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The New Cottage Industry— Forecasting Internet Retail Sales

A guide to understanding how the projections are being calculated and why they differ so greatly

Hardly a week goes by without at least one new announcement in the media of a fresh on-line retail sales forecast. Often it is not even a forecast but rather a “backcast,” wherein the company concerned revises a previous estimate of what happened in the past. Whether they are looking forward, backward or at the present, one thing that all of these estimates seem to have in common is a propensity to exceed the previous ones, sometimes by an order of magnitude.

Of course, estimation error and revisions to forecasts and historical data are commonplace in business and economics. However, in the majority of cases where reputable statistics are produced, there are long-established sampling techniques and sufficient historical experience to ensure that errors and revisions are kept within acceptable limits. (By “acceptable,” we mean that the information is sufficiently reliable that a reasonable person could use it as serious input into a business decision.)

The world of on-line retailing presents a new challenge because, in order to make estimates of present and future sales, it is necessary to make numerous assumptions about things like technology penetration and consumer behavior, which do not have to be made in the case of conventional retailing. For example, a forecast of Internet sales in the year 2002 depends partly (and crucially) on a prediction of how many people will have computers hooked up to the Internet

by then and how many of those people will be “shopping around” at home—which, in turn, is based on a segmentation of consumers into various demographic and psychographic groups. It also might depend on technological factors such as how many homes have access to broadband connection speeds that enable rapid download of World Wide Web pages. Another well-publicized obstacle to consumer acceptance of Internet retailing is the security of transmitting credit card information—the rate at which consumer perceptions about this change will also have a significant effect on the growth trajectory.

Forecasters don’t need to make assumptions about these things for conventional retailing because almost every person in society has some kind of access to, and dependence on, bricks-and-mortar retail outlets. Given the additional challenges facing Internet sales forecasters, it’s not surprising that the estimates of Internet retailing vary widely (sometimes wildly) between the estimating companies. Even the revisions made by one company to its own estimates can often be astronomical.

When estimates of Internet retail sales bear no logical resemblance to one another, as is too often the case, it raises the legitimate question of whether such estimates have much more than novelty value. At the very least, it should provoke some



serious critical scrutiny of the methods used to arrive at these projections. As an industry, the shopping center community urgently needs to have good information about the future of Internet retailing, not just so that it can prepare itself to meet a competitive challenge, but also so that it can take full advantage of the opportunity that the Internet provides to channel information to its bricks-and-mortar customers.

The reader should note that all of the numbers provided in this article are available in the public domain—from press reports, individual company reports and press releases. The list

of projections in Table 1 is not exhaustive and ICSC is not responsible for omissions. However, a good faith attempt has been made to include projections from a variety of sources and to ensure that these projections are recent. (Since companies making Internet sales forecasts tend to revise them so frequently, it is possible that some of the numbers reported here will already have been updated by the time this article is published.)

This article briefly outlines common methods for deriving projections of on-line sales and compares basic on-line retail statistics provided by various companies, a sample of which is

