Equity Research
North America

Industry

Technology

Mary Meeker
+1 (1)212 761 8042
mary.meeker@morganstanley.com
Brian Fitzgerald
+1 (1)212 761 4276
brian.fitzgerald@morganstanley.com

Quarterly

December 16, 2002

Technology Companies: Current Landscape — CQ3:02

MSCI SECTOR	INFORMATION TECHNOLOGY
US Strategist Weight	15.2%
S&P 500 Weight	15.2%

MORGAN STANLEY US TECHNOLOGY TEAM

Computer Services & IT Consulting
david.togut@morganstanley.com
julie.santoriello@morganstanley.com
elizabeth.vigano@morganstanley.com

Electronics Manufacturing Services
scott.craig@morganstanley.com

Enterprise Software
charles.phillips@morganstanley.com
ryan.rathman@morganstanley.com

Enterprise Storage
james.berlino@morganstanley.com
april.henry@morganstanley.com

Imaging Technology
solin.cho@morganstanley.com

Internet & PC Applications Software
mary.meeker@morganstanley.com
david.joseph@morganstanley.com

Semiconductors
mark.edelstone@morganstanley.com
louis.gerhardy@morganstanley.com

Semiconductor Capital Equipment
steven.pelayo@morganstanley.com
bill.lu@morganstanley.com

Systems & PC Hardware
rebecca.runkle@morganstanley.com
stirling.levy@morganstanley.com

Wireline/Wireless Networking Equipment
alkesh.shah@morganstanley.com
arindam.basu@morganstanley.com

- **This report recaps our December 6 CIO Conference presentation** At Morgan Stanley's annual Chief Information Officer (CIO) conference and Technology Teach-In we delivered a presentation called 'Technology Companies: Current Landscape — CQ3:02'. An expanded version of the presentation is included in this report.

- **The presentation was created to update the CIOs on key datapoints** that illustrate technology-related demand and pricing trends; revenue/earnings and stock market trends for technology companies; and general trends in the capital markets. It also includes an overview of the importance of founders/entrepreneurs in driving successful technology companies.

- **We plan to enhance and add to the datapoints in this report** on an ongoing basis. As always, the Morgan Stanley technology research team appreciates your input.

Note: All of Morgan Stanley's technology research reports are available on the Internet through Client Link on www.morganstanley.com. If you wish to receive this service, please contact your institutional sales rep. This report (along with other technology overview reports) can also be downloaded from www.morganstanley.com/institutional/techresearch/

Technology Companies

Current Landscape – CQ3:02

Mary Meeker

December 2002

Morgan Stanley

Morgan Stanley US Technology Team

Semiconductors:
Mark Edelstone (*mark.edelstone@morganstanley.com*) (415) 576-2381
Louis Gerhardy (*louis.gerhardy@morganstanley.com*) 2391

Computer Services & IT Consulting:
David Togut (*david.togut@morganstanley.com*) (212) 761-6388
Julie Santoriello (*julie.santoriello@morganstanley.com*) 8582
Elizabeth Vigano (*elizabeth.vigano@morganstanley.com*) 7339

Electronics Manufacturing Services:
Scott Craig (*scott.craig@morganstanley.com*) 4967

Imaging Technology:
Solin Cho (*solin.cho@morganstanley.com*) 6140

Enterprise Storage:
James Berlino (*james.berlino@morganstanley.com*) 7582
April Henry (*april.henry@morganstanley.com*) 4669

Internet & PC Applications Software:
Mary Meeker (*mary.meeker@morganstanley.com* (212) 761-8042
David Joseph (*david.joseph@morganstanley.com)* 3365

Enterprise Software:
Chuck Phillips (*charles.phillips@morganstanley.com)* 4450
Ryan Rathman (*ryan.rathman@morganstanley.com)* 6377

Wireline/Wireless Networking Equipment:
Alkesh Shah (*alkesh.shah@morganstanley.com)* 6554
Arindam Basu (*arindam.s.basu@morganstanley.com)* (415) 576-2329

Systems & Enterprise Hardware & PC Hardware:
Rebecca Runkle (*rebecca.runkle@morganstanley.com*) (212) 761-6466
Stirling Levy (*stirling.levy@morganstanley.com*) 6430

Semiconductor Capital Equipment:
Steven Pelayo (*steven.pelayo@morganstanley.com*) (415) 576-2324
Bill Lu (*bill.lu@morganstanley.com*) 2608

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- **Trends**
- Revenue & Earnings
- Stock Market
- Capital Markets
- Common Themes of Great Tech Companies

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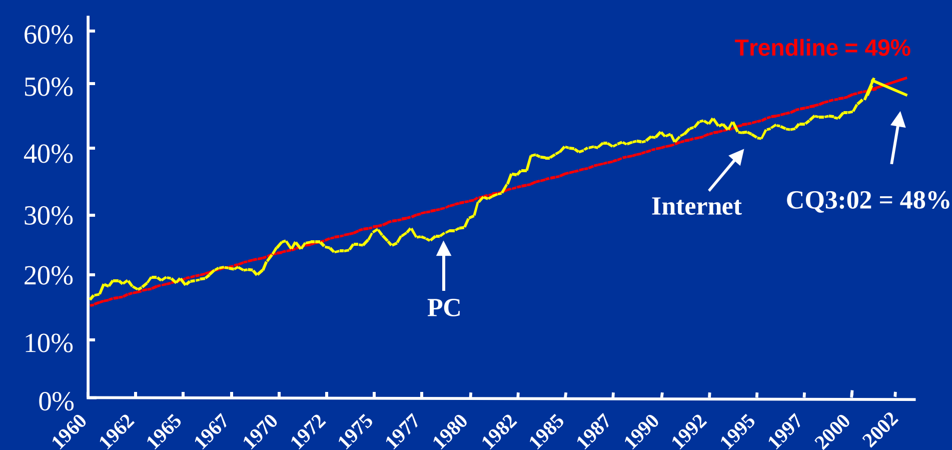
Tech Has Become Large Part Of The Economy…But Relative Impact Has Ebbed…

U.S.-Based IT % of Nominal Business Capital Equipment Spending



Source: Morgan Stanley Research; Data as of 12/06/02; HAVER series

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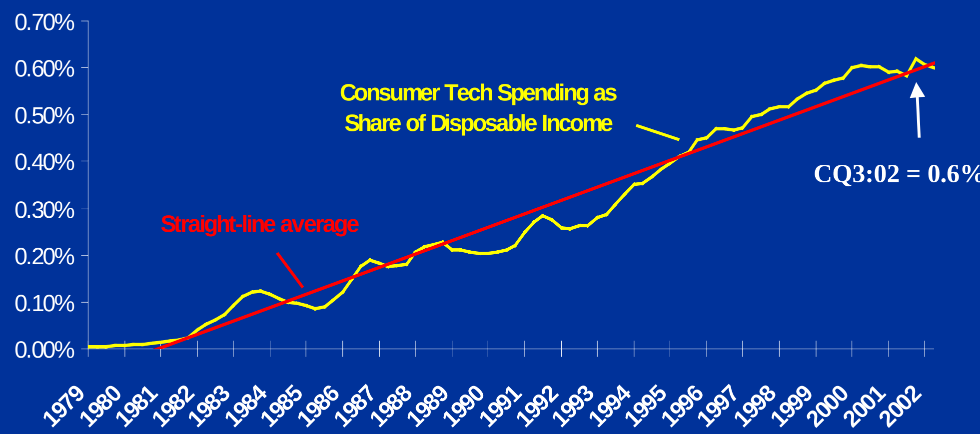
Consumer Tech Spending Remains Solid…But Relative Impact Has Ebbed



Source: Morgan Stanley Research; Data as of 12/06/02; HAVER series

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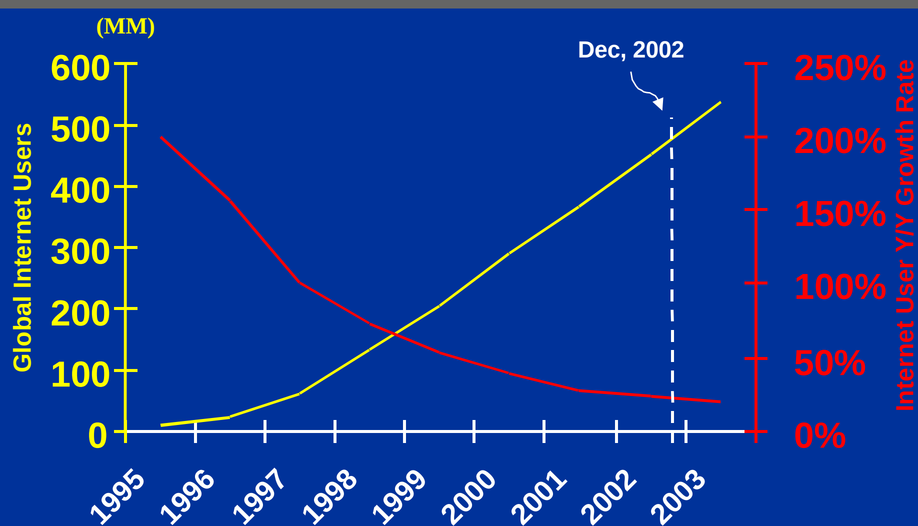
Internet Growth Rate Expectations Were Out of Line Though Absolute Numbers are Huge



Source: Morgan Stanley Research

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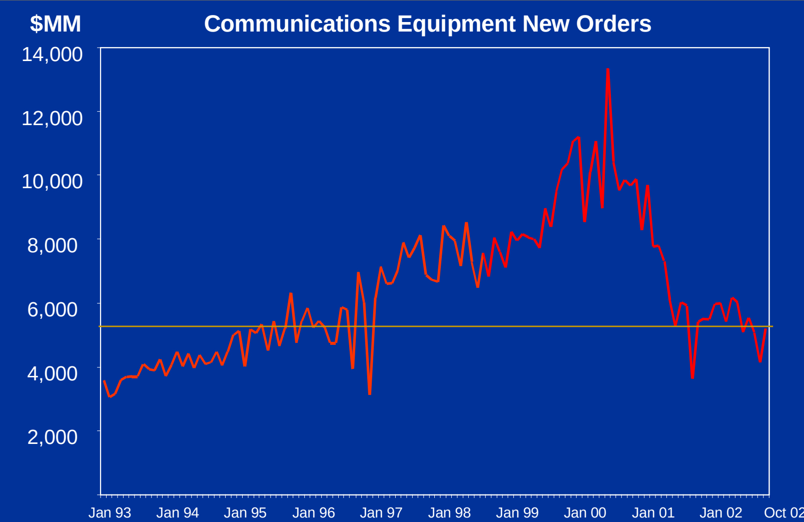
Communications Equipment New Orders -- Now Near 1995-1997 Levels



