

# **WORLD PCB MARKET**

## **SIZE, SCOPE & ELECTRONICS EQUIPMENT END MARKETS**

**WALTER CUSTER  
CUSTER CONSULTING GROUP**

**CHINA PRINTED CIRCUIT ASSOC  
MARCH 2000**

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**CUSTER CONSULTING GROUP'S  
INTERNET WEBSITE**

**<http://www.custerconsulting.com>**

# TOPICS

**GLOBAL ECONOMY**

**ELECTRONIC EQUIPMENT**

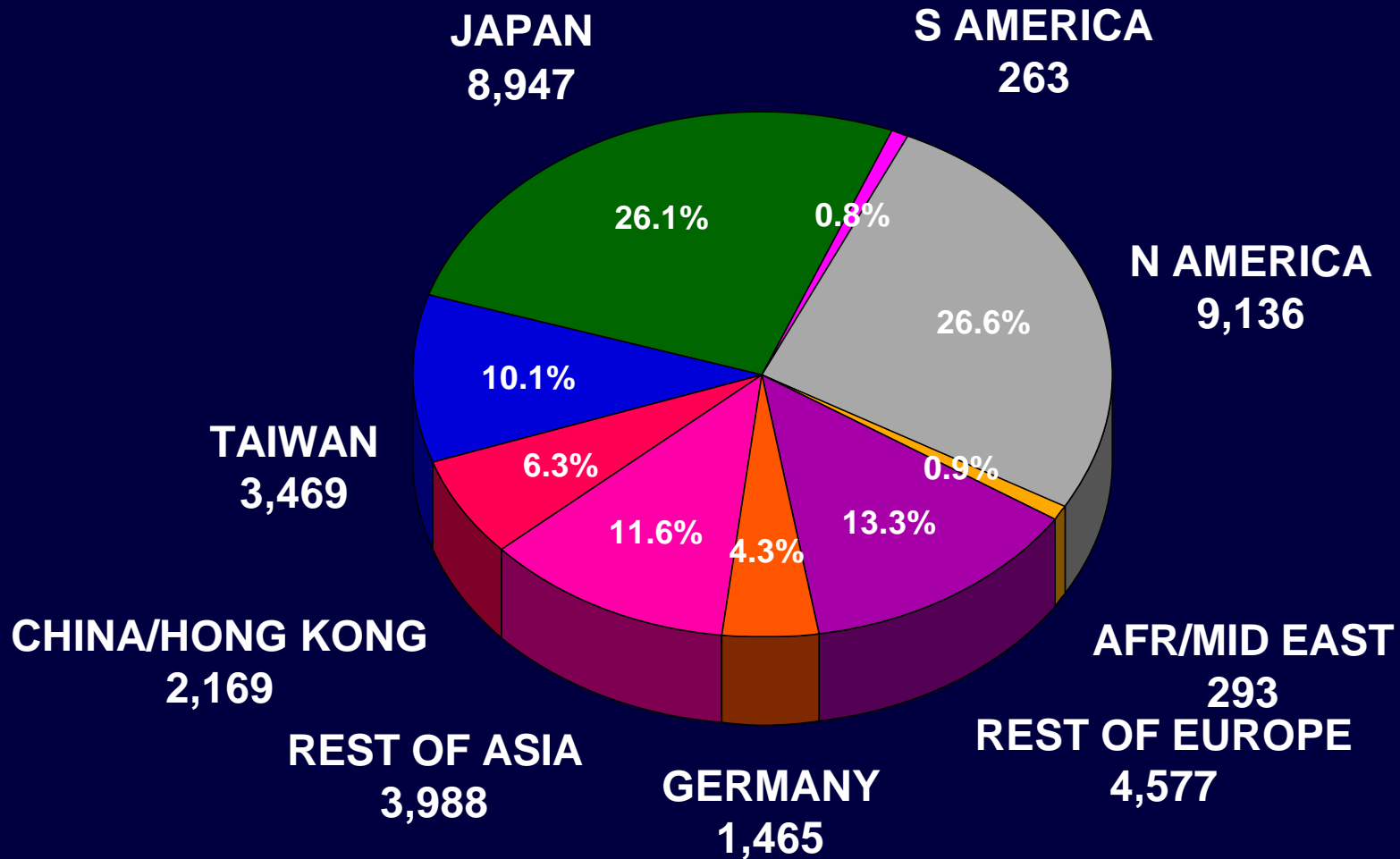
**SEMICONDUCTORS**

**PRINTED CIRCUIT BOARDS**

**FUTURE OUTLOOK**

# 1998 WORLD RIGID & FLEX PCB PRODUCTION

## BY GEOGRAPHICAL AREA (\$M)



**Total: \$34.3 Billion**

IPC T/MRC 6/99 (includes Buildup PCBs)

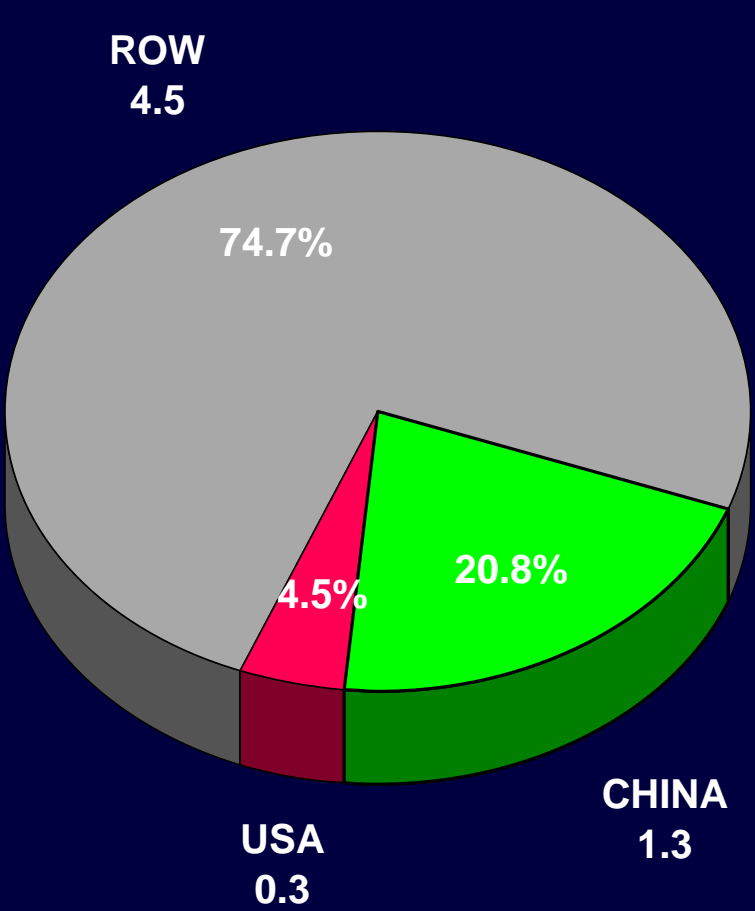
# INDUSTRIAL PRODUCTION - WORLD

% CHANGE vs ONE YEAR EARLIER

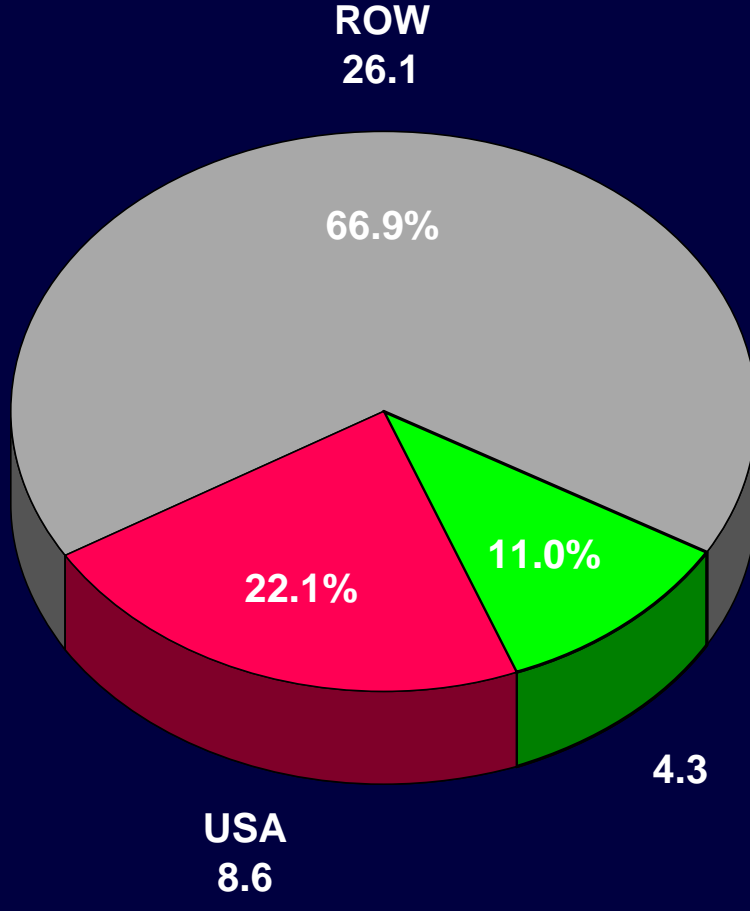
BRITAIN	+1.9 Dec
FRANCE	+4.5 Nov
GERMANY	+2.8 Dec
ITALY	+8.8 Dec
NETHERLANDS	+7.8 Dec
SPAIN	+6.2 Nov
EURO-11	+2.8 Nov
RUSSIA	+10.7 Jan
CANADA	+5.8 Nov
USA	+5.6 Jan
CHINA	+8.8 Dec
MALAYSIA	+16.2 Dec
SINGAPORE	+7.0 Dec
S KOREA	+24.1 Dec
TAIWAN	+10.9 Dec
THAILAND	+15.3 Dec
JAPAN	+5.3 Dec

# CHINA , USA & WORLD

## POPULATION & GROSS PRODUCT - 1998



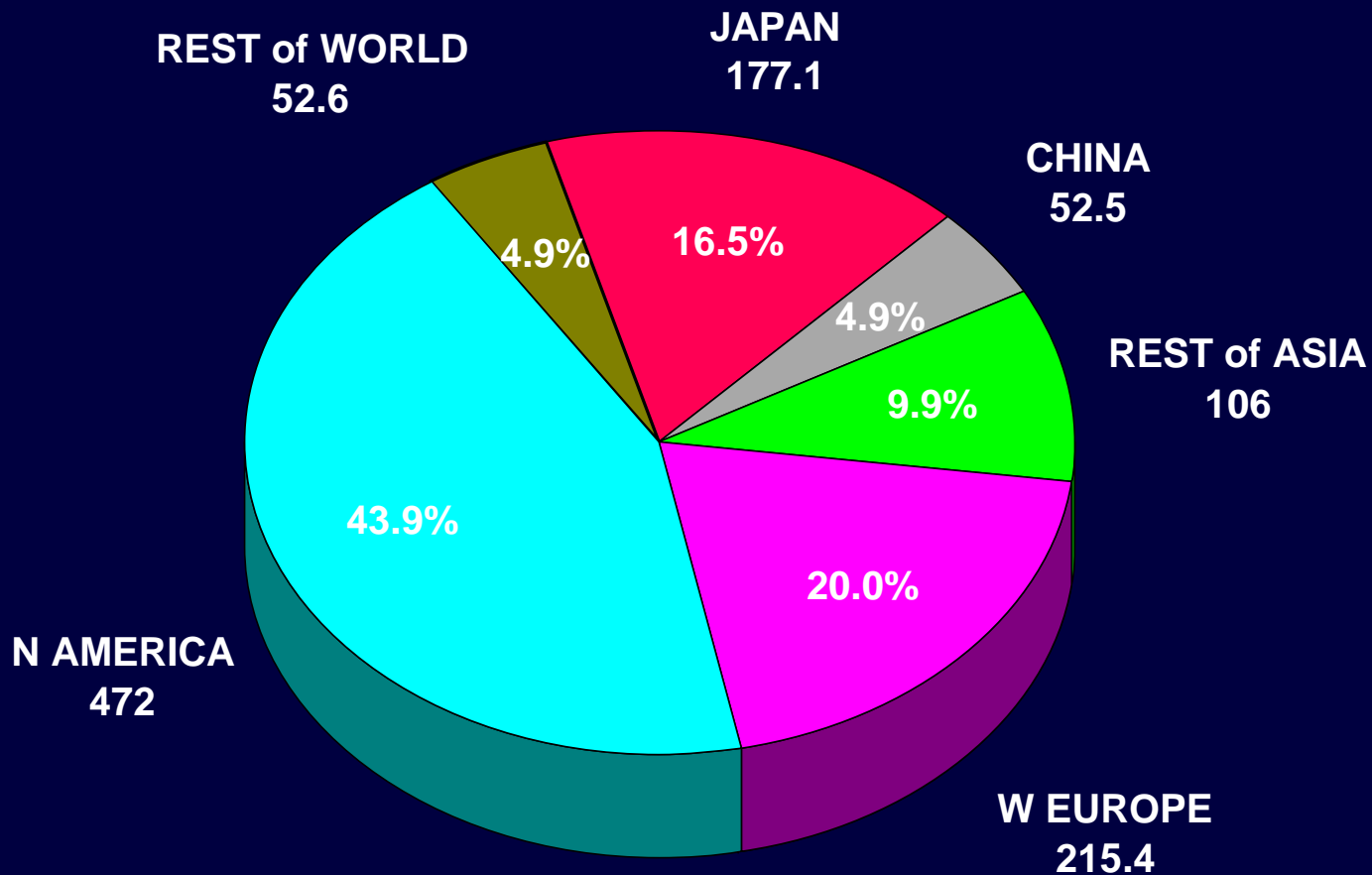
**POPULATION**  
**TOTAL: 6.0 Billion**



**GROSS PRODUCT**  
**TOTAL: \$39 Trillion**

# WORLD ELECTRONIC EQUIPMENT PRODUCTION

1999



**TOTAL \$1,076 Billion**

# **LONG TERM GROWTH DRIVERS**

**INCREASING ELECTRONIC CONTENT OF CAPITAL GOODS**

**PRODUCTS THAT DID NOT EXIST A DECADE AGO**

**EMERGING GLOBAL MARKETS**

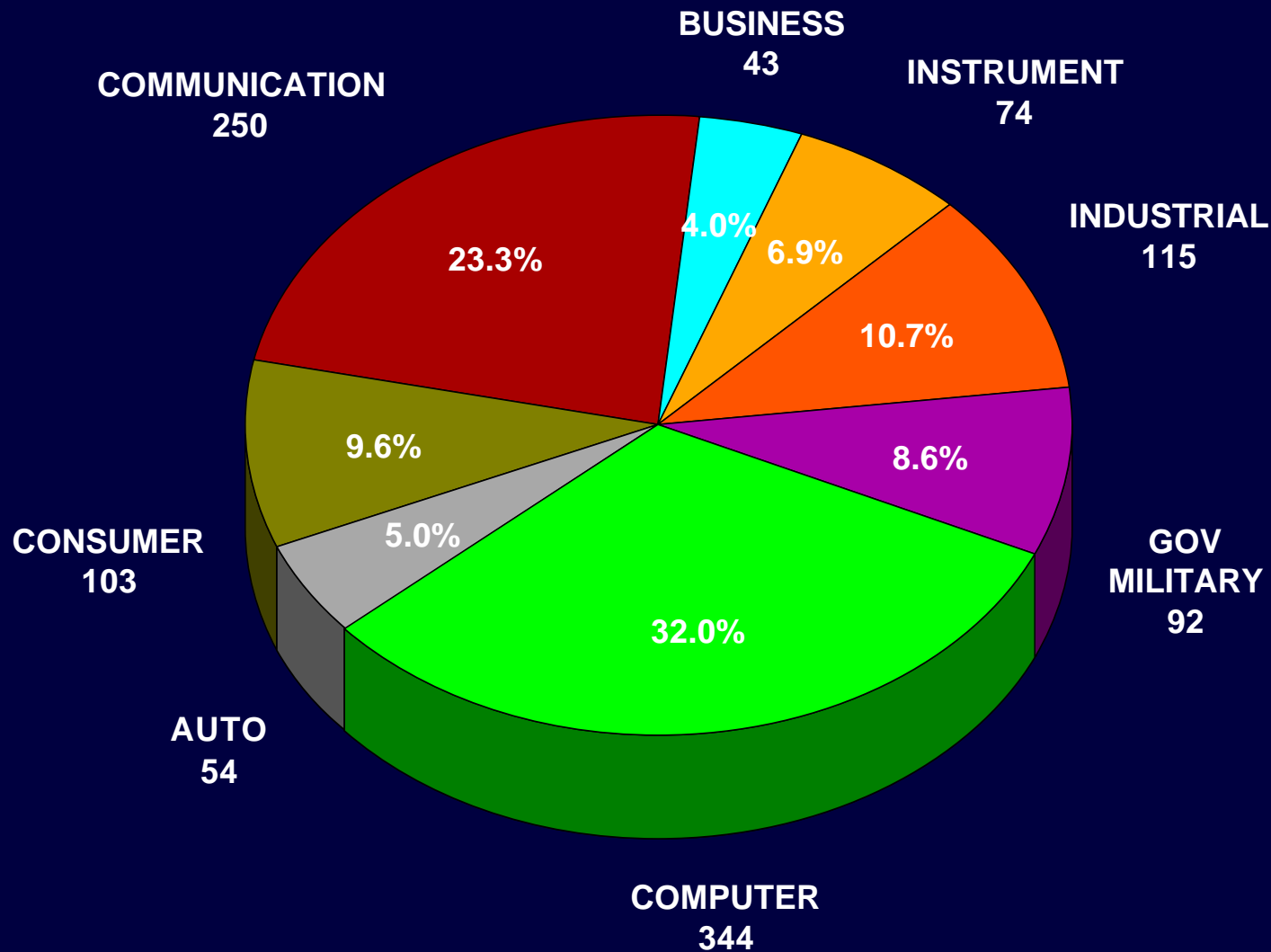
**GLOBAL PERSONAL COMPUTER CATCH-UP TO USA  
LEVELS**

**CELLULAR PHONES - DEVELOPING NATIONS**

**INTERNET EXPLOSION**

# ELECTRONIC EQUIPMENT PRODUCTION

WORLD - 1999 ESTIMATE (\$B)



# TOP N AMERICAN ELECTRONICS COMPANIES

COMPANY (1999 SALES IN \$ BILLIONS)

