overview

The data base for direction of trade statistics includes, in addition to all available reported data, monthly, quarterly, and annual estimates of trade for individual countries whose reported data are less current, incomplete, or not available. All estimates are currently available for periods starting January 1981 through the “reference month”<sup>1</sup> and are marked with a breaksign (for a list of breaksigns, see Table 2 in this appendix and Appendix II). Estimates are updated through the “current month” on a monthly basis, and the estimates are revised on a weekly basis.

### 2. Estimation functions

The basis of all estimates is the reported data stored in the Fund’s data base, including data on total exports and total imports. The Fund’s data management system generates estimates, for any country, of trade with each of its partner countries, for any month for which *DOTS* reports have not been reported by the country. When a country subsequently reports its own data, then the estimates for the reporting country’s trade with all its partners are removed.

---

<sup>1</sup>The “reference month” is in principle the most current period published in the *DOTS* quarterly issues and normally has a delay of four months from the latest month. For example, in March 1990, the “reference month” is November 1989, and therefore *DOTS* estimates are available from January 1981 through November 1989.

The estimation functions are based on a set of estimation types associated with a set of priorities. Although there are 14 estimation types (noted 1 to 14) that may be used for individual countries, estimates for most countries are based on a set of 6 estimation types, combined with a standard order of priority giving preference to estimates compiled on the following basis (in decreasing order of priority):

1. reported lower frequency (quarterly and annual) *DOTS* data,
2. monthly total export and import data reported for *International Financial Statistics (IFS)*, and
3. combination of reported and estimated partner country data, and extrapolated data.

A flowchart illustrating the rationale for the standard order of priority is shown in Table 1 of this appendix. A description of each estimation type is provided in Table 2.