Table 1

ESTIMATES OF INTERNET USAGE AND ON-LINE SALES									
Item	Company	Web Address	1997	1998	1999	2000	2001	2002	2003
U.S. Internet users (mil.)	eMarketer	www.emarketer.com	34.2	54.3	62.3	70.9	77.6	95.1	
	Cyber Dialogue	www.cyberdialogue.com	41.5	51.7	61.7	71.8	82.3		
	Jupiter Communications	www.jup.com		63.3	76	87.3	98.7	116.3	
U.S. Internet-using households (mil.)	ZD Market Intelligence	www.zdintelligence.com	23						
	Piper Jaffray	www.piperjaffray.com	15				34		
North American Internet users (mil.)	CommerceNet/Nielsen	www.commerce.net	58	78					
	Forrester Research	www.forrester.com		51	66	85	99		
Worldwide Internet users (mil.)	International Data Corp.	www.idcresearch.com	69	100				320	
	eMarketer	www.emarketer.com	36	67	92	106	127	142	
Worldwide users buying on-line (mil.)	International Data Corp.	www.idcresearch.com	18					128	
U.S. on-line "shoppers" (mil.)*	eMarketer	www.emarketer.com	19.1	33.1	41.7	50.4	56.7	72.3	
North American on-line "shoppers" (mil.)*	CommerceNet/Nielsen	www.commerce.net	35	48					
U.S. on-line purchasers (mil.)	eMarketer	www.emarketer.com	6.8	16.8	36.1	44.0	51.2	63.7	
	Cyber Dialogue	www.cyberdialogue.com	11.2	15.5	21.6	28.0	35.4		
	International Data Corp.	www.idcresearch.com				46.0			
U.S. households purchasing on-line	ZD Market Intelligence	www.zdintelligence.com	10						
	Odyssey Ventures		7						
	Piper Jaffray	www.piperjaffray.com	2.9				16.7		
North American on-line purchasers (mil.)	CommerceNet/Nielsen	10	20						
U.S. electronic commerce revenues (\$ bil.)**	eMarketer	www.emarketer.com		20				300	
	Zona Research	www.zonaresearch.com	10.4	31.3	71.3	134.5	204.1		
	International Data Corp.	www.idcresearch.com						250	
U.S. consumer on-line sales (\$ bil.)	eMarketer	www.emarketer.com	1.6	3.8	6.4	11.8	17.4	27.2	
	Forrester Research	www.forrester.com		7.8					108
	Jupiter Communications	www.jup.com		5.8	9.9	15.6	24.5		
	Marketing Corp. of America	www.interpublic.com		14.5					
	International Data Corp.	www.idcresearch.com		11.5		16.1			
	Yankee Group	www.yankeegroup.com		7.2					
	Datamonitor	www.datamonitor.com						12.5	
	Cyber Dialogue	www.cyberdialogue.com	3.3	6.2	10.8	16.8	24.8	34.7	
	BancAmerica Rob. Stephens	www.bankamerica.com		6.2					
	Morgan Stanley	www.ms.com		6.5					
North America consumer on-line sales (\$ bil.)	Gartner Group	gartner5.gartnerweb.com		6.1					
	Volpe Brown Whelan	www.vwco.com		6.0					
	Forrester Research***	www.forrester.com		4.8	7.9	12.1	17.4		
U.S. consumer on-line sales - Computer prod. (\$ mil.)	Boston Consulting/Shop.org	www.shop.org		13.0					
	eMarketer	www.emarketer.com	690	1,650	2,380	3,640	4,910	6,670	
U.S. consumer on-line sales - Travel (\$ mil.)	Jupiter Communications	www.jup.com		1,989		5,050		10,534	
	BancAmerica Rob. Stephens	www.bankamerica.com		2,137		5,805			
	eMarketer	www.emarketer.com	560	1,360	2,460	4,350	6,510	8,140	
U.S. consumer on-line sales - Books (\$ mil.)	Jupiter Communications	www.jup.com	910	1,841		4,590		11,700	
	BancAmerica Rob. Stephens	www.bankamerica.com		1,458		3,996			
	eMarketer	www.emarketer.com	160	560	690	840	1,230	1,450	
U.S. consumer on-line sales - Entertainment (\$ mil.)	Jupiter Communications	www.jup.com		216		725		2,200	
	BancAmerica Rob. Stephens	www.bankamerica.com		287		911			
U.S. consumer on-line sales - Music (\$ mil.)	eMarketer	www.emarketer.com	60	160	520	1,120	2,120	5,130	
U.S. consumer on-line sales - Music (\$ mil.)	eMarketer	www.emarketer.com	30	160	220	390	710	1,250	
	Jupiter Communications	www.jup.com		81		380		1,148	
	BancAmerica Rob. Stephens	www.bankamerica.com		125		671			



provided in Table 1. It is also important to understand some fundamental differences between the estimates about which a “consumer” of these projections should be aware at the very outset. They are described in “Understanding the Estimates,” on page 4.

VOODOO NUMBERS?

It is not unusual to become confused by the steady stream of apparently conflicting estimates. Here are some illustrations to make the point:

- Forrester Research, a firm in Cambridge, Massachusetts, is one of the most widely quoted

sources of information on World Wide Web retailing. In October 1997, Forrester estimated \$17.4 billion in Internet retail sales in the year 2001.¹ However, a year later Forrester was reported to be projecting Internet retail sales to reach \$108 billion in the year 2003.²

- Forrester also announced that Internet sales in 1998 would be \$7.8 billion, which represented an upward revision of about 63% from its previous estimate of \$4.8 billion (and a more than threefold increase from its estimate before that).

