E-TAILING AND ITS PROSPECTS—GREAT EXPECTATIONS RECONSIDERED

by

Jeffrey L. Mayer *
Economic Programs Directorate
U.S. Bureau of the Census

CES 06-16 July 2006

Abstract

This paper attributes slower than predicted growth in e-commerce retailing to four factors: consumer resistance; the ability of traditional retailers to become multi-channel sellers; prudent official survey and classification practices; and perhaps the limited range of "pure-play" business models (*i.e*., retail models that rely mainly on electronic sales). Based on responses to the Census Bureau's Monthly Retail Trade Survey (MRTS) in the five fourth quarter periods from 2001 to 2005, the paper finds that e-commerce has claimed a small but rapidly growing share of U.S. retailing markets; and that pure play companies are still important drivers of this process. However, it also finds that the capacity of pure-play companies to continue in this role may be nearing its limits, and that the rate of continued growth in e-commerce retailing may depend on the business decisions of large, multi-channel sellers. Qualified researchers can access MRTS-based quarterly e-commerce data for 2001-2005 at the Census Bureau's Regional Data Centers.

Key words: e-commerce; retailing; pure-play retailing; Monthly Retail Trade Survey.

* The analysis and results in this paper have undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. The paper is released to inform interested parties of ongoing research and to encourage discussion of work in progress. Comments should be addressed to Jeffrey.L.Mayer@census.gov .

Introduction

E-commerce[1] retail ("e-tail") sales in the fourth quarter (4Q) of 2005—$26.6 billion, up 23.4 percent from 4Q 2004—continued a pattern of rapid year-over-year growth that has prevailed since 4Q 1999, when the data series was established.[2] Despite this growth, however, e-tail sales as a share of total retail sales remain relatively modest—2.6 percent in 4Q 2005, up from 2.3 percent in 4Q 2004.

Why has the e-tail share of retail sales grown more slowly than some early observers expected? And what seem to be its principal opportunities for future growth? Based partly on information from the Census Bureau's Monthly Retail Trade Survey (MRTS), this paper suggests some possible answers.

How this paper uses MRTS data: MRTS surveys a statistical sample of more than 12,000 retail firms with paid employees, including roughly 1530 firms that conduct at least some of their business on-line (*i.e.*, e-commerce firms).[3] Bureau statisticians weight survey responses to produce statistically valid estimates of U.S. total and e-commerce retail sales.

Because weighting increases the value of sales by some respondents to represent the experience of all similar firms, however, weighted MRTS data cannot be used to rank individual respondents according to the size of their conventional or e-commerce sales. Thus, the following analysis, which examines the performance of e-commerce companies ranked according to the size of their e-commerce sales, uses *unweighted* MRTS data. And results of the analysis, though based on a large and interesting aggregation of e-commerce companies, are not statistically representative.

Unweighted, e-sales of companies in the MRTS sample accounted for 71 percent of estimated total e-commerce retail sales in 4Q 2005; e-sales of the top 100 e-commerce companies in the survey accounted for 62 percent of estimated total e-commerce retail sales for the quarter. (Table 1.)

---

[1] E-commerce is the value of goods and services sold over an Internet, extranet, business-to-business Electronic Data Interchange (EDI) network, electronic mail, or other on-line system. Payment may or may not be made on-line.

[2] U.S. Census Bureau, *Quarterly Retail E-Commerce Sales, 4th Quarter 2005*. The Bureau's *Quarterly Retail E-Commerce* reports estimate total and e-commerce retail sales using both seasonally adjusted and unadjusted data. Totals and percentages in this paragraph are not seasonally adjusted. For more information, visit: www.census.gov/estats.

[3] Employer responses are supplemented with estimates for non-employers. In 4Q 2005, responding firms accounted for approximately 85 percent of the Census Bureau's MRTS-based e-commerce sales estimate. Technical detail on the MRTS is available at: http://www.census.gov/mrts/www/mrts.html.