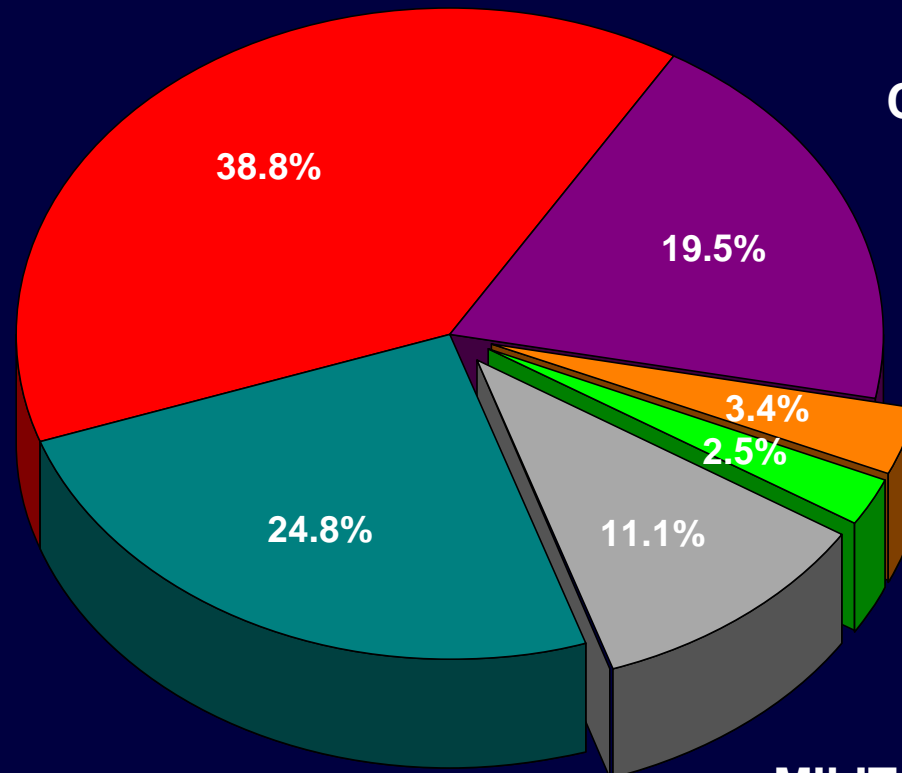
<b>IBM</b>	<b>92.4</b>	EATON	6.7
HEWLETT-PACKARD	42.4	NCR	6.6
COMPAQ	42.5	3 COM	6.3
LUCENT	38.3	APPLE	6.1
MOTOROLA	32.0	EMC	5.3
DELL	26.3	<b>LITTON</b>	<b>4.8</b>
NORTEL	22.6	MEDTRONICS	4.8
XEROX DOCUMENT	19.8	PITNEY-BOWES	4.6
<b>RAYTHEON</b>	<b>19.2</b>	DOVER	4.6
CISCO	12.2	QUALCOMM	3.9
SUN MICRO	11.7	COOPER IND	3.8
GATEWAY 2000	9.1	LEXMARK	3.5
<b>HONEYWELL</b>	<b>8.8</b>	QUANTUM HD	3.2
UNISYS	7.8	COMPUCOM	3.0
HUGHES ELEC	7.4	SILICON GRAPHICS	2.7
<b>ROCKWELL INTL</b>	<b>7.0</b>	STORAGE TECH	2.5
SEAGATE	6.8	GENERAL INSTR	2.3

# US PRODUCTION OF ELECTRONIC EQUIPMENT

## 1999 ESTIMATE (\$B)

COMPUTER & OFFICE  
\$170.0

COMMUNICATION  
\$85.3



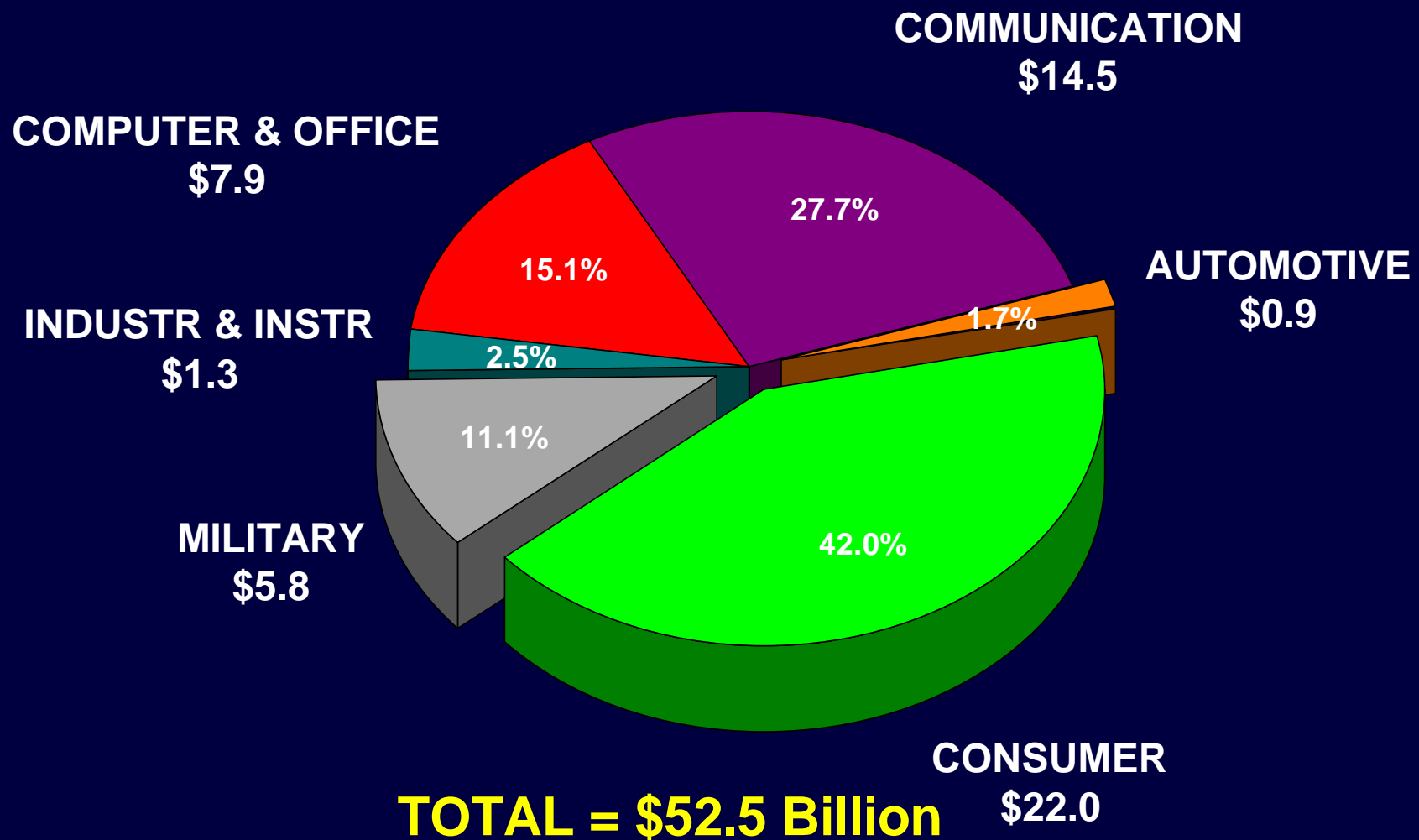
INDUSTRY & INSTR  
\$108.5

MILITARY  
\$48.6

AUTOMOTIVE  
\$14.9  
CONSUMER  
\$10.9

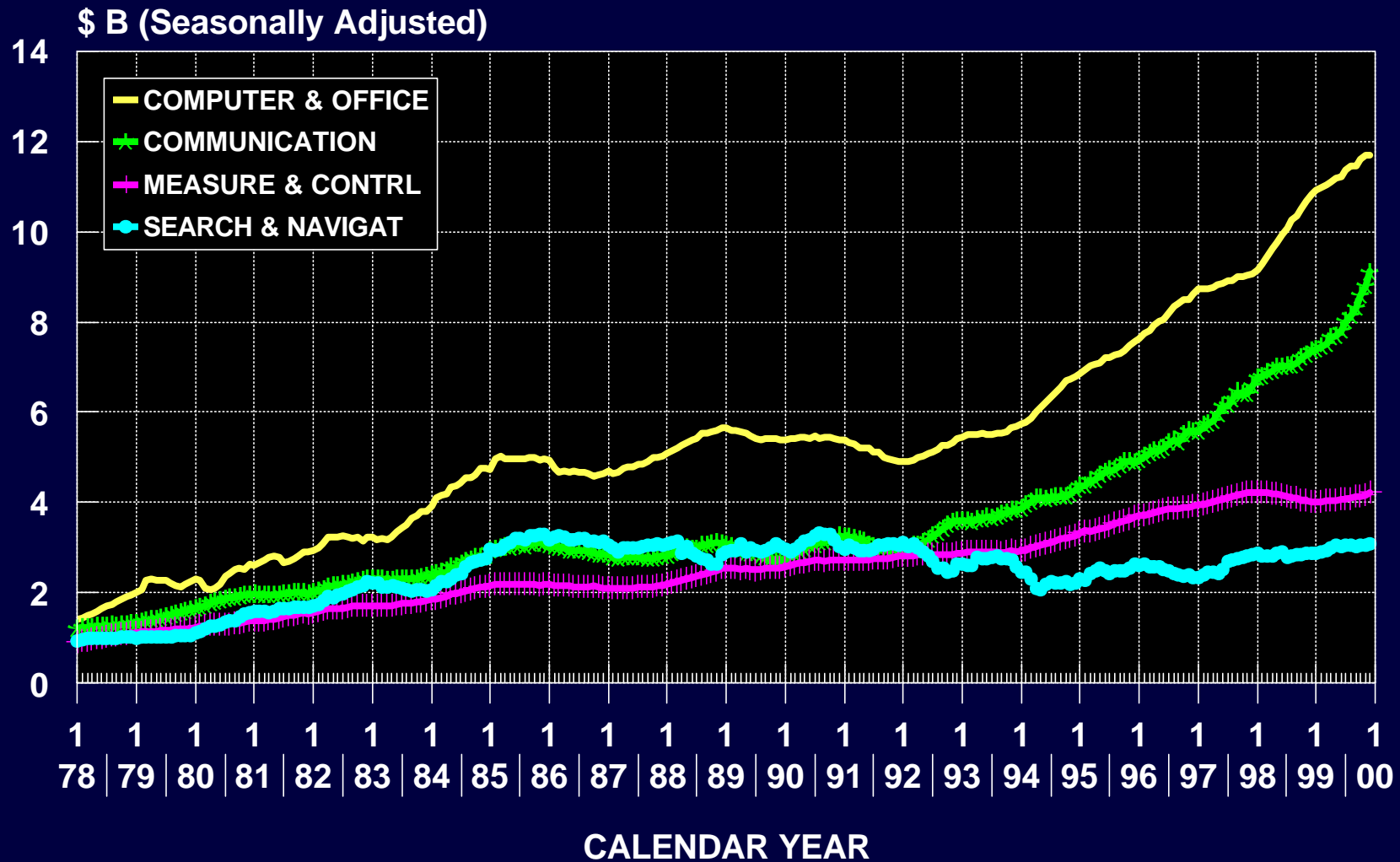
**TOTAL = \$438 Billion**

# CHINA PRODUCTION OF ELECTRONIC EQUIPMENT 1999 ESTIMATE (\$B)

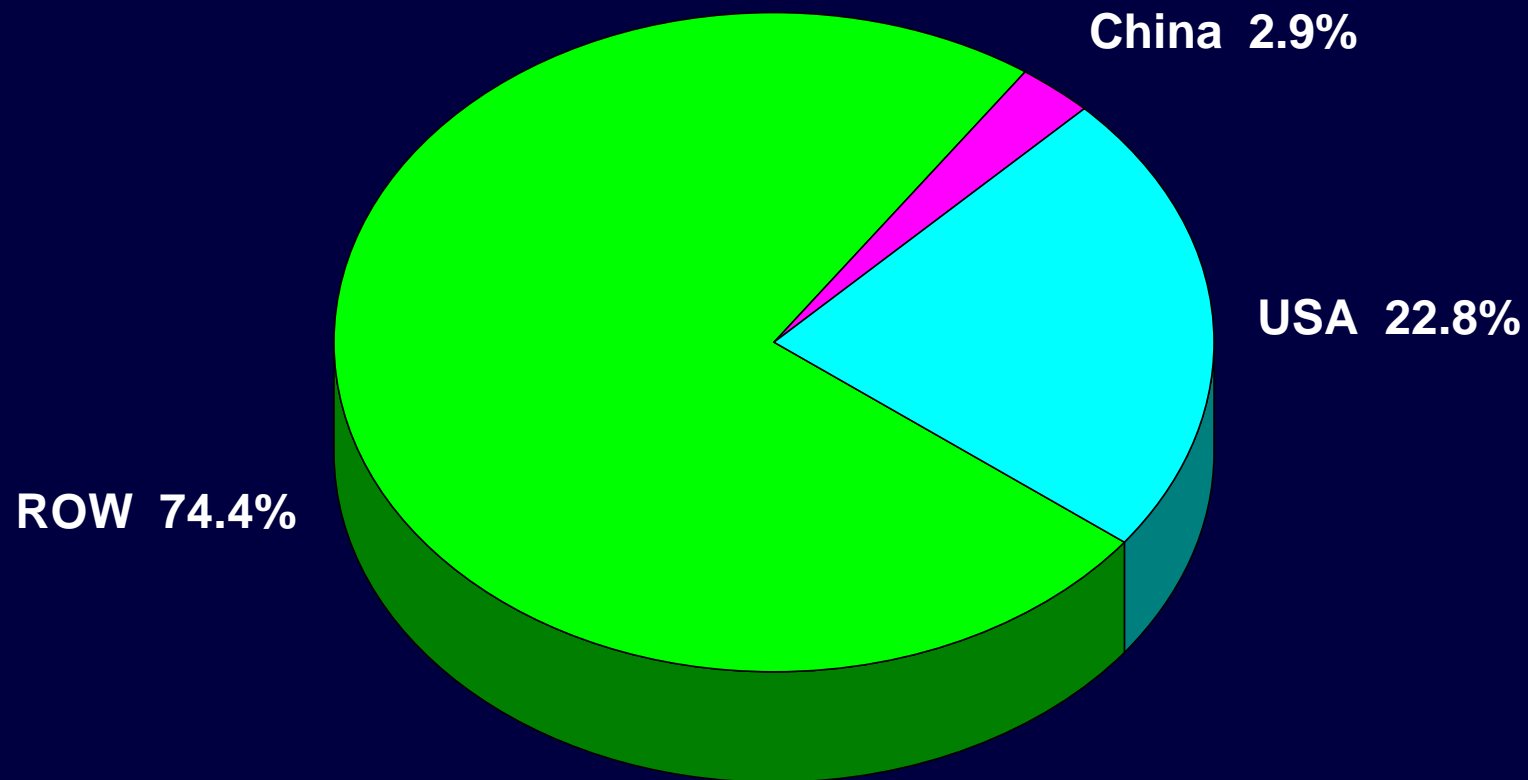


# US ELECTRONIC EQUIPMENT BOOKINGS

## 12 MONTH ROLLING AVERAGE



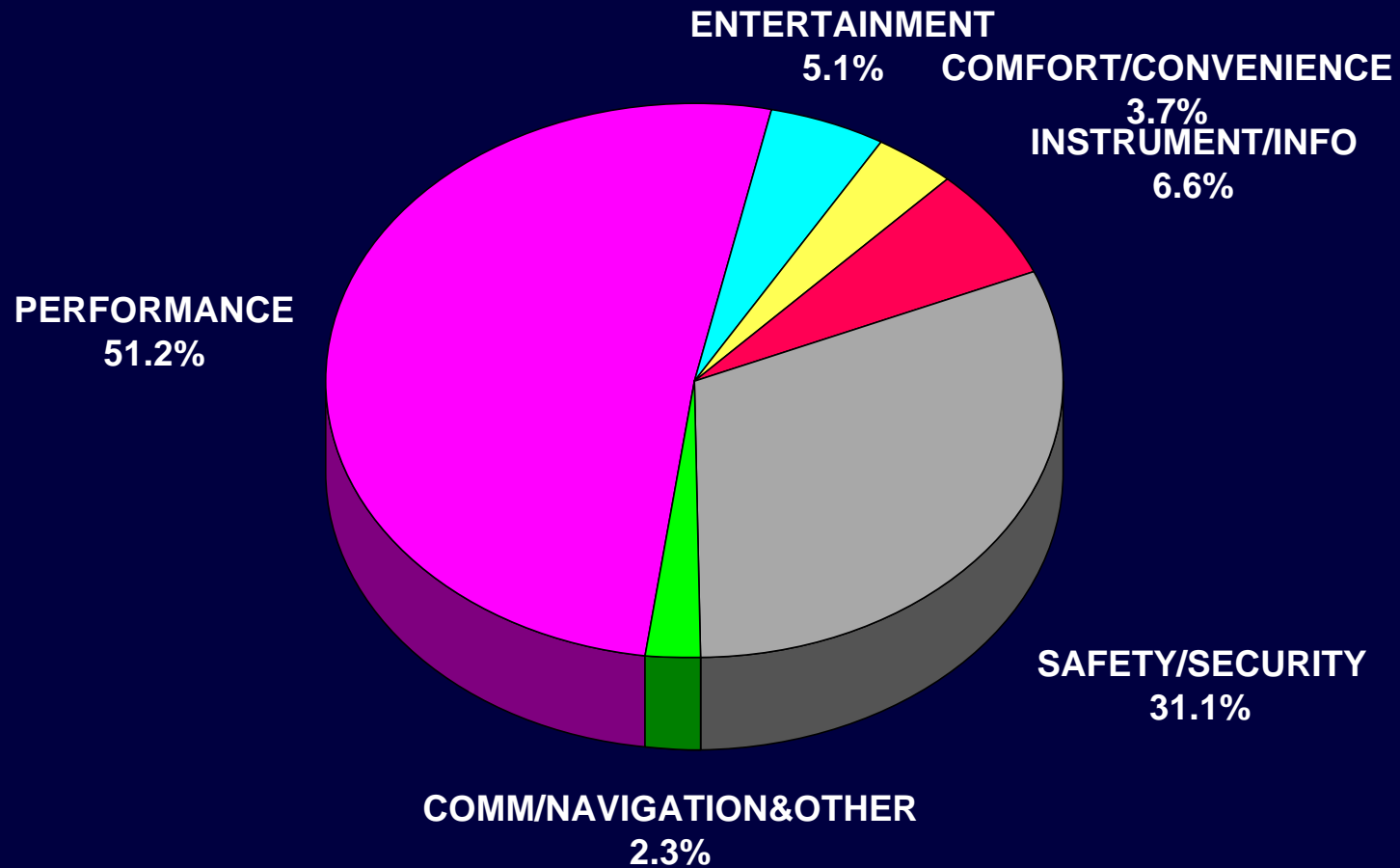
# 1999 WORLD MOTOR VEHICLE PRODUCTION AUTOS, TRUCKS & BUSES



**TOTAL: 56 Million Units**

# AUTOMOTIVE ELECTRONICS PRODUCTION

## U.S. - 1999



**TOTAL: \$14.7 Billion**

# Automotive Electronics

Rank		1998 Global Segment Revenue (\$M)
1	Ford Motor Co.	\$3,610
2	General Motors	\$3,074
3	Motorola	\$2,352
4	TRW	\$1,225
5	Sagem	\$874

# Consumer Electronics

(e.g. TVs, cameras & audio)

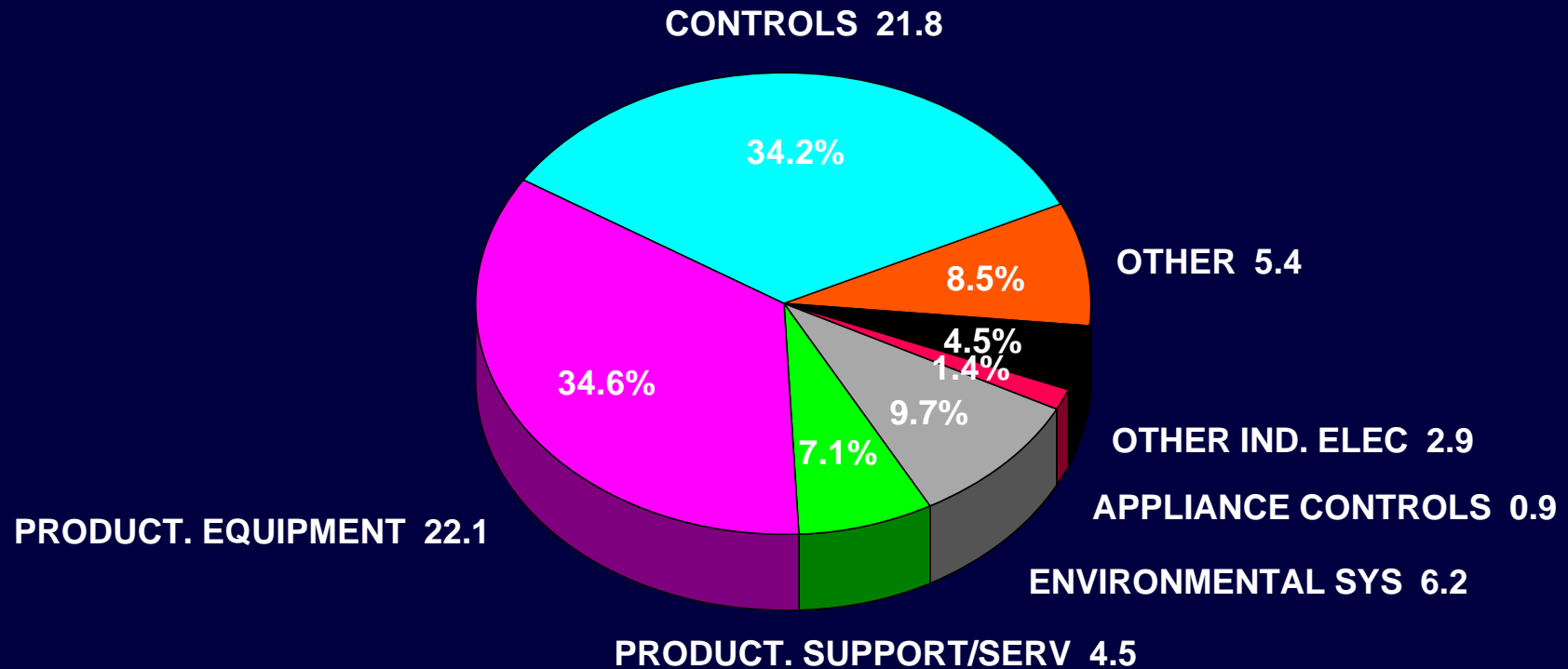
Rank		1998 Global Segment Revenue (\$M)
1	Hitachi	\$28,694
2	Pioneer Electronic	\$4,114
3	Nintendo	\$4,015
4	Casio Computer	\$3,773
5	Aiwa	\$2,749
6	Sega Enterprises	\$2,492
7	NEC	\$1,843
8	Kenwood	\$1,806
9	Semi-Tech Global (STG)	\$1,442
10	Fujitsu	\$1,124