Source: Morgan Stanley Research – Alkesh Shah, U.S. Department of Commerce

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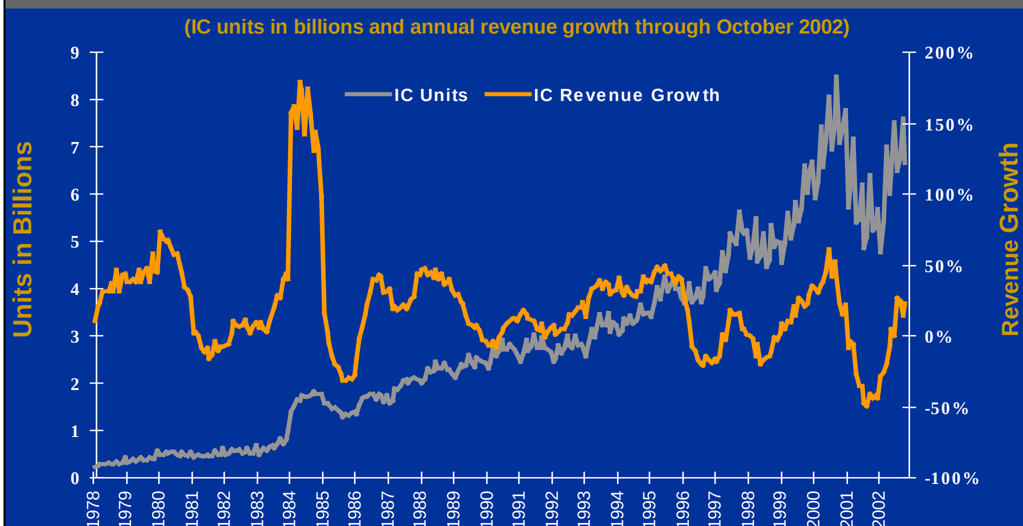
Semiconductors – Semi-Pervasive Pricing Pressure



Source: Morgan Stanley Research -- Mark Edelstone

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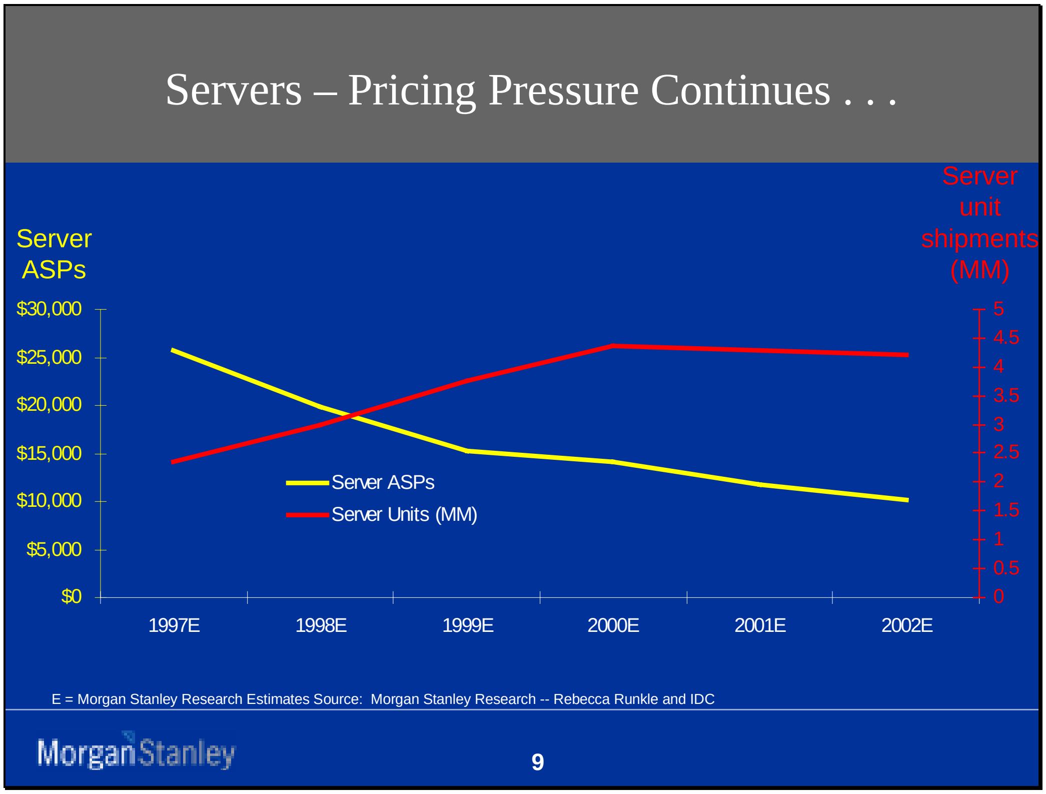

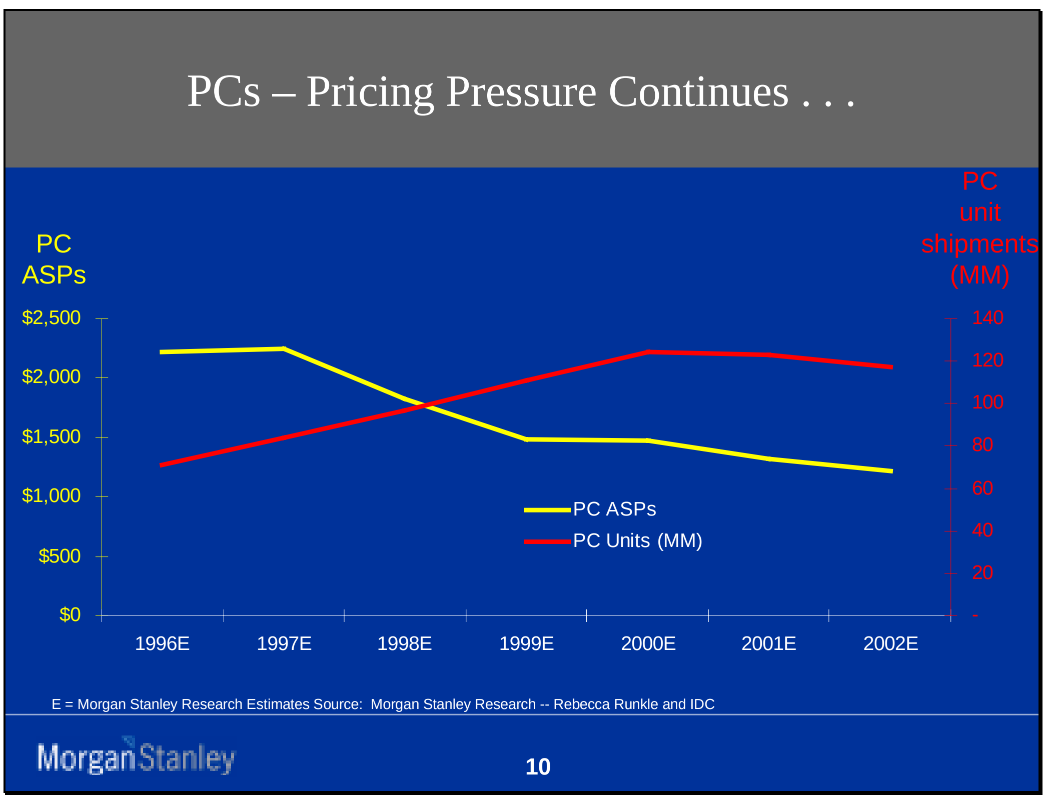

Please see the important disclosures at the end of this report.

Software – Pricing Pressure . . .

- **The decline in average pricing in enterprise software has been driven by changes in customer buying patterns.** Over the past year customers have shifted their approach to buying, and now purchase software piecemeal. **The days of buying everything one needed up front are largely behind us**, and the need for a rapid ROI -- meaning less than 12 months -- has become an important priority to enterprise software customers.
- We believe the combination of a change in customer buying habits toward smaller configurations combined with increasing pricing pressures translated into a -19% decline in **average deal in 2002 vs. -2% in 2001.**

Morgan Stanley Research Estimates; Source: Morgan Stanley Research -- Chuck Phillips

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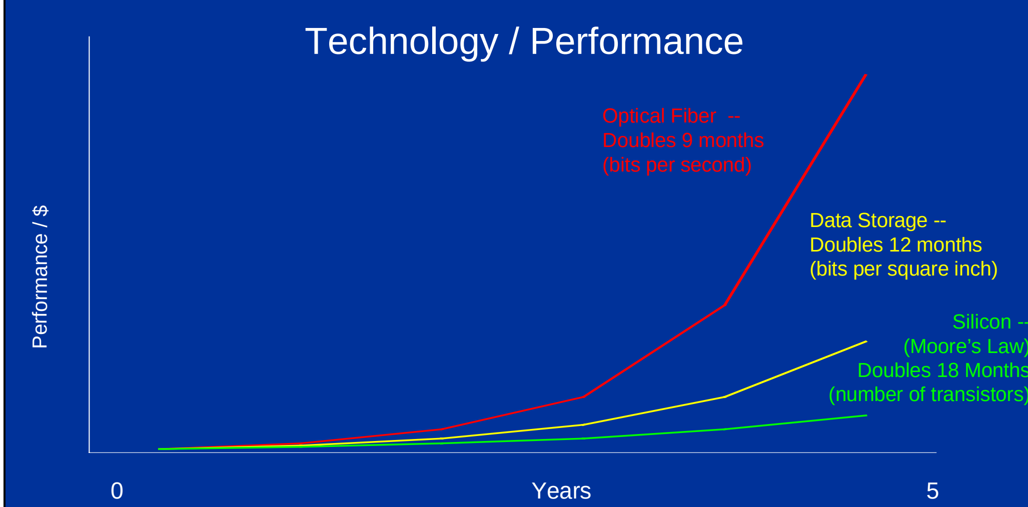
Speed of Innovation - Part of the Pricing Problem . . .



Source: Vinod Khosla, Kleiner Perkins Caufield & Byers

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Slowing GDP Growth Created Domino Effect . . .

Economy began to weaken in CQ3:00 and U.S. GDP growth of 0.3% in C2001 was 90%+ below early 2000 forecasts of 3.6% growth.

U.S. GDP Growth Forecasts — Estimated vs. Actual, C1999-C2003E

	C1999	C2000	C2001	C2002	C2003
Actual	4.1%	4.1%	0.3%		
Jan-99	4.1	3.4			
Jan-00		4.3	3.6		
Jan-01			1.1	3.4%	
Jan-02				1.0	3.4%
Aug 02				2.3	2.8

Yellow values are actual values. White values are Morgan Stanley estimates. Red values are Blue Chip consensus estimates.

Source: Morgan Stanley Research; Data as of 11/25/02

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Individual Company Execution vs. Earnings Estimates – 97% "Missed" – 1999-2001 !

