

E-Stats 2013: Measuring the Electronic Economy

Economy-Wide Statistics Briefs

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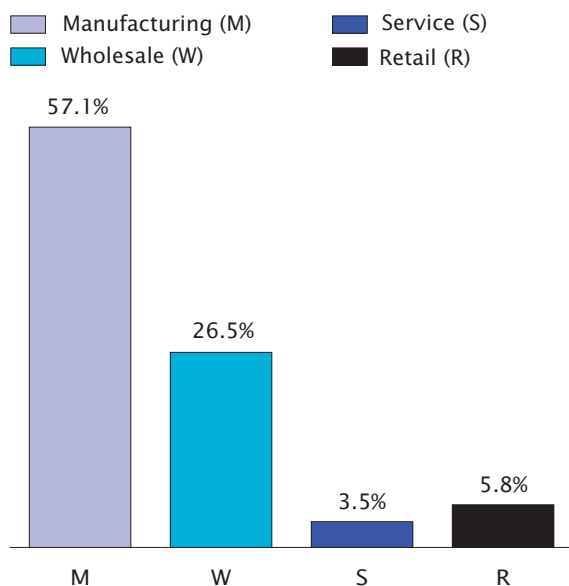
E13-ESTATS

INTRODUCTION

This edition of E-Stats provides estimates of e-commerce activity in key sectors of the U.S. economy for 2013, revises previously released estimates for 2012 and earlier, and places these estimates in historical context. Underlying data are collected in five separate surveys of manufacturing, wholesale, service, and retail businesses.

Figure 1.

E-commerce as Percentage of Total Shipments/Sales/Revenues: 2013



Note: For the estimates of e-commerce as a percentage of total shipments/sales/revenues by sector that are shown in this table, the corresponding standard errors can be found at www.census.gov/econ/estats/2013/all2013tables.html.

Source: U.S. Census Bureau, 2013 Annual Survey of Manufactures; 2013 Annual Wholesale Trade Survey; 2013 Service Annual Survey; 2013 Annual Retail Trade Survey.

For each sector, tables containing estimates and their corresponding measures of sampling variability can be found at www.census.gov/econ/estats/2013/all2013tables.html.¹

Manufacturing

- U.S. manufacturers reported e-commerce shipments were \$3.3 trillion in 2013, up 11.1 percent from a revised \$3.0 trillion in 2012. Total shipments were \$5.8 trillion in 2013, up 1.9 percent from a revised \$5.7 trillion in 2012.
- E-commerce shipments were 57.1 percent of all manufacturing shipments in 2013, up from a revised 52.4 percent in 2012.
- In 2013, 13 North American Industry Classification System (NAICS) subsectors had e-commerce shipments that accounted for more than 50 percent of their total manufacturing shipments, led by NAICS 336, Transportation equipment manufacturing; NAICS 312, Beverage and tobacco product manufacturing; and NAICS 322, Paper manufacturing.
- See the *U.S. Manufacturing Shipments—Total and E-commerce Value: 2013 and 2012* table for more information.

Wholesale

- U.S. merchant wholesalers, including manufacturers' sales branches and offices (MSBOs), reported total e-commerce sales of \$2.0 trillion in 2013, up from a revised \$1.9 trillion in 2012—an annual increase of 4.0 percent. Total sales increased by 2.7 percent to \$7.4 trillion in 2013 from a revised \$7.2 trillion in 2012.

¹ Percent changes quoted in the release are calculated using estimates rounded to millions as provided in the tables.

- E-commerce sales were 26.5 percent of merchant wholesalers, including MSBOs' total sales in 2013, which was not significantly different from a revised 26.1 percent in 2012.
- E-commerce sales accounted for 20.7 percent of total sales of merchant wholesalers, excluding MSBOs in 2013, while e-commerce sales were 41.1 percent of the sales of MSBOs.
- See the *U.S. Merchant Wholesale Trade Sales, Including Manufacturers' Sales Branches and Offices—Total and E-commerce: 2013 and 2012*; *U.S. Merchant Wholesale Trade Sales, Excluding Manufacturers' Sales Branches and Offices—Total and E-commerce: 2013 and 2012*; and *U.S. Manufacturers' Sales Branches and Offices Sales—Total and E-commerce: 2013 and 2012* tables for more information.

