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Ragnar Jonsson's paper is included in this version, but is missing from the paper copy.

Forest Products Trade Flow Discrepancies – Unintentional and Intentional Errors

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Abstract

Forest products trade flow data consists of two observations for each trade flow. The first observation is made by an exporting country A (concerning exports to importing country B) and the second observation is made by the importing country B (concerning imports from the previously mentioned, exporting country, A). The existence of these two different observations regarding the same trade flow allows for some rather interesting investigations. Looking at trade flow statistics one often sees that reports on opposite ends of the same trade flow are contradictory. In this paper a number of possible explanations will be given. Furthermore, some suggestions will be given that might help to distinguish between unintentional and intentional data reporting faults, because the latter can be an indication for the occurrence of illegal activities.

Keywords: EU, Asia, import and export reports, reporting errors, illegal forest products trade.

Introduction

Wood products are one of the most important commodity groups traded internationally and they have a significant impact on the balance of trade in many countries. Forest products and forest resources are also at the centre of international debates on environmental protection (Peck, 2001). About one quarter of the industrial forest products produced each year enter into international trade and this trade is valued at some \$150 billion per year (FAO, 2000). The “trade flow” represents a summary of the volume and the value of the effort in production and transport, of all shipments of good of a given category produced in one country and delivered to a second country in the course of one year. Information on trade flows helps to identify where the priority of those concerned with national forest products trade should be concentrated. Knowledge of international flows helps to indicate opportunities to develop markets and the supporting infrastructure to facilitate this. Information about the change in trade flows is essential for understanding the external factors influencing product trade and for assessing their impact. The power of comprehensive analysis in this area opens up completely new possibilities of understanding the existing information on trade in forest products and mobilizing it for decision-making on developing strategies to face the future (Michie and Wardle, 1998).

Trade Flow Data

To gather trade flow data is laborious, since one is dealing with many shipments of all sorts of goods by large numbers of different enterprises in one country to all sorts of enterprises in countries in the rest of the world. Official records of exports are compiled from the records of shipments collected at the point of departure, traditionally the customs post. These data are collected in relation to payment of duty or tariffs and to measure the economic activity associated

with trade. The records are collected together, for all a country's customs posts, in national trade statistics. To make the assembly orderly and to make comparisons possible, the collection procedure is standardized. Value and quantity measurements, origin and destination are defined and the types of goods are classified and defined and coded. International agreements on the regulation of trade have required international standardization of these classifications and measurement standards.

The United Nations Statistics Division assembles national data on trade in UN trade statistics (UNSTAT/COMTRADE). The only comprehensive data on trade in a country is that collected by the National Trade Statistics Office. The only comprehensive statistics on international trade is that collected – from the national offices – by the United Nations. Within Europe UNSTAT is not the only one recording trade flow data into a database. The member countries of the EU are required by EU regulations, to provide their national trade statistics to EUROSTAT/COMEXT. So that is an official source for EU countries in slightly more detail than UNSTAT/COMTRADE and with slightly different standards. Figure 1 represents the main flows of trade data collection and processing within EU and EFTA (European Free Trade Association) countries. At high levels of aggregation EUROSTAT/COMEXT and UNSTAT/COMTRADE may be regarded as equal for purposes of forest products trade statistics – in aggregate the difference is less than 2% (Wardle et al., 2003). Concerning forest products FAO and the UNECE have also collected data on primary forest products and FAO publishes annual statistics of both production and total trade for all countries (oral communication Wardle, 2004). The database used for this paper – the EFI/WFSE database – is based on data from UNSTAT's COMTRADE database.