Primary reason cited by companies for missing estimates was deterioration in economy

	Companies in S&P 500 that missed (downside) EPS at least once, 1999 - 2001	Companies in S&P 500
Consumer Discretionary	84	87
Consumer Staples	33	34
Energy	25	25
Financials	74	76
Health Care	41	46
Information Technology	77	78
Industrials	64	68
Materials	37	37
Telecommunication Services	12	12
Utilities	36	37
	483 (97%)	500

*62% of 483 companies that missed estimates did so post intro of Reg FD on 10/23/00**

Source: Morgan Stanley Research; EPS estimates about 2 months before release date; * 62% looking at 5 qtrs before Reg FD and 5 qtrs after Reg FD

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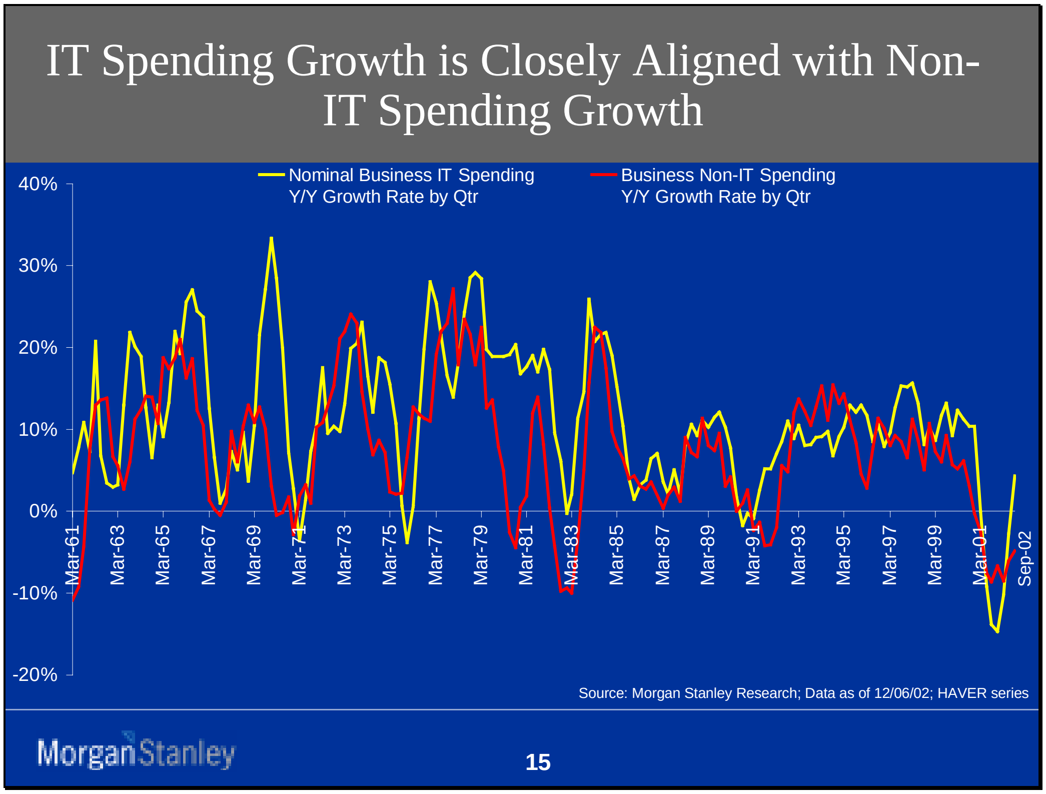
IT Spending Growth is Closely Aligned with Non-IT Spending Growth
Nominal Business IT Spending Y/Y Growth Rate by Qtr
Business Non-IT Spending Y/Y Growth Rate by Qtr
40%
30%
20%
10%
0%
-10%
-20%
Mar-61
Mar-63
Mar-65
Mar-67
Mar-69
Mar-71
Mar-73
Mar-75
Mar-77
Mar-79
Mar-81
Mar-83
Mar-85
Mar-87
Mar-89
Mar-91
Mar-93
Mar-95
Mar-97
Mar-99
Mar-01
Sep-02
Source: Morgan Stanley Research; Data as of 12/06/02; HAVER series
Morgan Stanley
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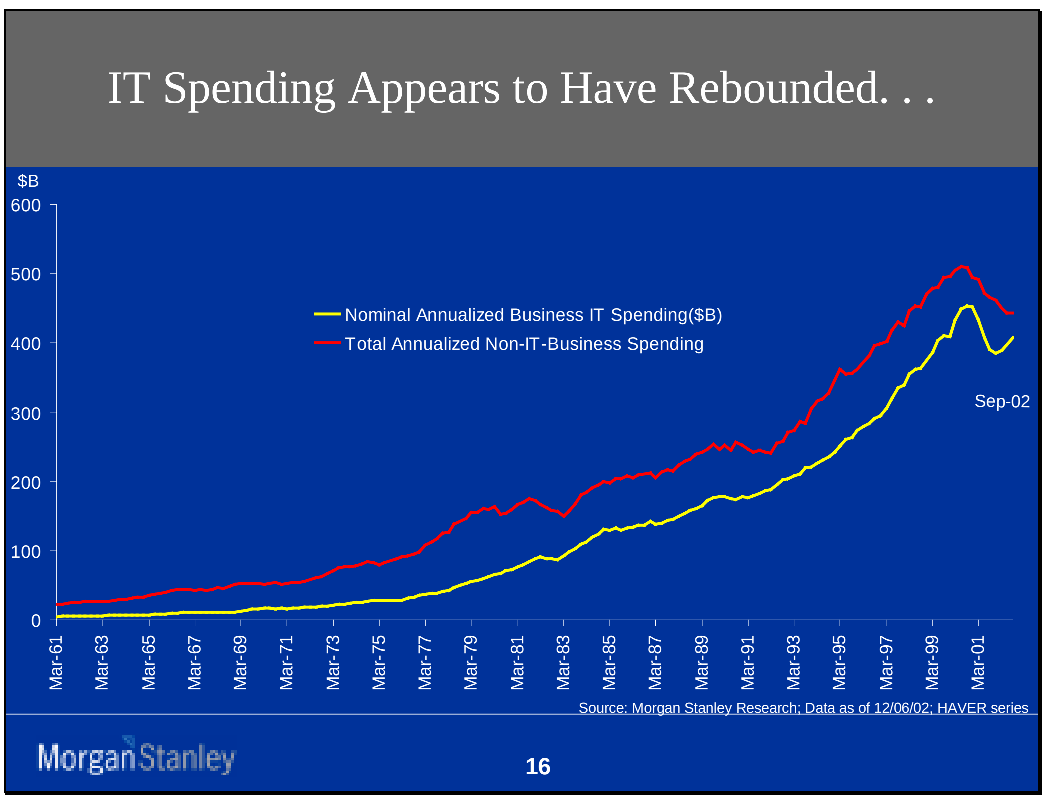
IT Spending Appears to Have Rebounded. . .
$B
600
500
400
300
200
100
0
Nominal Annualized Business IT Spending($B)
Total Annualized Non-IT-Business Spending
Sep-02
Mar-61
Mar-63
Mar-65
Mar-67
Mar-69
Mar-71
Mar-73
Mar-75
Mar-77
Mar-79
Mar-81
Mar-83
Mar-85
Mar-87
Mar-89
Mar-91
Mar-93
Mar-95
Mar-97
Mar-99
Mar-01
Source: Morgan Stanley Research; Data as of 12/06/02; HAVER series
Morgan Stanley
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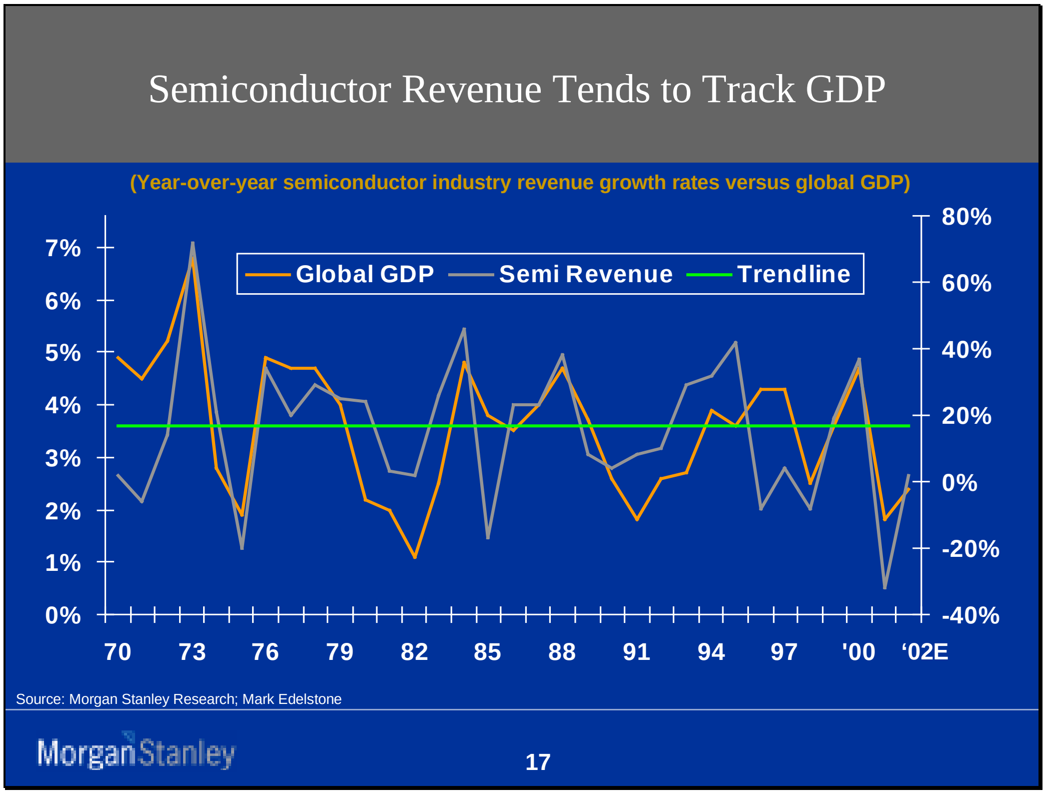
Semiconductor Revenue Tends to Track GDP
(Year-over-year semiconductor industry revenue growth rates versus global GDP)
Global GDP
Semi Revenue
Trendline
7%
6%
5%
4%
3%
2%
1%
0%
80%
60%
40%
20%
0%
-20%
-40%
70
73
76
79
82
85
88
91
94
97
'00
'02E
Source: Morgan Stanley Research; Mark Edelstone
Morgan Stanley
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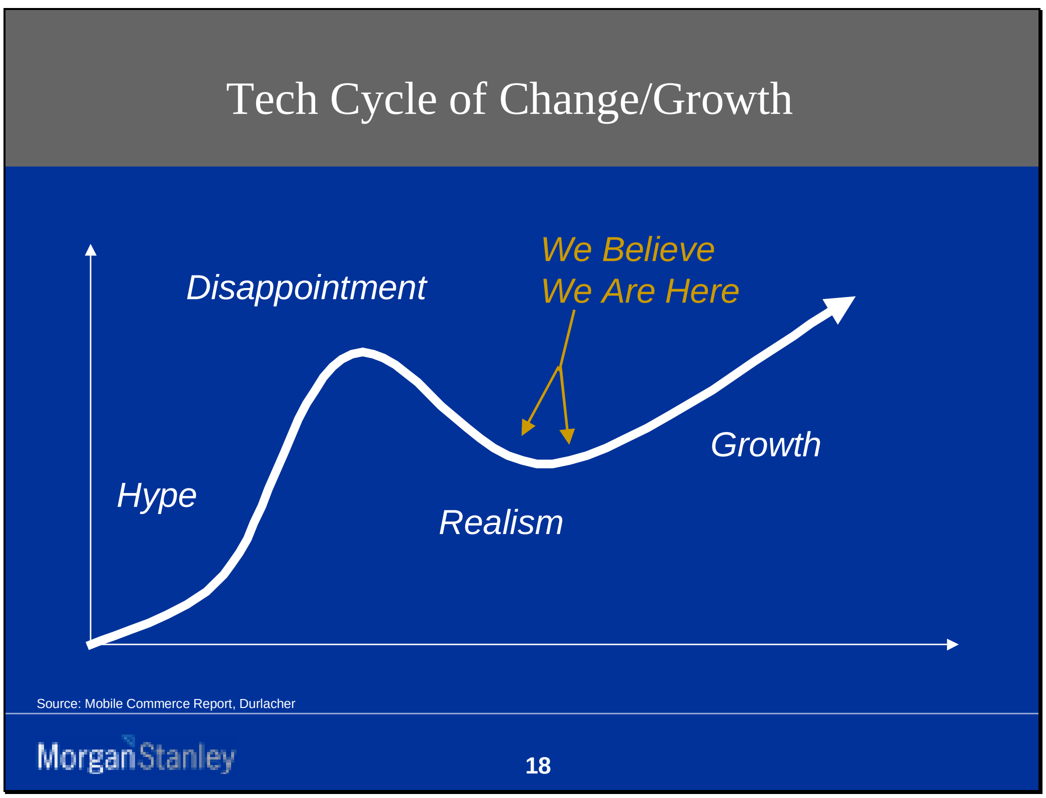
Tech Cycle of Change/Growth
We Believe
We Are Here
Disappointment
Growth
Hype
Realism
Source: Mobile Commerce Report, Durlacher
Morgan Stanley
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Internet Penetration Still Lags Other Technology/ Media/Telecom Services

Regional Penetration of TMT Services

HIGHER PENETRATION <<<----------------->>> LOWER PENETRATION

Region	Population (MM)	Cable	Telephone	Mobile Phone	PC	Internet
Asia/Pacific	2,948	27%	9%	9%	2%	3%
Europe	584	27	47	56	21	21
Latin America	421	19	17	20	6	4
North America	310	66	67	41	61	52
Japan	127	25	61	53	36	26
ROW	1,768	4	15	3	1	2
Weighted Average		**22%**	**19%**	**15%**	**8%**	**7%**

Sources: Morgan Stanley Internet Research, World Bank, IDC, Jupiter Communications, Kagan Associates; see our 05/15/02 TMT Report for further details.
Note that Cable TV penetration is calculated on a 'per household' basis.