Services

- E-commerce revenues for U.S. selected service industries were \$443 billion in 2013, up 8.5 percent from a revised \$408 billion in 2012. Total revenues were \$12.5 trillion in 2013, up 3.2 percent from a revised \$12.1 trillion in 2012.
- E-commerce revenues were 3.5 percent of total revenues in 2013, up from a revised 3.4 percent in 2012.
- See the *U.S. Selected Services Revenue—Total and E-commerce: 2013 and 2012* table for more information.

Retail

- E-commerce sales for U.S. retailers were \$261 billion in 2013, up 13.6 percent from a revised \$229 billion in 2012. Total sales increased by 3.8 percent to \$4.5 trillion in 2013 from a revised \$4.3 trillion in 2012.
- E-commerce sales were 5.8 percent of total sales in 2013, up from a revised 5.3 percent in 2012.
- In 2013, the largest retail merchandise category for e-commerce sales in the Electronic Shopping and Mail-Order Houses industry (NAICS 4541) was Clothing and Clothing Accessories (including footwear) with \$40 billion.
- See the *U.S. Retail Trade Sales—Total and E-commerce: 2013 and 2012* and *U.S. Electronic Shopping and Mail-Order Houses (NAICS 4541)—Total and E-commerce Sales by Merchandise Line: 2013 and 2012* tables for more information.

EXPLANATORY NOTES

General

The estimates in this release are based on data collected from five surveys conducted by the U.S. Census Bureau: the 2012 Economic Census—Manufacturing, the 2013 Annual Survey of Manufactures (ASM), the 2013 Annual Wholesale Trade Survey (AWTS), the 2013 Service Annual Survey (SAS), and the 2013 Annual Retail Trade Survey (ARTS). All of these surveys were conducted independently. Measures of total economic activity and e-commerce are presented in this report to provide a broad perspective of e-commerce activity across the many sectors. Brief descriptions of the survey methods are given below.

Industry classifications used in this report are based on the 2007 NAICS except for the 2013 and 2012 manufacturing data, which are based on the 2012 NAICS. Information about NAICS and additional detail about coverage, sample design, and estimation methodology for the annual surveys can be found at <www.census.gov/econ/estats>. In addition, all current and prior reports, historical data tables, and past research papers are available at this same Web site.

Different measures of economic activity are used in the five surveys:

2012 Economic Census—Manufacturing and ASM. “Value of shipments” is the measure used for manufacturing in the Economic Census and ASM. It is the value of all products shipped plus all miscellaneous receipts. Value of shipments includes shipments to outside customers, as well as to affiliated plants.

AWTS and ARTS. “Sales” is the measure used in AWTS and ARTS. Sales are the dollar value of transactions between the reporting firm and its customers. Sales include transactions to foreign affiliates, but exclude transactions among domestic affiliates.

SAS. “Revenues” is the measure used in SAS. Revenues are the dollar value of transactions and contracts between the reporting firm and its customers. These values include services performed for foreign affiliates, but exclude transactions among domestic affiliates. Revenue includes the total value of service contracts, the market value of compensation received in lieu of cash, amounts received for work subcontracted to others and other industry-specific items.

E-commerce sales/revenues are sales of goods and services where the buyer places an order, or the price

and terms of the sale are negotiated, over an Internet, mobile device (m-commerce), Extranet, Electronic Data Interchange (EDI) network, electronic mail, or other comparable online system. Payment may or may not be made online.

E-commerce shipments (e-shipments) are online orders accepted for manufactured products from customers, including shipments to other domestic plants of the same company for further manufacture, assembly, or fabrication where price and terms of sale are negotiated over an Internet, Extranet, EDI network, electronic mail, or other online system. Payment may or may not be made online.

