

MANAGEMENT

## INFORMATION ON THE "ORIGIN" OF U.S. WOOD PRODUCTS EXPORTS: A REVIEW

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### ABSTRACT

The increasing globalization of the U.S. economy and the growing importance of the export market has resulted in a call for information by state utilization specialists, resource managers, and others to help them assess the impact of the export market on their respective domestic economies, forest resources, and wood products industries. This paper presents the results of a review of published nationwide data sources that purport to have information on the state-of-origin of wood products exports. Both the availability and adequacy of the data were examined. Ultimately, five source documents were found to which all published export data could be traced: the Annual Survey of Manufactures, the Census of Manufactures, the Shipper's Export Declaration, Ship Manifests, and the Canadian Customs Coding Form. All information on the state-of-origin of U.S. wood products exports emanating from these documents was found to be inadequate and deficient in one or more ways. Consequently, if states are to have a true assessment of the impact of export trade on their domestic situation, either existing data collection efforts must be greatly improved, new efforts must be initiated, or individual, specifically targeted, studies must be conducted.

### DATA SOURCES

There are five source documents to which all published export data containing some reference to origin can be traced: Annual Survey of Manufactures, the Census of Manufactures for census years, Shipper's Export Declaration, Ship Manifest, and Canadian Customs Coding Form (Fig. 1). Data collected on these forms are made available by several agencies such as the U.S. Department of Commerce (USDC) and the U.S. Department of Agriculture (USDA), Statistics Canada, and the Journal of Commerce. In addition, the Massachusetts Institute of Social and Economic Research (MISER) is under contract with the USDC International Trade Administration, to develop and correct state-of-origin information taken from the Shipper's Export Declaration. The resulting information is available directly from MISER and through the National Trade Data Bank (NTDB), a CD-ROM issued by the USDC Economics and Statistics Administration (ESA). In the sections that follow we discuss the products, along with their limitations, that are currently available, those that have been discontinued, and those that might potentially be available in the future.

Since the mid-1980s, U.S. wood products exports have risen dramatically. Although the recent financial crisis in Asia has had a negative effect on exports, expansion is likely to resume at some point as long as the United States is looked upon by the rest of the world as a stable and reliable supplier. Because of the importance of exports, state development and resource officials are increasingly interested in measuring the impact of the export market on their respective economies, resources, and domestic industries. Because of repeated requests for information on the state-of-origin of U.S. exports of wood products, we decided to find out what information was and/or is available on a national level to answer these inquiries. Different groups or individuals likely have different levels of interest. For example, the forest resource manager may be

interested in the export of logs of particular species. The state utilization forester may want detailed information on the direct export of specific products, e.g., logs, lumber, and cut dimension. The state development specialist may be interested primarily in the overall direct and indirect impact of the broader "export market" on a particular industry or region. In this paper, we examine the availability and adequacy of information on the state-of-origin of U.S. wood products exports.

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Source Name	Issuing Agency	Document on Which Data is Collected	Level of Data	Unit(s) of Measure	Reference to Origin	Comment
Origin of Movement/Exporter Locator	USDC	Shipper's Export Declaration	2-digit SIC	Dollars	State 2-letter designation as to origin of movement/zip code of exporter	Origin based on state where goods began export journey or zip code of exporter. Does a particularly poor job in reflecting true origin of raw agricultural products, i.e., logs.
MISER	Massachusetts Institute of Social and Economic Research	Shipper's Export Declaration	2-digit SIC	Dollars, cubic meters	Zip code of exporter/customs port district	Provides an origin series similar to the EL. Also compiles customs district port data.
PIERS	Journal of Commerce, Inc.	Ship Manifest	Broad product group, i.e., logs, lumber, etc.	Tons plus other type measure, i.e., containers, pieces, board feet	Zip code of exporter/port of export	Excludes all overland shipments to Canada and Mexico. Excludes all air shipments
Analytical Report Series--Exports from Mfg. Est	USDC, Bureau of the Census	Annual Survey of Manufactures	2 and 3-digit SIC	Dollars, employment	State of manufacture	Four-year lag in publication, suspended with 1992 Census.
Analytical Report Series--Selected characteristics of manufacturing and wholesale establishments that export: 1992	USDC, Bureau of the Census	Census of Manufactures and the Census of Wholesale Trade	2 and 3-digit SIC	Dollars, employment	State of manufacture	Four-year lag in publication, suspended with 1992 Census.
Report title not yet determined	USDC, International Trade Administration	Annual Survey of Manufactures	2 and 3-digit NAICS	Dollars, employment	State of manufacture	Scheduled for release in 2000.
PIERS-Based Estimates	USDA Forest Service	Ship Manifest	10-digit HS	Board feet	Zip code of exporter/port of export	Logs and lumber only. Species identification for about 75 percent of all shipments. Discontinued in 1994.
TIERS	Statistics Canada	Canadian Customs Coding Form	6-8-10 digit HS	Canadian dollars, cubic meters	State-of-origin, port of export	Only first six digits of HS directly comparable with U.S. HS designation. Data on origin provided by importer. U.S. exports to Canada only
Wood products: International trade and foreign markets	USDA Foreign Agricultural Service	Shipper's Export Declaration	6-8-10 digit HS	Board feet	Export district	Logs and lumber by species and other wood products.
No Formal Report	USDA Animal Plant Health Inspection Service	Phytosanitary Certificate	Logs, lumber selected species	No. of logs, containers, bundles of lumber, etc.	State-of-origin	May or may not be readily available. No formal publication. ed.