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- Trends
- **Revenue & Earnings**
- Stock Market
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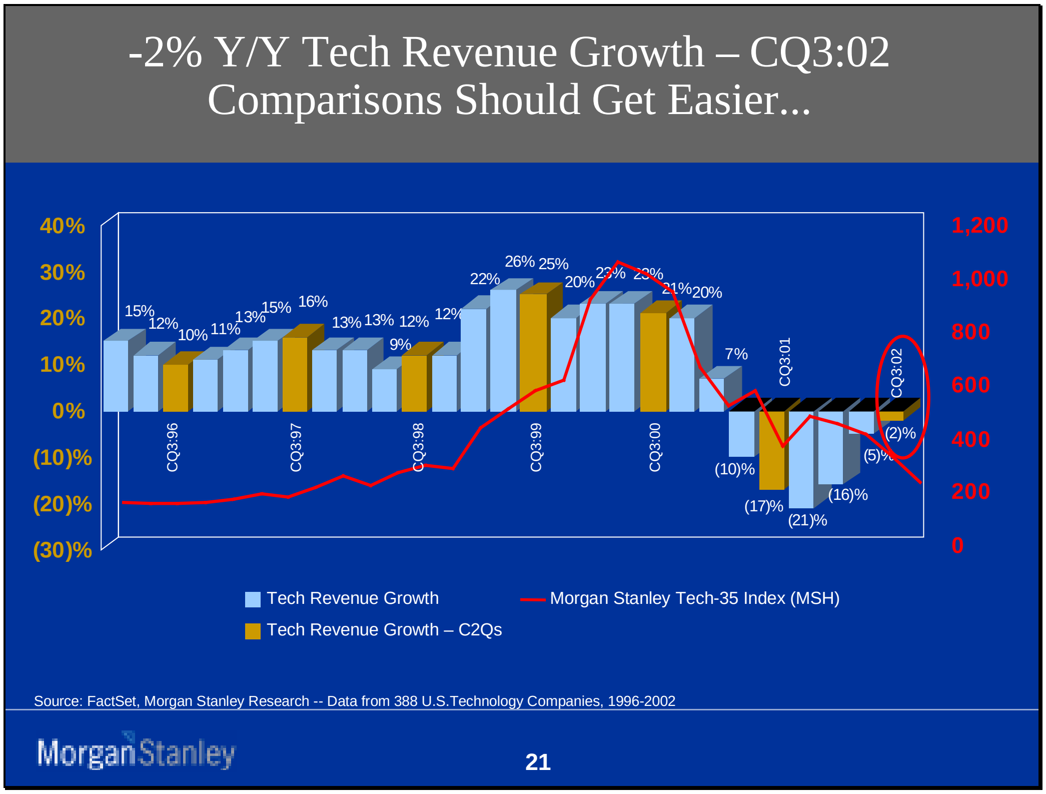
-2% Y/Y Tech Revenue Growth – CQ3:02
Comparisons Should Get Easier…
40%
30%
20%
10%
0%
(10)%
(20)%
(30)%
1,200
1,000
800
600
400
200
0
CQ3:96
CQ3:97
CQ3:98
CQ3:99
CQ3:00
CQ3:01
CQ3:02
Tech Revenue Growth
Tech Revenue Growth – C2Qs
Morgan Stanley Tech-35 Index (MSH)
Source: FactSet, Morgan Stanley Research -- Data from 388 U.S.Technology Companies, 1996-2002
Morgan Stanley
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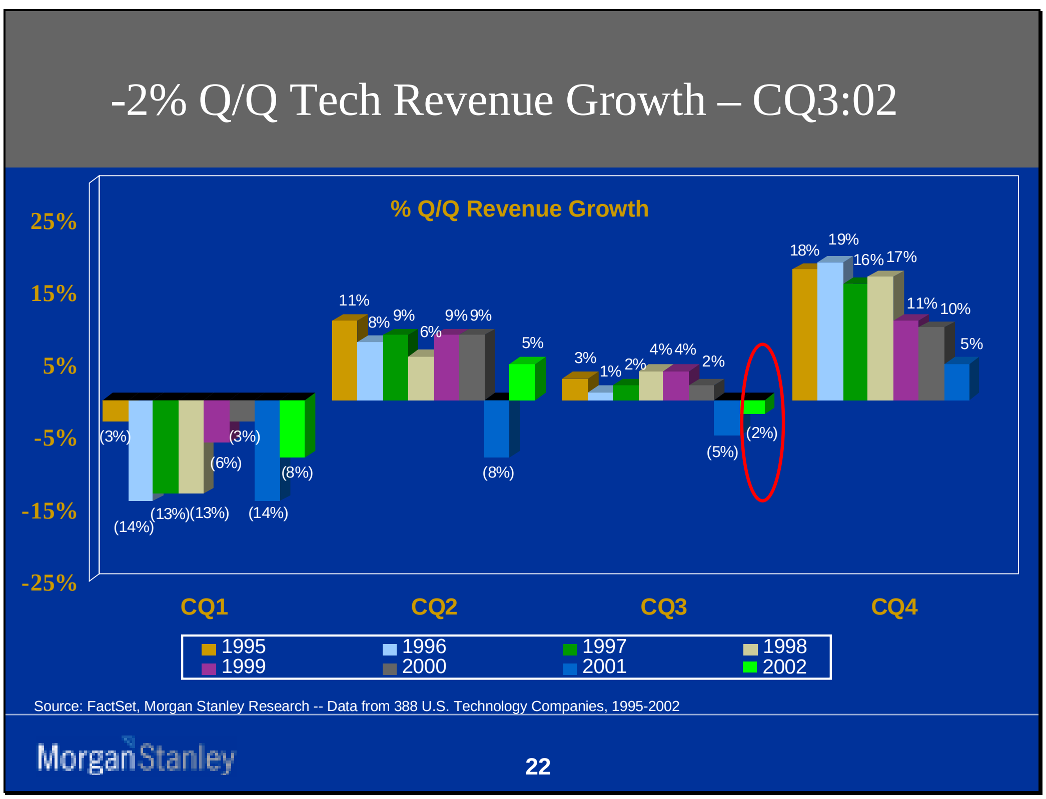
-2% Q/Q Tech Revenue Growth – CQ3:02
% Q/Q Revenue Growth
25%
15%
5%
-5%
-15%
-25%
CQ1
CQ2
CQ3
CQ4
1995
1996
1997
1998
1999
2000
2001
2002
Source: FactSet, Morgan Stanley Research -- Data from 388 U.S. Technology Companies, 1995-2002
Morgan Stanley
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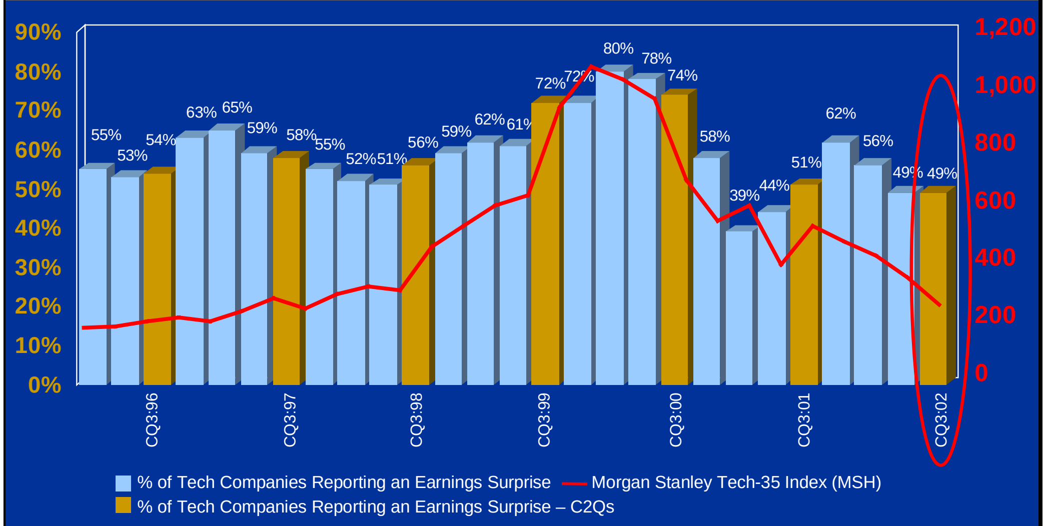
49% of Tech Beat EPS Estimates in CQ3; EPS Misses at 29%



Source: FactSet, Morgan Stanley Research -- Data from 383 U.S. Technology Companies, 1995-2002

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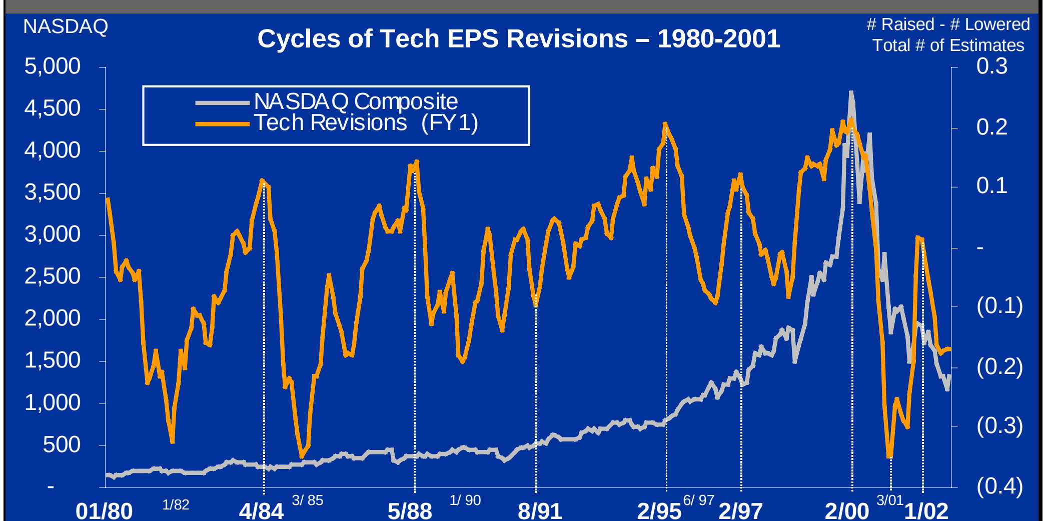
As Revenue Growth Rates Declined Downward Earnings Estimate Revisions Increased...



