

E-commerce 2007

- In 2007, e-commerce grew faster than total economic activity in three of the four major economic sectors covered by the *E-Stats* report. However, change over time in the e-commerce share of each sector's overall shipments, sales, or revenues continues to be gradual.
- In 2007, as in prior years, Manufacturers and Merchant Wholesalers relied far more heavily on e-commerce than Retailers or Selected Service businesses.
- In 2007, as in prior years, business-to-business (B-to-B) activity—by definition here, transactions by Manufacturers and Merchant Wholesalers—accounted for most e-commerce (93 percent).
- Evidence from Merchant Wholesalers indicates that B-to-B e-commerce continues to rely overwhelmingly on proprietary Electronic Data Interchange (EDI) systems.
- Merchant Wholesalers, including Manufacturing Sales Branches and Offices (MSBOs), ranked second, with e-commerce accounting for 21.2 percent (\$1,226 billion) of total sales.
- Retailers' e-commerce sales increased by 18.4 percent. As a share of total retail sales, however, e-commerce sales remained modest—3.2 percent (\$127 billion), up from 2.8 percent (\$107 billion) in 2006.
- E-commerce sales for Selected Service Industries, a special group of service industries created for the E-Stats report, increased by 19.7 percent. E-commerce accounted for 1.8 percent (\$124 billion) of these industries' total revenues—up from 1.6 percent (\$104 billion) in 2006.

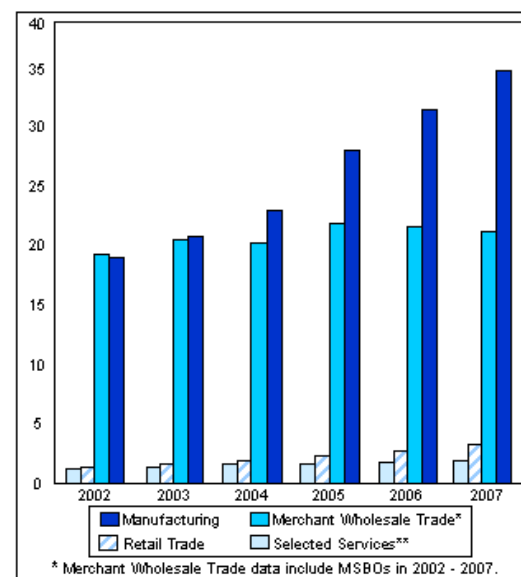
Sector data for 2007 and 2006 are the focus of the following section and are included in Appendix Tables 1-6. Appendix Table 7

Sector Highlights

This edition of E-Stats provides estimates of e-commerce activity in key sectors of the U.S. economy for 2007, revises previously released 2006 estimates, and places these estimates in historical context. Underlying data are collected in five separate surveys from manufacturing, wholesale, service, and retail businesses. The data show that in 2007:

- Manufacturers led all industry sectors, with e-commerce accounting for 35 percent (\$1,856 billion) of total shipments—up substantially for the sixth straight year.

E-commerce as Percent of Total Value: 2002 - 2007



U.S. Shipments, Sales, Revenues and E-commerce: 2007 and 2006

[Shipments, sales and revenues are in billions of dollars.]

Description	Value of Shipments, Sales, or Revenue				Year to Year Percent Change		% Distribution of E-commerce	
	2007		2006		Total	E-commerce	2007	2006
	Total	E-commerce	Total	E-commerce				
Total *	21,847	3,333	20,797	2,972	5.0	12.1	100.0	100.0
B-to-B*	11,088	3,082	10,542	2,761	5.2	11.6	92.5	92.9
Manufacturing	5,306	1,856	5,016	1,567	5.8	18.4	55.7	52.7
Merchant Wholesale	5,782	1,226	5,526	1,194	4.6	2.7	36.8	40.2
Excluding MSBOs ¹	4,150	689	3,881	639	6.9	7.8	20.7	21.5
MSBOs	1,632	537	1,645	555	-0.8	-3.2	16.1	18.7
B-to-C*	10,759	251	10,255	211	4.9	19.0	7.5	7.1
Retail	3,995	127	3,870	107	3.2	18.4	3.8	3.6
Selected Services	6,764	124	6,385	104	5.9	19.7	3.7	3.5

* We estimate business-to-business (B-to-B) and business-to-consumer (B-to-C) e-commerce by making several simplifying assumptions: manufacturing and wholesale e-commerce is entirely B-to-B, and retail and service e-commerce is entirely B-to-C. We also ignore definitional differences among shipments, sales, and revenues. The resulting B-to-B and B-to-C estimates, while not directly measured, show that almost all the dollar volume of e-commerce activity involves transactions between businesses. See the "Note to reader" for cautions relating to the interpretation of the "Total" shown here.