Figure 1. — Current, discontinued, and potential sources of information on state-of-origin of U.S. wood products exports.

#### CURRENTLY AVAILABLE

*Origin of movement/exporter locator.* — The Trade Competitiveness Act of 1988 mandated that the USDC collect "...export data...on a state-by-state basis aggregated at the product level including...data containing the state of the exporter" (10). Thus, since 1988, the USDC has required that shippers identify state-of-origin of movement (OM) by recording the proper two-digit state abbreviation on the Shipper's Export Declaration form. The USDC chose "state-of-origin of movement," rather than "state-of-origin," because the former is all the shipper might reasonably be expected to know. Data on OM are provided in dollars and metric tons.

These data have several deficiencies. First, the level of detail is the two-digit SIC. Second, they fail to provide information on the *true* origin, particularly for products that are shipped domestically

from one state to another before finding their way to export markets. This is particularly true for exported agricultural, mineral, and nonmanufactured products because exporters are said to "...overwhelmingly report the state that contains the port of embarkation as the state where the export journey began" (11). Hardwood logs fall into this category. Another deficiency with the original OM data is that on about one-quarter of all export declarations, a two-letter state abbreviation is not entered in response to the state-of-origin inquiry. These data are categorized as "not elsewhere classified" and are not included in state totals.

To rectify the problem of missing state codes on OM data, MISER used the five-digit zipcode of the shipper as a proxy for the two-letter state abbreviation where the latter was missing. As a result of this substitution, MISER began providing two separate data sets in 1993 as part of

the NTDB CD-ROM issued monthly by the ESA (12). The first data set is based on the two-letter state abbreviation with zipcode-based corrections for missing state codes. The second data set, Series II, is based solely on the zipcode of the exporter. The NTDB continues to report both series. Data are reported for both data sets for all 50 states by two-digit SIC, by quarter and annually, in dollars and metric tons. Differences between the two data sets can vary dramatically from state to state as is seen in a comparison of OM and Series II value data for all wood products (SIC-24) for selected states (Fig. 2). Both OM and Series II export values for Illinois, North Carolina, Tennessee, Virginia, and West Virginia are quite similar regardless of data sets. However, the Series II data set substantially increases the dollar values reported for Massachusetts and New York. For Louisiana, dollar values are twice as

large for the OM data set than for the Series II data set.

Further, differences in data sets also can distort the relative importance of overseas markets for individual states, as is seen in a comparison of the top 10 markets for Massachusetts wood products exporters (Fig. 3). According to the OM data, Canada is by far the largest and most important market for Massachusetts exporters. However, the Series II data set indicates that Italy and Japan are almost equally as important as Canada; their Series II dollar values are many, many times larger than that reported under OM.

The USDC also publishes both a state abbreviation-based OM data series and a zipcode-based exporter locator (EL) data series. The EL data, essentially Series II data reported in the NTDB CD-ROM, are based exclusively on the zipcode of the exporter. The OM data compiled by the USDC are based solely on the two-letter state abbreviation with no corrections for missing data. Although these two data sets can also differ widely at times, not unlike those included in the NTDB CD-ROM, the USDC contends that they are "...different pieces from the same puzzle," adding that the "divergent figures...should be viewed as complementary, not contradictory..." and that "taken together they give a reasonable picture of the export activity in one's area (12)." The USDC requires its state offices to use the EL series to the exclusion of all other data series in constructing reports or releasing information on individual state export market participation.

