## E-commerce 2009

- In 2009, e-commerce decreased in two of the four major economic sectors covered by the *E-Stats* report: Manufacturing and Merchant Wholesalers.

- In 2009, as in prior years, Manufacturers and Merchant Wholesalers relied far more heavily on e-commerce than Retailers or Selected Service businesses.

- In 2009, 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 (91 percent).

- Evidence from Merchant Wholesalers indicates that B-to-B e-commerce continues to rely overwhelmingly on proprietary Electronic Data Interchange (EDI) systems.

## Sector Highlights

This edition of E-Stats provides estimates of e-commerce activity in key sectors of the U.S. economy for 2009, revises previously released 2008 estimates, and places these estimates in historical context. Underlying data are collected in four separate surveys from manufacturing, wholesale, service, and retail businesses. The data show that in 2009:

- Manufacturers led all industry sectors, with e-commerce accounting for 42.0 percent ($1,862 billion) of total shipments.

- Merchant Wholesalers, including Manufacturing Sales Branches and Offices (MSBOs), ranked second, with e-commerce accounting for 23.4 percent ($1,211 billion) of total sales.

- Retailers' e-commerce sales increased by 2.1 percent. As a share of total retail sales, e-commerce sales was 4.0 percent ($145 billion), up from 3.6 percent ($142 billion) in 2008.

- E-commerce sales for Selected Service Industries, a special group of service industries created for the E-Stats report, increased by 2.2 percent. E-commerce accounted for 2.3 percent ($153 billion) of these industries' total revenues. In addition, a new Selected Service Industries total has been provided, which includes additional industries that have been published for the first time. This new series shows a total e-commerce sales of Selected Service Industries of $244 billion.
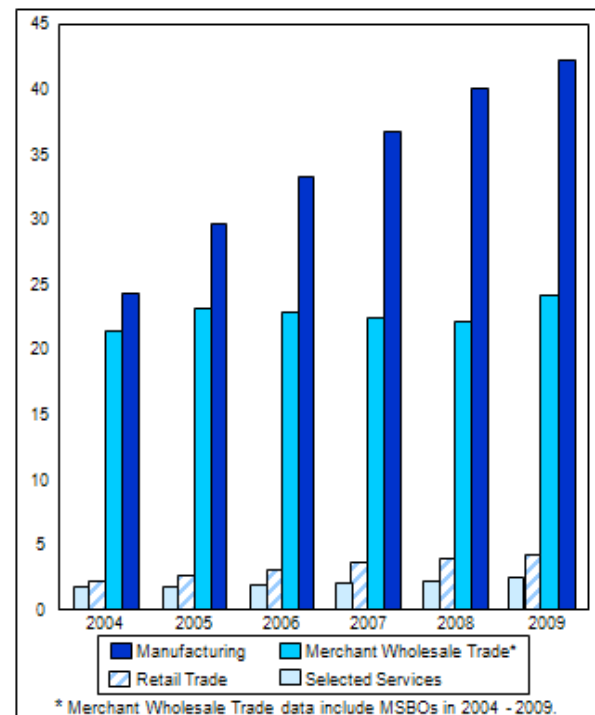
Sector data for 2009 and 2008 are the focus of the following section and are included in Appendix Tables 1-6. Appendix Table 7

**E-commerce as Percent of Total Value: 2004 - 2009**



* Merchant Wholesale Trade data include MSBOs in 2004 - 2009.

### U.S. Shipments, Sales, Revenues and E-commerce: 2009 and 2008
[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 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 2009 | | 2008 | | | | | |
| | Total | E-commerce | Total | E-commerce | Total | E-commerce | 2009 | 2008 |
| **Total \*** | **20,014** | **3,371** | **22,470** | **3,774** | **-10.9** | **-10.7** | **100.0** | **100.0** |
| **B-to-B\*** | **9,602** | **3,073** | **11,630** | **3,482** | **-17.4** | **-11.8** | **91.2** | **92.3** |
| Manufacturing | 4,436 | 1,862 | 5,468 | 2,171 | -18.9 | -14.2 | 55.2 | 57.5 |
| Merchant Wholesale | 5,166 | 1,211 | 6,162 | 1,311 | -16.2 | -7.6 | 35.9 | 34.7 |
| Excluding MSBOs[1] | 3,707 | 729 | 4,435 | 739 | -16.4 | -1.4 | 21.6 | 19.6 |
| MSBOs | 1,459 | 483 | 1,727 | 572 | -15.5 | -15.7 | 14.3 | 15.2 |
| **B-to-C\*** | **10,412** | **298** | **10,840** | **292** | **-3.9** | **2.1** | **8.8** | **7.7** |
| Retail | 3,638 | 145 | 3,953 | 142 | -8.0 | 2.1 | 4.3 | 3.7 |
| Selected Services | 6,774 | 153 | 6,887 | 150 | -1.6 | 2.2 | 4.5 | 4.0 |