Table 1:
UNWEIGHTED SAMPLE[1] COVERAGE OF STATISTICALLY ESTIMATED TOTAL AND E-COMMERCE RETAILING—4th QUARTER 2005

	Unweighted MRTS Sample ($billions)	Weighted MRTS Sample ($billions)	Unweighted Sales as a % of Weighted Sales		Census 4 Q 2005 Estimate of Total and E-commerce Retail Sales (not adjusted, in $billions)[2]	Unweighted Sales as a % of Census 4Q 2005 Estimate of Total and E-commerce Retail Sales	
			Total	Total E-com.		Total	Total E-com.
Total Retail Sales	614.4	1,122.3	54.7		1,009.5	60.9	
Total E-commerce Retail Company E-sales	17.5	24.5		71.4	26.6		65.8
Top 100 E-commerce Retail Company E-sales[3]	15.2			62.0			57.1

[1] This paper examines the reported and imputed sales of more than 12,000 retail companies, including about 1,530 e-commerce companies, surveyed in the Monthly Retail Trade Survey (MRTS) in the fourth quarter of 2005. For reasons explained in the body of the paper, the analysis looks primarily at unweighted MRTS data.
[2] Quarterly estimates of total and e-commerce retail sales published in the Census Bureau's *Quarterly Retail E-Commerce Sales* reports differ somewhat from the MRTS-based estimates used in this paper. The estimate of total sales in the *Quarterly* report is smaller than the MRTS-based estimate primarily because it excludes food service companies and weights firm births and deaths differently. The larger estimate of e-commerce sales in the *Quarterly* report reflects the benchmarking of MRTS responses to results of the Annual Retail Trade Survey and the 2002 Economic Census.
[3] E-commerce retail companies are retailers who do any retail business on-line. This paper ranks e-commerce retailers according to the size of their unweighted e-commerce sales.

Four Reasons for Slower-than-Expected Share Growth

One reason why the e-tail share of retailing has grown more slowly than some observers anticipated is that consumers were slower than expected to adjust to e-commerce sales environments—to forgo traditional person-to-person shopping experiences and overcome worries about security, delivery, and returns.

A second reason is the agility of traditional retailers. Instead of being swept away by a wave of new on-line companies, brick-and-mortar stores adapted, adding electronic selling to their marketing toolsets and contradicting expectations that e-tailing would quickly substitute for more traditional selling modes. In 4Q 2005, these multi-channel or "brick-and-click" retailers accounted for 74 percent of the total e-commerce receipts of the top 100 U.S. e-commerce retail companies.[4] (Noted in Table 3, on page 5, below.)

[4] In this paper, an e-commerce company is any retailer who concludes a sales agreement over an Internet, extranet, EDI network, electronic mail, or other on-line system. Payment may or may not be made on-line. The paper defines brick-and-click retailers as companies that do some, but less than 90 percent of their retail business on line. E-commerce retailers are ranked, based on unweighted MRTS data, according to the size of their e-commerce receipts.

A third reason may be confusion about which activities are included in e-tailing. The Census Bureau's approach to e-tail measurement leverages its existing programs. The approach has important advantages. It lets us work with our traditional data providers, which makes us more efficient and yields consistent and comprehensive results. It also lets us use conventional activity measures, industry definitions, and reporting units; so we can relate e-commerce data to existing data on business characteristics and performance. Using existing surveys to measure e-commerce also means that we are using established statistical methods and publicly available data to generate reproducible results; and that we are adding only slightly to the burden on respondents.[5] Because this approach relies on reports from sellers rather than buyers, however, its results may differ from private estimates based wholly or in part on the experience of buyers.

Also, in contrast to some private organizations, Census collects and reports e-commerce retailing data using the framework of the North American Industrial Classification System (NAICS). The NAICS retail sector includes virtually everything that economists normally understand as retailing; but it does not include several activities that some observers consider e-commerce retailing—*e.g.*, on-line purchases of stock and airline tickets. Census Bureau programs measure these purchases—indeed, we count them as e-commerce—but as service industry activities, not retailing.