Table 1 (cont.)

ESTIMATES OF INTERNET USAGE AND ON-LINE SALES (CONT.)									
Item	Company	Web Address	1997	1998	1999	2000	2001	2002	2003
U.S. consumer on-line sales - Apparel (\$ mil.)	eMarketer	www.emarketer.com	30	70	190	400	720	1,210	
	Jupiter Communications	www.jup.com		71		443		1,926	
	BancAmerica Rob. Stephens	www.bankamerica.com		137		361			
U.S. consumer on-line sales - Gifts/Flowers (\$ mil.)	eMarketer	www.emarketer.com	130	220	330	710	760	1,170	
	Jupiter Communications	www.jup.com		219		587		1,381	
	BancAmerica Rob. Stephens	www.bankamerica.com		231		559			
U.S. consumer on-line sales - Food/Drink (\$ mil.)	eMarketer	www.emarketer.com	70	150	640	2,270	3,420	7,070	
	Jupiter	www.jup.com		270		1,872		6,557	
	BancAmerica Rob. Stephens	www.bankamerica.com		112		304			
	Yankee Group	www.yankeegroup.com		70		1,900		6,400	
Business-to-business electronic commerce (\$ bil.)	eMarketer	www.emarketer.com	5.6			140		268	
	International Data Corp.	www.idcresearch.com				153			
	Yankee Group	www.yankeegroup.com				134			
	Forrester	www.forrester.com				66.5			
Worldwide consumer on-line sales (\$ bil.)	eMarketer	www.emarketer.com	1.8	4.5	7.7	14.8	22	35.3	
	Datamonitor	www.datamonitor.com						16	
	Phillips Tarifica	www.tarifica.com	0.7 - 5.0						60****
	Yankee Group	www.yankeegroup.com	2.7			10			
	Forrester	www.forrester.com	2.4			12.1			
	Legg Mason Wood Walker	www.leggmason.com	1.6	4.1	8.1	13.9	20.7	28.5	
	BancAmerica Rob. Stephens	www.bankamerica.com	3.6			16			
	Jupiter Communications	www.jup.com	2.6			17		41	
	Gartner Group	gartner5.gartnerweb.com				20			
	Cowles/Simba	www.simbanet.com	5.6			22.2		44.1	
	International Data Corp.	www.idcresearch.com	4.3			26.8		54.0	
	Morgan Stanley	www.ms.com	2			32			
	Price Waterhouse	www.pw.com	5					94	
	Worldwide electronic commerce revenues (\$ bil.)	Forrester Research	www.forrester.com						
eMarketer		www.emarketer.com	7.4					303.3	
1998 On-line holiday sales (\$ bil.)	International Data Corp.	www.idcresearch.com						400	
	Jupiter Communications	www.jup.com		2.3					
	Cyber Dialogue	www.cyberdialogue.com		2.0					
	Forrester Research	www.forrester.com		3.5					
	International Data Corp.	www.idcresearch.com		3.4					
	Boston Consulting/Shop.org	www.shop.org		4.4					
	Yankee Group	www.yankeegroup.com		2.6					
	Marketing Corp. of America	www.interpublic.com		5					

*On-line shopper defined as browser who may or may not make a purchase.

**Electronic commerce includes business-to-consumer and business-to-business sales.

***These estimates for Forrester are still widely cited despite their apparent revision by the company in November 1998, leading to the new estimates for the U.S. that appear in the table under “U.S. consumer on-line sales.”

****Figure is for the year 2005.

Sources: Company reports and press releases; eMarketer’s “eCommerce Retail Shopping Report (Part 1)”; Greenstein, Jennifer, “How Many? How Much? Who Knows?” in *Brill’s Content*, November 1998, pp. 54-58.

¹ Greenstein, Jennifer, “How Many? How Much? Who Knows?” in *Brill’s Content*, November 1998, pp. 54-58.

² “Forrester: Growth Spiral in Online Retail Sales Will Generate \$108 Billion in Revenues by 2003,” *Business Wire*, Nov. 19, 1998.