The OM and EL data are distributed by the USDC through several media: FT-900 Supplement Report; State Export Facts, International Trade Administration; and the Internet (<http://www.ita.doc.gov>). As mentioned earlier, MISER-derived data on CD-ROM differ somewhat from those reported directly by the USDC because of adjustments made in MISER.

Data on the Internet are EL based only. Tables include breakdowns of the data by world, region, state, and product. In all instances, data on the Internet are given in dollars only. Data in the supplement to the FT-900 report include OM- and EL-based information for the aggregated SIC-based manufactured and nonmanufactured product groupings. Data on exports also are available at the district or

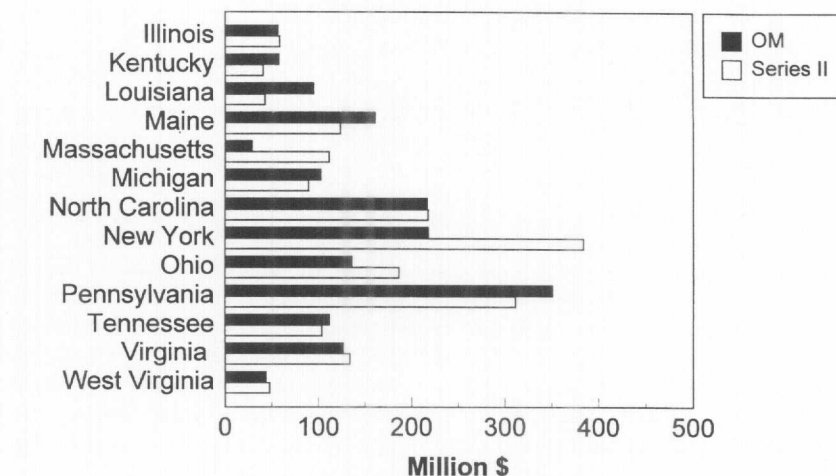


Figure 2. — Comparison of adjusted OM and Series II data sets, SIC-24 exports from selected states, 1996. Data are from the National Trade Data Bank (9).

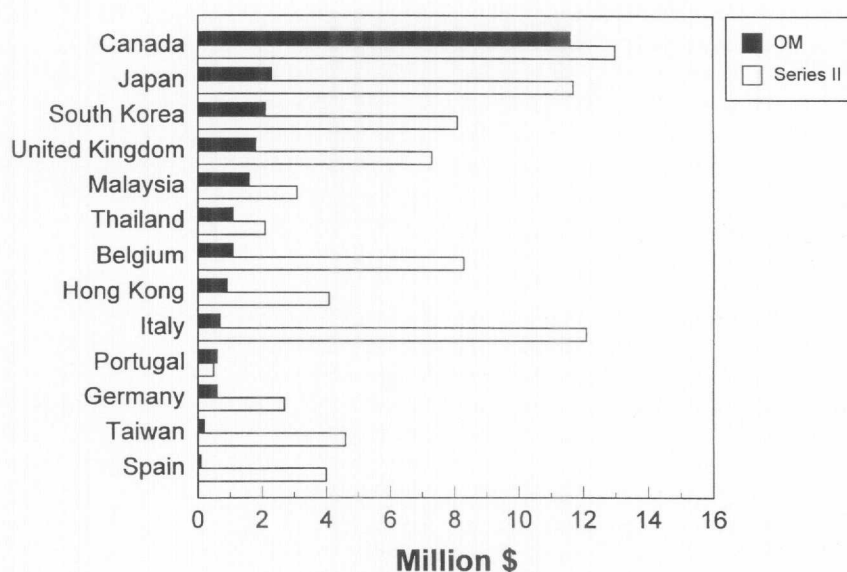


Figure 3. — Comparison of adjusted OM and Series II data sets for Massachusetts, SIC-24 exports by destination, 1996. Data are from the National Trade Data Bank (9).

support level but only for an aggregation of all commodities.

Through the International Trade Administration, the USDC also publishes U.S. Merchandise Imports and Exports on CD-ROM (12). Data on U.S. exports are available for approximately 14,000 individual Harmonized System-based commodities. Exports can be traced through 45 individual customs districts (ports) to more than 230 countries. MISER also makes district data available. Data are reported in dollars and the appropriate unit measure.

Logs and lumber are measured in cubic meters. Customs district data have been used to estimate state and regional

origin. Unfortunately, it is not possible to determine individual state export market participation from district data since they overstate exports for the states in which ports are located and understate market participation of surrounding interior states that must rely on these ports. Even regional tabulations are prone to error. For example, an informal investigation by the authors in 1995 revealed that 13 to 14 percent of the total log and lumber exports of known eastern hardwood species were exported through ports in Oregon, Washington, and California.