A fourth possibility, examined in the following section, is that while leading "pure-play"[6] companies continue to be the fastest growing component of the e-commerce retail sector, the pure-play model, as an exclusive approach to retailing, is reaching maturity. If this is true, the future growth of e-commerce retailing may depend increasingly on the business choices of multi-channel retailers.

Why Should Anyone Care About the Growth of E-tailing? As a practical matter, the decision to add e-commerce questions to the 1999 and subsequent MRTS surveys was prompted by the generally recognized need for an official benchmark of e-commerce retailing to reconcile and supplant then wide-ranging private estimates. At a more general level, statisticians care about e-tailing because changes in the structure and operation of U.S. industries present classification and measurement challenges. To distinguish e-commerce retailing from other U.S. retailing, the Census Bureau had first to find a functional definition of e-commerce, then revise its survey instruments to measure transactions meeting that definition, and establish a new industrial category for recording the results.

---

[5] Using existing surveys also lets us develop a comprehensive picture of e-commerce. For example, the Bureau's annual *E-Stats* report, which is based on four surveys—the Annual Survey of Manufactures, the Annual Wholesale Trade Survey, the Service Annual Survey, and the Annual Retail Trade Survey—has shown quite large shares of e-commerce activity in manufacturing and wholesaling, while showing relatively small shares in of e-commerce activity in retailing and selected service industries. All *E-Stats* reports are available at: http://www.census.gov/estats.

[6] In this paper, "pure play" retailers are retail companies that close at least 90 percent of their selling transactions on-line.

Economists care about e-tailing because they believe that the movement to IT-based buying and selling may increase productivity and create new growth opportunities. Anecdotal evidence suggests, for example, that order values from multi-channel customers are higher than order values from single channel customers; and that this "halo effect" has been an incentive for retailers to provide integrated, multi-channel access to their wares. In addition, companies may benefit from reduced transaction costs, because on-line customers show themselves merchandise and manage their own accounts.[7]

MRTS data lend support to the view that e-tail leads growth in multi-channel retail companies**.** During 2001-05, total fourth quarter sales of non-pure play retailers in the top 100 e-commerce retail companies grew at an average annual rate of 9 percent, while fourth quarter sales of the e-commerce components of these companies grew at an average annual rate of 22 percent. (Table 2.)

Table 2:
BRICK-AND-CLICK (B&C) COMPANIES[1] AMONG THE TOP 100 E-COMMERCE RETAILERS[2] —4TH QUARTER TOTAL SALES *vs.* 4TH QUARTER E-COMMERCE SALES, 2001-2005
(Sales in $billions)

	2001	**2002**	**2003**	**2004**	**2005**	**Avg. Change 4Q/4Q 2001-05 (percent)**
B&C Companies—Total 4Q Sales	159.9	171.5	189.2	196.9	222.4	
Percent Change from Prior 4Q		7.2	10.3	4.1	12.9	**8.6**
B&C Companies' E-Com. Components —4Q Sales	5.1	6.6	7.9	9.5	11.3	
Percent Change from Prior 4Q		29.2	18.6	21.0	18.7	**21.9**

[1] In this paper, brick-and click companies are retailers who do some, but less than 90 percent of their retail business on-line.
[2] E-commerce retail companies are retailers who do any retail business on-line. This paper ranks e-commerce retailers according to the size of their unweighted e-commerce sales.