# Government, Military & Aerospace

Rank		1998 Global Segment Revenue (\$M)
1	Raytheon	\$14,822
2	Lockheed Martin	\$7,342
3	General Electric Co. (GEC)	\$6,116
4	General Motors	\$5,968
5	TRW	\$4,900
6	Northrop Grumman	\$4,006
7	Litton Industries	\$2,841
8	Honeywell	\$2,528
9	Boeing Company, The	\$2,527
10	Rockwell International	\$2,318
11	Allied Signal	\$2,154
12	ITT Industries	\$1,220
13	Harris	\$937
14	Motorola	\$882
15	Sagem	\$739

# INDUSTRIAL ELECTRONICS PRODUCTION

U.S. - 1999



**TOTAL: \$63.7 Billion**

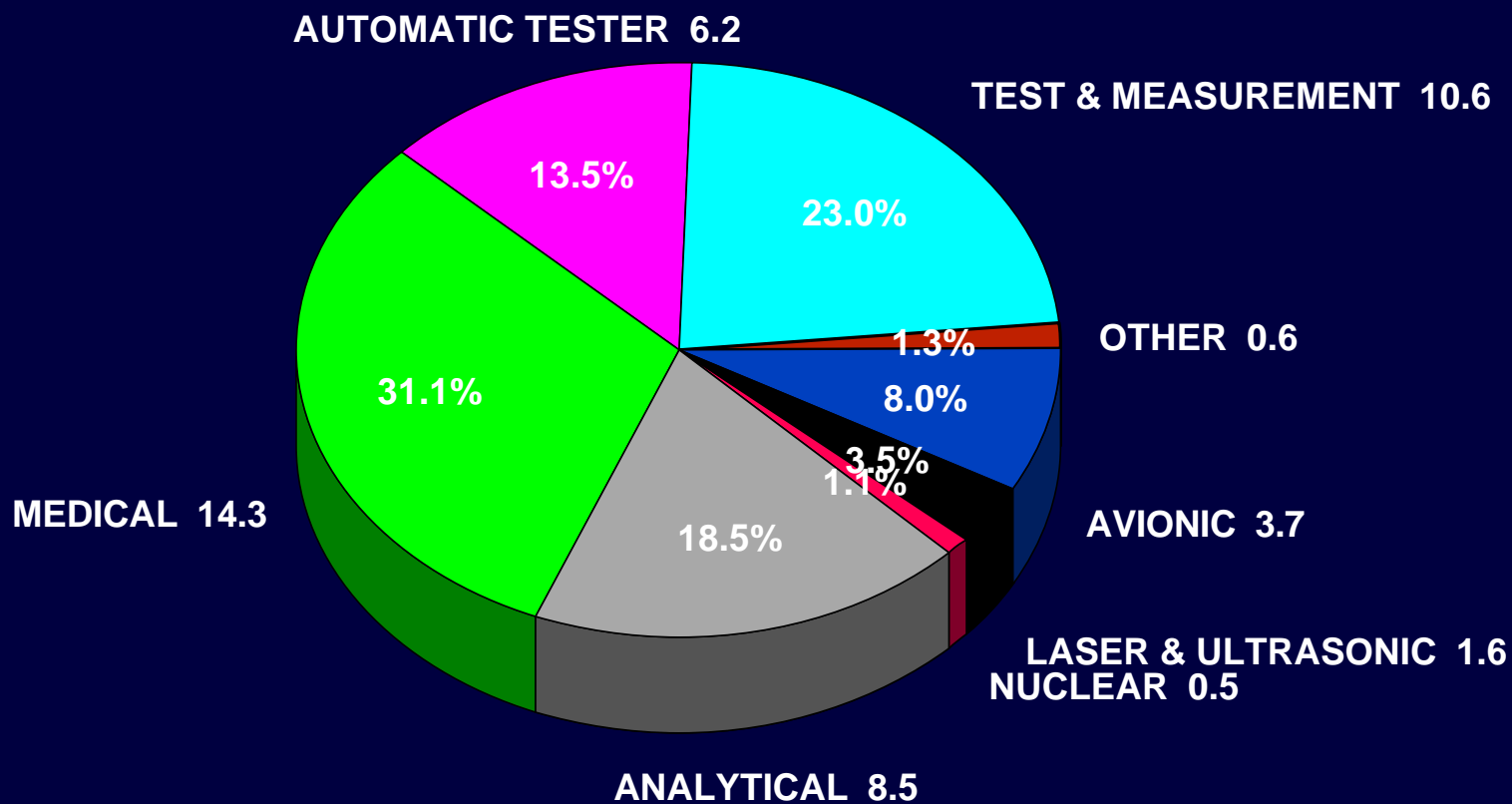
# Industrial Systems

(e.g. automation, controls & security)

Rank		1998 Global Segment Revenue (\$M)
1	Fuji Electric	\$7,385
2	Rockwell International	\$4,707
3	BTR Siebe	\$4,665
4	Omron	\$4,598
5	Emerson Electric	\$4,430
6	Honeywell	\$4,213
7	Johnson Controls	\$3,512
8	General Electric Co. (GEC)	\$3,511
9	Eaton	\$3,320
10	General Electric Co	\$2,926
11	Nikon	\$1,818
12	Matsushita Electric Works	\$1,612
13	Pittway	\$1,128
14	NEC	\$1,106
15	Symbol Technologies	\$978
16	Sensormatic Electronics	\$975
17	Dover	\$908
18	Allied Signal	\$816
19	Texas Instruments	\$761
20	Diebold	\$711

# ELECTRONIC INSTRUMENT PRODUCTION

U.S. - 1999



**TOTAL: \$46.0 Billion**

# Instruments, Test & Measurement

Rank		1998 Global Segment Revenue (\$M)
1	Hewlett-Packard	\$4,246
2	Thermo Electron	\$1,888
3	Perkin-Elmer	\$1,504
4	Teradyne	\$1,221
5	KLA-Tencor	\$926
6	Tektronix	\$886
7	Danaher	\$485
8	Honeywell	\$421
9	EG&G	\$270
10	Teac	\$135

# Medical Equipment

Rank		1998 Global Segment Revenue (\$M)
1	Medtronic	\$2,258
2	Hewlett-Packard	\$1,416
3	Imation	\$318
4	Eastman Kodak	\$280
5	Fuji Photo Film	\$230



# Today in the USA

**Data exceeds voice volume on phone lines**

**E-Mail exceeds hand-delivered mail volume**

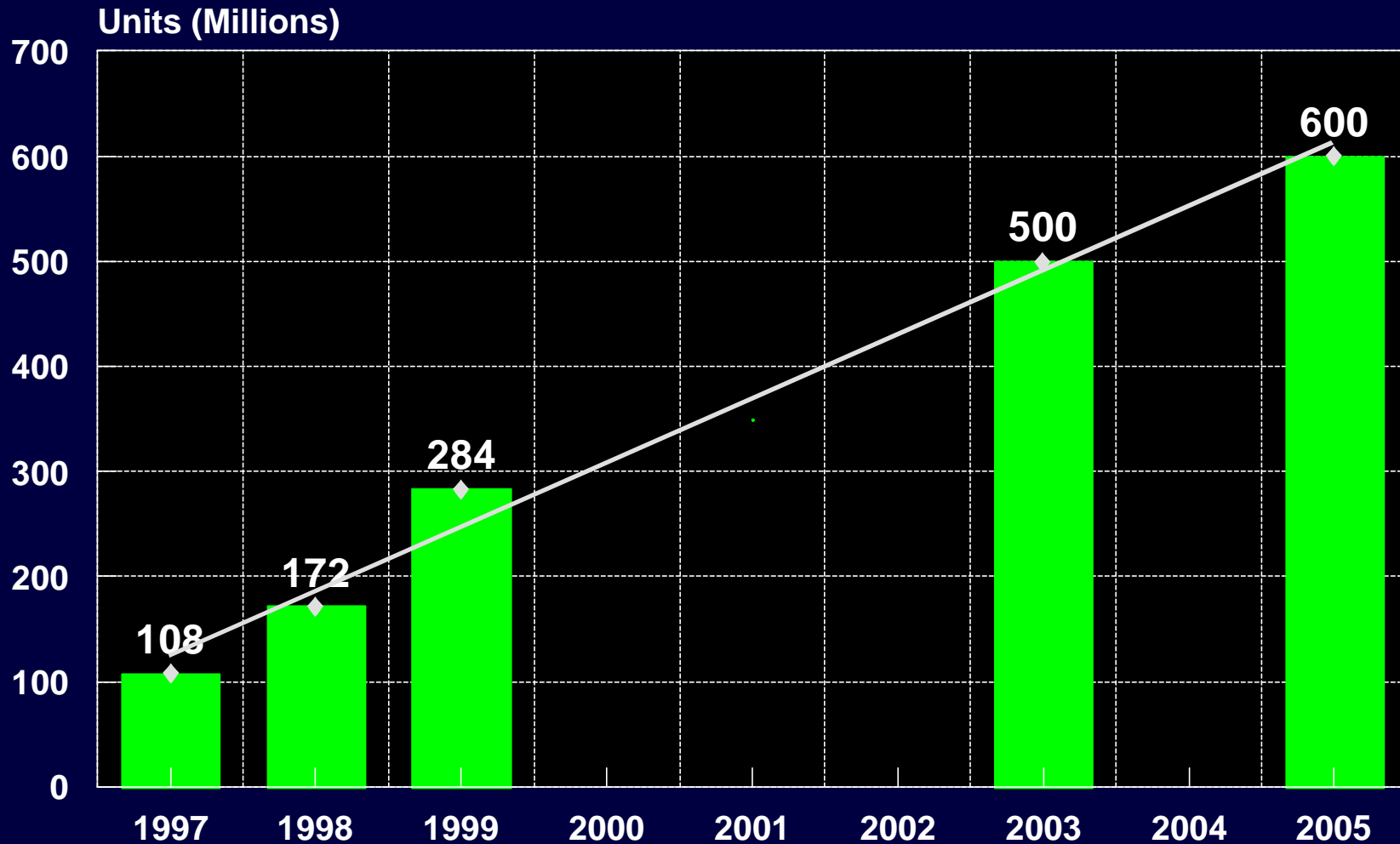
# Communications

(e.g. systems, modems, switches, software & telephones)

Rank		1998 Global Segment Revenue (\$M)
1	Lucent Technologies	\$27,564
2	Telefon AB LM Ericsson	\$22,691
3	Alcatel	\$21,254
4	Motorola	\$19,403
5	Northern Telecom	\$17,575
6	Siemens	\$16,876
7	Nokia	\$15,553
8	NEC	\$12,898
9	Cisco Systems	\$9,989
10	Fujitsu	\$6,369
11	3Com	\$5,572
12	GTE	\$4,977
13	Qualcom	\$3,503
14	Corning	\$2,440
15	General Instrument	\$1,988
16	Sagem	\$1,747
17	General Electric Co. (GEC)	\$1,699
18	Tellabs	\$1,660
19	Oki Electric Industry Co.	\$1,551
20	Ascend Communications	\$1,479

# WORLD CELLULAR PHONE GROWTH

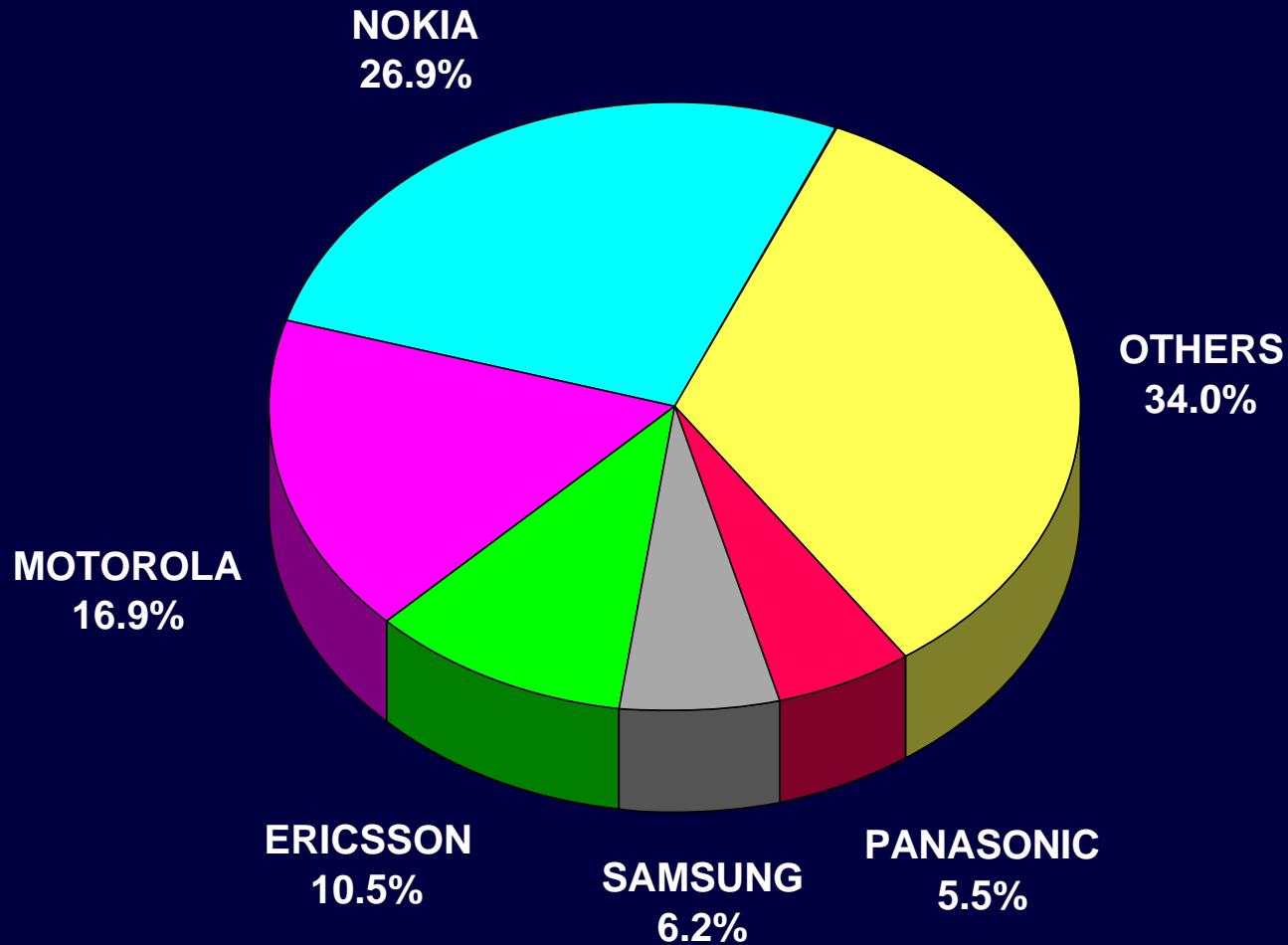
## TOTAL SALES - ANALOG & DIGITAL



Ericsson 5/99, Dataquest 2/2000

# WORLD CELLULAR PHONE SALES

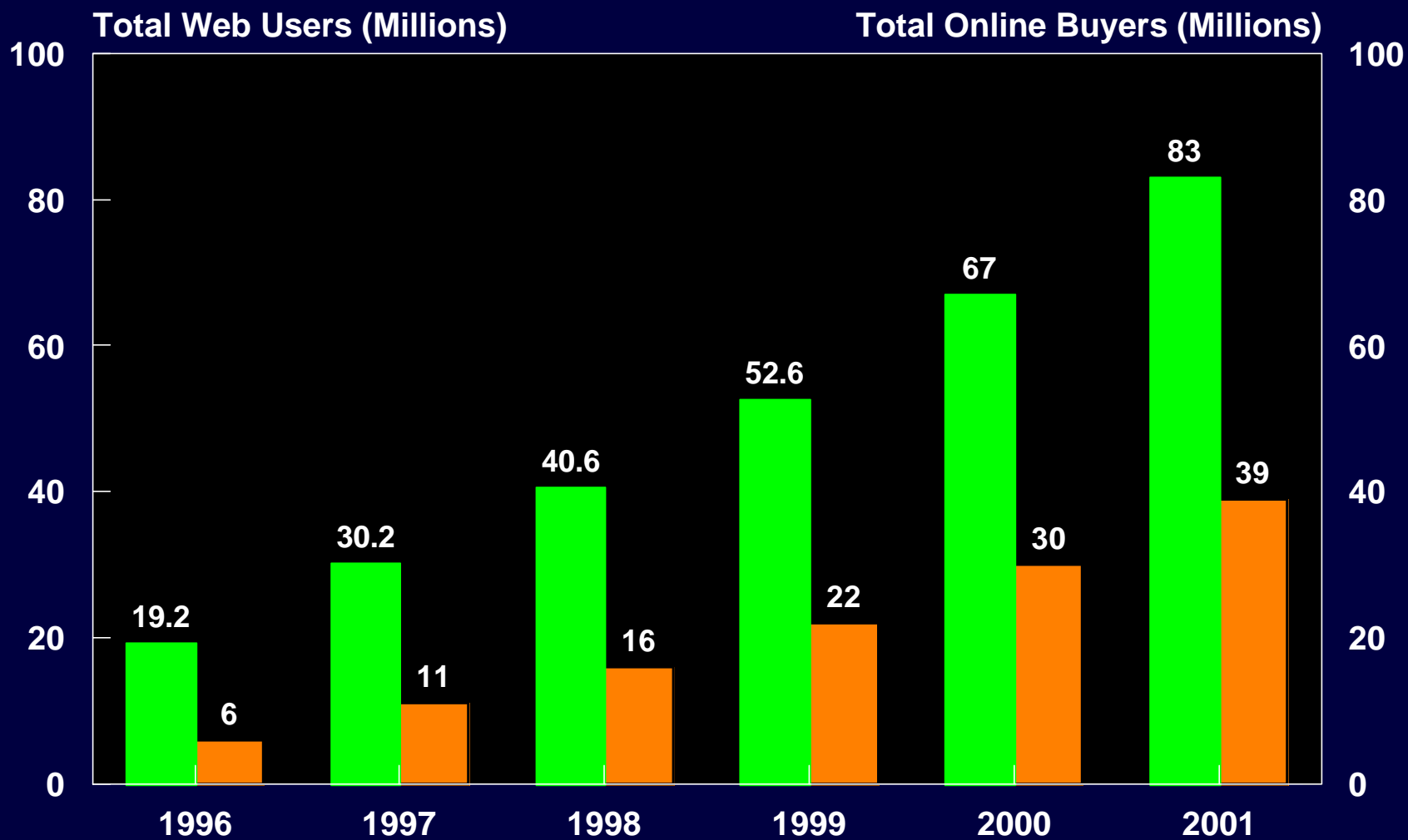
1999



DATAQUEST 2/2000

**TOTAL: 283 MILLION UNITS**

# Growing Market - US Online Consumers



Infoworld: IDC 1/99

# Computer Hardware

Rank		1998 Global Segment Revenue (\$M)
1	IBM	\$35,117
2	Compaq Computer	\$27,429
3	Fujitsu	\$25,850
4	Hewlett-Packard	\$18,873
5	Dell Computer	\$16,966
6	NEC	\$12,161
7	Siemens	\$9,087
8	Sun Microsystems	\$7,888
9	Gateway	\$7,169
10	Acer	\$6,700
11	Apple Computer	\$4,555
12	OKI Electric Ind. Co.	\$2,873
13	Unisys	\$2,523
14	Silicon Graphics	\$2,227
15	Bull	\$1,964
16	Micron Technology	\$1,368
17	Legend Holdings	\$758
18	Data General	\$629
19	Molden	\$544
20	Intergraph	\$516