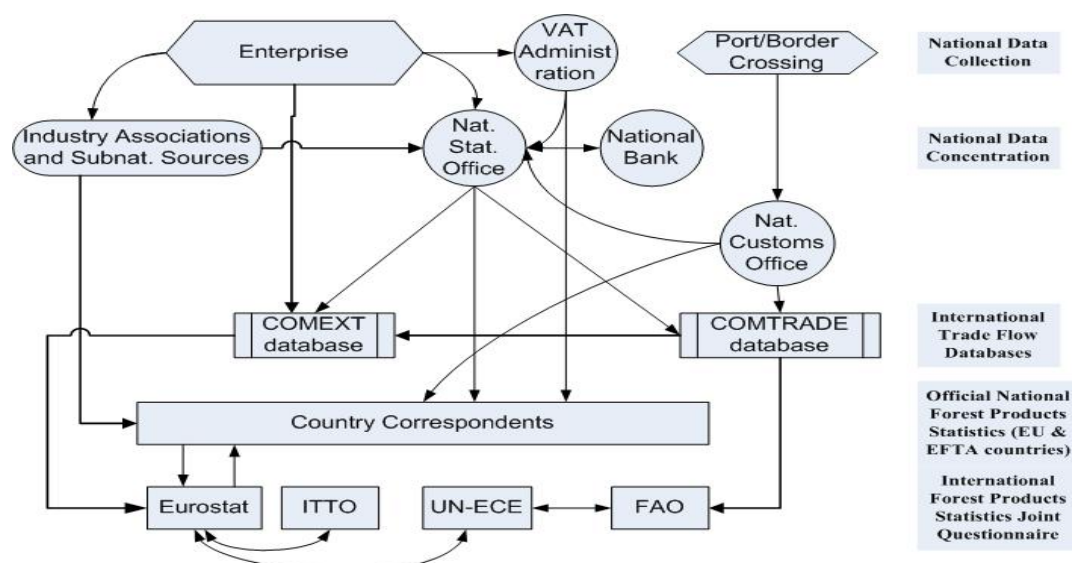


Figure 1. Flows of forest products trade and trade flow data between national and international organizations (Wardle et al., 2003).

Discrepancies

Trade flow data consists of two observations for each trade flow. The first observation is made by an exporting country A (concerning exports to importing country B) and the second observation is made by the importing country B (concerning imports from the previously

mentioned exporting country A). The existence of these two different observations regarding the same trade flow allows for some rather interesting investigations. For instance, when looking at trade flow statistics one often sees that reports on opposite ends of the same trade flow are contradictory (Kornai, 1985; Michie and Wardle, 1998 & 2002; Michie et al., 2002, Johnson, 2003). That is, a user may find that what country A officially declares as imports from country B will not correspond to what country B officially, and reciprocally, declares as its exports to country A, for a given commodity in a given year (in terms of quantity and/or value). It is difficult, if possible at all, to explain the differences between two reporting countries. It is equally difficult to choose between the two given (differing) figures in order to estimate what has actually been traded from country A to country B. When a country reports to have exported a product to another country it only means that it was shipped, but does not have to mean that it was actually received by the other country. On the other hand, when a country reports to have imported a product it only means that the product was received, but it does not have to mean that it was really shipped by the country listed as country of origin. Furthermore, it is difficult to check reported trade between EU (European Union) countries, because of the lack of custom formalities that could confirm the shipment of exports or the receipt of imports – making EU trade flow statistics especially troublesome.

There are a number of possible reasons – due to unintentional mistakes – that can partly explain discrepancies:

- Time lag: an export reported in December of a given year could reach destination in January of the following year (and would only then be reported as an import by the country of destination).
- Misclassification of commodities between exporter and importer.
- Partner country mismatch – “Triangular Trade”: the two reporting countries may report the place of origin or of final destination differently. Consider, for instance, an export that leaves country (A), is unloaded at the port of country (B), and is then transported by land to country (C). The exporter (A) could correctly state the country of final destination as (C), while the importer (C) could declare that the origin of the goods was country (B).
- Some countries provide data according to General Trade guidelines (all imports, exports and re-exports are reported), others according to Special Trade guidelines (only goods cleared through customs are reported. Goods in bonded warehouses and free zones are excluded).
- Data confidentiality. The exporting or importing company may choose to report a certain transaction under a secret code.
- Exported quantities could be destroyed or lost en route due to accidents, weather conditions, etc.
- Data-entry errors, such as simple typing/calculation errors when entering the data in customs database.
- Reporting periods. While most countries report on an annual January-December basis, some reporters have different periods (e.g. India is April-March; Pakistan is July-June) (FAO Statistics Division, 2004).
- Within the EU there is a problem of degree of coverage of traders particularly when they are small operators, since the EU does not try to measure 100% of products traded

as customs authorities normally would.