*MISER.* — As discussed previously, MISER supplies data to the USDC for inclusion on its NTDB CD-ROM and

also directly through its offices on the campus of the University of Massachusetts and the Internet. Data available from MISER include the adjusted Series II data set and exports by customs district similar to those provided on the U.S. Merchandise Exports CD-ROM.

*Journal of Commerce.* — The Journal of Commerce compiles data on U.S. exports taken directly from ship manifests. These data are made available through batch reports, "custom" formats, or special runs taken from Port Import/Export Reporting Service (PIERS) data tapes compiled and maintained by the Journal (2). Data on forest products exports are classified into 10 broad codes but these codes bear no relationship to the Harmonized System codes used by the USDC. Weight in tons is provided for all shipments, though one or more of the following measures also may be included: number of containers, number of bundles, number of pieces, and board feet. There is no information on value.

In addition, information on the ship manifest includes the name and location of the exporter, the port of export, and the overseas destination. In raw form, these data lack the degree of specificity demanded by many analysts, and they account only for those exports leaving U.S. ports via ocean freight. Thus, they exclude all direct overland shipments to Canada as well as European-bound shipments that are shipped first to Canada and subsequently to Europe through Canadian ports, and all overland exports to Mexico, an important and growing market for many U.S. hardwood exporters. These data also have many of the same deficiencies associated with data supplied by the USDC; that is, they do not pinpoint exports from a particular state. For example, the location of the exporter often does not represent the state-of-origin of the goods being shipped. Information based on the port of embarkation has the same deficiencies as the customs district information supplied by the USDC in that it is not possible to identify and separate materials from interior or neighboring states from those of states where ports are located. Finally, most written descriptions include species, but some shipment descriptions contain no more than a simple identifier, such as "logs" or "lumber," making species determination for these shipments virtually impossible. Also, summaries for individual species are not readily available.

*STAT Canada.* — Canada collects information on origin of imports from the Canadian Customs Coding Form. This document contains information on the source country of export, state-of-origin (if the source country is the United States), and place of export (7). Log and lumber imports are reported in cubic meters and Canadian dollars. Data are available according to 6-, 8-, and 10-digit Harmonized System classifications. However, only at the 6-digit level are Canadian and U.S. codes in agreement; written descriptions are provided at the 10-digit level so that more detailed data may be compared if needed.

Data on origin are reported by the Canadian importer. However, the source of that information usually is the U.S. exporter. As with the state-of-origin reported on the Shipper's Export Declaration, the origin of movement may be reported by the U.S. exporter rather than the true state-of-origin. Apart from possible difficulties surrounding the issue of true origin, the greatest drawback with these data is that they are limited to U.S. exports to Canada only.

#### DISCONTINUED

*USDA Forest Service—PIERS-based estimates.* — Luppold and Thomas (4,5) used raw PIERS ship manifest data to derive estimates of U.S. log and lumber exports to Europe and Asia from 1981 to 1994. They developed a computer algorithm that looked at all the information pertaining to each individual shipment and used expert-systems logic to both classify individual shipments according to Harmonized System codes and to develop board-foot estimates of log and lumber exports. The adjusted database included such information as the location of the exporter and port of export. Thus, they were able to provide Harmonized System-based species data in board feet on the basis of the location of the exporter or port of export. Despite their efforts, references to origin have the same deficiencies as the original PIERS information discussed earlier. Because of budget and personnel constraints, PIERS-based estimates no longer are derived by the Forest Service.

*Analytical Report Series.* — For non-census years, the ESA published "Exports from manufacturing establishments" (EME) as part of its Analytical Report Series (13). For census years, the ESA published "Selected characteristics

of manufacturing and wholesale establishments that export" (SCMWE) (14). Data used in EME were taken from the Annual Survey of Manufactures; data used in SCMWE were taken from the Census of Manufactures and the Census of Wholesale Trade.

Of particular interest was that the EME publication included estimates of the value of manufactured exports and export-related employment for both direct exports of goods and "indirect requirements" supporting manufactured exports. Data on direct exports represented state-of-origin as the state where the exported product was made and was based on the best estimate of the manufacturer as to the dollar value of shipments to the export market. Indirect requirements included items such as wood pallets and crates used to package exports as well as the lumber used in their production and the logs that were sawn into lumber. Estimates of indirect requirements were derived from input/output models and apportioned across states and industries. The greatest deficiencies of the EME estimates were their tie to 2- and 3-digit SIC codes and an approximate 4-year lag from the time the data were collected until they were published.