\* 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.
[1] Manufacturers' Sales Branches and Offices

summarizes total and e-commerce business activity in the four major sectors from 2000 to 2009.

### *Sector Analyses*

- **Manufacturing**

E-commerce accounted for $1,862 billion of manufacturing shipments in 2009, down from $2,171 billion in 2008, an annual decrease of 14 percent (Appendix Table 1).

E-shipments were 42 percent of all manufacturing shipments in 2009, up from 40 percent in 2008. Across the sector, e-shipments were pervasive, accounting for at least 25 percent of total shipments in all 21 manufacturing subsectors. In 2009, e-shipments as a share of total shipments were largest in the Beverage and Tobacco Products group (59 percent) and Transportation Equipment (58 percent). Six manufacturing subsectors accounted for 70 percent of the sector's 2009 e-shipments: Transportation Equipment with 17 percent of all e-shipments ($313 billion); Chemical Products with 14 percent ($262 billion); Food Products at 14 percent ($260 billion);

Petroleum and Coal Products at 12 percent ($219 billion); Computer and Electronic Products at 7 percent ($134 billion); and Machinery Products at 6 percent ($116 billion). In 2008, these six subsectors accounted for 71 percent of total manufacturing e-shipments.

From 2008 to 2009, e-shipments grew in three manufacturing subsectors: Food Products (5 percent), Beverage and Tobacco Products group (4 percent), and Miscellaneous Products (3 percent).

Information included in this section, Appendix Tables 1 and 7, and the table on page 2 of this report was collected in the 2009 Annual Survey of Manufactures (ASM). The ASM is 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 $1,211 billion in 2009, down from a revised $1,311 billion in 2008—an annual decrease of 7.6 percent (Appendix Table 2.0).

E-sales were 23.4 percent of merchant wholesalers and MSBOs' combined total sales in 2009 (Appendix Table 2.0).

In 2009, e-sales accounted for 19.7 percent ($729 billion) of total sales for merchant wholesale excluding MSBOs (Appendix Table 2.1).

Information included in this section, as well as in Appendix Tables 2.0, 2.1, 2.2, 3.0, 3.1, 3.2, and 7, and the table on page 2 of this report was collected in the 2009 Annual Wholesale Trade Survey (AWTS), a survey of about 8,600 merchant wholesalers, including about 1,000 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 are shown in Appendix Tables 2.1 and 3.1, data for MSBOs are shown in Appendix Tables 2.2 and 3.2, and combined data are shown in Appendix Tables 2.0, 3.0, and 7.

Merchant wholesalers made use of the availability of e-commerce across all industries, with e-commerce counting for more than 6% of sales in 11 of the 15 merchant wholesale industry groups (excluding MSBOs) for which complete data for 2009 were publishable. Drugs and Druggists' Sundries Merchant Wholesalers conducted more than 70% of their business electronically. In value terms, in the 15 industries noted above, three industry groups accounted for 64.4 percent of total e-sales—Motor Vehicles and Automotive Equipment; Professional and Commercial Equipment and Supplies; and Drugs, Drug Proprietaries and Druggists' Sundries (Appendix Table 2.1).

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 2007 Economic Census, merchant wholesalers (including MSBOs) accounted for about 90.4 percent of the total sales of the wholesale trade sector. Wholesale agents, brokers, and electronic markets made up the remaining 9.6 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 3.0 shows that in 2009, EDI had a 70.9 percent share of merchant wholesalers' (including MSBOs) e-commerce activity. Appendix Table 3.1 shows that EDI accounted for 71.4 percent of e-commerce activity in 2009 for merchant wholesalers (excluding MSBOs) and Appendix Table 3.2 shows that EDI accounted for 70.2 percent of e-commerce activity in 2009 for MSBOs.