Illegal activities in timber trade

Illegal activities do not stop at illegal logging; rather, they include the entire market chain from illegal transport to industrial processing and trade operations, all the way down the line to markets (Contreras-Hermosilla, 2001). Although quantifying the illegal trade is by its nature very hard, the problem of illegal logging has reached proportions where in producer countries it has now in places started to undermine the rule of law. The volumes of illegal timber entering the global trade, and the current difficulties of distinguishing legal timber from illegal, make it impossible for consuming countries to verify that imported wood products are not made from illegally harvested timber, or that the trade in wood and wood products – tropical and temperate alike – is not contributing directly to deforestation and undermining good governance and the rule of law in producer countries (Scotland and Ludwig, 2002). The definitions of illegal logging vary between countries and time, and it is difficult to find a single explanation on what logging is illegal. From the legal perspective, illegal logging can be understood as logging done with the infringement of criminal law (timber robbery) or of administrative law (e.g. legally binding forest management and harvesting regulations) (Bouriaud and Niskanen, 2003).

Numerous types of illegal activities can be mentioned, but with regard to forest products trade flow discrepancies the avoidance of royalties and duties by under-grading, under-measuring, under-reporting and under-valuing of timber and mis-classification of species are most relevant (Callister, 1999; Contreras-Hermosilla, 2001).

Johnson (2003) discusses the use of comparing trade data between trade partners for detecting potential instances of illegal or undocumented trade. He, however, recognizes that global analyses of all timber products using customs statistics contained in the UNSTAT/COMTRADE database have shown that errors and other problems in statistical reporting together with legitimate reasons for discrepancies between trading partner reports may reduce the utility of such analyses for identifying potentially illegal trade flows. Nonetheless the International Tropical Timber Organization (ITTO) has found that trade flow statistics, in so far as they are reliable and when analyzed over a period of several years, and for several trading partners, can be useful first indicators for the existence and extent of illegal or otherwise undocumented trade. Johnson (2003) states that when discrepancies are consistent in direction across a range of trading partners and /or across a range of years for one or more trading partners, this can provide a strong indication of, and hence an argument for, the need for further investigation. The use of trade flow data discrepancies can also prove useful as an instrument in the frame of the recently issued EU proposal for an action plan on “Forest Law Enforcement, Governance and Trade (FLEGT)” (Commission of the European Communities, 2003). Furthermore, it is also imaginable that trade discrepancies can be used to raise awareness at the international level.

A closer look at the discrepancies

If one takes a closer look at trade flow discrepancies, several peculiar things can be seen. For one, there are numerous cases of *Unconfirmed Exports* and *Unconfirmed Imports* showing up in trade statistics. Unconfirmed exports are exports that are claimed by the exporting country, but do not get reported by the importing country. Unconfirmed imports are imports claimed by the importing country, but do not get reported as exports by the exporting country.

In the following Figures some examples are given [Source of the data: UNCOMTRADE database, standardized in European Forest Institute's WFSE database].