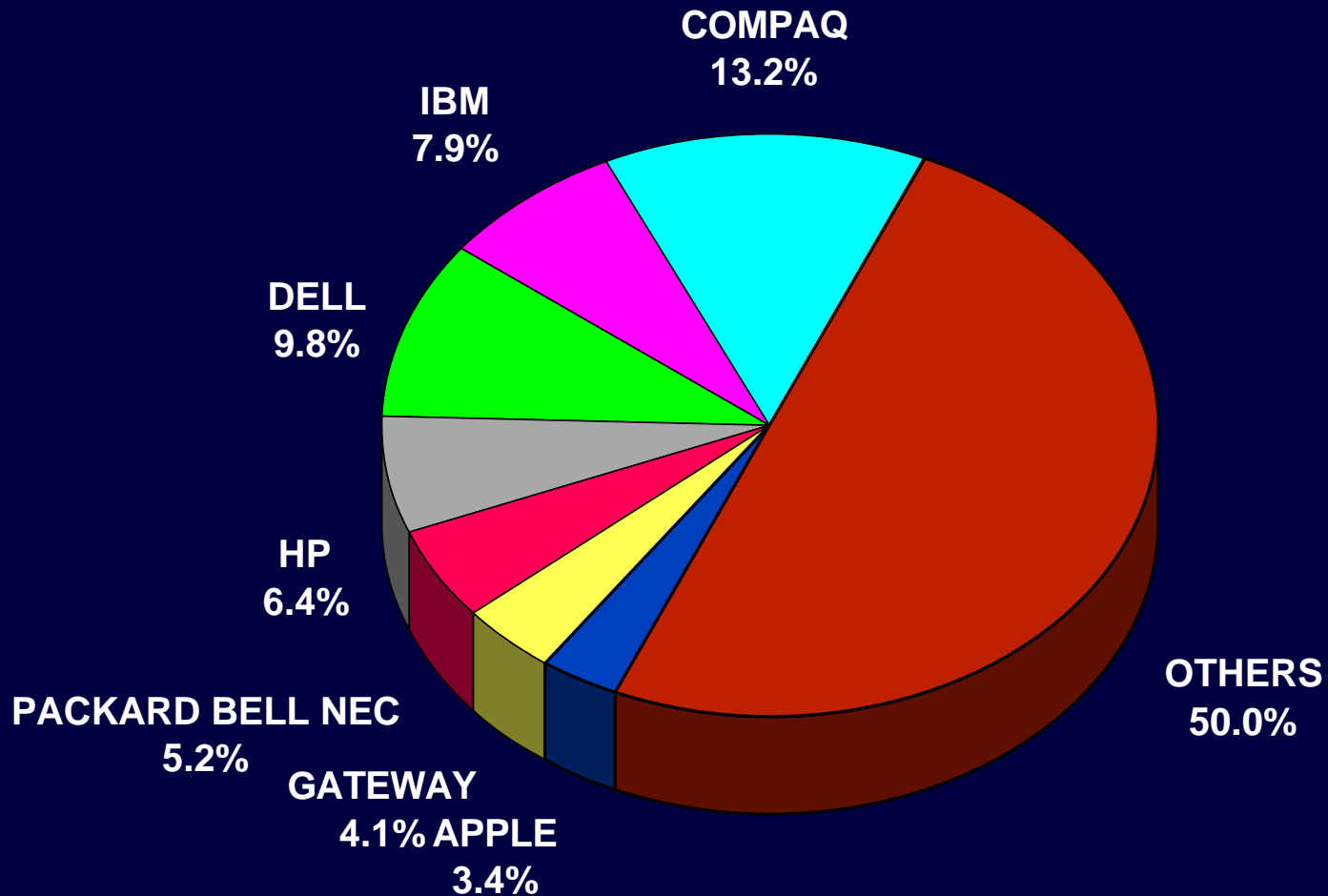
# Office Equipment

(e.g. copiers, scanners & calculators)

Rank		1998 Global Segment Revenue (\$M)
1	Xerox	\$14,565
2	Canon	\$12,132
3	Ricoh	\$9,070
4	Pitney Bowes	\$3,158
5	OCE	\$3,075

# WORLD PERSONAL COMPUTER MARKET

1999



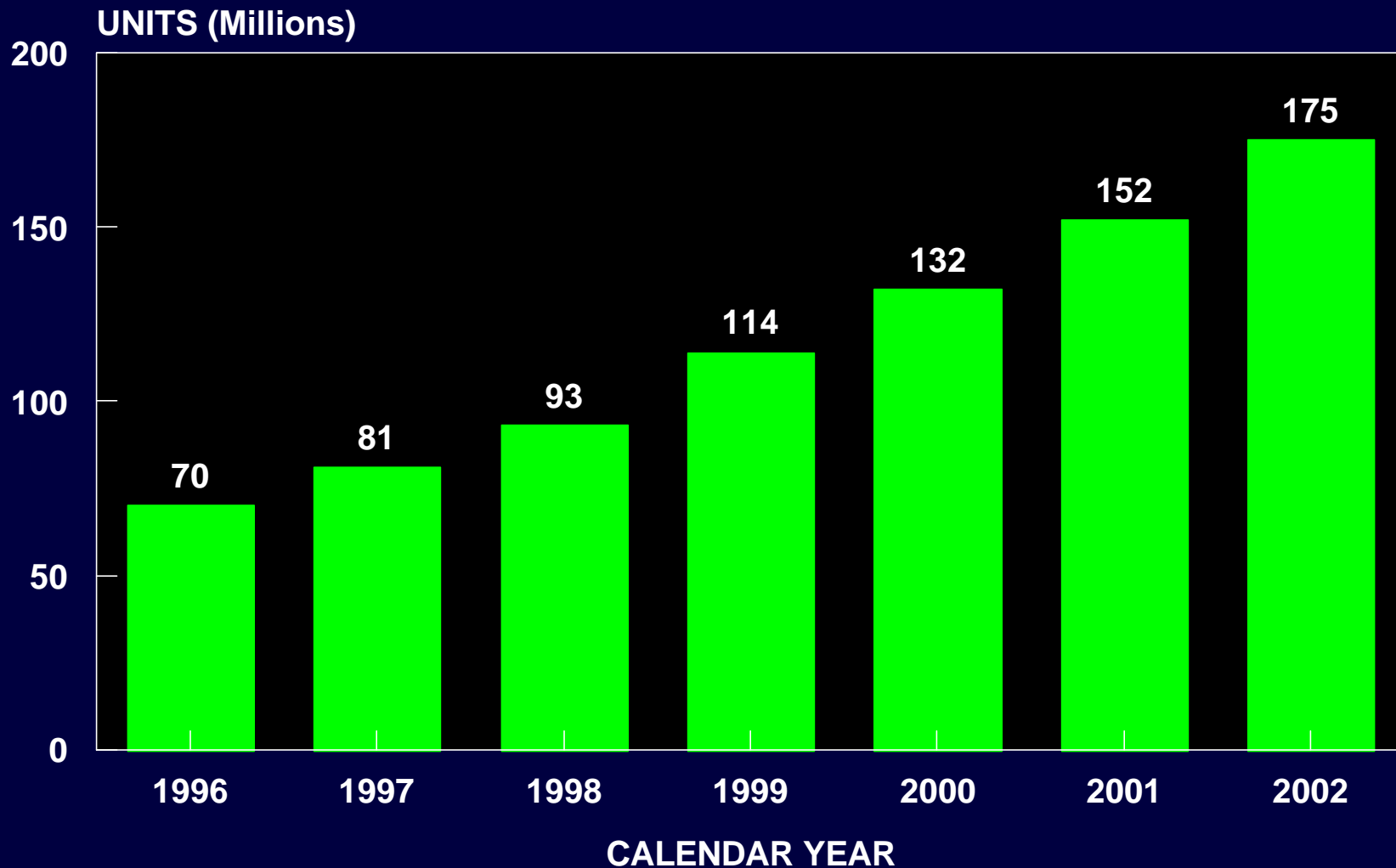
DATAQUEST 1/2000

Preliminary, Servers not included

**TOTAL: 113.5 M UNITS**

# PC COMPUTER GROWTH

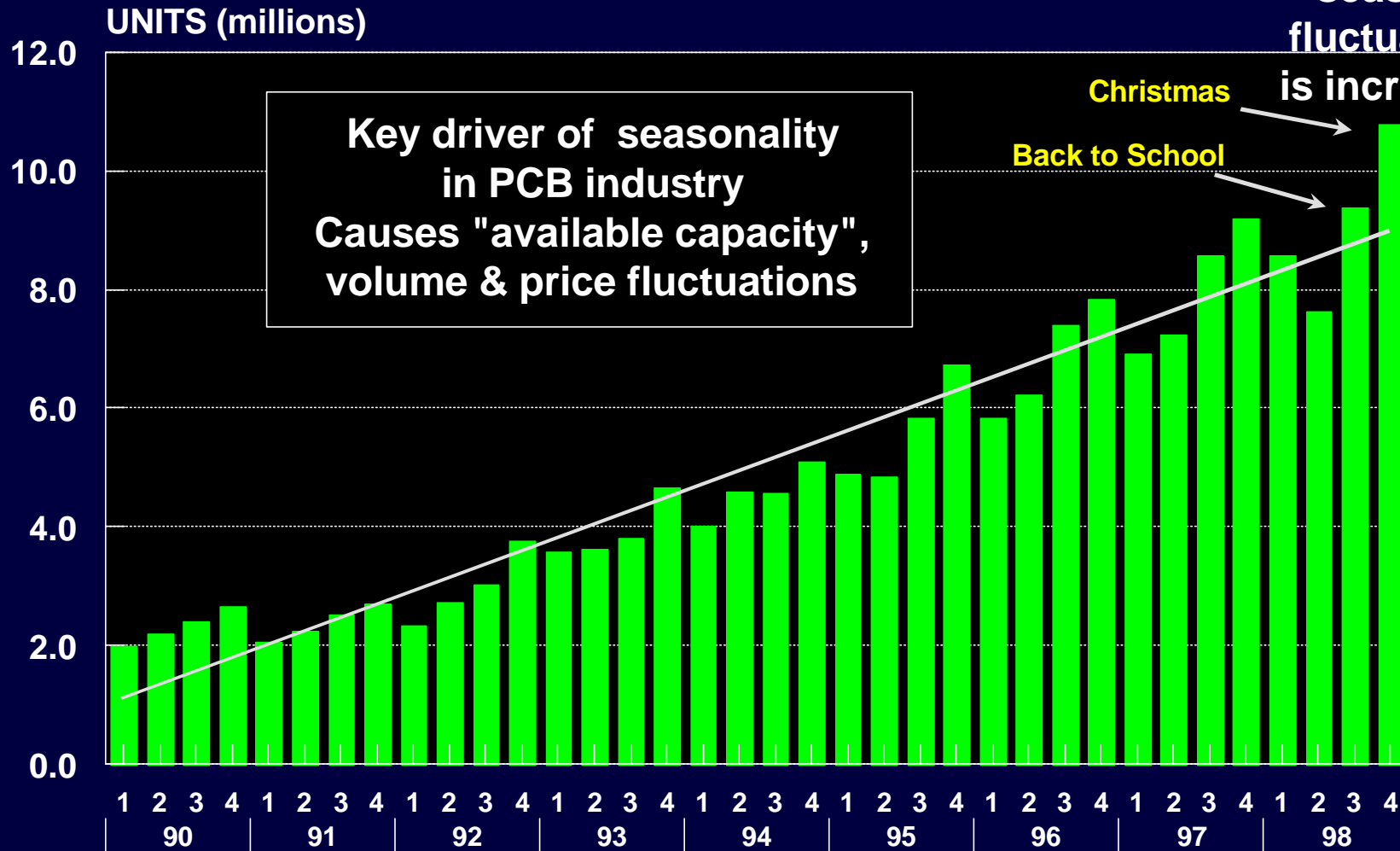
## GLOBAL SALES



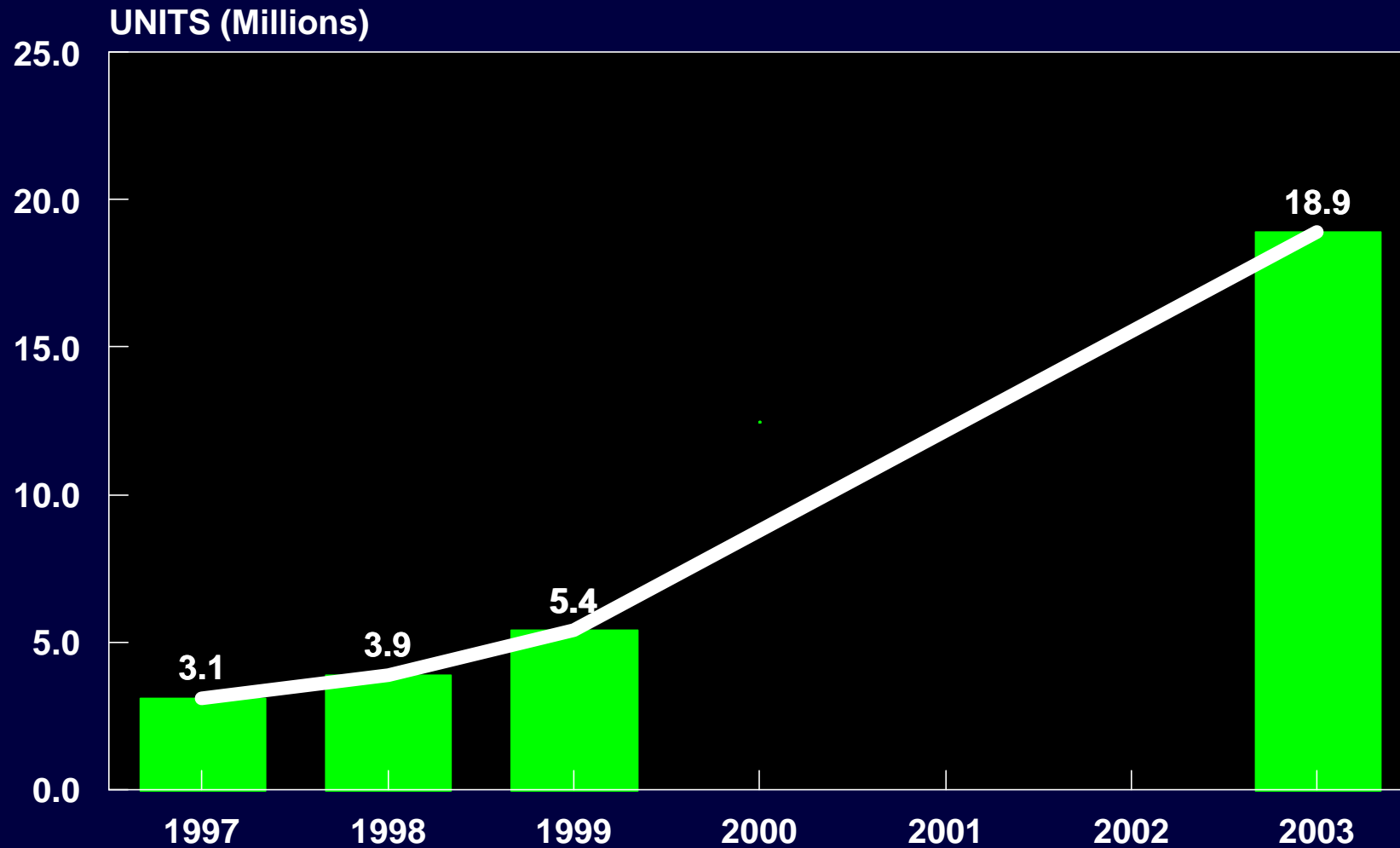
EBN:John Peedie Assoc 8/97, Dataquest 1/99 & 1/2000, Custer 1/2000  
Desktops, Notebooks, Ultraportables - does not include Servers

# MICROCOMPUTER SHIPMENTS TO THE U.S.

Magnitude of seasonal fluctuations is increasing



# HANDHELD COMPUTER WORLDWIDE UNIT SHIPMENTS



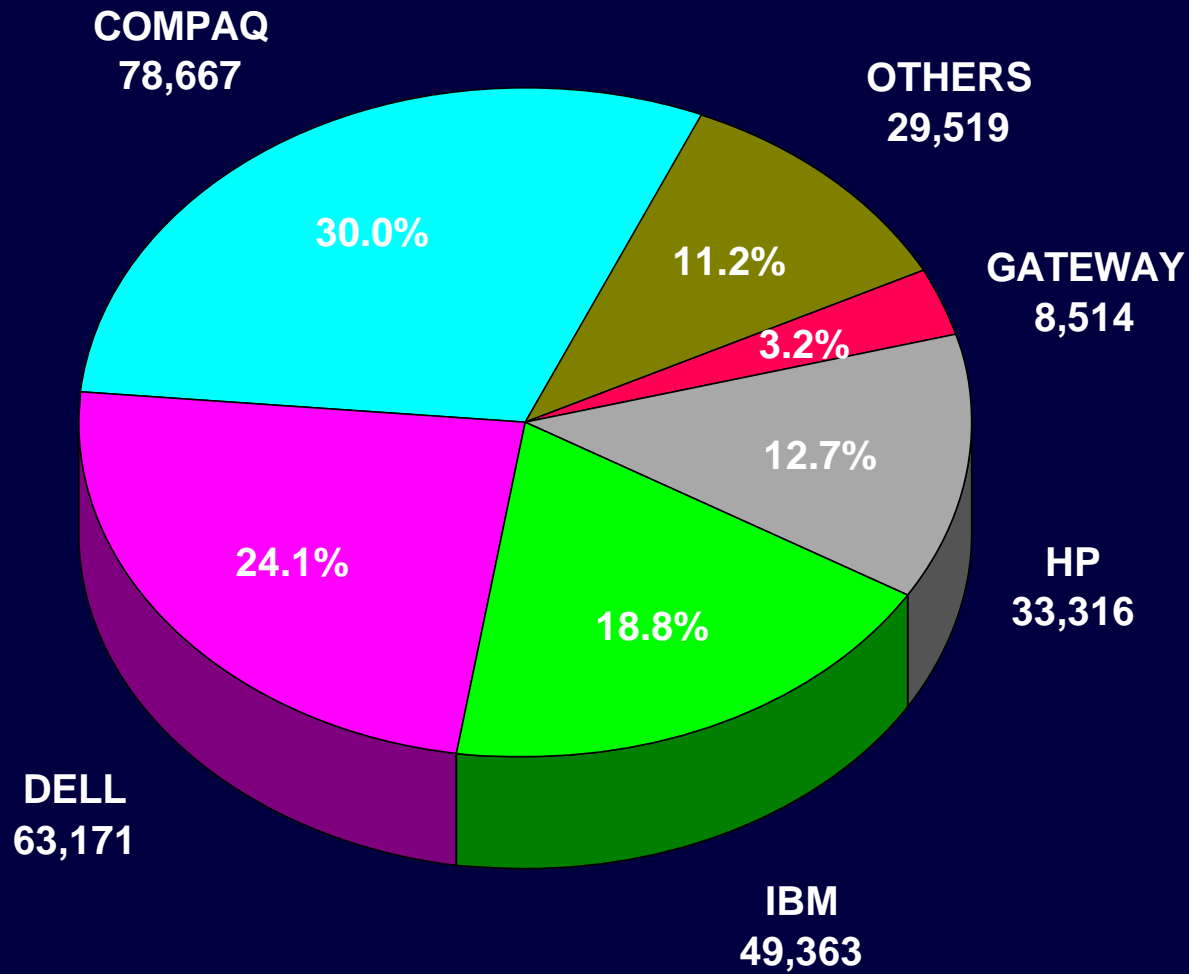
IDC 12/99

# Peripherals

(e.g. printers, disk drives & surge protectors)