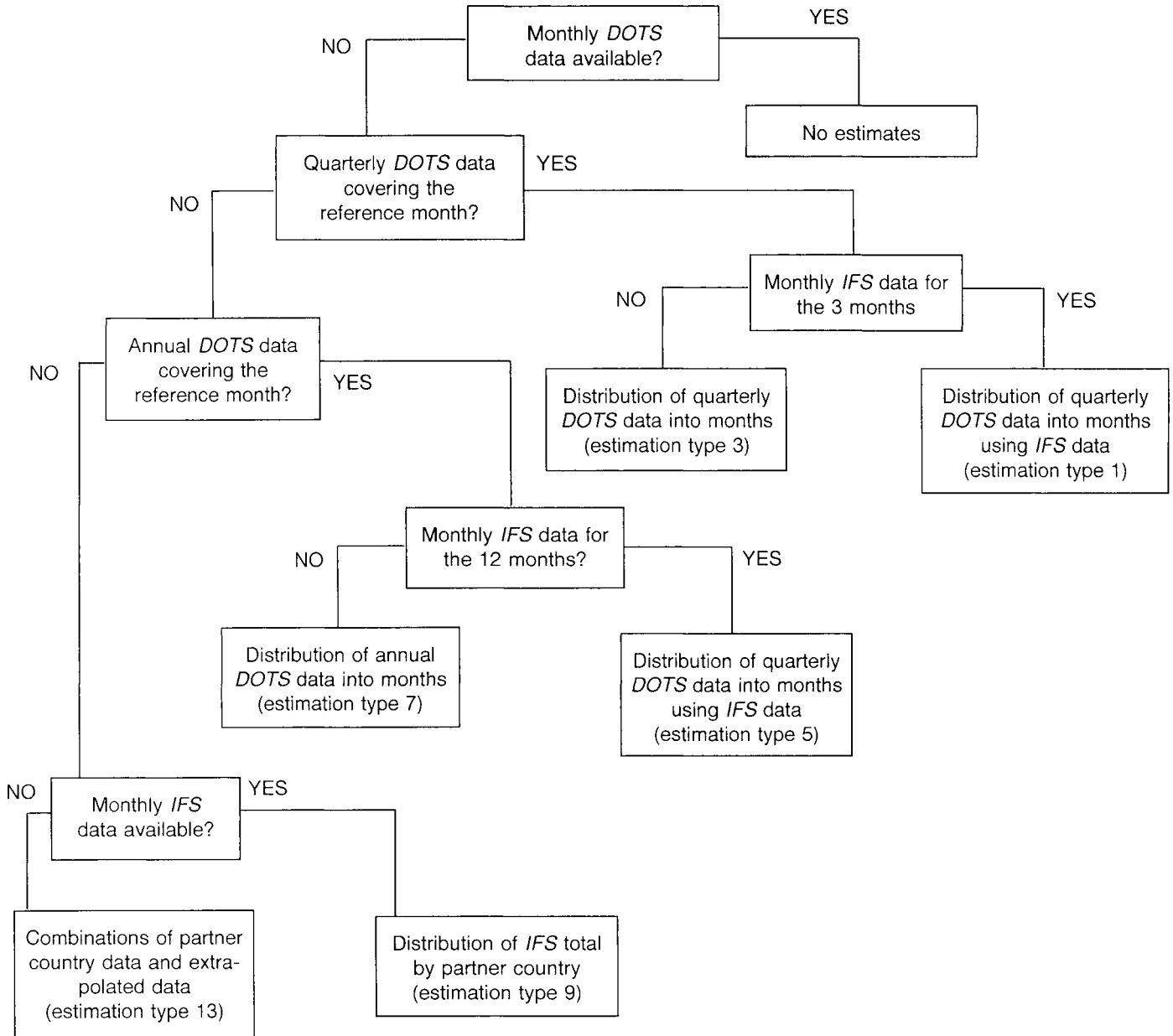
### 3. Consolidation

Reported monthly data and estimates are consolidated into quarterly and annual figures. Reported quarterly and annual data, however, are never overridden by consolidated figures that include estimates.<sup>2</sup> Consolidated quarterly and annual data including at least one estimated month are marked with a breaksign. Breaksigns for consolidated quarterly and annual data are presented in Appendix II.

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<sup>2</sup>Reported quarterly and annual data can only be overridden by (revised) reported data.

**Table 1. Flowchart for the Standard Order of Priority for Estimation Types**



**Table 2. Estimation Types**

Estimation type	Availability requirements for <i>DOTS</i> reported data	Availability requirement for <i>IFS</i> reported data	Estimation Method	Breaksign
1	Quarterly <i>DOTS</i> data covering the reference month	Monthly <i>IFS</i> data for the three corresponding months	Distribution of quarterly <i>DOTS</i> data <sup>1</sup> using: 1.1 monthly pattern displayed by monthly reported partner data, where data for 3 months are available 1.2 monthly pattern of <i>IFS</i> monthly data, for remaining partner countries	A  B
2	same as 1	same as 1	Distribution of quarterly <i>DOTS</i> data <sup>1</sup> using monthly pattern of <i>IFS</i> monthly data for all partner data	B
3	same as 1	no requirement	Distribution of quarterly <i>DOTS</i> data <sup>1</sup> using: 3.1 monthly pattern displayed by monthly reported partner data, where data for 3 months are available 3.2 Even distribution for the remaining partner countries	A  D
4	same as 1	no requirement	Distribution of quarterly <i>DOTS</i> data <sup>1</sup> using monthly pattern determined by the user	F
5	Annual <i>DOTS</i> data covering the reference month	Monthly <i>IFS</i> data for the twelve corresponding months	Distribution of annual <i>DOTS</i> data <sup>2</sup> using: 5.1 monthly pattern displayed by monthly reported partner data, where data for 12 months are available 5.2 monthly pattern of <i>IFS</i> monthly data, for remaining partner countries	A  B
6	same as 5	same as 5	Distribution of annual <i>DOTS</i> data <sup>2</sup> using monthly pattern of <i>IFS</i> monthly data for all partner data	B
7	same as 5	no requirement	Distribution of annual <i>DOTS</i> data <sup>2</sup> using: 7.1 monthly pattern displayed by monthly reported partner data, where data for 12 months are available 7.2 Even distribution for the remaining partner countries	A  D

(continued on next page)