- Also in November 1998, Boston Consulting Group announced its estimate of \$13 billion for 1998 Internet retail sales—a 66% difference from Forrester’s most recent prediction. Both of these numbers were higher than those of two competitors: Jupiter Communications and eMarketer, whose estimates came in at \$5.8 billion and \$3.8 billion, respectively.³
- Phillips Tarifica—a European telecommunications consulting firm—estimated in 1998 (with some confidence, one may assume) that worldwide Internet retail sales amounted to between \$700 million and \$5 billion in 1997—that is, \$2.15 billion plus or minus 67%. Despite this wide margin of error in estimating 1997 sales, the company was not deterred from predicting on-line sales for the year 2005, which it put at \$60 billion.⁴
- Jupiter Communications estimated 1997 worldwide consumer on-line revenues of \$2.6 billion, compared with a \$4.3 billion estimate by International Data Corporation (IDC) and a \$5 billion estimate by Price Waterhouse. The three firms diverged so drastically in their forecasts that for the year 2002 Jupiter predicted sales of \$41 billion, IDC predicted \$54 billion and Price Waterhouse forecast \$94 billion.⁵
- There were a number of widely publicized estimates of on-line sales for the 1998 holiday season, including Boston Consulting Group at \$4.4 billion, Forrester Research at \$3.5 billion, Jupiter Communications at \$2.3 billion and eMarketer at \$1.1 billion.

To be fair to the originators of these estimates, it is very difficult to predict the growth path of a new technology when there are so many unknowns. However, the sheer magnitude of the differences between projections highlights the need for a careful scrutiny of the methods used to calculate them.

UNDERSTANDING THE ESTIMATES

There are at least seven basic questions about an on-line sales estimate—six definitional and one

methodological—that the reader should be able to answer in order to interpret it properly:

- How is “on-line sales” defined?
- How is “Internet user” defined?
- What does it mean to “shop on-line”?
- Does the estimate include only business-to-consumer sales, or does it also include business-to-business sales?
- If it is only business-to-consumer sales, then what products are included?
- What is the geographic coverage—is the estimate for the United States only, or for North America, or worldwide?
- Does it employ a demand-side or a supply-side approach? Both or neither?

There is no single definition of what constitutes *on-line sales*, and different companies apply different standards. The strictest and most unambiguous definition is that the transaction must be concluded over the Internet, with the order placed and payment made. Few companies use this standard. The next level is when the consumer researches a product on-line and is given the option of paying on-line, but elects instead to call the retailer to provide credit card or other payment information. The least strict definition requires that the product simply be researched on-line.

How the term *Internet user* is defined is critically important because many sales projections are based initially on an estimate of the number of users, which is then used to calculate the number of Internet “shoppers,” and, from there, the number of purchases made in a given time period. This figure can then be multiplied by an estimated average expenditure per purchase to derive a final sales figure.

Forrester Research defines an Internet user as anyone 18 years and older who has used the Internet three times in the last three months, while eMarketer defines a user as anyone who logs on at least once a week and is on-line for at least two hours per week. Jupiter Communications, on the other hand, has a looser definition, defining a user as anyone who has logged on during the past year. As Table 1 indicates,

³ www.eMarketer.com, November 23, 1998.

⁴ *International Journal of Retail & Distribution Management*, June-July 1998, V. 26 No. 6-7, p. 260(2).

⁵ eMarketer, “Retail Shopping Report,” November 1998, p. 14.

this difference in assumptions can result in significantly different numbers.

Shopping on-line is another ambiguous phrase that needs to be clarified. Usually, it means that the consumer is browsing and researching, but no actual purchase is required.

Business-to-consumer sales is the retail piece of electronic commerce. However, by far the largest piece of total on-line revenue is (and will be in the future) *business-to-business sales*. For example, Intel recently announced that its monthly sales on the Internet had reached \$1 billion dollars—that would all be classified as business-to-business sales because the buyers are computer manufacturers and not retail customers. As mentioned above, Forrester estimates business-to-consumer sales of \$108 billion in the year 2003 and total electronic commerce revenues at between \$1.4 and \$3.2 trillion in that year.