Rank		1998 Global Segment Revenue (\$M)
1	Hewlett-Packard	\$16,514
2	Canon	\$9,926
3	Seagate Technology	\$6,406
4	IBM	\$5,717
5	Quantum	\$4,879
6	EMC	\$3,974
7	Western Digital	\$2,871
8	Intel	\$2,627
9	Lexmark Intl. Group	\$2,447
10	Storage Technology	\$2,258
11	lomega	\$1,694
12	Creative Technology	\$1,259
13	Apple Computer	\$1,215
14	American Power Conversion	\$1,126
15	Ricoh	\$1,055
16	Eastman Kodak	\$839
17	Read-Rite	\$777
18	Sun Microsystems	\$736
19	Dell Computer	\$730
20	Adaptec	\$712

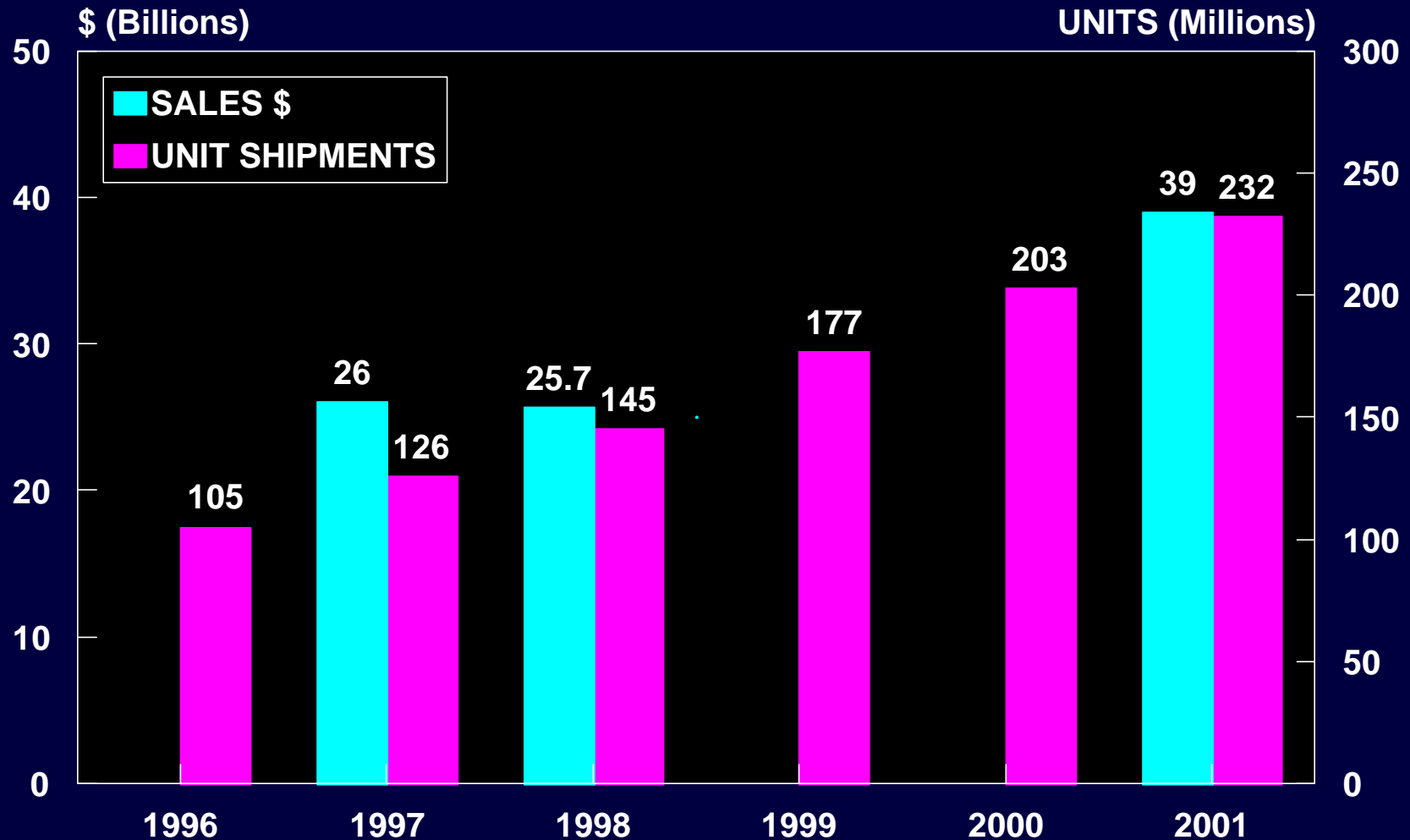
# US PC SERVER VENDORS 1999



**TOTAL: 262,560 Units**

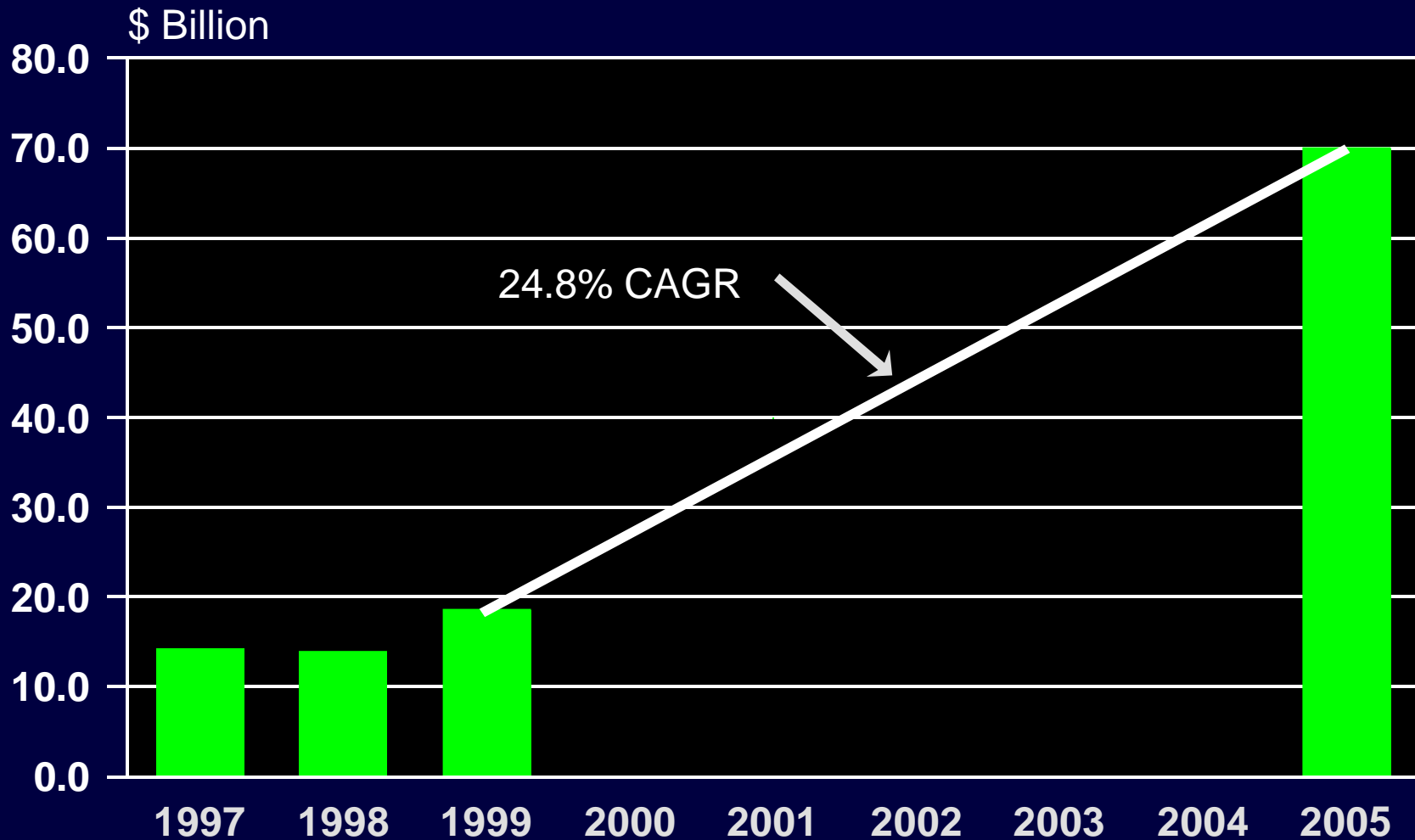
# RIGID DISK DRIVES

## WORLDWIDE SALES & UNIT SHIPMENTS



DISK/TREND 6/98, TrendFocus 2/99

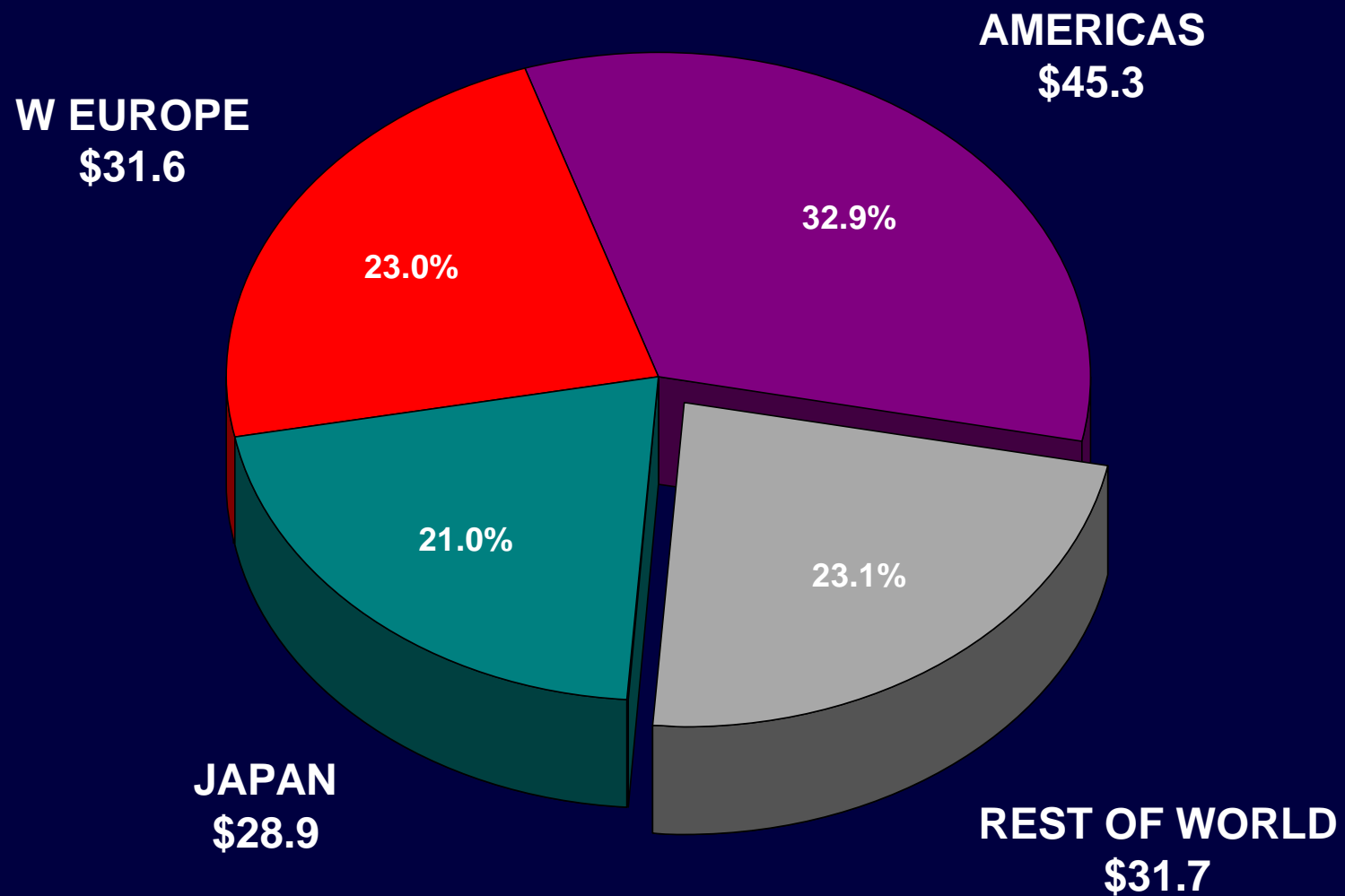
# FLAT PANEL DISPLAYS



EBN: Stanford Resources 12/98, DisplaySearch 2/2000

# MERCHANT SEMICONDUCTOR MARKET

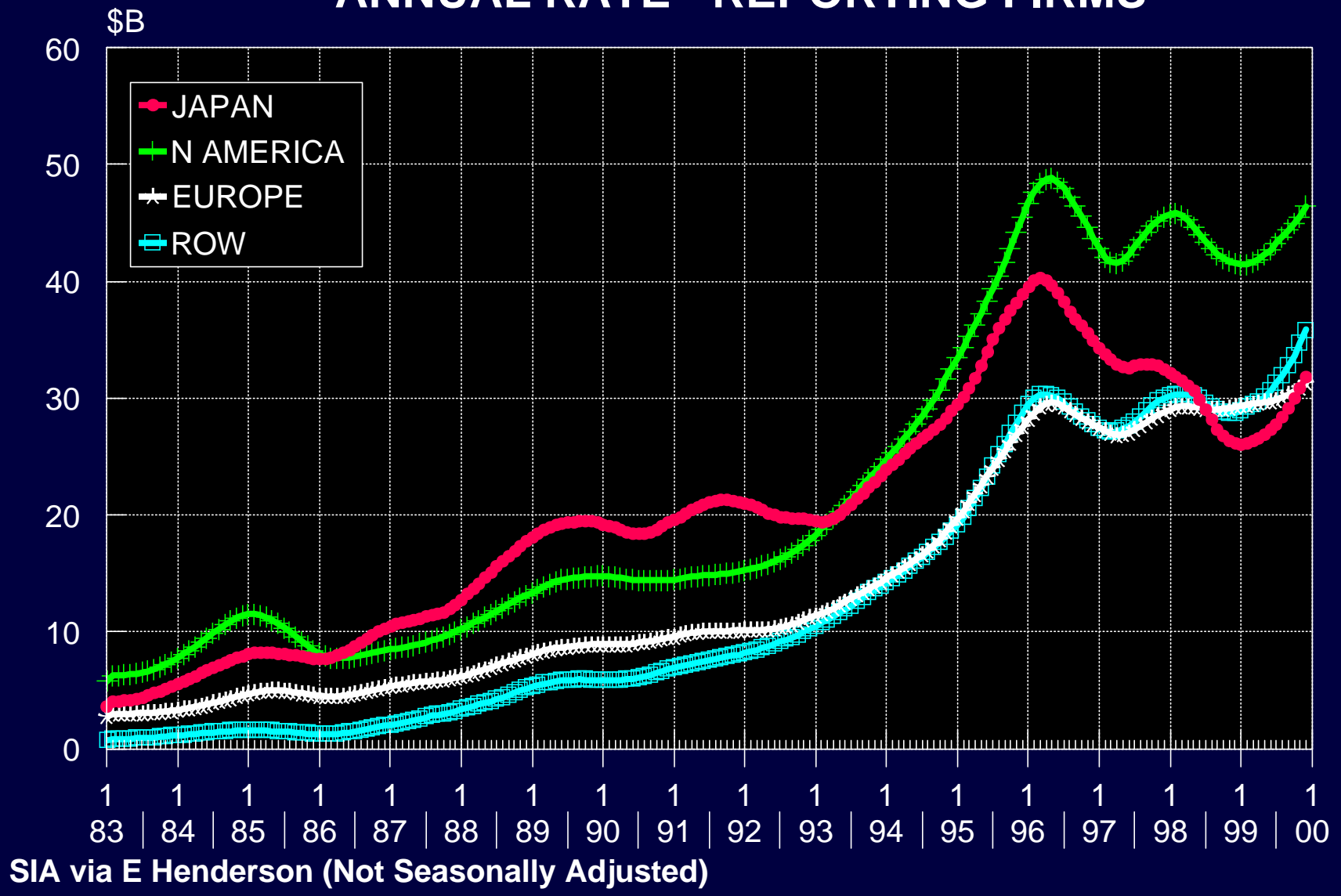
## 1999 ESTIMATE (\$B)



**TOTAL = \$138 Billion**

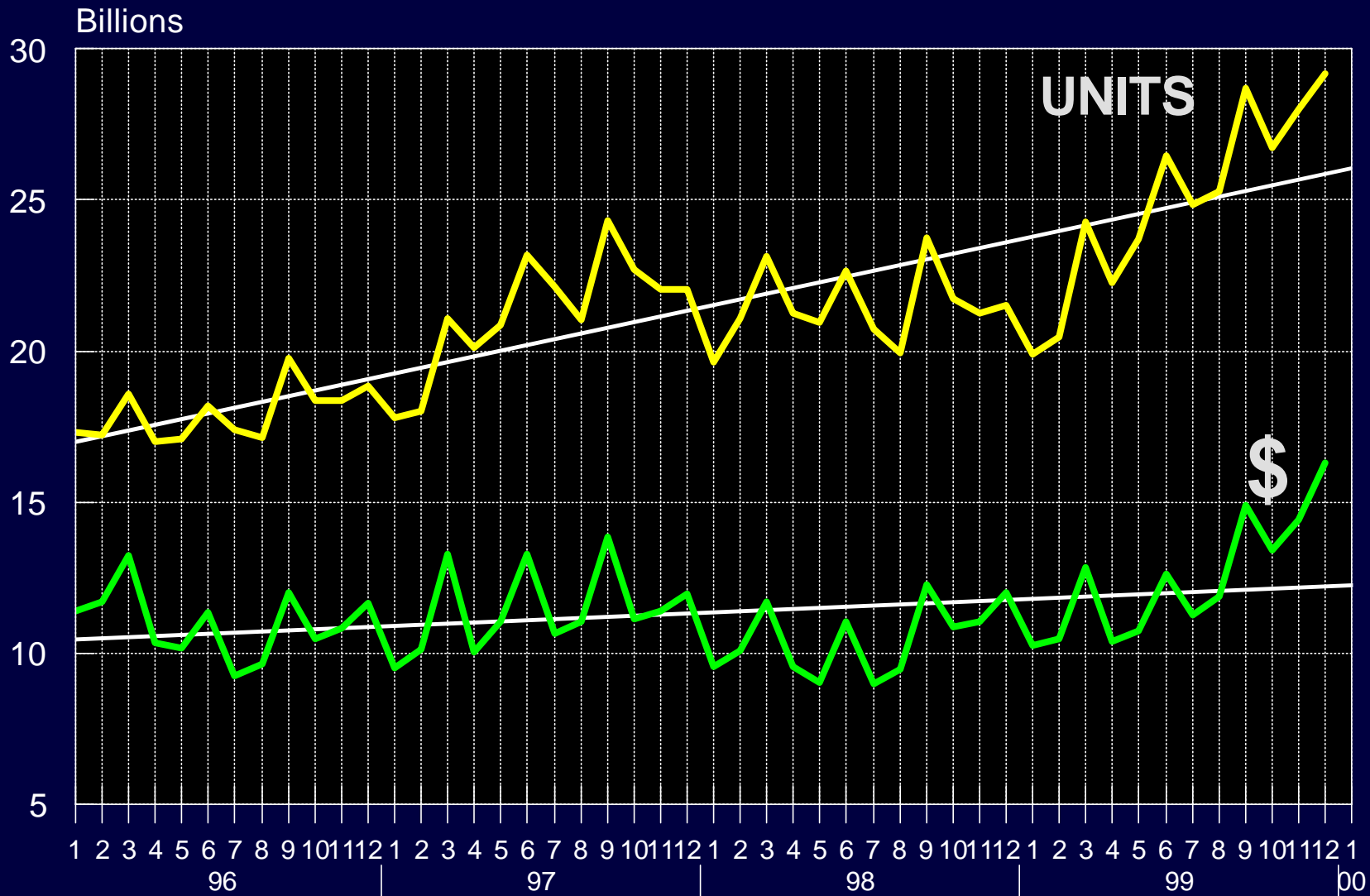
# TOTAL SEMICONDUCTOR \$ SHIPMENTS TO AREA

