
Causes and Remedies for Errors in International Forest Products Trade Data: Examples from the Hardwood Trade Statistics

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ABSTRACT, The quality of data concerning international hardwood products trade declined in the 1980s because of several problems associated with the collection and processing of individual export transaction records. This note examines the source, impact, and remedies for data problems caused by data screening procedures, nonreporting, recording errors, and alternative accounting systems. Although this study focuses on the hardwood products, many of the problems discussed affect trade data for other forest products. FOR. SCI. 41(2): 278-283.

THE VALIDITY OF ANY ANALYSIS OF INTERNATIONAL FOREST PRODUCTS TRADE depends on the quality of the data. Unfortunately, the accuracy of international trade data has long been in question. Yeats (1978) found large unexplained variations between the reported value of U.S. exports and trading partners import values. The Yeats study also found that variation between imports and export statistics increased as the level of product aggregation was lowered. Analysis by Durst et al. (1986) found frequent and serious disagreement between U.S. exports and trading partners import statistics for hardwood logs and lumber. Darr (1984) found discrepancies between U.S. softwood log and lumber export statistics and Japanese import statistics that appeared to be the result of factors used to convert board foot measures to cubic meter measures.

Recent analyses of hardwood trade statistics have found especially large data errors and inconsistencies (Luppold and Thomas 1991a, 1991b, Luppold 1992). These data problems have been linked to data compilation procedures, nonreporting of exports to Canada, misreporting of exports, and inconsistencies between European and North American trade statistics resulting from Canadian re-exports of U.S. products (Table 1). Because of the magnitude of the errors that have been discovered, it is important that researchers be aware of the problems that exist in forest products trade data and methods of rectifying these problems. This paper discusses the method of identifying the errors found by Luppold and Thomas (1991a) and Luppold (1992) and the way these error problems can be remedied.

TABLE 1.

Type, source, impact, status, and remedy of errors found in international hardwood products trade statistics.

Error type	Source	Impact	Current status	Remedy
1. Outdated price parameters in USDC computer programs.	Reference and default price parameters of computer programs used by USDC to validate and compile export data from Customs declaration were too low.	Export volumes of higher value products were inflated. Markets receiving higher value products are especially affected.	Much of this problem was eliminated for hardwood products in May 1989. Problems may still exist for other wood products.	Find alternative source of data if problem has occurred over several years. Contact USDC, Census if problem is in current data.
2. Underreporting of values and volumes exported to Canada.	Shippers fail to accurately file Customs declaration for products crossing the U.S./Canadian border.	Exports of hardwood and softwood products were being underestimated. Values were more affected than volumes.	Problems ceased in 1990 with U.S. and Canadian adoption of counterpart import statistics accounting system.	Use Canadian import data for U.S. exports for years prior to 1990.
3. Recording errors.	Data incorrectly entered or product is accidentally or purposefully misclassified.	High-value, misclassified products invoke default procedures that inflate export volumes.	Still a problem.	When problem appears in current data, call USDC for an investigation. Errors found in older data must be replaced with best estimate.
4. Canadian re-exports and double counting.	Material exported to Canada or other country is subsequently exported to a third country. Third country attributed shipment to U.S.	Difficult to rectify differences between U.S. export statistics and European import statistics.	Re-exportation still occurs.	Obtain Canadian re-export statistics.

OUTDATED PRICE PARAMETERS IN DATA SCREENING COMPUTER PROGRAMS

In an attempt to reduce misreporting errors, data taken from Customs declarations are screened by computer programs developed by U.S. Department of Commerce, Bureau of the Census (Luppold and Thomas 1991a). The screening procedure~ first develops an imputed price for the product being shipped from value and volume information on the Customs declaration. If the imputed price falls within an expected range of reference prices, the observation is accepted. However, if the observation lies outside the range, a new volume is estimated using a default price.

Prior to May 1989, many of the price parameters for hardwood products had not been changed since 1978. Because hardwood product prices had increased since 1978, legitimate observations were being replaced with inflated observations calculated using the 1978 default price (Luppold and Thomas 1991a). By 1988, the volumes of log exports to Europe were overreported by nearly 90%, and lumber exports to Europe and Asia were overreported by 62 and 33%, respectively. Although Luppold and Thomas (1991a, 1991b, 1991c) examined only hardwood log and lumber exports, similar errors appear to exist for hardwood veneer exports, higher value softwood product exports, and hardwood plywood imports.

A method of determining if this type of error exists in trade statistics of other products is to examine imputed price (value divided by volume) for each month and Customs district. If imputed prices are lower than expected, within a narrow range, or decreasing over time, the situation should be investigated by contacting the Bureau of the Census. If screening errors are found, alternative data series can be developed from shipping manifest data using procedures developed by Luppold and Thomas (1991b).

UNDERREPORTING OF EXPORTS TO CANADA

During the 1980s, the discrepancies between reported U.S. exports to Canada and Canadian imports from the U.S. increased yearly until 1989 (Luppold 1992). Although the problem was most severe for hardwood log shipments, discrepancies also existed for softwood lumber, softwood logs, and other wood products (Table 2).