For figures 2 to 5 those European trade-flows (intra EU as well as from a non-EU country to an EU country) with the largest discrepancies have been selected. In Figure 2 the unconfirmed exports of coniferous sawnwood have been approximately 2 million m³ per year over the last 7 years, which is a large proportion compared to the total confirmed trade. In Figure 3 the unconfirmed imports of coniferous roundwood have increased from approximately 500.000 m³ to 1 million m³ over the last 12 years, which is also a considerable proportion compared to the total trade. Apparently something goes wrong when recording trade, since the proportion of unconfirmed imports and exports is quite large for the selected trade flows. The graphs in Figures 2 and 3 are made up of several trade-flows (cf. Fig. 4 and 5, in which this trade is split up per bilateral trade-flow). Some of the selected trade-flows take place within EU boundaries; some of the other trade-flows are between EU and non-EU countries. Statistics on intra-EU trade differ from extra-EU trade with regard to reporting of trade. The European Union functions as a single market (since 1st of January 1993) and with its removal of customs formalities the traditional source of statistical data has disappeared. Beside national statistics or customs offices being a primary source of trade data, data may also be obtained from industry associations, a secondary source, which is usually used when national data are not available or considered unreliable. EUROSTAT and COMTRADE aim to collect as much trade data as possible, through a country's national statistics office. Sometimes national statistics offices may collect data only on the production of enterprises with more than 50 employees, or in case the data stems from an industry association, this association may only provide data on its member organizations (Wardle et al., 2003). This may account for some of the underreporting taking place.

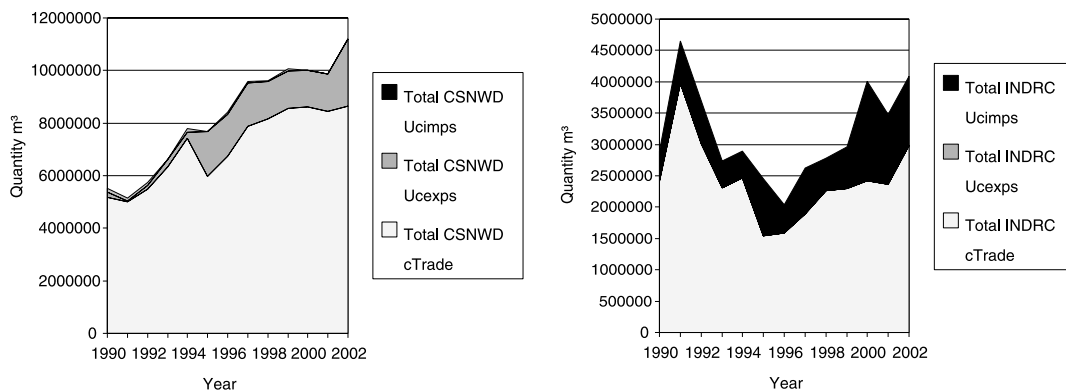


Figure 2. [left] Confirmed and Unconfirmed (Imports and Exports) Trade within Europe for Coniferous Sawnwood (selection of trade-flows within Europe with the largest discrepancies). **Figure 3.** Confirmed and Unconfirmed (Imports and Exports) Trade within Europe for Coniferous Roundwood (selection of trade-flows within Europe with the largest discrepancies).

Figure 4 gives the unconfirmed exports of coniferous sawnwood of Figure 2 split up per trade-flow. Figure 5 gives the unconfirmed imports of coniferous roundwood of Figure 3 split up per trade-flow. The unconfirmed export trade-flows of coniferous sawnwood in Figure 4 are all more or less of the same magnitude. The unconfirmed imports of coniferous roundwood

in Figure 5, on the other hand, reveal a single large discrepancy for the trade from Germany to Austria. Apparently a considerable proportion of Germany's exports of roundwood to Austria are not reported.