## ANNUAL RATE - REPORTING FIRMS



# WORLD SEMICONDUCTOR SHIPMENTS

## MONTHLY \$ and UNITS



SIA via E Henderson (Not Seasonally Adjusted)

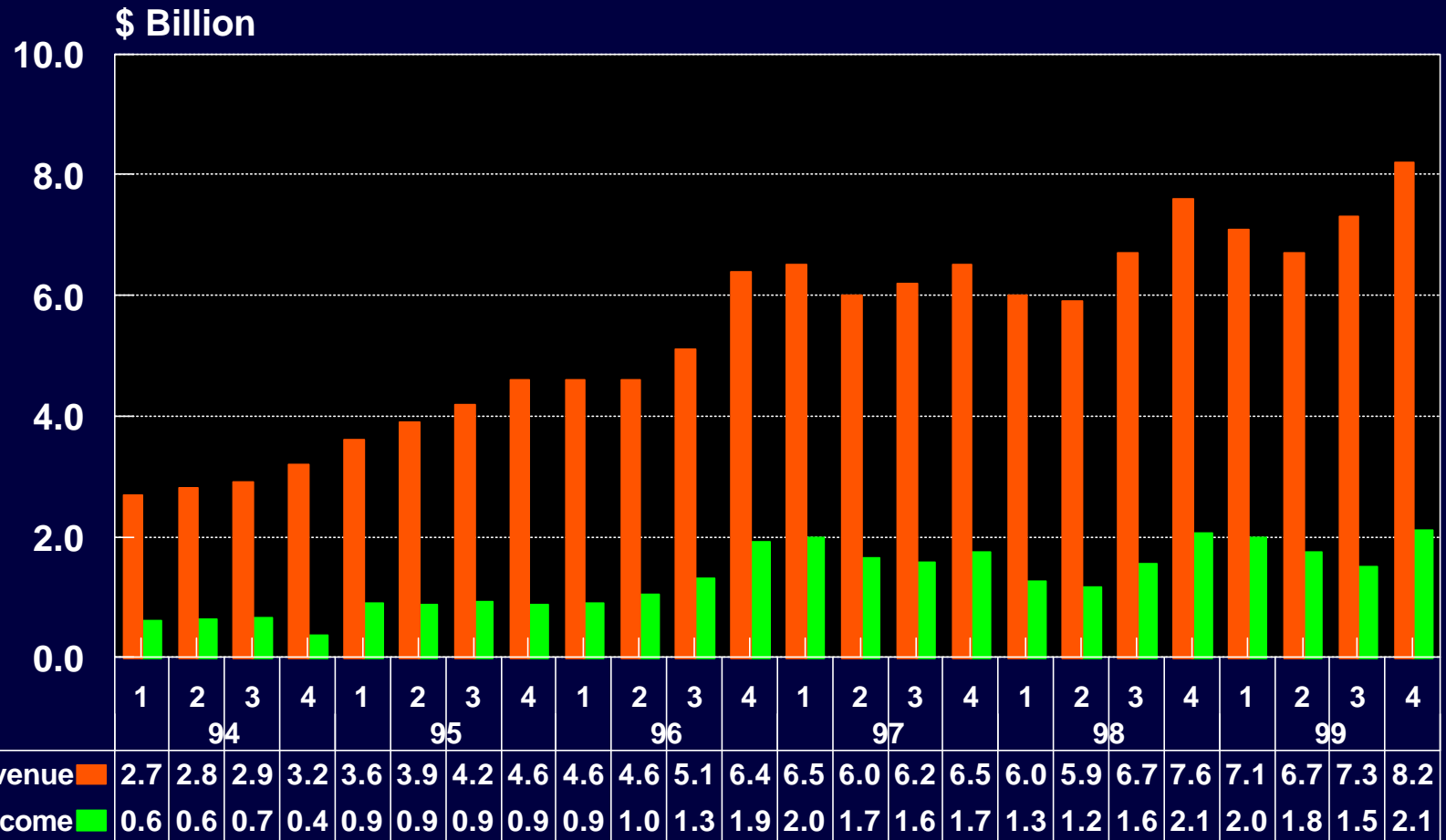
# MONTHLY SEMICONDUCTOR SHIPMENTS

## \$ Billions

	<u>12/98</u>	<u>12/99</u>	<u>% CH</u>
Americas	3.70	4.52	22.3%
Europe	2.77	3.11	12.3%
Japan	2.72	3.28	20.6%
Asia Pacific	2.73	3.80	39.1%
Total	11.91	14.70	23.4%

# Intel

## Revenue & Net Income



CY

INTC

FY=CY

# **64 BITS IN 2000**

**AMD Sledgehammer - 2000**

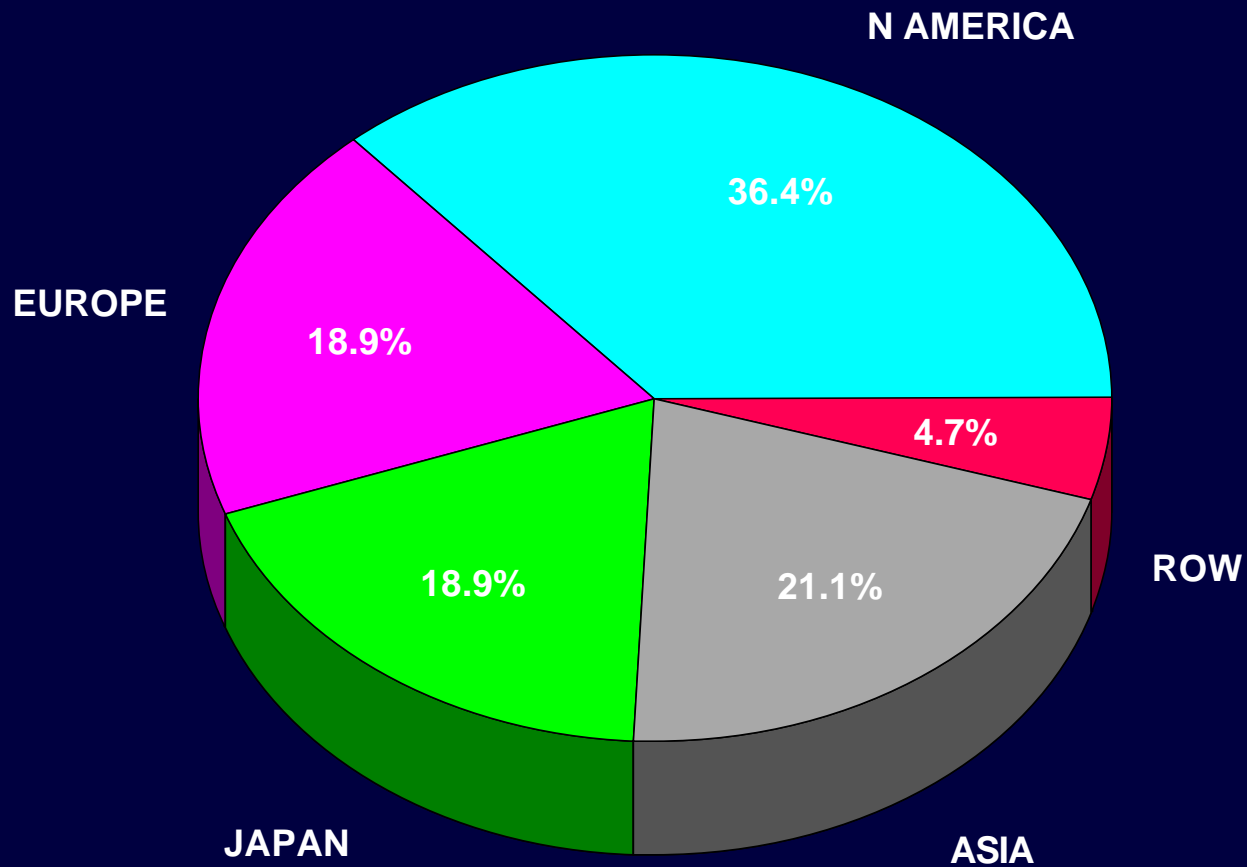
**IBM Power4 - middle of 2000**

**Intel Itanium - middle of 2000**

**Sun Sparc64 V - middle of 2001**

# 1999 CONNECTOR MARKET

## MARKET SHARE %

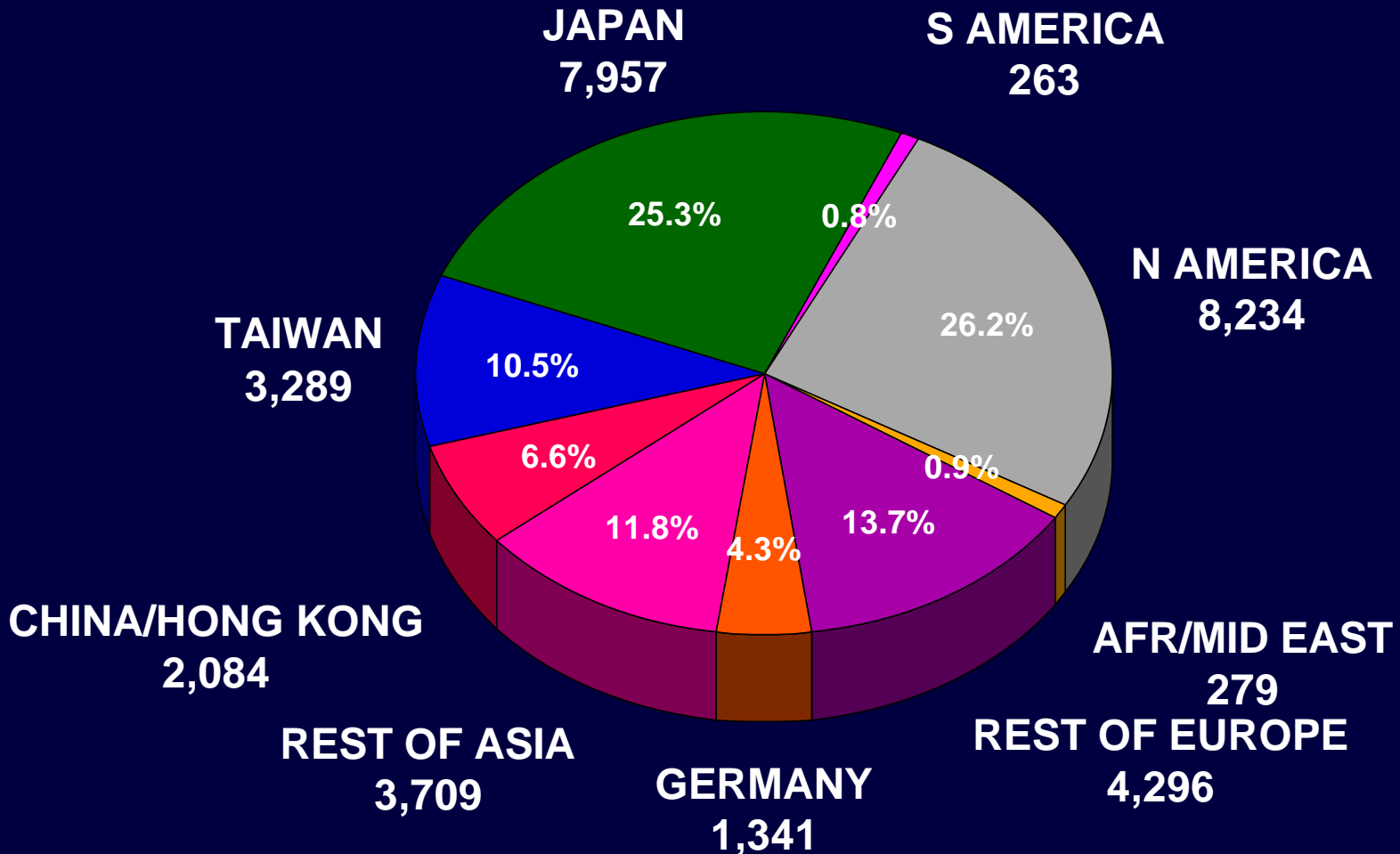


**WORLD**  
**\$36.5 Billion**

EBN: Fleck Research 9/99, Custer estimates

# 1998 WORLD RIGID PCB PRODUCTION

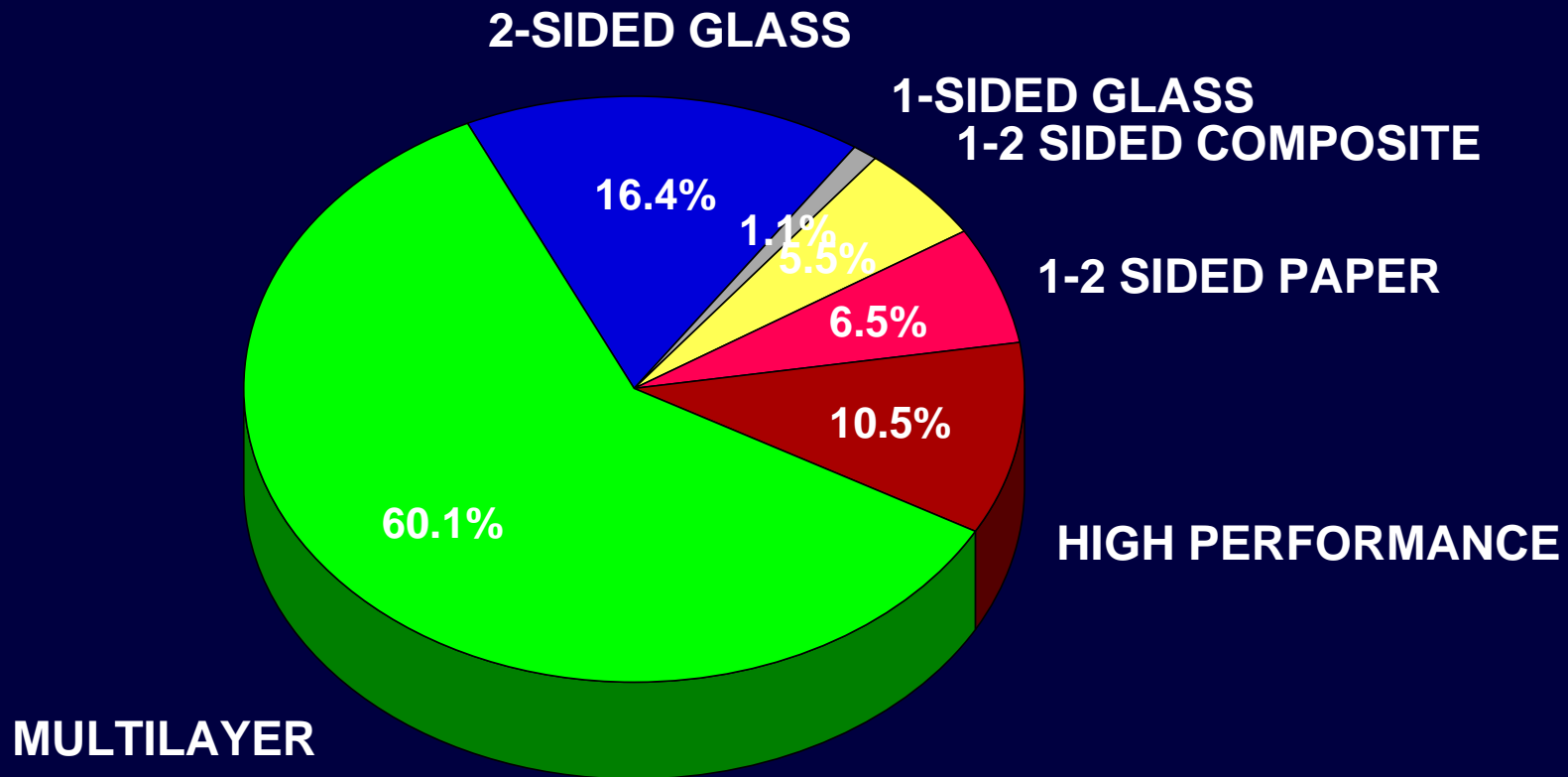
BY GEOGRAPHICAL AREA (\$M)



**Total: \$31.5 Billion**

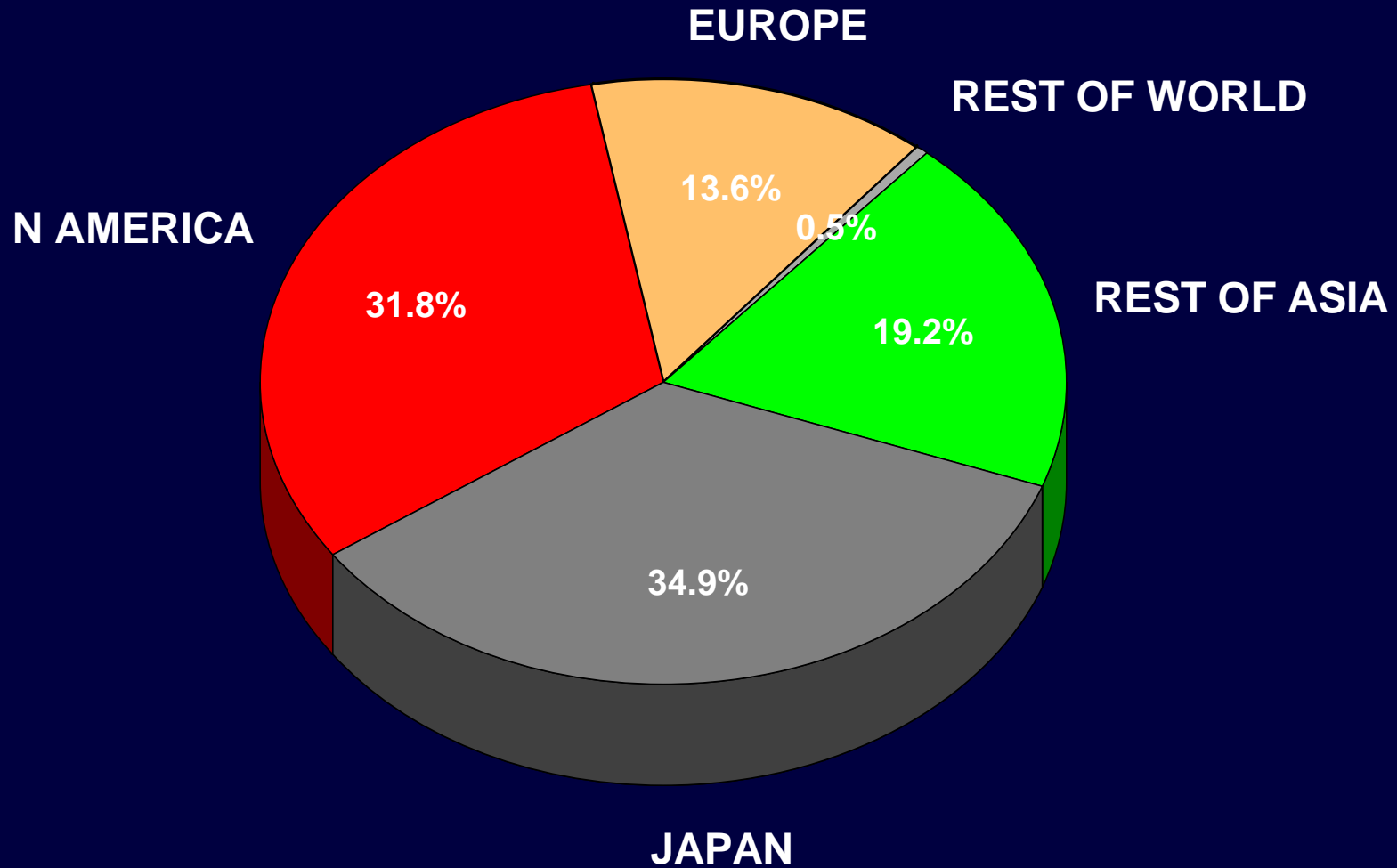
IPC T/MRC 6/99 (includes Buildup PCBs)