Caveat on e-tailing and growth: Readers should remember that while e-tailing is a growth leader in e-commerce retail companies, these companies—*i.e*., retailers who do *any* of their business on-line—account for only a fraction of all retail companies and 37 percent of all retail company sales (4Q 2005).[8]

---

[7] Angela Schorah of Zendor, an Internet consulting firm, reports that encouraging catalogue buyers to start using the Internet "generally results in a higher order value and lower returns rate." ERT Weekly (12/5/02) at: http://www.findarticles.com/p/articles.mi_m0KZC/is_2002_Dec_5/ai_96194829/print

[8] Estimated e-commerce company and total retail sales are based on a Census tabulation using weighted MRTS data. E-commerce companies accounted for 11 percent of the roughly 12,000 retail companies in

Sources of Current E-tail Growth

Despite the apparent advantages of multi-channel selling, pure-play companies are still a major source of overall growth in e-commerce retailing. Between 4Q 2001 and 4Q 2005, e-sales of pure-play retailers ranked in the top 100 e-commerce retail companies increased two-and-a-half fold; and the pure play share of e-commerce sales by top-100 companies increased from 24 percent to 26 percent. (Table 3.)

Table 3:
E-COMMERCE RETAIL COMPANY[1] RECEIPTS—
PURE-PLAYS[2] *vs*. BRICK-AND-CLICKS[3]

	4Q/2001			4Q/2005		
	Number of Companies in the Category	Total E-commerce Receipts ($billions)	Share of Total E-commerce Receipts of Companies in the Category (percent)	Number of Companies in the Category	Total E-commerce Receipts ($billions)	Share of Total E-commerce Receipts of Companies in the Category (percent)
Top-100 E-commerce Retailers--Total	100	6.8	100	100	15.2	100
Pure-Plays	18	1.6	24.2	15	3.9	25.8
Brick-and-Clicks	82	5.1	75.8	85	11.3	74.2
Top 20 E-commerce Retailers--Total	20	4.6	100	20	9.4	100
Pure-Plays	4	1.3	28.1	4	2.8	30.3
Brick-and-Clicks	16	3.3	71.9	16	5.9	69.7
Top 50 E-commerce Retailers--Total	50	5,9	100	50	13.2	100
Pure-Plays	8	1.4	24.4	10	3.7	28.0
Brick-and-Clicks	42	4.5	75.6	40	9.5	72.0
Bottom 50 E-commerce Retailers--Total	50	0.9	100	50	2.1	100
Pure-Plays	10	0.2	22.4	5	0.2	11.4
Brick-and-Clicks	40	0.7	77.6	45	1.8	88.6

[1] E-commerce retail companies are retailers who do any retail business on-line. This paper ranks e-commerce retailers according to the size of their unweighted e-commerce receipts
[2] In this paper, pure-plays are retail companies whose e-commerce receipts are at least 90 percent of their total receipts.
[3] In this paper, brick-and clicks are retail companies who do some, but less than 90 percent of their retail business on-line.

---

the 4Q 2005 MRTS sample. Because the sample is designed to produce statistically valid estimates of sales, not numbers of companies, however, this calculation is not a statistical representation of the actual number of e-commerce firms as a percentage of all U.S. retail companies.

The strength of pure-plays is apparent chiefly in the upper echelons of e-commerce retailers. In 4Q 2001 and 4Q 2005 alike, the top 20 e-commerce retail companies included four pure-plays. Moreover, between the two periods, pure-plays increased their share of top-20 e-commerce company e-sales from 28 percent to 30 percent. (Table 3.)

Simultaneously, the number of pure plays among the top 50 e-commerce retail companies increased from 8 to 10, and the pure-play share of top-50 e-commerce company e-sales increased from 24 to 28 percent.

Below the top echelons of MRTS e-commerce companies, however, pure-play e-tailing is less wide-spread and dynamic. Between 4Q 2001 and 4Q 2005 the number of pure plays among the e-commerce companies ranked 51 to 100 in the top 100 declined from 10 to 5, and the pure-play share of "bottom-50" e-sales fell from 22 to 11 percent. Thus, while the largest pure-play retailers have strengthened their position as e-commerce leaders, the ranks of smaller pure-plays that might grow to join them appear to be thinning.