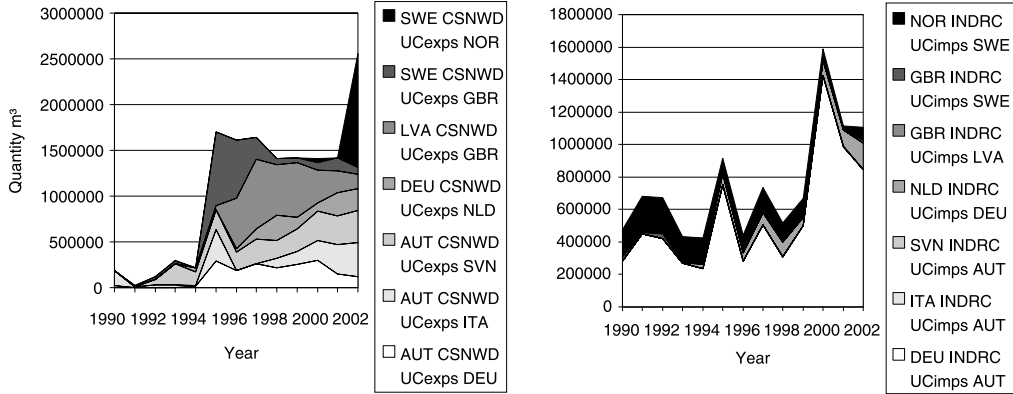


Figure 4. [left] Unconfirmed Exports of Coniferous Sawnwood for Several European Countries (split up per country pair for the unconfirmed exports of Figure 2)

Figure 5. Unconfirmed Imports of Coniferous Roundwood for Several European Countries (split up per country pair for the unconfirmed imports of Figure 3).

It is virtually impossible to pinpoint a reason for the discrepancies in a specific trade-flow. Many of the explanations given earlier could partly apply here. Companies exporting goods to another EU country could, for instance, be below the reporting limit set by national statistics offices (e.g. in the Germany-Austria trade-flow). The sum of all these unreported exports could make up a large part of the unconfirmed imports. In a sense, having a threshold for reporting is deliberate under reporting of trade. However, there are two players supplying trade data: companies and the statistical authority. A company might like to hide some transactions for its own reasons (taxation, etc.) so it under reports. The statistical authority might also like to miss some transactions for balance of trade reasons instance. This is, however, impossible to prove.

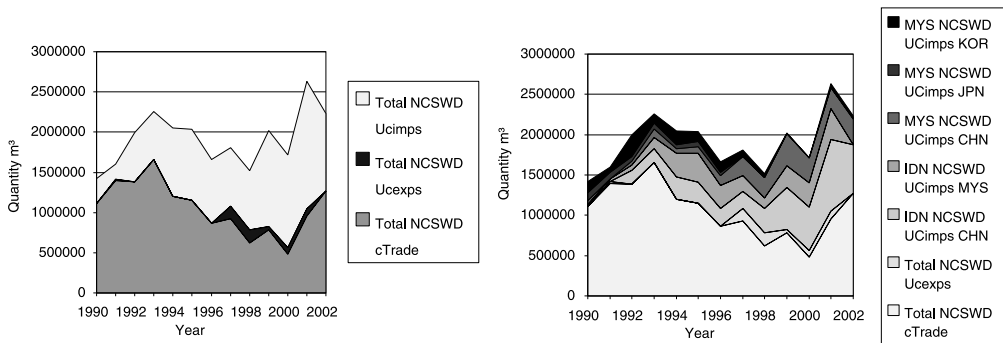


Figure 6. [left] Confirmed and Unconfirmed (Imports and Exports) Trade within Asia for Non-Coniferous Sawnwood (selected trade-flows with largest discrepancies)

Figure 7. Unconfirmed Imports of Non-Coniferous Sawnwood for several Asian Countries (split up per country pair for the unconfirmed imports of Figure 6; selected trade-flows with largest discrepancies)

Before discussing the Asian graphs it is important to note that in Asia, compared to EU trade, customs formalities exist, and hence all trade should be reported there.