The USDC began reporting data on direct exports in 1960 (13). Estimates of supporting exports were added to the EME reports in 1976. From 1960 to 1983, reports were issued about once every 3 years. Since 1983, the report had been published annually. However, the USDC suspended publication of the EME in 1994 and the SCMWE in 1995.

#### POTENTIAL SOURCES

*USDC International Trade Administration.* — Currently, plans call for the USDC International Trade Administration to initiate publication of export data (similar to that previously published by ESA) for manufacturing establishments obtained from the Annual Survey of Manufactures beginning in the year 2000 (1). This publication will be published annually for non-census as well as census years. The new publication will base export data on the North American Industry Classification System. Plans call for value and employment data that were attributed to indirect exports in the past to be replaced with data based on "supporting shipments."

*USDA Foreign Agricultural Service.* — The wood products division of the For-

eign Agricultural Service (FAS) publishes trade data on a quarterly and annual basis for U.S. wood products exports (including hardwood logs and lumber) by species and destination country (9). We were told that it does not publish district port data, but these data are included in the information provided to FAS. These data could provide a breakdown of exports by port and species, but the data would still be subject to all the inaccuracies cited for district data available directly from the USDC or MISER.

*USDA Animal and Plant Health Inspection Service.* — Another possible limited source of data on the origin of exports of some wood products is the USDA Animal and Plant Health Inspection Service (APHIS). APHIS is charged with certifying that log and lumber exports of certain species are free from insects and disease. Currently, certification is required for oak, yellow-poplar, and maple logs for export to countries in both Europe and Asia.

APHIS measures exports only with respect to number of logs, bundles of lumber, or containers. It intentionally does not use units of measure common to the trade, such as board feet or cubic meters, even if available because of the lack of their international understanding and possible controversy surrounding their use among trading partners. APHIS also does not report value.

The phytosanitary certificate, which documents inspection, contains a block for "place of origin." While the certificate provides some clues as to origin, this information is not readily available. Also, it does not report shipments in board feet, cubic meters, or dollars, and applies only to specific species going to specific markets during specific times of the year. These data might be most useful in meeting the need for information in isolated, localized situations, if the local or regional APHIS office were willing to make them available.

#### DISCUSSION AND CONCLUSIONS

All national sources of data claiming to have information on the origin of U.S. wood products exports generally fail to consistently pinpoint their true origin. If one were interested only in the dollar value of all wood products exports (SIC-24 or NAICS-321) from a particular state, the upcoming sequel to the now discontinued Analytical Report Series (13,14) may likely be the best source.

By its own admission, the USDC does not purport to identify true origin. Rather, it reports origin of movement or the location of the exporter, which for large volumes of shipments do not coincide with the true origin. These data are particularly deficient in reporting the origin of raw agricultural products. Further, data are expressed in value only, and for broad two- and three-digit SIC designations.

As for detailed statistics on the origin of specific product exports, such as log and lumber by species, the only data that hint at origin are taken from customs port districts. Crediting exports to customs districts builds up the export totals for states in which districts are located while diminishing the export totals of inland states and states with no port facilities. Use of these data to estimate regional export market participation may be somewhat better, although an informal study conducted by the authors in 1995 revealed that 13 to 14 percent of the exports of eastern hardwood log and lumber species traveled through West Coast ports on their way to Asia. Similarly, an analysis of PIERS data developed for 1993 found that more than 30 percent of the red oak logs shipped to Asia were traced to exporters located in Washington, Oregon, and California.

Perhaps, the best and only way to accurately determine origin and assess impacts of selected product exports by type and species is to do as Luppold (6) did in assessing the log export situation. That is, to undertake a specific, targeted investigation. This type of investigation, however, provides a one-time glimpse of a particular situation but does not provide a continuous assessment of trends.

Barcoding of logs with species and volume information at the source of their harvest, and subsequent transfer of this information at the point of further manufacture or port of export, might provide the only solution to accurately tracking exports and assessing export market impacts and importance to particular states or regions. In order to encourage voluntary participation, the usefulness of the collected data would need to be demonstrated to the exporters. The least desirable solution would involve either state or federal government mandates for reporting and collecting data.

Stevens (8) may have summed up the current situation best when he concluded: "In general, secondary data

sources for state-level forest products export data do not give an accurate accounting of volumes and values, especially for an inland state like Michigan. Using these data as justification for policy decisions is fraught with peril."

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