Consistent with this pattern, pure-play retail activity is also highly concentrated. Table 3 shows that, in 4Q 2005, the four largest pure-play retailers accounted for 72 percent (and the 10 largest pure-plays 94 percent) of all sales by pure-play companies ranked among the top 100 e-commerce retailers.

A combination of high concentration and stability in the top group over time would lend support to the theory suggested at the beginning of this paper that the pure-play model may be nearing the limit of its applicable range. On the issue of stability, however, the evidence is mixed. Movement into and out of the upper ranks of pure-play retailers has been reasonably fluid. During one or another of the five 4Q-periods in 2001-2005, 19 different firms have ranked among the 10 largest pure-play retailers; while 7 have ranked among the top 4. Since 4Q 2002, however, only 5 companies have ranked among the top 4.[9]

Prospects for Continued Growth

If not pure-play companies, who will lead the continued growth of e-commerce retailing? Part of an answer may take the form of a select group of multi-channel sellers that seem to have the capacity, the will, and the economic incentive to carry the process forward. These are large and growing retailers (*i.e.*, as defined here, companies with 4Q 2005 receipts greater than *both* $1 billion and the company's 4Q 2001 receipts), whose e-commerce receipts in 4Q 2005 were less than 10 percent of the company's total fourth quarter receipts.

Eight top-100 e-commerce retail companies met these criteria in 4Q 2005. Over the 2001-05 period, total fourth quarter receipts for this group increased year-over-year at an

[9] Based on Census tabulations of unweighted MRTS data.

average rate of 8 percent. In contrast, over the same period, fourth quarter receipts of the e-commerce components of these companies increased at an average rate of 44 percent.

As in the past, future e-tail growth may also be product-driven. A review of annual Census Bureau *E-Stats* reports shows that, between 2000 and 2004 (the last year for which data are available), the scope of substantial e-tail purchasing from Electronic Shopping and Mail Order House (ESMOH) retailers expanded and the composition of purchases markedly changed. In 2000, the e-tail share of total ESMOH sales was 20 percent. Merchandise categories with the highest percentage e-sales were Books and magazines, at 49 percent, and Computer software and Electronics and appliances, both at 31 percent.[10] No other merchandise category recorded e-sales above 30 percent.

In 2004, by contrast, the e-tail share of total ESMOH sales was 36 percent, and on-line sales accounted for large shares of ESMOH selling in 13 of the 14 reported merchandise categories. Books and magazines and Computer software remained among the leaders (at 55 percent and 35 percent respectively). But e-tail shares of Computer hardware sales had increased from 23 to 35 percent; of Electronics and appliances sales from 31 to 59 percent; of Toys and hobby goods from 27 to 45 percent; and of Music and videos, from 29 to 50 percent. In Office equipment and supplies, e-tail shares had more than doubled—from 21 to 53 percent. And in Clothing and accessories and Furniture and home furnishings, they had more than tripled—from 14 to 43 percent, and from 13 to 49 percent.

Conclusion

Contrary to initial expectations, e-tailing has not overwhelmed more traditional, store-based selling modes; but it has claimed a small and rapidly growing share of U.S. retailing markets. Pure play companies are still important drivers of this process. However, analysis suggests that their capacity to continue this role may be nearing its limits, and that the rate of continued growth in e-commerce retailing may depend on the business decisions of large, multi-channel sellers.

Qualified researchers can access MRTS-based quarterly e-commerce data for 2001-2005 at the Census Bureau's Regional Data Centers. Guidance on designing research proposals and accessing these data is provided at: www.ces.census.gov.

[10] Calculations in this and the following paragraph are from the Census Bureau's March 2002 and May 2006 *E-Stats* reports, Table 6. The decision rules that determine what to include in the ESMOH industry group result in almost all the e-sales of brick-and-click retailers being included in this category, which in turn reduces the e-sales shown in other retail groups. The exception to this rule is brick-and-click motor vehicles dealers whose on-line sales are shown in the Motor Vehicles and Automotive Equipment group.