**Table 2. Estimation Types (concluded)**

Estimation type	Availability requirements for <i>DOTS</i> reported data	Availability requirement for <i>IFS</i> reported data	Estimation Method	Breaksign
8	same as 5	no requirement	Distribution of annual <i>DOTS</i> data <sup>2</sup> using monthly pattern determined by the user	F
9	No requirement	Monthly <i>IFS</i> data	Distribution of total exports or imports from <i>IFS</i> applying partner country pattern calculated from the most recent annual reported <i>DOTS</i> data	I
10	No requirement	Monthly <i>IFS</i> data	Distribution of <i>IFS</i> total applying the most recent annual partner country pattern defined by the user	J
11	No requirement	No requirement	Distribution of a monthly total defined by the user applying partner country pattern same as 9	M
12	No requirement	No requirement	Distribution of a monthly total determined by the user applying partner country pattern same as 10	N
13	No requirement	No requirement	This estimation type uses adjusted monthly partner country data, or, for partner countries with no such data, extrapolated data: <sup>3</sup> 13.1.1 derived reported data 13.1.2 derived estimates (estimation types 1-8) 13.1.3 derived estimate types 9-12 & 14 13.2 Extrapolated data from the most recent monthly: a. reported data b. estimated data (estimation types 1-12 & 14) c. derived reported data d. derived estimated data	P Q R X
14	No requirement	No requirement	Data determined by the user for all partner countries	E

<sup>1</sup>When the quarterly *DOTS* data have incomplete monthly reported data, the amount to be distributed in the unreported months is equal to the quarterly data minus the monthly reported data.

<sup>2</sup>When annual *DOTS* data are summed from incomplete monthly or quarterly reported data, the amount to be distributed in the unreported months is equal to the annual data minus the quarterly and monthly reported data.

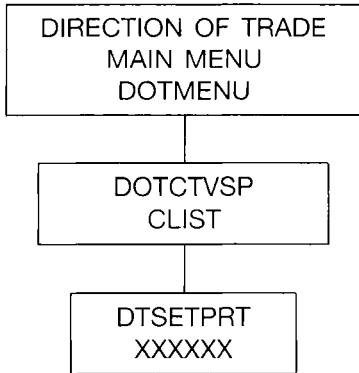
<sup>3</sup>In order to calculate consistent estimates for all countries, estimates for countries using estimation type 13 in automatic mode have to be calculated after all countries using estimation types 1 to 12 and 14 have been calculated.

# APPENDIX IV

## Procedure for Printing Partner Country Data

The following procedure prints country tables on the basis of partner country data and recalculates area totals.<sup>1</sup> Partner country data are selected by choosing the “Part B” option on screen No. 4, and the recalculation of an area total is selected on screen No. 5.

Command lists, or c-lists, are on-line interactive selection menus that set up JCLs (job control language) for submission to the system. C-lists are a sequence of TSO (time sharing option) commands arranged to perform specific tasks. An entire c-list is called a command procedure which has many of the same capabilities as the online system. The Direction of Trade (DOT) c-lists and jobs are shown in the following flow chart.



Note: XXXXXX will be the user’s TSOID.

### START-UP

Each job is set up for a run by invoking (executing) the c-list named ‘DOTMENU’. To invoke this c-list, follow normal TSO LOGON procedures. When the ISPF/PFS PRIMARY OPTION MENU is shown, choose Option 6. The resulting screen will look like this:

```

----- TSO COMMAND PROCESSOR -----
ENTER TSO COMMAND OR CLIST BELOW:
===== >
  
```

<sup>1</sup>As indicated in section 5.2.2, EIS option 14.2 also prints partner country tables; however, area totals are not recalculated and therefore may not add up to individual country data.

- At the cursor prompt, type:  
EX 'EIS.PROD.USER.CLIST(DOTMENU)'.  
The command to invoke the c-list may be typed in caps or small letters. The screen should look like this:

```

----- TSO COMMAND PROCESSOR -----
ENTER TSO COMMAND OR CLIST BELOW:
===== > ex 'eis.prod.user.clist(dotmenu)'
  
```

You are now in the DOTS main menu c-list.

```

2
DIRECTION OF TRADE
=== MAIN MENU ===
SELECTIONS ARE:
0. EXIT CLIST
1. DOTS SET PRINTS
2. FUTURE OPTION
   (NOT YET AVAILABLE)
ENTER SELECTION ===== >
  
```

Type the number of your selection; then press Enter. Option 0 will return you to the TSO command processor. Option 2 will return you to the Direction of Trade main menu. The only option available at the present time is option 1—DOTS Set Prints. Type 1 at the prompt and press Enter.

You will now be prompted for information specific to your run. Following are the prompts for the information you will provide and the correct response information.

```

3
WHAT COUNTRY DO YOU WISH TO PRINT?
ENTER COUNTRY CODE == >
  
```

Type a country code at the prompt and press enter. (Country code must be numeric).