¹Manufacturers' Sales Branches and Offices

summarizes total and e-commerce business activity in the four major sectors from 2000 to 2007.

Sector Analyses

• Manufacturing

E-commerce accounted for \$1,856 billion of manufacturing shipments in 2007, up from \$1,567 billion in 2006, an annual increase of 18.4 percent (Appendix Table 1).

E-shipments were 35 percent of all manufacturing shipments in 2007 up from 31.2 percent in 2006. Across the sector, e-shipments were pervasive, accounting for at least 17 percent of total shipments in all 21 manufacturing industry groups. In 2007, as in prior years, e-shipments as a share of total shipments were largest in the Beverage and Tobacco Products group (56.5 percent) and Transportation Equipment (55.6 percent). In value terms, however, manufacturing e-shipments were concentrated. Six manufacturing industry groups accounted for 70 percent of the sector's 2007 e-shipments: Transportation Equipment, with 22 percent of all

e-shipments (\$409 billion); Chemical Products with 13 percent (\$247 billion); Food Products at 11 percent (\$203 billion); Petroleum and Coal Products at 10 percent (\$190 billion); Computer and Electronic Products at 8 percent (\$142 billion); and Machinery Products at 6 percent (\$109 billion). In 2007, these six industries accounted for 64 percent of total manufacturing shipments.

From 2006 to 2007, e-shipments grew substantially in five manufacturing industry groups: Paper (50 percent), Leather and Allied Products (46 percent), Primary Metal Products (34 percent), Printing and Related Support Activities (34 percent), and Food Products (32 percent).

Information included in this section, Appendix Tables 1 and 7, and the table on page 2 of this report was collected in the 2007 Economic Census – Manufacturing and the 2006 Annual Survey of Manufactures (ASM), a survey of more than 50,000 plants in the United States.

• Merchant Wholesale Trade

U.S. merchant wholesalers including MSBOs reported total e-commerce sales of \$1,226 billion in 2007, up from a revised \$1,194 billion in 2006—an annual increase of 2.7 percent (Appendix Table 2.0).

E-sales were 21.2 percent of merchant wholesalers and MSBOs' combined total sales in 2007 (Appendix Table 2.0).

In 2007, merchant wholesale e-sales excluding MSBOs accounted for 16.6 percent (\$689 billion) of the combined sector's total sales (Appendix Table 2.1).

Information included in this section, as well as in Appendix Tables 2.0, 2.1, 2.2, 3, and 7, and the table on page 2 of this report was collected in the 2007 Annual Wholesale Trade Survey (AWTS), a survey of about 8,700 merchant wholesalers, including about 1,200 MSBOs. MSBOs were classified as merchant wholesalers under the 2002 North American Industry Classification System (NAICS) and were first included in the AWTS in 2003. In this report, data for merchant wholesalers excluding MSBOs, and data for MSBOs are shown separately in Appendix Tables 2.1 and 2.2 respectively; data are combined in Appendix Tables 2.0 and 7.

As in manufacturing, merchant wholesalers' reliance on e-commerce was widespread in 2007. Ten of the 15 merchant wholesale industry groups (excluding MSBOs), for which complete data for 2007 were publishable, conducted more than 6 percent of their business electronically. In value terms, in the 15 industries noted above, three industry groups accounted for 35 percent of total e-sales—Motor Vehicles and Automotive Equipment; Professional and Commercial Equipment and Supplies; and Grocery and Related Products.

Unlike other wholesalers (i.e., brokers, commission agents, and electronic market places and exchanges), merchant wholesalers take title to the goods they sell. In the 2002 Economic Census, merchant wholesalers (including MSBOs) accounted for about 90 percent of the total sales of the

wholesale trade sector. Wholesale agents, brokers, and electronic markets made up the remaining 10 percent.

Uniquely, the AWTS includes a question intended to gauge whether B-to-B e-commerce continues to be conducted chiefly using EDI both via value added networks (VAN) and over the Internet. Appendix Table 3 shows that in 2007, EDI had a 73.5 percent share of merchant wholesalers' (excluding MSBOs) e-commerce activity.

• Retail Trade

U.S. retail e-commerce sales reached almost \$127 billion in 2007, up from a revised \$107 billion in 2006—an annual gain of 18.4 percent. Rapid growth in e-retail has been the norm. From 2002 to 2007, retail e-sales increased at an average annual growth rate of 23.1 percent, compared with 5.0 percent for total retail sales. Nonetheless, in 2007, e-sales were only 3.2 percent of total retail sales—up from 2.8 percent in 2006 (Appendix Tables 5 and 7).