In Figure 6 the confirmed and unconfirmed imports and exports for several trade-flows within Asia (those trade-flows with the largest discrepancies) are shown. As one can see the unconfirmed imports have grown larger over the years and in some years even outnumber the confirmed trade. In Figure 7 the unconfirmed imports of Figure 6 are split up per country pair trade flow. Especially the discrepancy between what China claims to have imported from Indonesia and what Indonesia claims to have exported to China is considerable. Johnson (2003) points to the same discrepancy, thereby noting that in Indonesia the problems of illegal logging and illegal trade forest products have been widely recognized. The unconfirmed imports in the Malaysia (exporter) to China (importer) trade-flow are lower, but still quite visible, something which is also mentioned by Johnson (2003). A possible explanation China's higher reported imports as compared to the Indonesian exports might be that Indonesia reports exports of non-coniferous roundwood to a "middle-man" country where the roundwood then is processed into sawnwood, which is then sent to China. Indonesia may claim exports of roundwood to China, or claim exports of roundwood to a middle-man country. China on the other hand may claim imports of sawnwood from Indonesia, since that is the origin of the timber. There is also the theoretical possibility of Indonesian companies not reporting exports, for whichever reason. But, as stated before, finding possible explanations for discrepancies is one thing, proving your hypotheses right is another. With regards to the Malaysia-China trade-flow, Johnson (2003) also mentions that part of the discrepancy could be due to different definitions of sawnwood.

According to ITTO (2003) discrepancies in the import and export data for tropical timber between China and the exporting countries of Malaysia, Indonesia, Thailand and Myanmar, for example, can arise from several sources, according to analyst Dai Guangcui. These include: the incorrect specification of origin or destination of shipment, particularly since a significant quantity of tropical timber imports to China are trans-shipped through Hong Kong; confusion in the classification of tropical and temperate non-coniferous timber; and differences in measurement standards and scaling methods. Illegal trade is likely to account for some of the discrepancies but it is difficult to assess the extent of this without a more detailed analysis of customs documents in both source and destination countries than was possible under this study. On the other hand, analysts S.Y. Chrystanto and Imam Santosa suggest that smuggling is the most significant contributor to the very large export-import data discrepancies observed between Indonesia and several importing countries (ITTO, 2003).

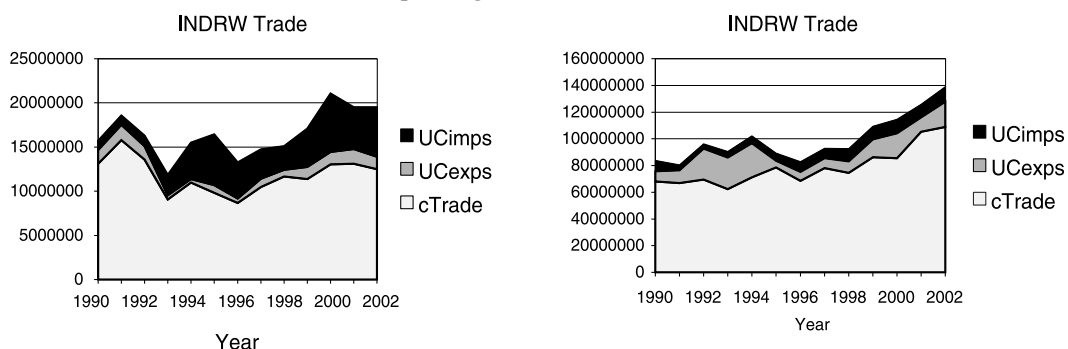


Figure 8. [left] EU Total Industrial Roundwood (coniferous and non-coniferous) Trade
Figure 9. World minus EU Total Industrial Roundwood (coniferous and non-coniferous) Trade

As can be seen in Figure 8 the EU Total Industrial Roundwood Trade has a relatively high unconfirmed import part in the graph, whereas for the world minus EU (Fig 9) the unconfirmed imports and exports are more or less of the same magnitude. A reason for the relatively high unconfirmed imports in the EU trade might be that there are many small-sized producers of roundwood that do not report their exports, because they are below the reporting limit – and since there are no customs formalities for intra EU trade these figures do not get recorded anywhere.