# 1998 WORLD RIGID PWB PRODUCTION BY TYPE (\$ BASIS)



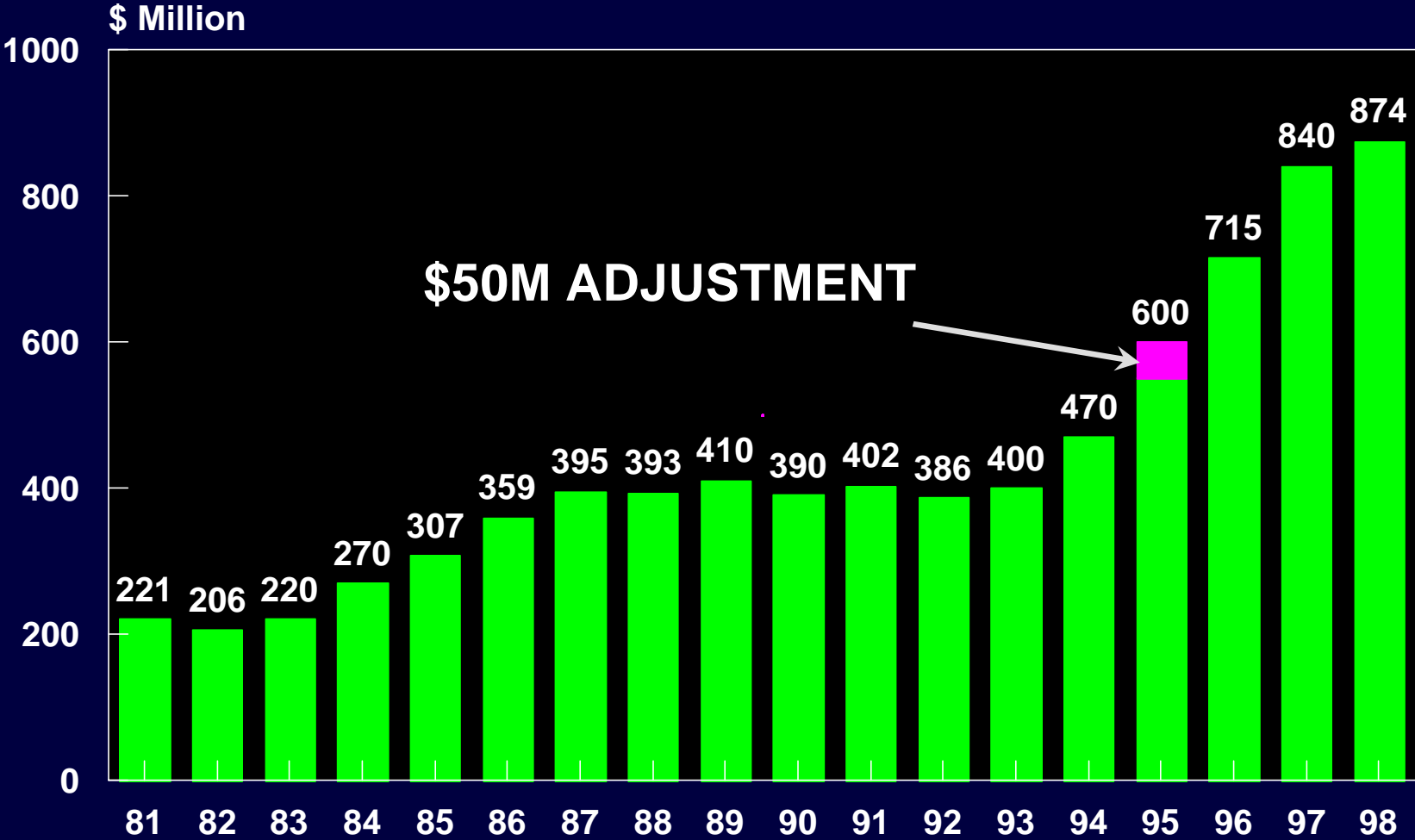
**TOTAL: \$31.5 Billion**

# 1998 WORLD FLEXIBLE CIRCUIT PRODUCTION BY GEOGRAPHICAL AREA (\$ BASIS)



**TOTAL: \$2.8 Billion**

# U.S. MARKET FOR FLEXIBLE CIRCUITS

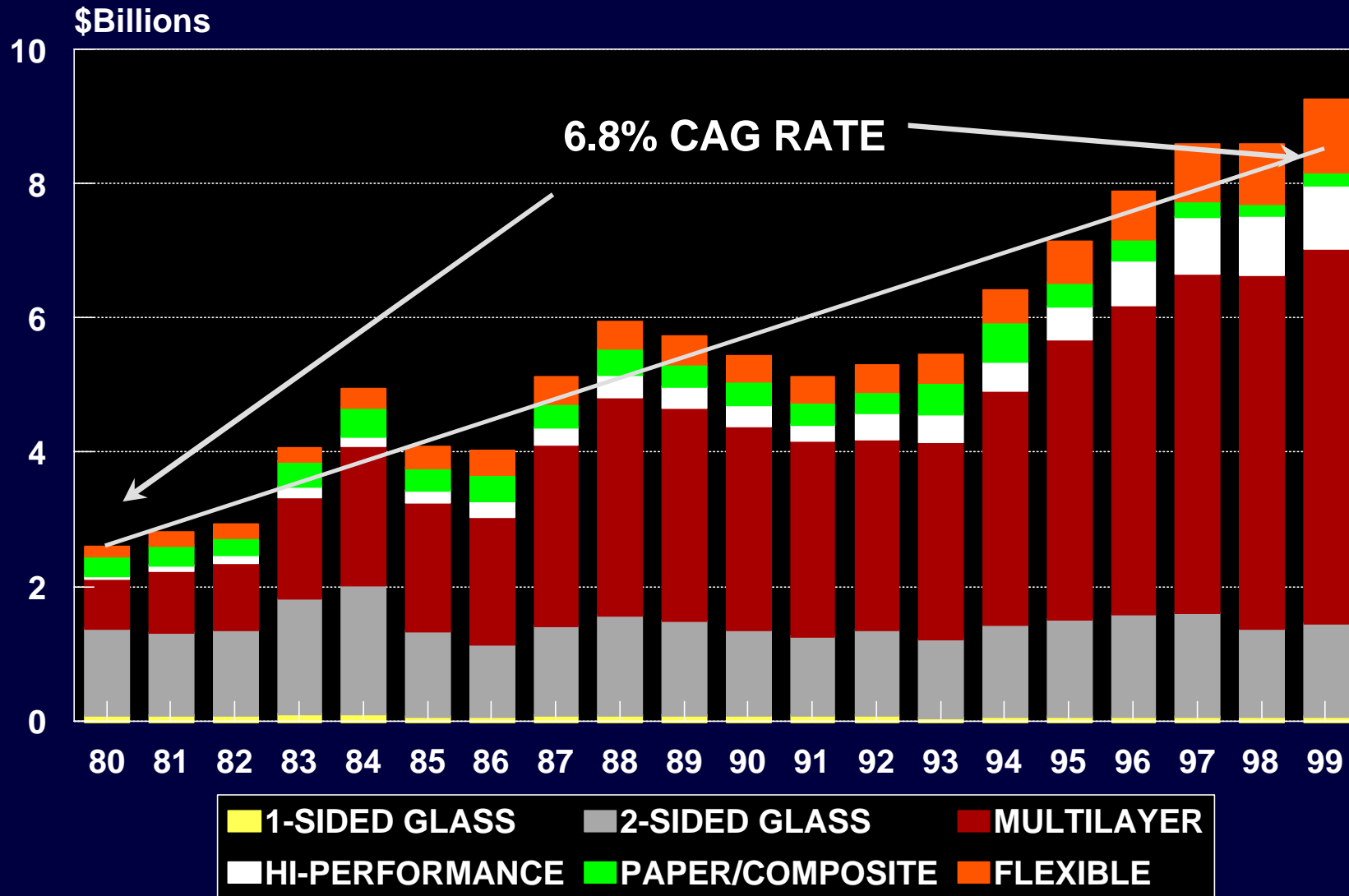


# US PWB MARKET

## 1999

<b>RIGID SHIPMENTS</b>	<b>8,094</b>
<b>FLEX SHIPMENTS</b>	<b>845</b>
<b>TOTAL SHIPMENTS</b>	<b>8,938</b>
<b>EXPORTS</b>	<b>904</b>
<b>IMPORTS</b>	<b>1,398</b>
<b>TOTAL PURCHASES</b>	<b>\$9,432 Million</b>

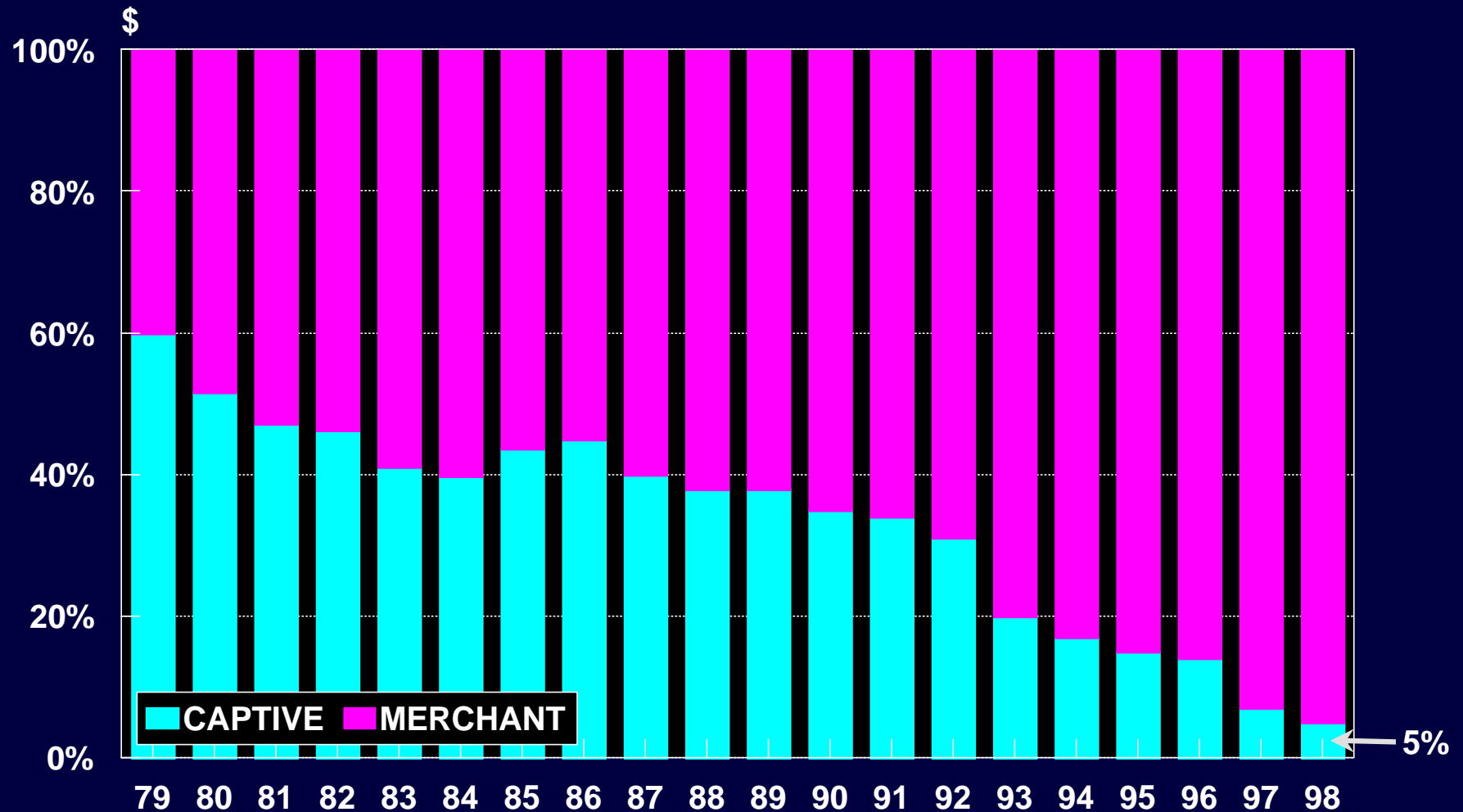
# N. AMERICAN PCB SHIPMENTS



IPC T/MRC 6/99 + Custer 1999 estimates 2/2000

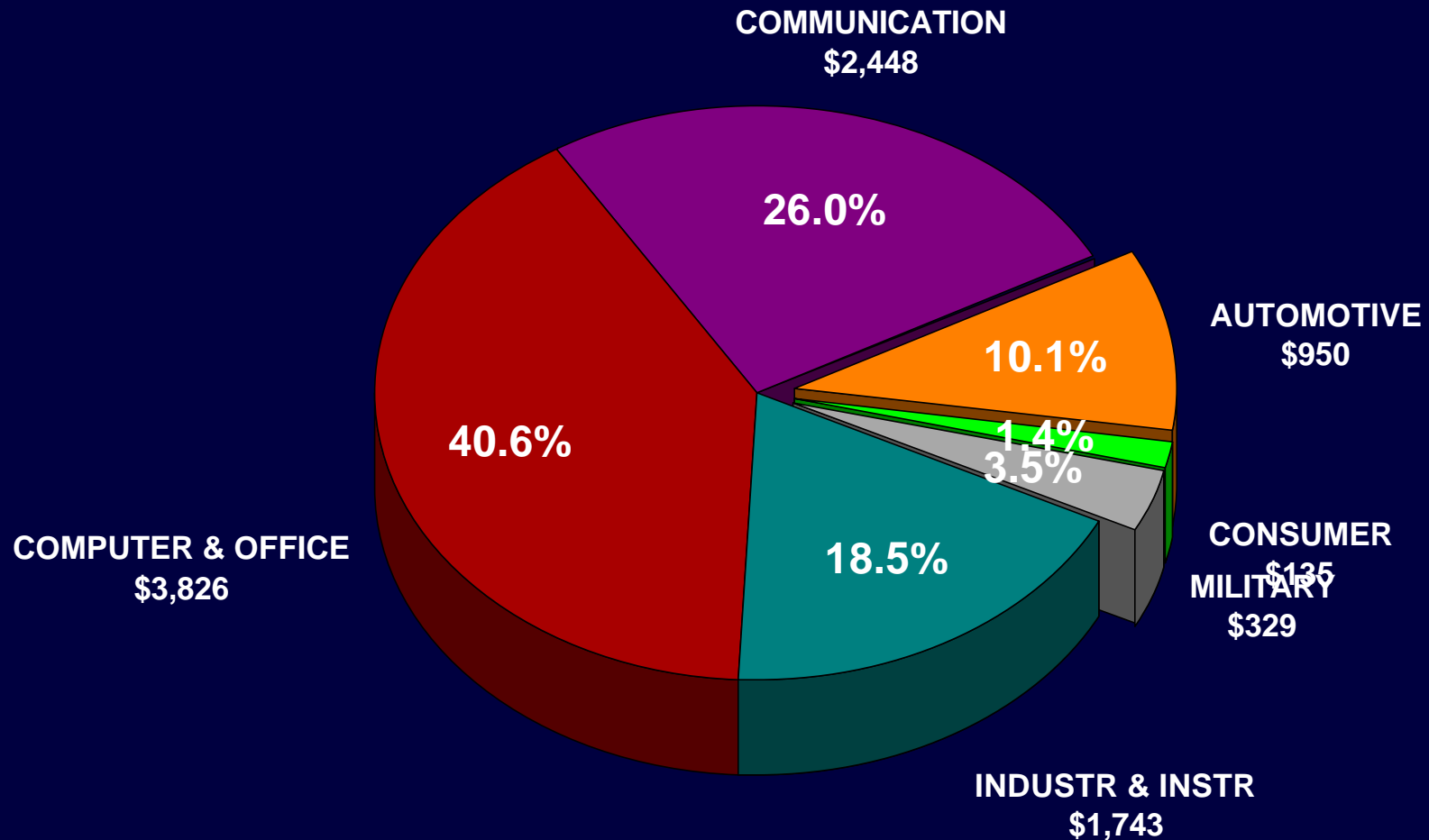
# RIGID PCBs - MAKE OR BUY

## U.S. CAPTIVE vs MERCHANT PRODUCTION



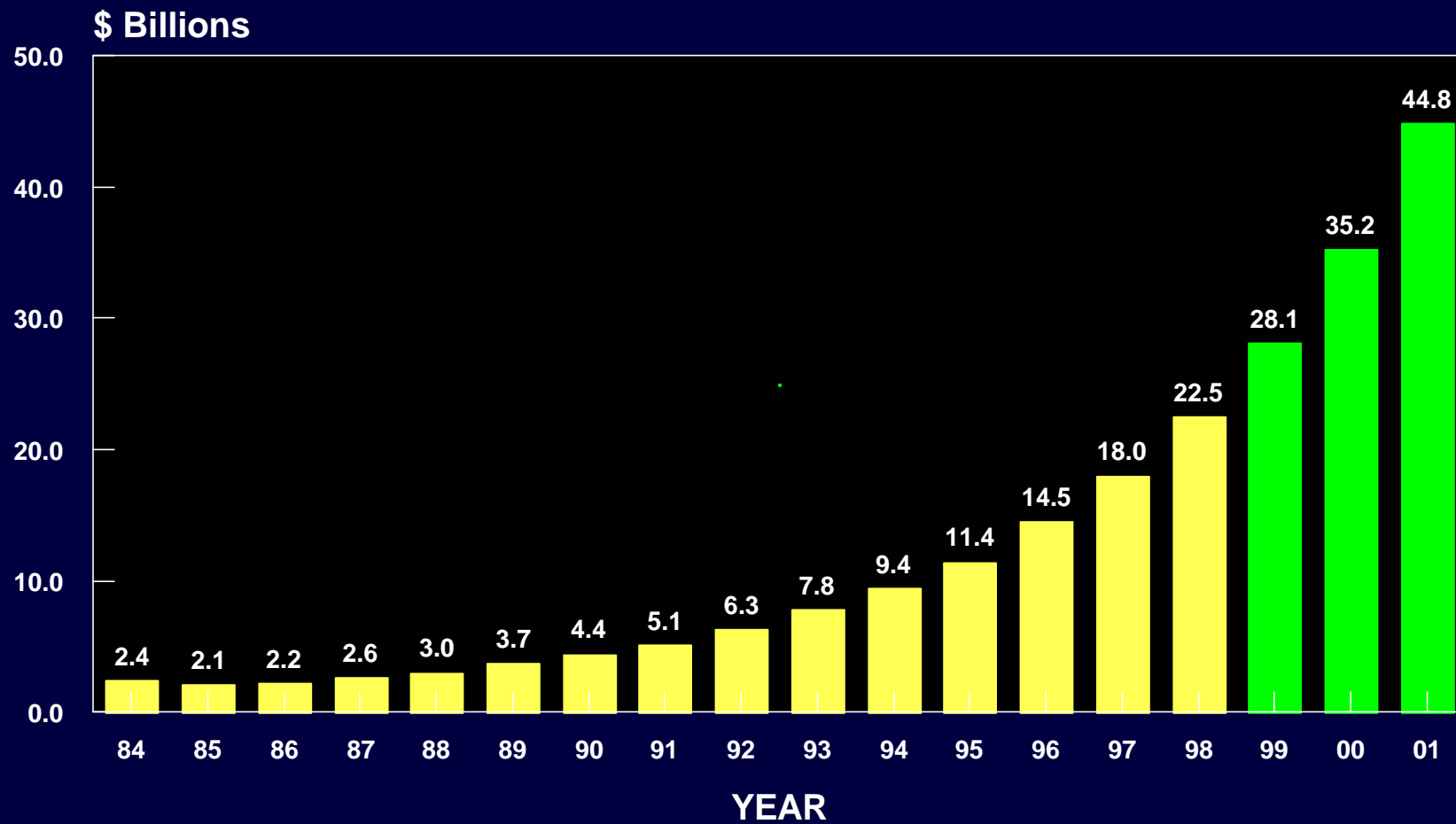
# US PWB PURCHASES BY END EQUIPMENT MARKET