Over 90 percent of retail e-sales were concentrated in two industry groups—Nonstore Retailers, and Motor Vehicles and Parts Dealers—which accounted respectively for 73 percent (\$93 billion) and 19 percent (\$24 billion) of the sector's total e-sales.

Nearly all Nonstore Retail e-sales occurred in the Electronic Shopping and Mail-Order Houses industry group. This group includes: catalog and mail order operations, many of which sell through multiple channels; “pure plays” (i.e., retail businesses selling solely over the Internet); and e-commerce units of traditional brick-and-mortar retailers (i.e., “brick and clicks”), in which the unit operates as a separate entity and does not sell motor vehicles online.

Appendix Table 6 provides detailed information on the kinds of merchandise sold by businesses classified in the Electronic Shopping and Mail-Order Houses industry. In 2007, the leading merchandise category for e-sales within this industry was Clothing and Clothing Accessories (including

footwear) with \$14 billion, followed by Other Merchandise with e-sales of \$13 billion, and Computer Hardware with e-sales of \$11 billion.

The top two merchandise categories for percentage of online sales were Electronics and Appliances, and Music and Videos, both with 74 percent. Furthermore, online sales were 40 percent or more of total sales in all but one of the 14 published merchandise lines. For the Electronic Shopping and Mail-Order Houses industry as a whole, e-sales accounted for 45 percent of total sales in 2007.

More recent data on e-sales for retail trade are available as part of the ongoing quarterly retail e-commerce series. Data for the 2nd quarter of 2009 will be released on August 17, 2009.

In the first quarter of 2009, unadjusted U.S. retail e-sales were \$30.2 billion for the quarter. The estimate of total 2008 retail e-sales was \$132.4 billion—3.4 percent of total 2008 retail sales. The most recent data are available at <http://www.census.gov/estats>.

- **Selected Service Industries**

E-commerce revenues in selected service industries were \$124 billion in 2007, an increase of 19.7 percent over revised 2006 e-revenues of \$104 billion. In 2007, as shown in Appendix Table 4, e-revenues accounted for 1.8 percent of total revenues in these industries—up from 1.6 percent in 2006. From 2002 to 2007, e-commerce revenues in the sector increased at an average annual growth rate of 15.7 percent, compared with 6.7 percent for the total revenue of the selected services industries (Appendix Table 7).

Appendix Table 4 shows that two groups accounted for 22 percent (\$27 billion) of total selected service e-revenues: Publishing Industries (except Internet), and Securities and Commodity Contracts Intermediation and Brokerage.

The e-revenues share of total revenue was largest (23 percent) in the Travel

Arrangement and Reservation Services industry group.

The selected service industry total provided in Appendix Table 4 is not an official NAICS grouping, but rather the sum of the bolded groups shown in the table. Some of these groups are not complete. Incomplete industry coverage within a group is denoted by the absence of a NAICS code for an Appendix Table 4 bolded row and the use of “Selected” in the group description. Appendix Table 4 covers about two-thirds of the NAICS service-related industries included in the 2002 Economic Census.

Information in this section and in Appendix Table 4 and the tables on pages 1 and 2 of this report was collected in the 2007 Service Annual Survey, a survey of about 58,000 firms. The NAICS codes shown in Appendix Table 4 correspond to the 2002 NAICS.

Explanatory Notes

General

The e-commerce estimates in this release are based on data collected from five surveys conducted by the U.S. Census Bureau: the 2007 Economic Census – Manufacturing, the 2006 Annual Survey of Manufactures (ASM), the 2007 Annual Wholesale Trade Survey (AWTS), the 2007 Service Annual Survey (SAS), and the 2007 Annual Retail Trade Survey (ARTS). It should be noted that the AWTS was called the Annual Trade Survey (ATS) in some editions of *E-Stats*. 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 four sectors. Brief descriptions of the survey methods are given below.

Industry classifications used in this report are based on the 2002 NAICS. Information about NAICS and additional detail about coverage, sample design, and estimation methodology for the annual surveys may be found online at www.census.gov/estats. In addition, all current and prior reports, historical data tables, and past research papers are available at this same website.

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

2007 Economic Census – Manufacturing and ASM. “Value of Shipments” is the measure used in these surveys. It is the market value of all commodities shipped from a plant. 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.

Survey Methods

Annual Survey of Manufactures and the Economic Census - Manufacturing

The 2007 data were obtained from the Economic Census – Manufacturing. The manufacturing universe is comprised of approximately 320,000 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 2007 value of shipments did not have an opportunity to report e-commerce shipments.