SURVEY METHODS

Economic Census—Manufacturing and the Annual Survey of Manufactures

The 2012 data were obtained from the Economic Census—Manufacturing. The manufacturing universe is comprised of approximately 300,000 plants. In the census, data are collected from establishment firms above a specified payroll cutoff that can vary by industry. For most very small firms, data from existing administrative records were used instead. Establishments representing approximately five percent of the total 2012 value of shipments did not have an opportunity to report e-commerce shipments.

The 2013 estimates of manufacturing shipments and e-shipments were derived from the 2013 ASM. In the ASM, data are collected annually from a probability sample of approximately 50,000 manufacturing plants. Data for small- and medium-sized single establishment companies are estimated using information obtained from administrative sources.

The ASM is a survey of manufacturing plants and represents activities at individual plants rather than the entire company.

E-commerce questions were included on the Economic Census—Manufacturing and ASM questionnaires along with questions about such things as employment, payroll, value of shipments, cost of materials consumed, and capital expenditures. Data for nonresponding plants were imputed using information from responding plants with similar characteristics.

Shipments estimates for the NAICS subsectors were calculated by summing both the reported and the imputed plant data. For the ASM, the data were weighted by the reciprocal of the probability of the plant's inclusion in the sample. These estimates were

then linked to the 2012 Economic Census results to reduce sampling and nonsampling errors.

For more information on the Economic Census and the ASM, see <www.census.gov/econ/census/> and <www.census.gov/manufacturing/asm/>.

Annual Wholesale Trade Survey, Service Annual Survey, Annual Retail Trade Survey

The AWTS measures the economic activity of merchant wholesale firms with paid employees (i.e., employer firms) including MSBOs as defined by the 2007 NAICS. Merchant wholesale firms are those that take title to the goods they sell. The AWTS also collects data from wholesale agents and brokers, but e-commerce sales are not requested. Therefore, agents and brokers are not included in the wholesale E-Stats estimates. Data are requested annually from about 8,000 merchant wholesale firms, which include approximately 1,000 MSBOs. Data for MSBOs were first collected with the 2003 AWTS for years 2002 and 2003. For more information about AWTS, see <www.census.gov/wholesale/>.

The SAS measures the economic activity of employer firms classified in 11 service-related sectors as defined by the 2007 NAICS: Utilities; Transportation and Warehousing; Information; Finance and Insurance; Real Estate and Rental and Leasing; Professional, Scientific, and Technical Services; Administrative and Support and Waste Management and Remediation Services; Educational Services; Health Care and Social Assistance; Arts, Entertainment, and Recreation; and Other Services. Data are requested annually from about 72,000 firms. For more information about SAS, see <www.census.gov/services/>.

The ARTS measures the economic activity of employer and nonemployer (i.e., business without paid employees) firms classified in Retail Trade or Accommodation and Food Services as defined by the 2007 NAICS. The sample contains approximately 22,000 firms with paid employees—roughly 17,500 that are classified in Retail Trade and 4,500 that are classified in Accommodation and Food Services. Data for nonemployers are included in the estimates through imputation or administrative data provided by other federal agencies. For more information about ARTS, see <www.census.gov/retail/>.

For these three surveys, stratified random samples of firms are selected from a sampling frame constructed using information from the 2007 Economic Census and updated with information from the Census Bureau's Business Register. The samples are subsequently

updated to represent employer firms in business during 2013.

All wholesale, service, and retail firms surveyed are asked to report total sales/revenues and e-sales/e-revenues for 2013. Wholesalers are also asked to report e-sales made through EDI networks. Retailers in the Electronic Shopping and Mail-Order Houses industry are also asked to report total sales and e-sales for 2013 for specific merchandise lines. E-commerce data for nonresponding employer firms and all retail nonemployers were imputed from responding firms within the same kind of business.

Estimates of total sales/revenues and e-sales/e-revenues were calculated by summing data (both reported and imputed) weighted by the reciprocal of the probability of the firm's inclusion in the appropriate sample. The retail and wholesale estimates in this report have been adjusted using preliminary results of the 2012 Economic Census to reduce sampling error and to allow comparability with the census results. The service estimates have been adjusted using results of the 2007 Economic Census. For next year's report, retail, wholesale, and service estimates will be adjusted using final results of the 2012 Economic Census.