Source: IBES, Morgan Stanley Research – Steve Galbraith. 3 month moving average of the ratio of upward revisions to downward revisions for the stocks in the S&P 500 tech sector. The gray overlay is the NASDAQ composite (excludes dividends). Updated as of 11/25/02

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Tech Revenue Growth by Industry Group

		Q4:01	Q1:02	Q2:02	Q3:02	Q4:02E	Q1:03E	Q2:03E	Q3:03E	Q4:03E
Technology Universe	Revenue	$188	$173	$180	$178	$188	$176	$185	$206	$188
	Y/Y	-15%	-14%	-4%	0%	0%	2%	3%	16%	0%
	Q/Q	6%	-8%	4%	-1%	6%	-7%	5%	11%	-9%
Internet & PC Software	Revenue	$23	$21	$22	$22	$26	$23	$24	$29	$24
	Y/Y	10%	11%	14%	18%	12%	6%	11%	28%	-8%
	Q/Q	24%	-9%	1%	4%	17%	-13%	6%	19%	-16%
Hardware	Revenue	$60	$52	$55	$55	$61	$55	$58	$65	$59
	Y/Y	-15%	-13%	-6%	1%	1%	6%	6%	18%	-2%
	Q/Q	11%	-13%	5%	1%	10%	-9%	6%	12%	-9%
EMS/Distributors/ Connectors	Revenue	$15	$15	$15	$15	$15	$15	$15	$17	$16
	Y/Y	-30%	-19%	1%	13%	4%	-2%	-1%	10%	4%
	Q/Q	9%	2%	2%	-1%	0%	-4%	4%	10%	-6%
Semiconductors	Revenue	$22	$22	$23	$24	$23	$23	$24	$28	$26
	Y/Y	-38%	-26%	-7%	8%	6%	5%	5%	17%	10%
	Q/Q	-1%	0%	4%	4%	-2%	-1%	4%	16%	-7%

Source: FactSet; E = First Call Consensus estimates; $ in billions; Data from 283 U.S. Technology Companies.

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Tech Revenue Growth by Industry Group

		Q4:01	Q1:02	Q2:02	Q3:02	Q4:02E	Q1:03E	Q2:03E	Q3:03E	Q4:03E
Technology Universe	Revenue	$188	$173	$180	$178	$188	$176	$185	$206	$188
	Y/Y	-15%	-14%	-4%	0%	0%	2%	3%	16%	0%
	Q/Q	6%	-8%	4%	-1%	6%	-7%	5%	11%	-9%
Computer Services & IT Consulting	Revenue	$21	$22	$22	$21	$21	$21	$21	$22	$21
	Y/Y	5%	5%	6%	4%	0%	-4%	-2%	5%	2%
	Q/Q	2%	3%	1%	-2%	-2%	0%	3%	5%	-5%
Software	Revenue	$11	$10	$11	$10	$10	$10	$12	$11	$10
	Y/Y	-12%	-12%	-9%	-7%	-8%	0%	4%	13%	0%
	Q/Q	6%	-8%	6%	-10%	5%	0%	11%	-2%	-7%
Networking Equip - Wireline/Wireless	Revenue	$36	$30	$33	$30	$31	$29	$30	$34	$31
	Y/Y	-29%	-26%	-14%	-20%	-12%	-4%	-7%	14%	0%
	Q/Q	-4%	-15%	8%	-9%	5%	-7%	4%	12%	-8%

Source: FactSet; E = First Call Consensus estimates; $ in billions; Data from 283 U.S. Technology Companies.

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C2002 Y/Y Revenue Change – (Q1+Q2+Q3)

Industry Group	Q1+Q2+Q3 Y/Y Revenue Δ ($B)	Q1+Q2+Q3 % Δ Y/Y	Q1+Q2+Q3 C2002YTD ($B)	Q3 Y/Y Revenue Δ ($B)	Q3 % Δ Y/Y
Internet & PC Software	$8	13%	$71	$3	16%
Computer Services / IT Consulting	2	3	75	1	3
Software	-3	-8	35	-1	-7
EMS/Distributors/Connectors	-6	-10	58	1	7
Semiconductors	-9	-11	72	2	7
Hardware	-11	-6	178	1	1
Networking Equip(Wireline/Wireless)	-35	-23	117	-11	-23
Total Tech	**-$54**	**-8%**	**$606**	**-$4**	**-2%**

Source: FactSet, Morgan Stanley Research -- Data from 388 U.S.Technology Companies, 1996-2002

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C2002 Y/Y Revenue Gainers – (Q1+Q2+Q3)

Green text = stock has outperformed the S&P 500

Company	Absolute Y/Y Rev Gain/Loss ($B)	Y/Y Revenue Growth (%)	C2002YTD ($B)	C2002 YTD Stock Performance
Microsoft	$3.0	16%	22	**-19%**
AOL Time Warner	2.7	10	30	-57
Dell	2.6	11	26	**3**
Cisco	1.0	8	14	-23
First Data	0.6	11	6	**-11**
EDS	0.6	4	16	-75
NVIDIA	0.6	65	1	-79
Insight Enterprises	0.6	36	2	-62
Nokia	0.5	3	21	-29
Electronic Arts	0.5	72	1	**5**
SAP	0.5	11	5	-38
Amazon.com	0.5	25	3	102
SunGard	0.5	35	2	-22
ADP	0.5	6	8	-29
Skyworks	0.3	284	0.5	-53
Concord EFS	0.3	27	2	-52
Qualcomm	0.3	16	2	-22
Western Digital	0.3	22	2	**18**
Flextronics	0.3	3	10	-61
Fiserv	0.3	18	2	**-20**
Total	$16		Average	-26%
			S&P 500 YTD	-21%

Source: FactSet, S&P data excludes dividends; 388 U.S.Tech Companies; Data as of 12/13/2002

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C2002 Y/Y Revenue Gainers – Q3

Green text = stock has outperformed the S&P 500

	Absolute Y/Y Rev Gain/Loss ($B)	Y/Y Revenue Growth (%)	CQ3:02 ($B)	C2002 YTD Stock Performance
Dell	$1.7	22%	$9.1	3%
Microsoft	1.6	26	7.7	-19
AOL Time Warner	0.6	7	10.0	-57
Texas Instruments	0.4	22	2.2	-39
Cisco	0.4	9	4.8	-23
Insight Enterprises	0.4	74	0.9	-62
Micron Technology	0.3	56	0.7	-55
STMicroelectronics	0.2	17	1.6	-27
Qualcomm	0.2	36	0.9	-22
First Data	0.2	13	2.0	-11
Electronic Arts	0.2	89	0.5	5
Amazon.com	0.2	33	0.9	102
ADP	0.2	9	2.4	-29
SunGard	0.2	38	0.7	-22
Applied Materials	0.2	14	1.4	-26
Benchmark Electronics	0.2	66	0.4	50
CDW	0.2	16	1.2	-12
Western Digital	0.1	32	0.6	18
Vishay Intertechnology	0.1	42	0.5	-42
BearingPoint	0.1	23	0.7	-53
Total	$8.0		Average	-16%
			S&P 500 YTD	-21%

Source: FactSet; S&P data excludes dividends; 388 U.S.Tech Companies; Data as of 12/13/2002

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C2002 Y/Y Revenue Losers – (Q1+Q2+Q3)

Red text = stock has underperformed the S&P 500

	Absolute Y/Y Rev Gain/Loss ($B)	Y/Y Revenue Growth (%)	C2002YTD ($B)	C2002 YTD Stock Performance
Lucent	-$8.2	-48%	9	-72%
Nortel	-6.0	-43	8	-76
Alcatel	-5.0	-29	12	-68
Ericsson	-4.5	-27	12	-82
Solectron	-3.9	-30	9	-67
Motorola	-3.4	-15	19	-39
IBM	-3.4	-50	58	-33
Corning	-2.7	-13	3	-58
Ingram Micro	-2.5	-26	17	-27
Arrow	-2.0	-37	5	-55
Gateway	-1.9	-15	3	-56
Sun Micro	-1.7	-20	9	-72
Avnet	-1.7	-29	7	-55
EMC	-1.7	-27	4	-53
Avaya	-1.4	-21	4	-75
Agilent	-1.3	-16	5	-40
Celestica	-1.2	-63	6	-62
JDS	-1.2	-13	0.7	-67
Oracle	-1.1	-13	7	-23
Agere	-1.1	-40	2	-77
Total	-$55		Average	-58%
			S&P 500 YTD	-21%

Source: FactSet, S&P data excludes dividends; 388 U.S.Tech Companies; Data as of 12/13/2002

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Please see the important disclosures at the end of this report.

C2002 Y/Y Revenue Losers – Q3

Red text = stock has underperformed the S&P 500	Absolute Y/Y Rev Gain/Loss ($B)	Y/Y Revenue Growth (%)	CQ3:02 ($B)	C2002 YTD Stock Performance
Lucent	-$2.9	-56%	$2.3	-72%
Alcatel	-2.4	-40	3.5	-68
Ericsson	-1.7	-33	3.6	-82
Nortel	-1.4	-37	2.4	-76
Motorola	-1.0	-14	6.4	-39
Corning	-0.7	-45	0.8	-58
Solectron	-0.5	-13	3.1	-67
Gateway	-0.3	-21	1.1	-56
Avaya	-0.3	-20	1.2	-75
Xerox	-0.3	-6	3.8	-23
Advanced Micro	-0.3	-34	0.5	-50
Celestica	-0.2	-11	2.0	-62
Oracle	-0.2	-10	2.0	-23
Ingram Micro	-0.2	-4	5.6	-27
Maxtor	-0.2	-21	0.8	-10
Nokia	-0.2	-3	7.2	-29
State Street	-0.2	-15	1.2	-20
Arrow	-0.2	-10	1.8	-55
Conexant	-0.2	-56	0.2	-60
Tellabs	-0.2	-36	0.3	-52
Total	-$14		Average	-50%
			S&P 500 YTD	-21%

Source: FactSet, S&P data excludes dividends; 388 U.S.Tech Companies; Data as of 12/13/2002

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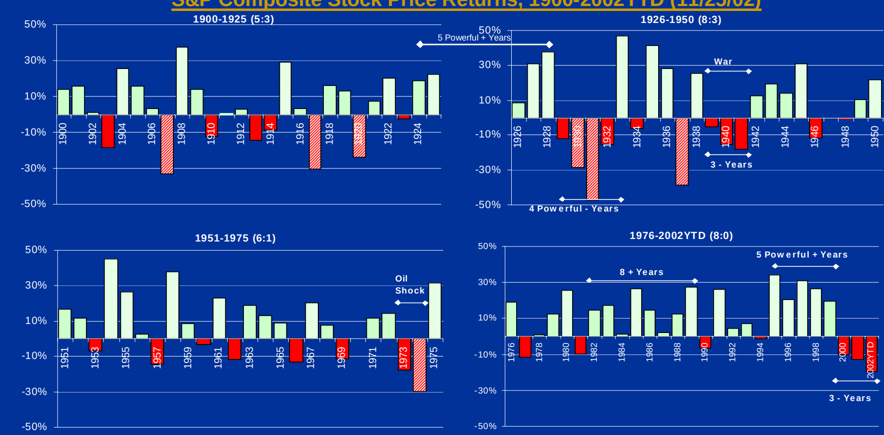
Performance of S&P Composite was Very Strong in 1980s and Especially Strong in 1995-1999

From 1995-1999, S&P Composite averaged 25% compound annual return — highest consecutive returns from 1900-2002YTD (only close comparison was 1924-1928 when the average compound annual return was 24%). 13% decline in 2001 was greatest annual decline in quarter of a century (since 1974 when the oil shock occurred), and with a 19% decline in C2002 YTD, C2002 would be worse than C2001.