The 2006 estimates of manufacturing shipments and e-shipments were derived from the 2006 ASM. In the ASM, data are

collected annually from a probability sample of more than 50,000 manufacturing plants with five or more employees. Data for plants with less than five employees 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 ASM questionnaires along with questions about such things as employment, payroll, value of shipments, cost of materials consumed, and capital expenditures. Information for nonresponding plants was 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 each plant the data were weighted by the reciprocal of the probability of the plant’s inclusion in the ASM sample. These estimates were then linked to the 2002 Economic Census results to reduce sampling and non-sampling errors.

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

The AWTS measures the economic activity of merchant wholesale firms with paid employees including manufacturers’ sales branches and offices. Merchant wholesale firms are those that take title to the goods they sell. Data are requested annually from about 8,700 merchant wholesale firms, including 1,200 MSBOs. These data are weighted to represent the universe of approximately 405,000 merchant wholesale establishments, of which 19,000 are MSBOs. Data for MSBOs were first collected with the 2003 AWTS for years 2002 and 2003.

The SAS measures activity of employer firms classified in nine service-related sectors: 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; Health Care and Social Assistance; Arts, Entertainment and Recreation; and Other Services. Data are tabulated annually from about 58,000 firms representing the universe of approximately three million establishments with paid employees.

The ARTS measures the economic activity of all retailers with and without paid employees. The sample contains approximately 26,000 firms with paid employees; roughly 21,000 that are classified in Retail Trade and 5,000 that are classified in Accommodation and Food Services. Sales for firms without paid employees are estimated using administrative records. The Retail Trade universe contains approximately 2.6 million firms. The Accommodation and Food Services universe contains approximately 700,000 firms.

For these three surveys, stratified random samples of firms were drawn from a sampling frame constructed using information from the 2002 Economic Census and updated with information from the Census Bureau's Business Register. The samples were subsequently updated to represent employer firms in business during 2007.

All wholesale, service, and retail firms surveyed were asked to report total and e-sales/e-revenue for 2007. Wholesalers were also asked to report e-sales made through EDI networks. Retailers in the Electronic Shopping and Mail-Order Houses industry were also asked to report total sales and e-sales for 2007 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 and sales size category.

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 estimates in this report have been adjusted using the results of the 2002 Economic Census to reduce sampling error

and to allow comparability with the census results. The corresponding estimates of e-sales/e-revenues have been modified accordingly to preserve their ratio to total sales as measured in the annual surveys.

Reliability of Estimates

Except for the 2007 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 1A through 6A 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 differs 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. Sampling variability measures for summary Appendix Table 7 are presented in respective sector Appendix Tables 1A, 2.0A, 2.1A, 4A, and 5A.

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 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. For ASM, we estimate sampling variances for estimates produced from the sample, but we do not use 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.

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.

Percentage of 2007 Total and E-commerce Sales Obtained from Reported Data

Survey	Total Sales	E-commerce Sales
Census - Manufacturing	87	86
AWTS	88	74
ARTS	94	87
SAS	89	73

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

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.

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E-Stats Reports

All *E-Stats* reports are available at www.census.gov/estats.

Future Reports

- Quarterly retail e-commerce data will be released August 17 and November 18, 2009.
- *E-Stats* for 2008 will be released in Spring 2010.

Prior Reports, Historical Data Tables, and Research Papers

All prior reports, historical data tables, and past research papers, are available at www.census.gov/estats.

Note to reader

E-commerce data are collected in five separate Census Bureau surveys. These surveys use different measures of economic activity—value shipments for manufacturing, sales for wholesale and retail trade, and revenues for service industries. Consequently, measures of total economic and e-commerce activity in this report should be interpreted with caution. Also, in *E-Stats* reports prior to 2007, Annual Wholesale Trade Survey is cited as the Annual Trade Survey.

The Census Bureau's e-commerce measures include the value of goods and services sold online whether over open networks such as the Internet, or proprietary networks running systems such as Electronic Data Interchange (EDI).

This report covers 2002 North American Industry Classification System (NAICS) industries that accounted for approximately 74 percent of the U.S. economic activity measured in the 2002 Economic Census. The report does not cover agriculture, mining, utilities, construction, agents, brokers, and electronic markets in wholesale trade, and approximately (one third) of service-related industries.

This edition of *E-Stats* revises 2006 data released in May 2008. See **Explanatory Notes** for information on report coverage, method, data reliability, and prior revisions. All reported changes between 2006 and 2007 reflect revised data for 2006.

The Census Bureau thanks all the businesses that participated in the surveys underlying this *E-Stats* report. Their cooperation and continued participation is vital to the future success of the programs that provide the business community and policymakers with relevant and accurate economic statistics.