Reliability of Estimates

Except for the 2012 manufacturing estimates, the estimates in this report are based on sample surveys and are subject to sampling error. All estimates in this report are subject to nonsampling error. Sampling error occurs because only a subset of the entire population is measured. Nonsampling error encompasses all other factors that contribute to the total error of a sample survey estimate and may also occur in censuses.

Appendix Tables, which can be found at www.census.gov/econ/estats/2013/all2013tables.html, show standard errors for estimates of percentages and coefficients of variation for estimates of total dollar value. The standard error measures the extent to which estimates derived from all possible samples of the same size drawn using the same design differ from the average of these estimates. The coefficient of variation (expressed as a percentage) is the standard error of the estimate divided by the estimate. Note that standard errors and coefficients of variation are estimates derived from the sample and are also subject to sampling error. The coefficients of variation and standard errors presented in the tables may be used to compute confidence intervals about the sample estimates.

The particular sample used for each survey included in this report is one of a large number of samples of the same size that could have been selected using the same design. For the ASM, we estimate sampling variances using the Poisson variance estimator rather than the method of random groups. In about 9 out of 10 (90 percent) of the possible samples, the estimates would differ from the results of a complete enumeration by less than 1.645 times the estimated standard error. For AWTS, ARTS, and SAS, we use the method of random groups ($G=16$ random groups) to estimate sampling variances for estimates produced from these samples. In about 9 out of 10 (90 percent) of the possible samples, the estimates would differ from the results of a complete enumeration by less than 1.753 (a t -statistic with 15 ($G-1$) degrees of freedom) times the estimated standard error.

To compute a 90 percent confidence interval for an estimated total, multiply the estimate by its coefficient of variation and then by either 1.753 or 1.645, as indicated above. This amount is then added to and subtracted from the estimate to give the upper and lower bounds of the interval. As an example, suppose the estimated total revenue is \$51,770 million and the estimated coefficient of variation for this estimate is 1.3 percent (0.013). Multiplying \$51,770 million by 0.013 and by 1.753 gives \$1,180 million. Subtracting \$1,180 million from and adding \$1,180 million to \$51,770 million gives a 90 percent confidence interval of \$50,590 million to \$52,950 million. Confidence statements for estimated percentages are computed in a similar manner. The Census Bureau recommends that individuals using estimates in this report incorporate this information into their analyses, as sampling error could affect the conclusions drawn from these estimates. All comparative statements in this report have undergone statistical testing, and, unless otherwise noted, comparisons are statistically significant at the 90 percent confidence level.

One source of nonsampling error is the inability to obtain information about all cases in the samples.

Economic surveys at the Census Bureau are required to compute two different types of response rates: a unit response rate and weighted item response rate. Refer to each survey's Internet page (links provided previously) for the unit response rates of the surveys that contribute to this report. The weighted item response rates are called Total Quantity Response Rates (TQRR) and are item-level indicators of the quality of each estimate. The following table shows the TQRRs for the sectors included in this report. More detailed information about calculating and reporting

response rates for economic surveys can be found at <www.census.gov/quality/standards/appendixd3b.html>.

Total Quantity Response Rate for 2013 Total Shipments/Sales/Revenues and E-commerce

Sector	Total sales	E-commerce sales
Manufacturing	80.0	76.0
Wholesale	92.6	79.0
Retail	93.7	87.4
Services	87.3	76.4

Other sources of nonsampling error include response errors, unclear definitions, differences in the interpretation of questions, mistakes in recording or coding the data obtained, and other errors of collection, response, coverage, and estimation of missing data. Although no direct measures of these sources of nonsampling error have been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

CONTACTS

For additional information regarding surveys included in this report, and for general information about the Census Bureau's e-business measurement program, contact:

Data User Outreach and Education Office
Economy-Wide Statistics Division
ewd.outreach@census.gov
(800) 242-2184

E-STATS REPORTS

Future Reports

- Quarterly retail e-commerce data will be released August 17 and November 17, 2015.
- E-Stats for 2014 will be released in mid-2016.

All E-Stats reports, including prior reports, historical data tables, and past research papers, are available at <www.census.gov/econ/estats>.