4

WHICH DO YOU WANT TO PRINT?  
(CHOOSE ONLY 1 SELECTION)

- 1) PART A EXPORTS
- 2) PART A IMPORTS
- 3) PART B EXPORTS
- 4) PART B IMPORTS
- 5) ALL OF THE ABOVE
- 6) PART A EXPORTS + PART A IMPORTS
- 7) PART B EXPORTS + PART B IMPORTS

ENTER SELECTION === >

Type your selection number at the prompt and press enter.

5

DO YOU WANT TO RECALCULATE  
AREA TOTALS?

ENTER Y OR N == >

Type Y for yes and press enter or type N for no and press enter.

6

HOW MANY DECIMAL POSITIONS  
DO YOU WANT TO PRINT?  
(0, 1, OR 2)

ENTER 0, 1, OR 2 == >

Type 0, 1, or 2 and press enter.  
(CAUTION: you may only make one selection.)

7

WHAT MODE IS THIS PRINT?

- 1) FINAL MODE
- 2) WORK MODE

ENTER SELECTION == >

Type 1 or 2 and press enter.

8

WHAT ARE THE DATES FOR THIS PRINT?

\*\*\*\*\*  
WARNING—ENTER DATES IN THE  
CORRECT FORMAT. FOR EXAMPLE:  
AA80-AA89  
\*\*\*\*\*

ENTER DATES == >

Type the dates you want and press enter.  
Date formats will not be checked for syntax.

9

DO YOU WANT PRINTS TO AUTOMATICALLY  
GO TO A PRINTER?

IF YOU SELECT YES, YOU WILL  
BE PROMPTED FOR A PRINTER NAME

IF YOU SELECT NO, THE PRINTER  
WILL BE SET TO STA1 AND THE  
REPORT WILL GO TO IOF

ENTER Y OR N == >

Type Y for yes and press enter if you want the report to be sent to the printer of your choice. If you type Y, you will be prompted for the name of the printer (see step 10).

Type N for no and press enter if you want the report to be sent to printer STA1. You will not be prompted for the printer name if you choose no. You will skip step 10. You must manually release your prints in IOF if this option is chosen.

10

PLEASE ENTER PRINTER SELECTION

\*\*\*\*\*  
YOU MUST ENTER A VALID  
PRINTER NAME. FOR EXAMPLE:  
STA1 OR RMT2 OR RMT3  
\*\*\*\*\*

ENTER PRINTER NAME == >

Type the name of the printer and press enter.

11

DO YOU WANT TO:

0. RETURN TO MAIN MENU
1. SAVE JOB(S) FOR LATER
2. SUBMIT THE JOB(S) NOW WITHOUT SAVING

ENTER PRINTER NAME == >

Option 0 will return you to the DOTS main menu without saving any of the information you have entered. This option cancels the set print.

Option 1 allows you to save the set print job in your user library. You must manually submit the job at a later time. In order to use this option you must have an established library named 'XXXXXX.PROG.CNTL' where XXXXXX is your user-id. See step 12 (next) for instructions for this option.

Option 2 submits the set print to be run immediately. See step 13 (next) for instructions for this option.

- 12** To save your job for later, type 1 and press enter.  
The following messages will appear:

```

====JOB IS BEING COPIED TO 'XXXXXX.PROG.CNTL'====
DATA SET UTILITY—GENERATE
                PAGE 0001

PROCESSING ENDED AT EOD
CREATED MEMBER 'DTSETPRT' ON 'XXXXXX.PROG.CNTL'

====JOB HAS BEEN SUCCESSFULLY COPIED====
***
    
```

Wait until the above messages have all displayed. Do not press any keys until you see '\*\*\*'; then press enter. You will see the following:

```

====JOB IS NOW BEING EDITED. PLEASE WAIT====
EDITING IN PROGRESS ...

===== JOB HAS BEEN SUCCESSFULLY EDITED =====
***
    
```

Wait until the above messages have all displayed. Do not press any keys until you see '\*\*\*'; then press enter. The job will be saved in the library indicated and you will be returned to the DOTS main menu.

- 13** To execute the job without saving, type 2 and press enter.

The following messages will appear:

```

===== JOB IS NOW BEING EDITED. PLEASE WAIT =====
EDITING IN PROGRESS ...

===== JOB HAS BEEN SUCCESSFULLY EDITED =====
***
    
```

Wait until the above messages have all displayed. Do not press any keys until you see '\*\*\*'; then press enter. The job will automatically be submitted. You may view your job in IOE.