S&P Composite Stock Price Returns, 1900-2002YTD (11/25/02)



Diagonal hash bar denotes year when S&P Composite rose/fell in excess of 20%. Also noted ratios equal number of years during period that S&P Composite rose 20%+ compared with number of years S&P Composite declined by 20%+. Source: Morgan Stanley Research; data excludes dividends

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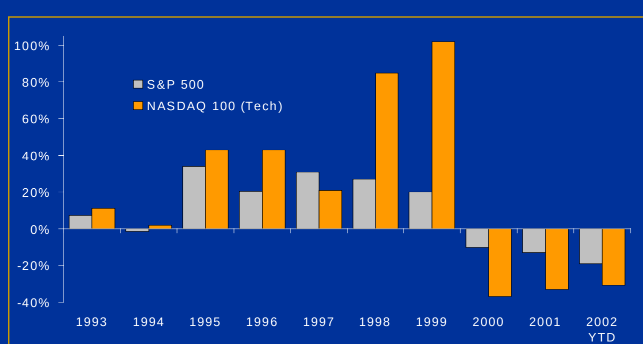
Technology – Relative Stock Price Performance

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002 YTD	Average 93-'02YTD	Average 93-'97	Average 98-'02
S&P 500	7%	-2%	34%	20%	31%	27%	20%	-10%	-13%	-19%	10%	18%	1%
NASDAQ 100	11	2	43	43	21	85	102	-37	-33	-31	21	24	17



Source: Morgan Stanley Research. S&P/Nasdaq data excludes dividends; 2002 YTD is as of 12/05/02.

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Breadth of Declines in the Stock Market…

S&P Sector	1999	2000	2001	2002YTD	Mkt Cap Leaders
Basic Materials	23%	(18)%	1%	(3)%	DuPont, Dow Chemical, Alcoa
Consumer Staples	(17)	15	(8)	(7)	Coca-Cola, Proctor & Gamble
Financials	2	23	(11)	(12)	Citigroup, AIG
Transportation	(11)	17	(1)	(13)	FedEx, Union Pacific
Energy	16	13	(12)	(13)	Exxon, Royal Dutch
Health Care	(12)	36	(13)	(17)	Pfizer, Johnson & Johnson
Capital Goods	29	4	(11)	(25)	GE, Minnesota Mining
Technology	78	(41)	(26)	(27)	Microsoft, IBM, Intel
Comm Services	17	(40)	(14)	(31)	Verizon, SBC, BellSouth
Utility	(13)	52	(33)	(35)	Southern, Duke
S&P 500	**20%**	**(10%)**	**(13%)**	**(18%)**	

Source: Morgan Stanley Research; As of 12/04/02. S&P/Nasdaq data excludes dividends; YTD changes within each year.

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Best Global Tech Stock Performers LTM

Market Cap >$1B		Market Cap >$5B		Market Cap >$15B	
Hotels.com	117%	Amazon.com	113%	Samsung	78%
Amazon.com	113	Samsung	78	Canon	11
Expedia	107	Infosys	45	eBay	4
Take Two	107	Symantec	36	Dell	4
Victor (Japan)	101	Yahoo! Japan	34	Rohm	3
Alps Electronics	95	Lexmark	30	First Data	-3
SanDisk	93	USA Interactive	24	Sony	-6
Western Digital	89	Intuit	24	Hewlett-Packard	-10
Imation	82	Microchip	22	Microsoft	-10
Samsung	78	Yahoo!	16	Accenture	-11
Average	**98%**	**Average**	**42%**	**Average**	**6%**

NASDAQ: -24% S&P 500: -18%

Source: FactSet, Morgan Stanley Research -- Data from 892 Global Technology Companies. S&P/Nasdaq data excludes dividends Data as of 12/04/02

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Best Global Tech Stock Performers LTM – Selected Themes

- Business turnaround
- Up following dramatic stock price decline
- Consumer oriented
- Internet leader
- Only 5 stocks of companies with market cap >$15B were up
- Small cap stocks up most. Big cap stocks up least.

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Worst Global Tech Stock Performers LTM

Market Cap >$1B		Market Cap >$5B		Market Cap >$15B	
Brocade	-83%	Ericsson	-83%	EMC	-57%
Ericsson	-83	EDS	-74	AOL Time Warner	-53
Hynix Semi	-79	Sun Micro	-71	Texas Instruments	-38
Sanmina	-77	Nortel	-71	Nintendo	-38
ARM	-77	Lucent	-68	Intel	-36
Logica	-76	Alcatel	-64	Motorola	-29
EDS	-74	NEC	-59	SAP	-28
Verisign	-74	Fujitsu	-57	Qualcomm	-27
Avaya	-73	EMC	-57	Philips Electronics	-27
Sun Micro	-71	Veritas	-55	Cisco	-26
Average	**-77%**	**Average**	**-66%**	**Average**	**-36%**

NASDAQ: -24% S&P 500: -18%

Source: FactSet, Morgan Stanley Research -- Data from 892 Global Technology Companies. S&P/Nasdaq data excludes dividends; Data as of 12/04/02

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Worst Global Tech Stock Performers LTM – Selected Themes

- Communications equipment oriented
- Enterprise hardware oriented
- Poor management execution
- Small cap stocks down most. Big cap stocks down least.

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As Stock Prices Have Fallen, Volatility Has Risen…

Source FactSet; S&P data excludes dividends;

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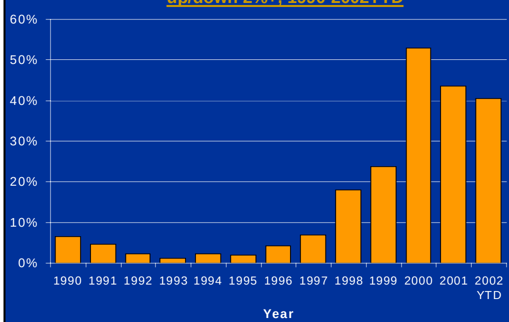
High Beta (volatile) Stocks have Wider Valuation Ranges and Price Swings than Low Beta Companies...

In 2000, on average, NASDAQ stocks traded up/down 2%+ on 53% of the trading days. This compares with 15% for S&P 500 stocks.

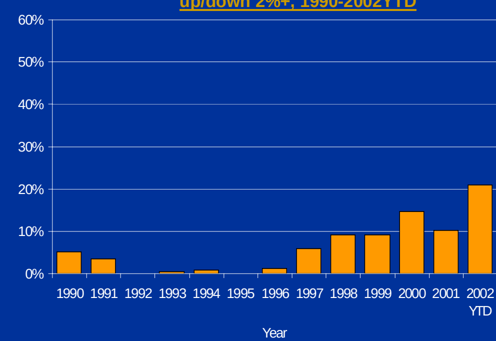
NASDAQ Trading Volatility

% of trading days stocks traded up/down 2%+, 1990-2002YTD



S&P 500 Trading Volatility

% of trading days stocks traded up/down 2%+, 1990-2002YTD



Source: Morgan Stanley Research

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Technology Stock Performance by Industry Group – CQ4 Has Been Great . . .

	1Q02	2Q02	3Q02	4Q02 QTD	2002 YTD	First Call Mean P/E C02E	First Call Mean P/E C03E
Internet & PC Software	2	(25)	(28)	44	(24)	34	31
Hardware	(4)	(25)	(26)	44	(25)	27	23
Computer Services / IT Consulting	5	(27)	(32)	30	(35)	22	20
Semiconductors	11	(34)	(44)	59	(39)	52	42
EMS/Distributors/Connectors	(2)	(27)	(41)	51	(40)	31	28
Software	(12)	(39)	(35)	66	(46)	31	30
Networking Equip - Wireline/Wireless	(19)	(40)	(33)	82	(51)	31	29
Mean	(4)	(34)	(35)	59	(40)	32	29
S&P 500	(0)	(14)	(18)	13	(20)	19	17
NASDAQ	(5)	(21)	(20)	22	(27)	--	--

Source: FactSet, Morgan Stanley Research -- Data from 427 U.S.Technology Companies. Data as of 12/06/02

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Please see the important disclosures at the end of this report.

Top Global Tech Stocks Ranked by a Measure of Investor Interest

1. Samsung	—	16. USA Interactive	↑
2. Dell	↑	17. IBM	↓
3. Amazon.com	↑	18. First Data	↓
4. Microsoft	↑	19. Qualcomm	↓
5. eBay	↓	20. Cisco	↓
6. Intuit	↓	21. Sony	↓
7. Oracle	↓	22. Microchip	↑
8. Nokia - ADR	↓	23. Rohm	↑
9. Yahoo!	↑	24. Applied Materials	↑
10. Electronic Arts	↓	25. Maxim	↑
11. Canon	↑	26. KLA-Tencor	↑
12. Hewlett-Packard	↑	27. Siemens	↑
13. Symantec	↓	28. Linear Technology	↑
14. Eastman Kodak	↑	29. State Street	↓
15. Lexmark	↑	30. Accenture	↑

Source: Morgan Stanley Research. Ranking includes data related to market capitalization, trading volume, stock price performance ranking each company against a universe of 892 Global Technology Companies. Arrows indicate generally increasing/decreasing investor interest as ranked by our Investor Interest Model; Data as of 12/04/02

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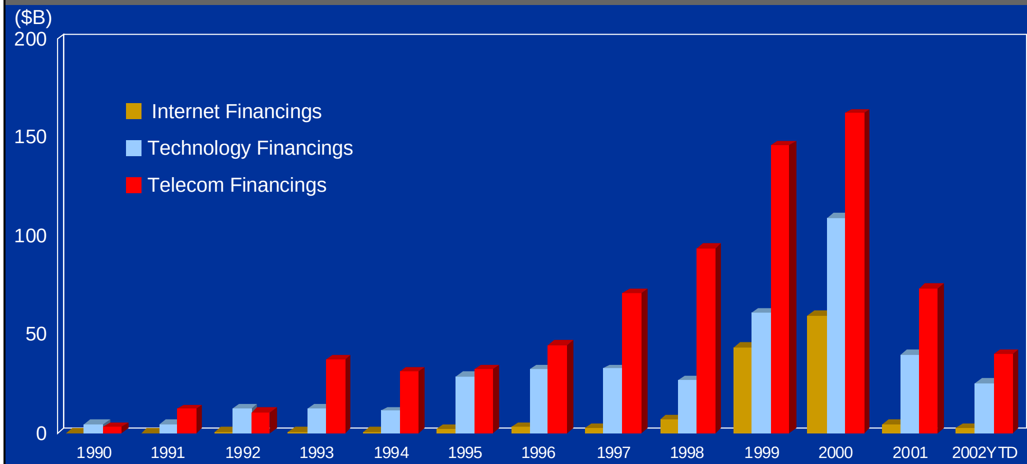
Global Internet, Technology & Telecom Public Market Financings. . .