Some companies include products that are not retail items. For example, the study by Boston Consulting Group (see above) included on-line brokerage fees and various other kinds of fees and revenues that are not included in conventional retail sales.

It is also important to understand the *geographic coverage*. Some estimates are for the United States only but others include Canada (such as CommerceNet/Nielsen's estimates of the number of on-line shoppers and purchasers; see Table 1) and many projections are worldwide in scope.

ESTIMATION METHODS

Serious estimates of on-line retail sales usually involve either or both of two data collection methods: supply-side and demand-side. Supply-side projections are derived from surveying on-line retailers themselves about their past, current and expected revenues. Boston Consulting Group used this approach exclusively. Early projections by Forrester Research and Jupiter Communications also relied exclusively on retailer interviews.

Demand-side projections are built from consumer surveys that capture information about technology penetration and on-line shopping behavior. Cyber Dialogue uses this approach.

Some companies employ a hybrid methodology, whereby demand and supply-side approaches are used to supplement each other. Forrester Research and Jupiter Communications derive their predictions in this manner. Meanwhile,

eMarketer also uses a hybrid method, although it is based on a synthesis of existing data collected by other companies.

Supply-side method. Until fairly recently, companies relied heavily on this method of gathering data. They simply conducted interviews with on-line retail executives to arrive at estimates for individual merchandise categories, and then totaled them up. For example, Forrester Research interviewed 52 on-line retailers for its October 1997 estimates, which the company believed accounted for roughly three-fourths of the total on-line market at that time. Meanwhile, Jupiter Communications reportedly interviewed 237 companies that accounted for 90% of on-line sales for its November 1997 estimates.⁶

For its November 1998 projections, Forrester said that it interviewed 100 on-line retailers, although this was supplemented with data drawn from large-scale consumer surveys. (Forrester mailed surveys to 120,000 households in the United States and Canada.)⁷ Boston Consulting Group used an exclusively supply-side approach in its 1998 study, interviewing 127 on-line retailers about their expected 1998 revenues.⁸

This is the conventional means of collecting sales data—asking from the retailers themselves. Although it works reasonably well for estimates of current on-line retail activity, it is dangerous for forecasting because it depends upon retailers' own revenue estimates going forward. This is why some on-line forecasting companies use demand-side analysis to augment their supply-side data. (See below.)

Demand-side method. Demand-side procedures involve surveying consumers themselves to determine current buying habits and intentions. A typical approach might involve asking consumers questions that seek to establish, for various demographic and psychographic segments of the population, the following information:

- How many are connected to the Internet?
- How many of them shop on-line and with what frequency?
- How many of these on-line shoppers actually purchase on-line, and with what frequency?

⁶ Greenstein, Jennifer, *Ibid.*

⁷ *Business Wire*, November 19, 1998.

⁸ Company press release, November 18, 1998.



- What kinds of merchandise (or services) are purchased, and why?
- What is the average expenditure per purchase?
- What would induce those who shop on-line but don't purchase anything to actually do so (e.g., more secure payment methods)?

By overlaying these survey data on to projections about technology penetration, demographic trends, and even the historical rate of adoption of "comparable" retail formats such as catalogs and TV shopping channels, expenditures by consumer segment and merchandise category are then extrapolated. However, there are a number of huge assumptions that need to be made about such things as technology adoption, the psychology of the consumer and even public policy toward the Internet, since government intervention or non-intervention in the form of tax policy and infrastructure investment will either encourage or hamper Internet development.

As a different position taken by forecasters on any one of these assumptions has the potential to create extremely divergent

outcomes, it is not really surprising that we have the profusion of inconsistent forecasts appearing in the media every day.

CONCLUSION

Clearly, the tools available for making on-line retail sales forecasts are not quite up to such a difficult job, even when they are used judiciously. However, the moral of this story is not that the tools are poor and so the numbers are unusable. In fact, quite the opposite: One thing that virtually all of the estimates have in common is that even the lowest numbers are big enough to make Internet retailing a significant competitor of conventional retail formats. Rather than dismissing the numbers as self-interested hype, it is important to understand what is behind them, to distinguish between the irresponsible and the conscientious, and to develop better models for predicting the growth path of this technology.

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