- **Retail Trade**

U.S. retail e-commerce sales reached $145 billion in 2009, up from a revised $142 billion in 2008—an annual gain of 2.1 percent. From 2002 to 2009, retail e-sales increased at an average annual growth rate of 18.1 percent, compared with 2.2 percent for total retail sales. In 2009, e-sales were 4.0 percent of total retail sales—up from 3.6 percent in 2008 (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 80.3 percent ($117 billion) and 11.8 percent ($17 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 2009, the leading merchandise category for e-sales within this industry was

Clothing and Clothing Accessories (including footwear) with $19.5 billion.

Online sales were less than 40 percent of total sales in only one of the 14 published merchandise lines (Drugs, Health Aids, and Beauty Aids). For the Electronic Shopping and Mail-Order Houses industry as a whole, e-sales accounted for 48 percent of total sales in 2009.

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 2011 will be released on August 16, 2011.

In the first quarter of 2011, unadjusted U.S. retail e-sales were $ 43.7 billion for the quarter. The estimate of total 2010 retail e-sales was $ 167.4 billion—4.3 percent of total 2010 retail sales. The most recent data are available at <www.census.gov/estats>.

- **Selected Service Industries**

E-commerce revenues in selected service industries were $153 billion in 2009, an increase of 2.2 percent over revised 2008 e-revenues of $150 billion. In 2009, as shown in Appendix Table 4, e-revenues accounted for 2.3 percent of total revenues in these industries.  From 2004 to 2009, e-commerce revenues in the sector increased at an average annual growth rate of 13.3 percent, compared with 4.0 percent for the total revenue of the selected services industries (Appendix Table 7).  In addition, a new Selected Service Industries total has been provided, which includes additional industries that have been published for the first time.  This new series shows a total e-commerce sales of Selected Service Industries of $244 billion.

Appendix Table 4 shows that three groups accounted for 27.9 percent ($68 billion) of the new total selected service e-revenues: Air Transportation, Publishing Industries (except Internet), and Securities and Commodity Contracts Intermediation and Brokerage.

The e-revenues share of total revenue was largest (28.3 percent) in the Air

Transportation industry group.

The two totals for selected service industries provided in Appendix Table 4 are not an official NAICS grouping, but rather the sum of groups detailed in the table footnotes.

Information in this section and in Appendix Table 4 and the tables on pages 1 and 2 of this report was collected in the 2009 Service Annual Survey, a survey of about 70,000 service businesses. 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 four surveys conducted by the U.S. Census Bureau:  the 2009 Annual Survey of Manufactures (ASM), the 2009 Annual Wholesale Trade Survey (AWTS), the 2009 Service Annual Survey (SAS), and the 2009 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 for 2009 data from the AWTS, SAS, and the ARTS are based on the 2002 NAICS. The 2009 ASM data are based on the 2007 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 four surveys:

*ASM.* "Value of Shipments" is the measure used in the 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.

## Survey Methods

### Annual Survey of Manufactures

The 2009 estimates of manufacturing shipments and e-shipments were derived from the 2009 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 ASM questionnaires along with questions about such things as employment, payroll, value of shipments, cost of materials consumed, and capital expenditures.  Data for non-responding 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 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 2007 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 8,600 merchant wholesale firms, including 1,000 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 11 service-related sectors: 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 tabulated annually from about 71,000 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 22,000 firms with paid employees; roughly 18,000 that are classified in Retail Trade and 4,000 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 2008.

All wholesale, service, and retail firms surveyed were asked to report total and e-sales/e-revenue for 2009. 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 2009 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 retail, wholesale, and services estimates in this report have been adjusted using final results of the 2007 Economic Census to reduce sampling error and to allow comparability with the census results.

## Reliability of 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 2009 Total and E-commerce Sales Obtained from Reported Data**

| Survey | Total Sales | E-commerce Sales |
|--------|-------------|------------------|
| ASM | 82 | 82 |
| AWTS | 86 | 79 |
| ARTS | 93 | 90 |
| SAS | 87 | 83 |

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 16 and November 17, 2011.
- *E-Stats* for 2010 will be released in mid-2012.

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 four 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 does not cover agriculture, mining, construction, agents, brokers, and electronic markets in wholesale trade.

This edition of *E-Stats* revises 2008 data released in May 2010. See **Explanatory Notes** for information on report coverage, method, data reliability, and prior revisions.  All reported changes between 2008 and 2009 reflect revised data for 2008.

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.