Source: Thomson Financial; Securities Data Corporation -- Data as of 11/25/02; Includes public IPOs, follow-ons, convertibles and high yield deals (rated high yield by both Moody's and S&P) greater than $10MM, excluding rights offerings, limited partnerships, derivatives, and floating rate notes.
Note: “Telecom Financings” includes Telecom Service & Telecom Equipment Financings

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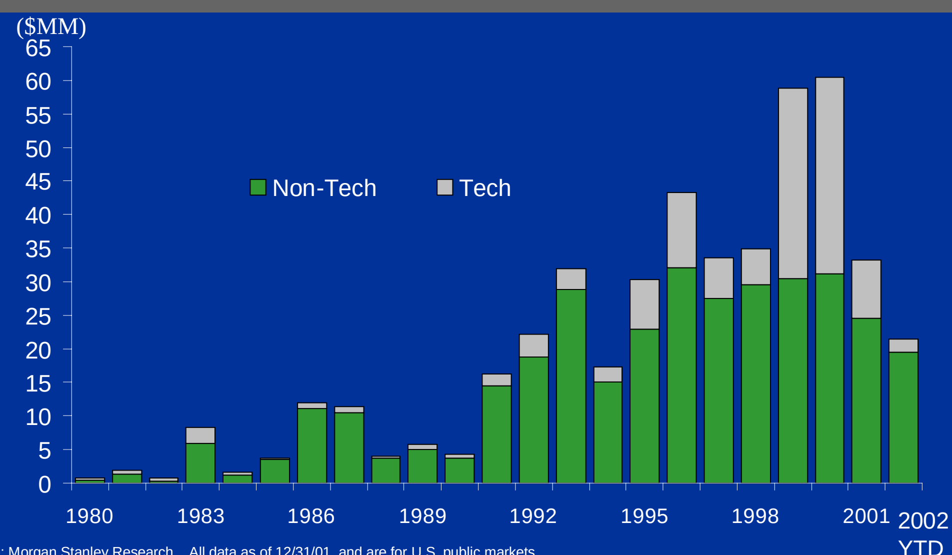
Overview of Domestic IPOs – Tech vs. Non-Tech



Source: Morgan Stanley Research. All data as of 12/31/01, and are for U.S. public markets.

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Tech as Percent of S&P 500 Market Cap

Information Technology % of S&P 500 Market Cap

Source: Morgan Stanley Research Data as of 12/01/02

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Tech as Percent of S&P 500 Market Cap

Dec 1989[1] - S&P 500 = $2.3T

Sector	Weight
Consumer Staples	16%
Energy	13%
Consumer Cyclicals	11%
Communication Services	10%
Financials	9%
Health Care	9%
Capital Goods	8%
Technology 8	*8%*
Basic Materials	8%
Utilities	6%
Transportation	2%
Total:	**100%**

[1] as of 12/29/89

Mar 2000[2] - S&P 500 = $11.5T

Sector	Weight
Technology 1	*37%*
Financials	12%
Health Care	9%
Consumer Staples	9%
Consumer Cyclicals	8%
Capital Goods	7%
Communication Services	7%
Energy	5%
Utilities	2%
Basic Materials	2%
Transportation	1%
Total:	**100%**

[2] as of 03/10/00

Dec 2002[3] - S&P 500 = $8.3T

Sector	Weight
Financials	21%
Technology 2	*16%*
Health Care	15%
Consumer Cyclicals	14%
Consumer Staples	9%
Capital Goods	8%
Energy	6%
Communication Services	4%
Basic Materials	3%
Utilities	3%
Transportation	2%
Total:	**100%**

[3] as of 12/03/02

Source: Morgan Stanley Research

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Aggregate Net Tech Wealth Creation Has Been Large

- 1,705 technology companies have gone public in last 22 years.
- Created ~ $1.6 trillion in public market wealth.

Source: Morgan Stanley Research, The Technology & Internet IPO Yearbook, March 2002; Data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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1999+2000 Tech Financing was Extraordinarily High

- 70% of tech venture capital financing over 21 years occurred in 1999+2000
- 55% of tech public financing over 21 years occurred in 1999+2000
- Annual IPO volume 593% higher than the annual average for 1980-1994

Source: Morgan Stanley Research, The Technology & Internet IPO Yearbook, March 2002; Data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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'Normal' Tech Company Maxims

- On average, 4 "Ten Baggers" IPO'd per year since 1980
- 5% of tech IPOs create 90%+ of the tech wealth – bottom line, few companies win big...

Source: Morgan Stanley Research, The Technology & Internet IPO Yearbook, March 2002; Data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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Technology Industry Groups Typically Have One Big Winner

Industry Group	Leading Company	Market Cap. Share	Mkt Cap Change Since IPO ($B)
Software	Microsoft	57%	$621
Data Networking	Cisco	67	198
Semiconductors	Qualcomm	20	187
Internet	AOL TWX	85	160
Services	First Data	26	109
PCs	Dell	99	72
Workstations/Servers	Sun	75	52
Peripherals	EMC	56	52
Lasers	SDL	99	41
EMS	Flextronics	34	29
Radio/TV/Cable Equip.	GI	43	26
Semi Capital Equip.	KLA	37	25
CAD/CAM, EDA	Cadence	27	19
Other	--		14
		Total	$1,605

Source: Morgan Stanley Research. Mkt Cap. as of 12/31/01. Leading company share is based on company's share of industry group lifetime market value change. Industry group wealth creation data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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Global Technology: 10% of Companies = 75% of Market Cap

85 Companies = $2.2T (50 US; 35 Non-US)

Microsoft	$309	ADP	$26	Infosys Tech.	$11	Concord EFS	$8
IBM	148	MEI	25	Eastman Kodak	11	HOYA	8
Intel	140	STMicro	23	USA Interactive	11	T-Online Intl	8
Cisco	110	eBay	22	Yahoo!	11	Alcatel-ADR	8
Nokia - ADR	96	Accenture	19	Linear Tech.	10	Hon Hai Precision	8
Dell	75	Rohm	17	Toshiba	10	Infineon Tech.	8
AOL Time Warner	71	EMC	16	Micron	10	Keyence	7
Oracle	64	Nintendo	15	Electronic Arts	9	Veritas	7
Hewlett-Packard	61	Ericsson	15	Computer Assoc.	9	Fujitsu	7
Samsung	48	State Street	14	Amazon.com	9	Wanadoo	7
Siemens	46	Hitachi	14	Tokyo Electron	9	NEC	7
Sony	41	Maxim	14	Agilent	9	Adobe	7
Texas Instruments	34	Sun Micro	13	Nortel	9	Fiserv	7
Qualcomm	33	Kyocera	13	Seat Pagine Gialle	9	SunGard	7
Canon	33	Ricoh	12	EDS	9	Lucent	6
Philips	29	UMC	12	Lexmark	8	Symantec	6
SAP	29	Sharp	12	KLA-Tencor	8	Xerox	6
TSMC	28	Murata	12	NTT Data	8	Affiliated Comp Svcs	6
Applied Materials	28	Analog Devices	11	Wipro	8	Thomson Multimedia	6
First Data	27	Intuit	11	Pitney Bowes	8	PeopleSoft	6
Motorola	27	Paychex	11	Xilinx	8	Flextronics	6
						Microchip	6

Source: FactSet, Morgan Stanley Research -- Data from 892 Global Technology Companies. Data as of 12/04/02 $ in billions; Revenue = LTM Sales

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Global Technology: 10% of Companies = 85% of Revenue

85 Companies = $760B (80 US; 5 Non-US)

IBM	$80	Computer Sciences	$11	IKON Office Solutions	$5	DST Systems	$2
Hewlett-Packard	49	ADP	10	USA Interactive	5	Agere	2
Dell	32	Oracle	9	Pitney Bowes	4	Paychex	2
Microsoft	30	Avnet	9	Lexmark	4	Pioneer Electronics	2
Nokia - ADR	28	Celestica	9	Gateway	4	Electronic Arts	2
Intel	27	Sanmina	9	CDW	4	Concord EFS	2
Motorola	26	Texas Instruments	8	Maxtor	4	StorageTek	2
Ingram Micro	23	Arrow	8	Amazon.com	4	Sabre	2
EDS	22	First Data	7	Corning	4	PeopleSoft	2
Alcatel	20	SAP	7	Jabil Circuit	4	E*Trade	2
Ericsson	20	AOL Time Warner	7	Affiliated Computer	3	Harris	2
Cisco	19	Kudelski	7	Computer Associates	3	NVIDIA	2
Tech Data	16	STMIcro	6	Qualcomm	3	Molex	2
Xerox	16	Agilent	6	Equant	3	Vishay	2
Flextronics	13	Apple	6	AMD	3	LSI Logic	2
Nortel	13	Unisys	6	Insight Enterprise	3	Siebel	2
Eastman Kodak	13	NCR	6	Micron	3	Analog Devices	2
Sun Micro	12	EMC	5	SunGard	2	Viad	2
Lucent	12	State Street	5	FIserv	2	Amdocs	2
Solectron	12	Avaya	5	Convergys	2	National Semi	2
Accenture	12	Applied Materials	5	Western Digital	2	Scientific-Atlanta	2
						Amkor	2

Source: FactSet, Morgan Stanley Research -- Data from 892 Global Technology Companies. Data as of 12/04/02 $ in billions; Revenue = LTM Sales

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- Trends
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- **Common Themes of Great Tech Companies**

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It's About the Entrepreneur and the Market…

- Individual with strong balanced (evolving) team takes big risks and changes the way the game is played and typically helps create new markets.
- Timing is important. Massive opportunities are infrequent.
- Persistence against odds is critical – the tough get tougher…
- One company typically wins big per industry group – Microsoft (PC Software), AOL (online services), Oracle (databases), Dell (PCs).

Source for data Morgan Stanley Research -- The Technology & Internet IPO Yearbook, March 2002

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Top 40 Technology Companies (Based on Wealth Creation) IPO'd Since 1980…

- Accounted for 87% of net wealth created of 1,700+ companies.
- 84% of standalone companies still have active involvement of founder.
- 80% of the wealth creation is from companies where founder is still actively involved.
- Each of companies generates majority of revenue from a distinct business that doesn't overlap with the dominant business of one of the other companies.

Source for data Morgan Stanley Research -- The Technology & Internet IPO Yearbook, March 2002; data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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Top 40 Technology Companies (Based on Wealth Creation) IPO'd Since 1980…

- Average period from founding company and IPO was 6 years.
- Average IPO valuation was $403MM
- Average period between IPO and 2-year period of consecutive maximum wealth creation was 8 years.