The discrepancies shown in Table 2 mainly result from undocumented exports from the United States (USDC, Bureau of the Census, Foreign Trade Division 1990). All discrepancies between U.S. and Canadian statistics were eliminated in 1990 with the adoption of the counterpart import statistics accounting system (USDC, Bureau of the Census, Foreign Trade Division 1990). The adoption of this system caused the sudden convergence between U.S. export and Canadian import statistics. Any historic analyses of exports to Canada should employ Canadian import data rather than U.S. export data.

TABLE 2.

Comparison of U.S. exports and Canadian imports of forest products in 1989 and joint U.S./Canadian import export statistics of forest products in 1990 (in thousands of U.S. dollars).

Product	1989 U.S. ^a exports	1989 Canadian ^b imports	1990 joint U.S. ^a and Canadian imports and exports
Softwood logs	90,140	118,062	109,967
Hardwood logs	19,403	61,198	75,508
Softwood lumber	163,100	185,504	169,824
Hardwood lumber	114,879	209,943	202,203
Softwood veneer	4,736	5,864	6,474
Hardwood veneer	15,560	25,670	26,292
Molding, flooring, millwork, etc.	43,698	86,490	89,020
Particleboard, fiber - board, etc.	53,654	71,314	68,010
Plywood	35,599	46,730	45,783

^a Compiled from U.S. Department of Commerce, Bureau of the Census, Foreign Trade Division data base (1991).

^b Compiled from Statistics Canada data base (1980-89).

RECORDING ERRORS

Recording errors have long been recognized as a source of data inaccuracy (Durst et al. 1986). However, the impact of a recording error can be magnified by the data screening procedure used by Census. One recent example was the misclassification of red oak lumber exports to Mexico as beech lumber. Since oak lumber is considerably more expensive than beech, the default procedure increased the volume of the shipments twofold (Luppold 1991). Repeated shipments with this recording error resulted in export volumes to Mexico for 1990 being overestimated by 15%.

The method of identifying recording errors is similar to the method used to find screening program errors. If exports suddenly increase with a large drop in imputed price, then monthly statistics for each Customs district should be examined. If the increase can be attributed to a change in 1 month or 1 Customs district, then the possibility of a recording error exists.

CANADIAN RE-EXPORTS

Between 10 and 20% of the hardwood lumber exported to Canada is re-exported to Europe by Canadian firms without any additional processing (Luppold 1992). In addition, some material that is exported to Canada is remanufactured (kiln-dried, planed, etc.) and then exported to Europe. However, European import statistics appear to attribute most Canadian re-exports and exports as originating from the United States. These accounting differences exist for most major European markets

(Luppold and Thomas 1991c). They are especially apparent in comparisons of North American export statistics with French import statistics (Table 3). Trade accounting problems stemming from the re-exportation of U.S. material by Canadian firms is easily remedied by obtaining Canadian re-export and export data.

SUMMARY AND CONCLUSION

Although many of the errors discussed in this paper apply to hardwood products, it would take a giant leap in faith to believe that the errors do not exist in the trade statistics for other forest products. Consequently, a serious investigation of the data is a prerequisite to any analysis of international trade flows. Even though data errors are troublesome, most errors can be identified and resolved, or corrected data can be developed. It does take time to investigate and correct databases.

TABLE 3.

Comparison of U.S. and Canadian export statistics to French import statistics for hardwood logs and lumber for 1987-1989 (in 1000 m3).

Year/source	Hardwood lumber	Hardwood logs
1987		
French imports ^a		
From U.S.	42.7	16.8
From Canada	<u>3.1</u>	<u>2.3</u>
Total imports	45.8	19.1
U.S. exports ^b	12.9	4.2
Canadian exports ^c	18.9	9.5
Canadian re-exports ^c	<u>12.0</u>	<u>9.7</u>
Total exports	43.8	23.4
1988		
French imports ^a		
From U.S.	57.6	22.8
From Canada	<u>3.8</u>	<u>2.1</u>
Total imports	61.4	24.9
U.S. exports ^b	29.2	15.2
Canadian exports ^c	9.1	2.9
Canadian re-exports ^c	<u>31.9</u>	<u>9.1</u>
Total exports	70.2	27.2
1989		
French imports ^a		
From U.S.	50.3	25.8
From Canada	<u>4.6</u>	<u>1.3</u>
Total imports	54.9	27.1
U.S. exports ^b	38.6	16.9
Canadian exports ^c	11.3	4.3
Canadian re-exports ^c	<u>9.7</u>	<u>5.4</u>
Total exports	59.6	26.6

a Compiled from Comite National Pour Le Developpement Du Bois (1991).

b Compiled from Luppold and Thomas (1991b).

c Compiled from Statistics Canada data base (1980-1989).

Still, when the researcher has the choice of using a more complex method of analysis or using a trustworthier database, the latter choice is probably the most prudent.

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