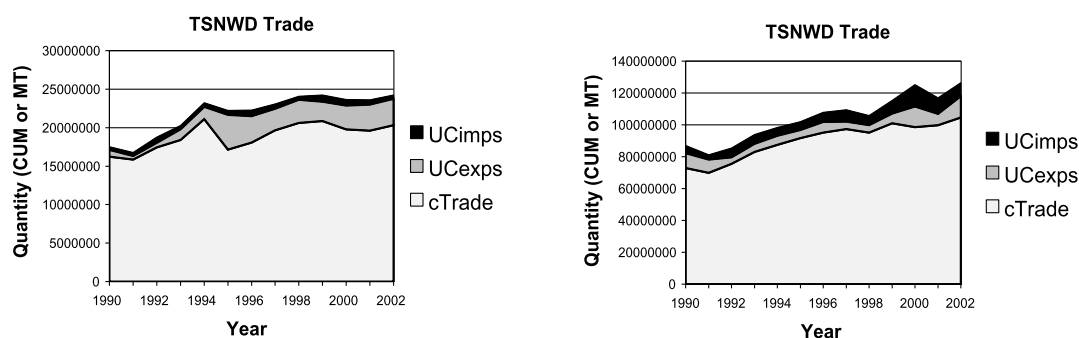


Figure 10. [left] EU Total Sawnwood (coniferous and non-coniferous) Trade
Figure 11. World minus EU Total Sawnwood (coniferous and non-coniferous) Trade

For Total Sawnwood the EU Trade (Fig 10) also behaves differently than the rest of the World (Fig 11). In the EU there is a relatively large amount of unconfirmed exports of sawnwood, whereas the World minus the EU has a more equal distribution of unconfirmed imports and exports. A possible explanation for the relatively high part of unconfirmed exports in EU trade could be that sawmills deliver the sawnwood they produce directly to construction sites or small enterprises abroad that are too small to be asked to report their imports.

Conclusions and recommendations

For policy decision-makers the numerous explanations for discrepant transactions might be interesting, but what is really important to them is that countries, which systematically misrepresent their reported bilateral trade, are identified. Identification of unreliable reporters, however, requires empirical evidence.

Gehlar (1996), for instance, proposes the use of an Index of Reliability, based on the sum of the total value of accurate partner matches as a share of total reported trade (see his paper for a detailed calculation methodology). With this index one is better to be able to assess the reliability of a country's reporting.

With regard to suggestions on how to deal with missing trade data some might argue that in the case of missing import (or exports) reports from one country regarding a bilateral trade, one might substitute this data with the export (or import) reports of the trading partner. Yeats (1995), however, concludes that partner country gap filling procedures have little or no potential for improving the general coverage or quality of international trade data, although they may be useful in cases where the trade data of a specific country are known to incorporate a large error component. The conclusion applies equally to attempts to substitute partner country directly into missing records, or where such information is allocated to missing records using some purely mechanistic procedure. Significant progress in upgrading the accuracy and

coverage of trade statistics will require improved procedures for data collection and reporting at the country level.

Other suggestions on how to validate data and how to deal with missing data are given by Wardle et al. (2003). The main premise for their suggestions is that all countries check data and have procedures to follow up and revision; certain countries indicate the investigation of compatibility of data from alternative sources in deciding the best estimate; some countries utilize secondary sources when the primary source does not report or official data are suppressed for confidentiality reasons; and certain countries repeat previous period data as an estimate when current data are delayed.

It is important to keep in mind that the UNSTAT/COMTRADE and EUROSTAT/COMEXT depend on competent national authorities to submit correct data. For this reason Wardle et al. (2003) make the following recommendations:

- Validation as much as possible at the national level
- Data from secondary sources should be provided by the national correspondent
- The use of a secondary source by the international collecting agency be acceptable to the national correspondent
- A secondary source should be used in preference to missing data in the case of non-response by the normal source

In general one should also consider establishing oversight by independent observers where there may be a conflict of interest by those required to report trade and those charged with collecting trade statistics. It might be worthwhile to study what impact these discrepancies might have on the measurement of EU production statistics as well as on total imports and exports within the EU.

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