Source for data Morgan Stanley Research -- The Technology & Internet IPO Yearbook, March 2002; data from 1980 to year-end 2001 for all domestic US companies that went public with an IPO market value >= $10MM

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Industry Views:

Semiconductors: *In-line — Although we believe that industry fundamentals will steadily improve after 1Q03, current valuation parameters and the potential for increased earnings risk in Q1 suggest that it will be difficult for the semiconductor stocks to outperform the S&P 500 until near-term visibility improves.*

Semiconductor Capital Equipment: *In-line— The recovery will likely be choppy and valuations are stretched, so we recommend buying the dips. But the bias is to have exposure, as industry fundamentals should begin to stabilize in 1Q03. Eventually, we believe the combination of three years of flat-to-down industry capital spending, combined with an unprecedented number of technologies ramping (300mm, copper, low k, 130nm, and 90nm) and an improving economy, should set the industry up for an upturn beginning next year that builds momentum in 2004.*

Wireline/Wireless Networking: *Cautious — Challenging fundamentals, including weak demand, lower carrier capex, and soft enterprise spending are likely to lead to another leg down in 2003, in our view.*

Internet & PC Applications Software: *Attractive — Given still strong 20%+ global growth in Internet users and usage, we continue to believe our stocks could outperform the market over the next 12-18 months.*

Software: *Cautious — We think the enterprise software industry has already entered a period of modest recovery. However, we expect the recovery to be muted and inconsistent. Considering valuation, many of the stocks in our coverage universe more than reflect the likely upturn and, therefore, valuations appear extended.*

Computer Services & IT Consulting: *In-line — Softening fundamentals at industry bellwethers could limit stock price appreciation potential for our industry coverage as a whole. From current valuations, we believe our computer services coverage will perform in-line with the S&P 500.*

Systems & PC Hardware: *Cautious — We believe that current valuations do not fully discount the cyclical and secular pressures which appear likely to drive fundamental performance over the next 12-months*

Enterprise Storage: *Cautious — Reflecting expectations of broad volatility-generated risk without the required return over the next 12 months, largely due to IT spending weakness in the subsystems market.*

Electronic Manufacturing Services*: Cautious — We believe favorable long-term growth trends and strengthened balance sheets are more than offset by valuation, margin pressure, and earnings estimate risk.*

Morgan Stanley Global Technology Research Teams

Semiconductors:
Mark Edelstone *(mark.edelstone@morganstanley.com)* (415) 576-2381
Louis Gerhardy *(louis.gerhardy@morganstanley.com)* 2391
Sonia Kimotsuki *(sonia.kimotsuki@morganstanley.com)* 2388
Harlan Sur *(harlan.sur@morganstanley.com)* 2359
Jay Iyer *(jay.iyer@morganstanley.com)* 2607

Computer Services & IT Consulting:
David Togut *(david.togut@morganstanley.com)* (212) 761-6388
Julie Santoriello *(julie.santoriello@morganstanley.com)* 8582
Elizabeth Vigano *(elizabeth.vigano@morganstanley.com)* 7339
Charles Murphy *(charles.murphy@morganstanley.com)* 4990
Vivian Cervantes *(vivian.cervantes@morganstanley.com)* 4649
Laurie Kennedy *(laurie.kennedy@morganstanley.com)* 7038
Rekha Sampath *(rekha.sampath@morganstanley.com)* 8024

Electronics Manufacturing Services:
Scott Craig *(scott.craig@morganstanley.com)* 4967
Bernie Mahon *(bernie.mahon@morganstanley.com)* 6274

Imaging Technology:
Solin Cho *(solin.cho@morganstanley.com)* 6140

Enterprise Storage:
James Berlino *(james.berlino@morganstanley.com)* 7582
April Henry *(april.henry@morganstanley.com)* 4669

Systems & Enterprise Hardware & PC Hardware:
Rebecca Runkle *(rebecca.runkle@morganstanley.com)* 6466
Stirling Levy *(stirling.levy@morganstanley.com)* 6430
Kathryn Huberty *(kathryn.huberty@morganstanley.com)* 6249
Max Gross *(max.gross@morganstanley.com)* 3735

Semiconductor Capital Equipment:
Steven Pelayo *(steven.pelayo@morganstanley.com)* (415) 576-2324
Bill Lu *(bill.lu@morganstanley.com)* 2608
Gary Hsueh *(gary.hsueh@morganstanley.com)* 2610

Cross Industry:
Brian Fitzgerald *(brian.fitzgerald@morganstanley.com)* (212) 761-4276

European Technology:
Angela Dean *(angela.dean@morganstanley.com)* (London) 425-6614
Ross MacMillan *(ross.macmillan@morganstanley.com)* 8606
Stuart Adrian *(stuart.adrian@morganstanley.com)* 2611
Marcus Nash *(marcus.nash@morganstanley.com)* 3748
Gary Rollo *(gary.rollo@morganstanley.com)* 4619
Sean Gardiner *(sean.gardiner@morganstanley.com)* 2175
James Lindsay *(james.lindsay@morganstanley.com)* 3504
Kirsten Parker *(kirsten.parker@morganstanley.com)* 8617
Anuj Mutreja *(anuj.mutreja@morganstanley.com)* 3731
Andrew White *(andy.white@morganstanley.com)* 9721
Dieter Weber *(dieter.weber@morganstanley.com)* 9895
Rajesh Nathwani *(raj.nathwani@morganstanley.com)* 5919
Jonty Starbuck *(jonty.starbuck@morganstanley.com)* 4610

Japan Technology:
Takatoshi Yamamoto *(takat.yamamoto@morganstanley.com)* 424-5301
Noriko Oki *(noriko.oki@morganstanley.com)* 5330
Tomohiro Murata *(tomohiro.murata@morganstanley.com)* 5341
Masaharu Miyachi *(masaharu.miyachi@morganstanley.com)* 5321
Shunji Yamashina *(shunji.yamashina@morganstanley.com)* 5363
Koichiro Nakamura *(koichiro.nakamura@morganstanley.com)* 5924
Ema Yamakawa *(ema.yamakawa@morganstanley.com)* 5378

Internet & PC Applications Software:
Mary Meeker *(mary.meeker@morganstanley.com)* (212) 761-8042
David Joseph *(david.joseph@morganstanley.com)* 3365
Michael L. Brown *(michael.l.brown@morganstanley.com)* 6030

Enterprise Software:
Chuck Phillips *(charles.phillips@morganstanley.com)* 4450
Ryan Rathman *(ryan.rathman@morganstanley.com)* 6377
Evan Bloomberg *(evan.bloomberg@morganstanley.com)* 3659
Aaron Brann *(aaron.brann@morganstanley.com)* 6126

Wireline Networking Equipment:
Alkesh Shah *(alkesh.shah@morganstanley.com)* 6554
Scott Coleman *(scott.coleman@morganstanley.com)* 6055
David Feinberg *(david.feinberg@morganstanley.com)* 0216
John Marchetti *(john.marchetti@morganstanley.com)* 8940

Telecom Equipment-Wireless:
Alkesh Shah *(alkesh.shah@morganstanley.com)* 6554
Arindam Basu *(arindam.s.basu@morganstanley.com)* (415) 576-2329
Judson Coplan *(judson.coplan@morganstanley.com)* 2611

Asia-Pacific Technology:
Dickson Ho *(dickson.ho@morganstanley.com)* +886 2 2730-2999
Sunil Gupta *(sunil.gupta@morganstanley.com)* +656 834-6732
George Chu *(george.chu@morganstanley.com)* +886 2 730 2865
Naiwen Kerr *(naiwen.kerr@morganstanley.com)* +886 2 730-2869
Keon Han *(keon.han@morganstanley.com)* +822 399-4933
Evelyn Ou *(evelyn.ou@morganstanley.com)* +886 2 730-2866
Viktor Ma *(viktor.ma@morganstanley.com)* +852 2 848-5903
Ellen Tseng *(ellen.tseng@morganstanley.com)* +886 2 730-2864
Shawn Kim *(shawn.kim@morganstanley.com)* +822 399-4939
Anantha Narayan *(anantha.narayan@morganstanley.com)* 122 209-7161
David Wanis *(david.wanis@morganstanley.com)* +61 2 9770-1559
Stephen Adams *(stephen.adams@morganstanley.com)* 9770-0116
Eric Wen *(eric.wen@morganstanley.com)* +656 834-6754
Diana Chou *(diana.y.chou@morganstanley.com)* +886 2 2730-2811
Akshay Soni *(akshay.soni@morganstanley.com)* 9122-209-7151
Jeff Park *(jeff.park@morganstanley.com)* +822-399-4937

European Internet:
Javier *Marin (javier.marin@morganstanley.com)* (London) 425-5263
Edward Steel *(edward.steel@morganstanley.com)* 4486

Asia-Pacific Internet:
Minyan Liu *(minyan.liu@morganstanley.com)* +852 2 848-6729

Japan Internet:
Yoshiko Motoyama *(yoshiko.motoyama@morganstanley.com)* 424-5912
Aya Kurita *(aya.kurita@morganstanley.com)* 5366

Global Stock Ratings Distribution

(as of November 30, 2002)

	Coverage Universe		Investment Banking Clients (IBC)		
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight	607	31%	240	37%	40%
Equal-weight	954	48%	301	46%	32%
Underweight	427	21%	110	17%	26%
Total	1,988		651		

Data include common stock and ADRs currently assigned ratings. For disclosure purposes (in accordance with NASD and NYSE requirements), we note that Overweight, our most positive stock rating, most closely corresponds to a buy recommendation; Equal-weight and Underweight most closely correspond to neutral and sell recommendations, respectively. However, Overweight, Equal-weight, and Underweight are not the equivalent of buy, neutral, and sell but represent recommended relative weightings (see definitions below). An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

ANALYST STOCK RATINGS

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U). The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

More volatile (V). We estimate that this stock has more than a 25% chance of a price move (up or down) of more than 25% in a month, based on a quantitative assessment of historical data, or in the analyst's view, it is likely to become materially more volatile over the next 1-12 months compared with the past three years. Stocks with less than one year of trading history are automatically rated as more volatile (unless otherwise noted). We note that securities that we do not currently consider "more volatile" can still perform in that manner.

Ratings prior to March 18, 2002: SB=Strong Buy; OP=Outperform; N=Neutral; UP=Underperform. For definitions, please go to www.morganstanley.com/companycharts.

ANALYST INDUSTRY VIEWS

Attractive (A). The analyst expects the performance of his or her industry coverage universe to be attractive vs. the relevant broad market benchmark over the next 12-18 months.

In-Line (I). The analyst expects the performance of his or her industry coverage universe to be in line with the relevant broad market benchmark over the next 12-18 months.

Cautious (C). The analyst views the performance of his or her industry coverage universe with caution vs. the relevant broad market benchmark over the next 12-18 months.

Stock price charts and rating histories for companies discussed in this report are also available at www.morganstanley.com/companycharts. You may also request this information by writing to Morgan Stanley at 1585 Broadway, 14th Floor (Attention: Research Disclosures), New York, NY, 10036 USA.

For a discussion, if applicable, of the valuation methods used to determine the price targets for these stocks and the risks related to achieving these targets, please refer to the latest published research on these stocks. Research is available through your sales representative or on Client Link at www.morganstanley.com and other electronic systems.

Morgan Stanley

The Americas
1585 Broadway
New York, NY 10036-8293
United States
Tel: +1 (1)212 761 4000

Europe
25 Cabot Square, Canary Wharf
London E14 4QA
United Kingdom
Tel: +44 (0)20 7513 8000

Japan
20-3, Ebisu 4-chome
Shibuya-ku,
Tokyo 150-6008, Japan
Tel: +81 (0)3 5424 5000

Asia/Pacific
Three Exchange Square
Central
Hong Kong
Tel: +852 2848 5200