1999 ESTIMATE - \$M (Rigid & Flex)



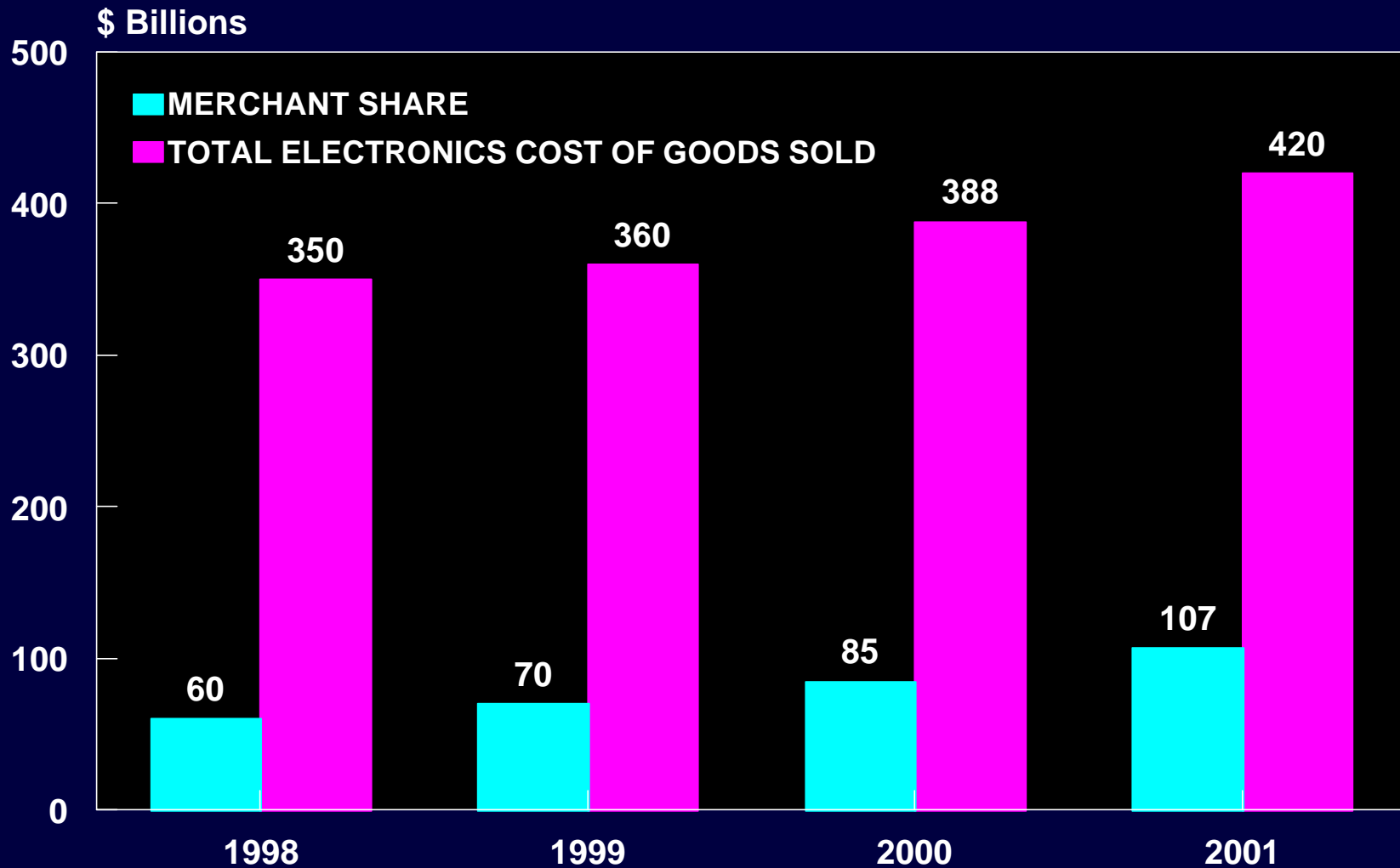
**TOTAL = \$9,432 Million**  
(includes imports)

# MARKET FOR ELECTRONIC MANUFACTURING SERVICES (U.S. CONTRACT ASSEMBLY)



# CONTRACT ELECTRONIC MANUFACTURERS PICKING UP A LARGER SHARE

## MERCHANT MARKET SHARE OF WORLD ELECTRONICS MARKET



EBN: Technology Forecasters 10/99, Custer estimates

# TOP CONTRACT MANUFACTURERS

1998

	<u>\$ Sales</u>	<u>98/97 Growth %</u>
SCI Systems	6,583	3
Solectron	6,097	52
Celestica	3,249	62
Flextronics Intl	1,630	71
NatSteel Electronics	1,472	76
Jabil Circuit	1,449	27
AVEX Electronics	850	23
Manufacturers' Services	838	49
Sanmina	691	44
Universal Scientific	600	62
Dovatron Intl	589	15
Benchmark Electronics	524	61
Bull Electronics	466	1
Venture Manufacturing	437	-7

# TOP N AMERICAN PCB MANUFACTURERS

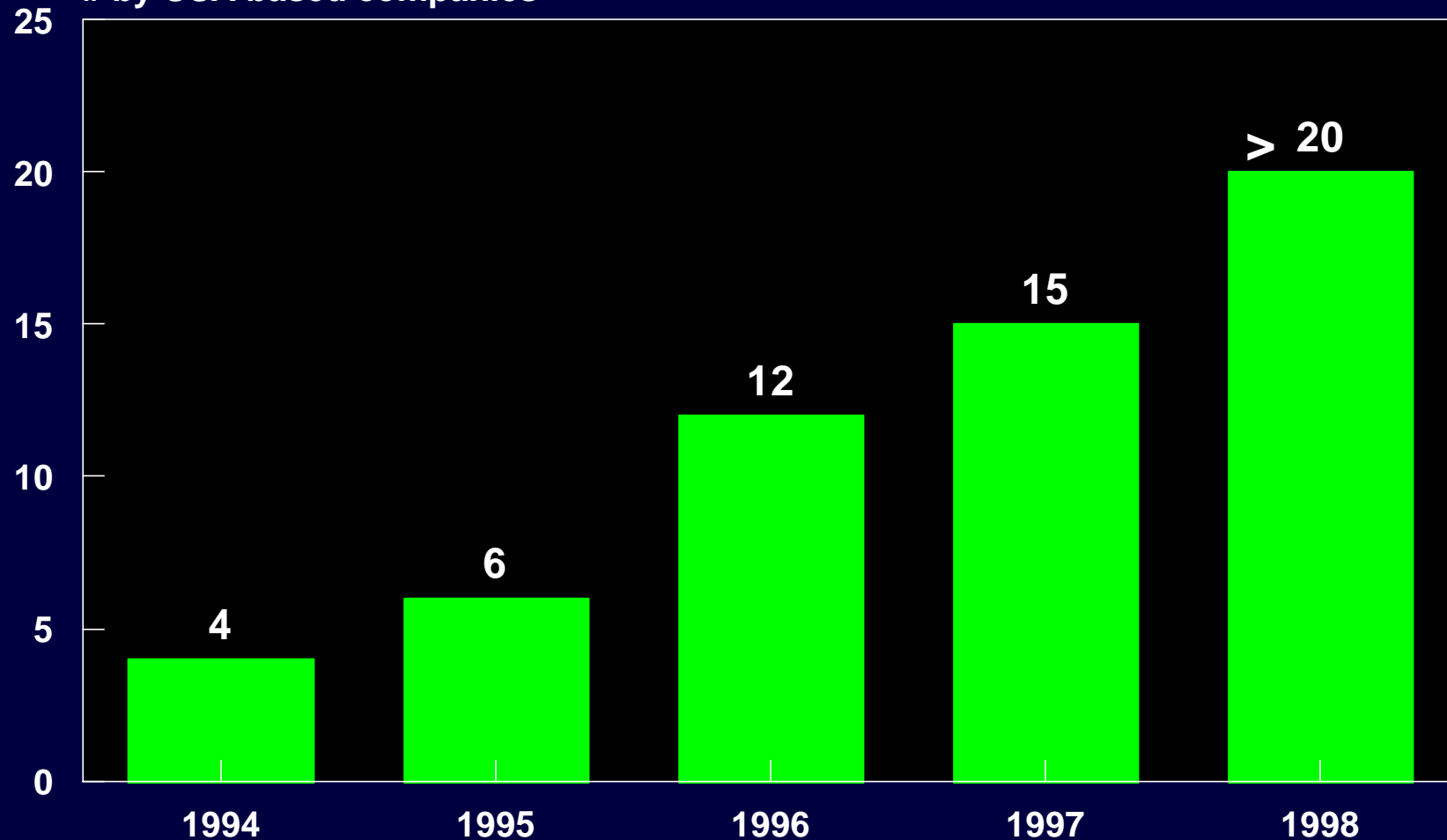
PCB FAB & TOTAL - 1999 ESTIMATE (\$M)

	<u>PCB</u>	<u>TOTAL</u>
VIASYSTEMS	1,130	1,230
HADCO	885	1,015
TYCO	515	590
HONEYWELL	405	Large
PHOTOCIRCUITS	385	385
SANMINA	330	1,375
DII GROUP	315	1,100
DYNAMIC/DETAILS	280	280
IBM	220	430
3M	150	Large
MERIX	138	138
TTM TECHNOLOGIES	125	125
AUTOMATA INTERNATIONAL	110	110
SHELDAHL	105	127
VIKTRON	93	133
CIRCUIT SYSTEMS	89	89
TOPPAN WEST	80	80
CIRCUIT-WISE	75	75
BUREAU ELECTRONICS	74	74

# ACCELERATING PACE OF ACQUISITIONS

## NUMBER OF ACQUISITIONS IN PCB INDUSTRY

# by USA based companies



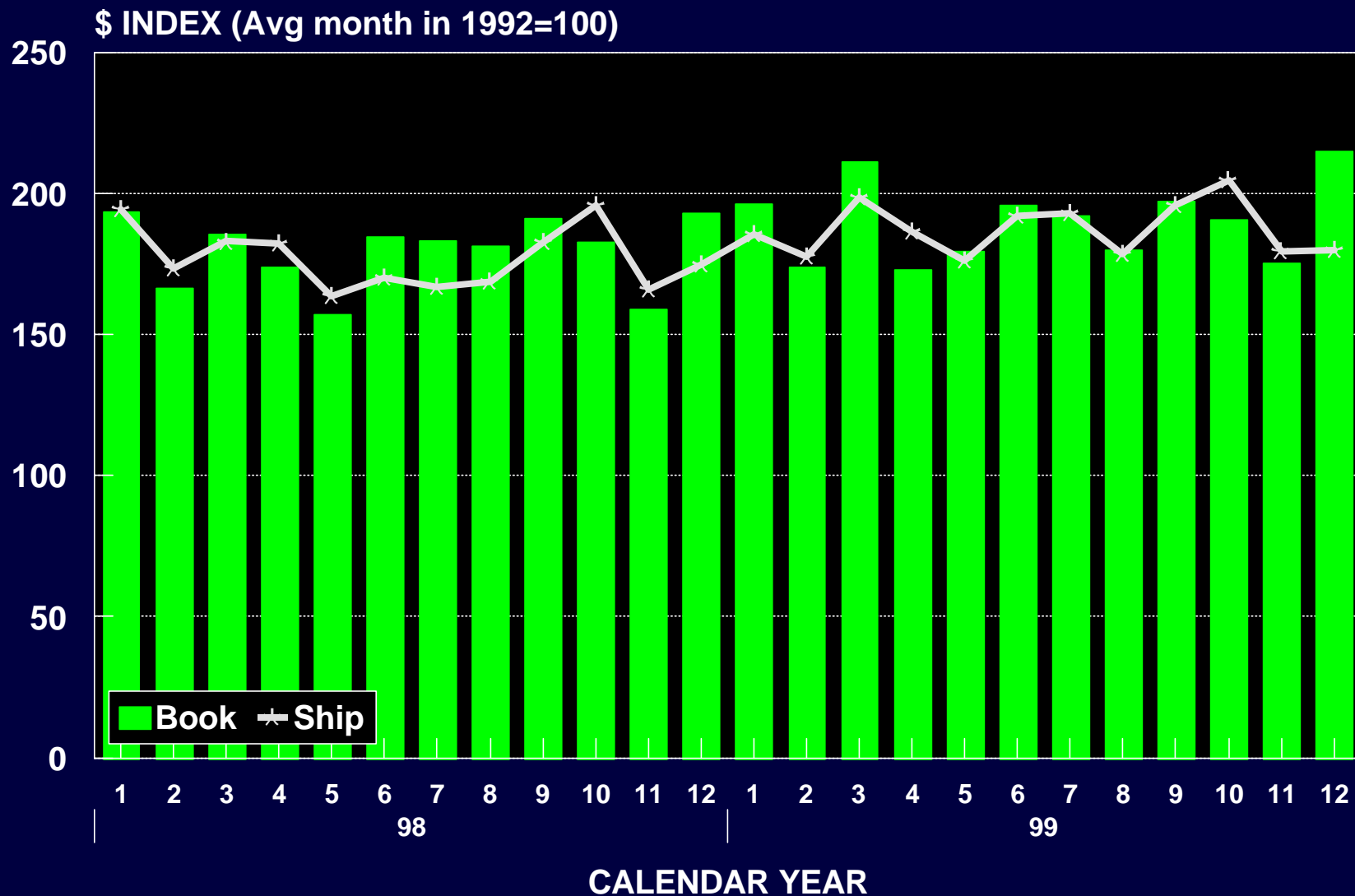
## N. AMERICAN PCB MANUFACTURERS - PUBLIC DATA

### QUARTERLY SALES & NET INCOME (\$M)

		LAST YEAR		THIS YEAR		QUARTER
		SALES	INC	SALES	INC	ENDING
CIRCUIT SYS	CSYI	25.1	1.2	24.9	-0.8	10/99
CIRCUIT WORLD	TSE:CWW	3.5	0.1	3.6	-0.6	9/99
HADCO	HDCO	236.0	2.0	244.7	7.1	1/00
INNOVEX	INVX	22.0	3.0	44.7	-11.2	12/99
MERIX	MERX	30.0	-1.9	35.9	1.2	11/99
M-WAV	MWAV	3.5	0.1	3.6	0.0	12/99
PARLEX	PRLX	15.4	0.5	24.4	1.6	12/99
SHELDAHL	SHEL	28.5	-3.0	34.8	-1.9	11/99
VIASYSTEMS		263.0	-15.7	270.1	-48.2	9/99
<b>TOTAL</b>		<b>627.0</b>	<b>-13.7</b>	<b>686.7</b>	<b>-52.8</b>	
<b>INCOME %</b>			<b>-2.2%</b>		<b>-7.7%</b>	

**Includes foreign sales**

# U.S. RIGID PCB BOOKINGS & SHIPMENTS



# DECEMBER U.S. PCB GROWTH INDICATORS

% GROWTH - Dec 99 vs Dec 98

## RIGID PCB \$ SHIPMENTS

UP 3.0%

## RIGID PCB \$ BOOKINGS

UP 11.5%

## RIGID PCB BOOK/BILL RATIO

3-MONTH AVG 1.04

1-MONTH 1.17

## LAMINATE+PREPREG SQ FT SHIPMENTS

UP 13.5%

## LAMINATE+PREPREG SQ FT BOOKINGS

UP 41.8%

## FLEX CIRCUIT \$ SHIPMENTS

UP 43.1%

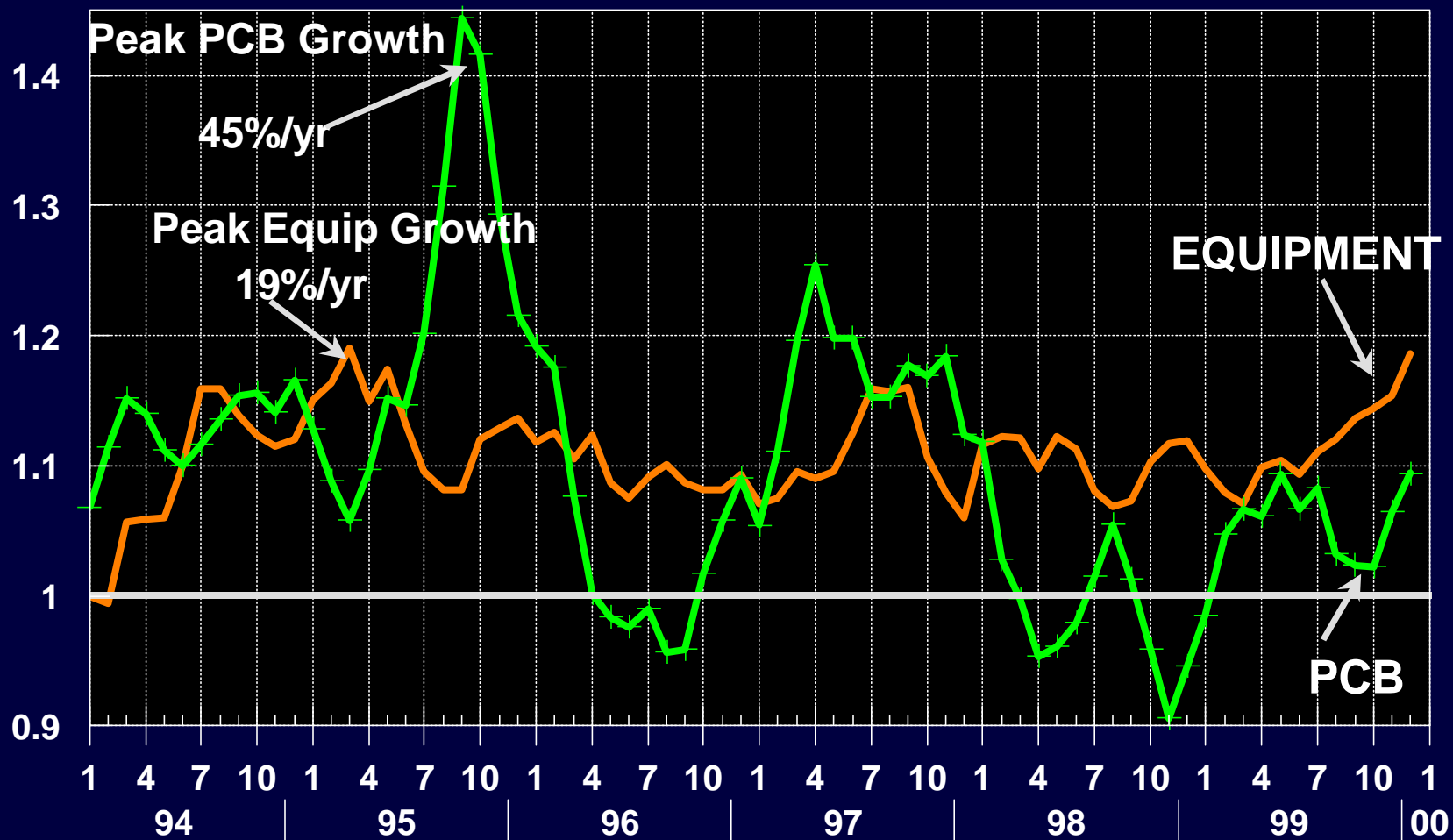
## FLEX CIRCUIT \$ BOOKINGS

UP 70.3%

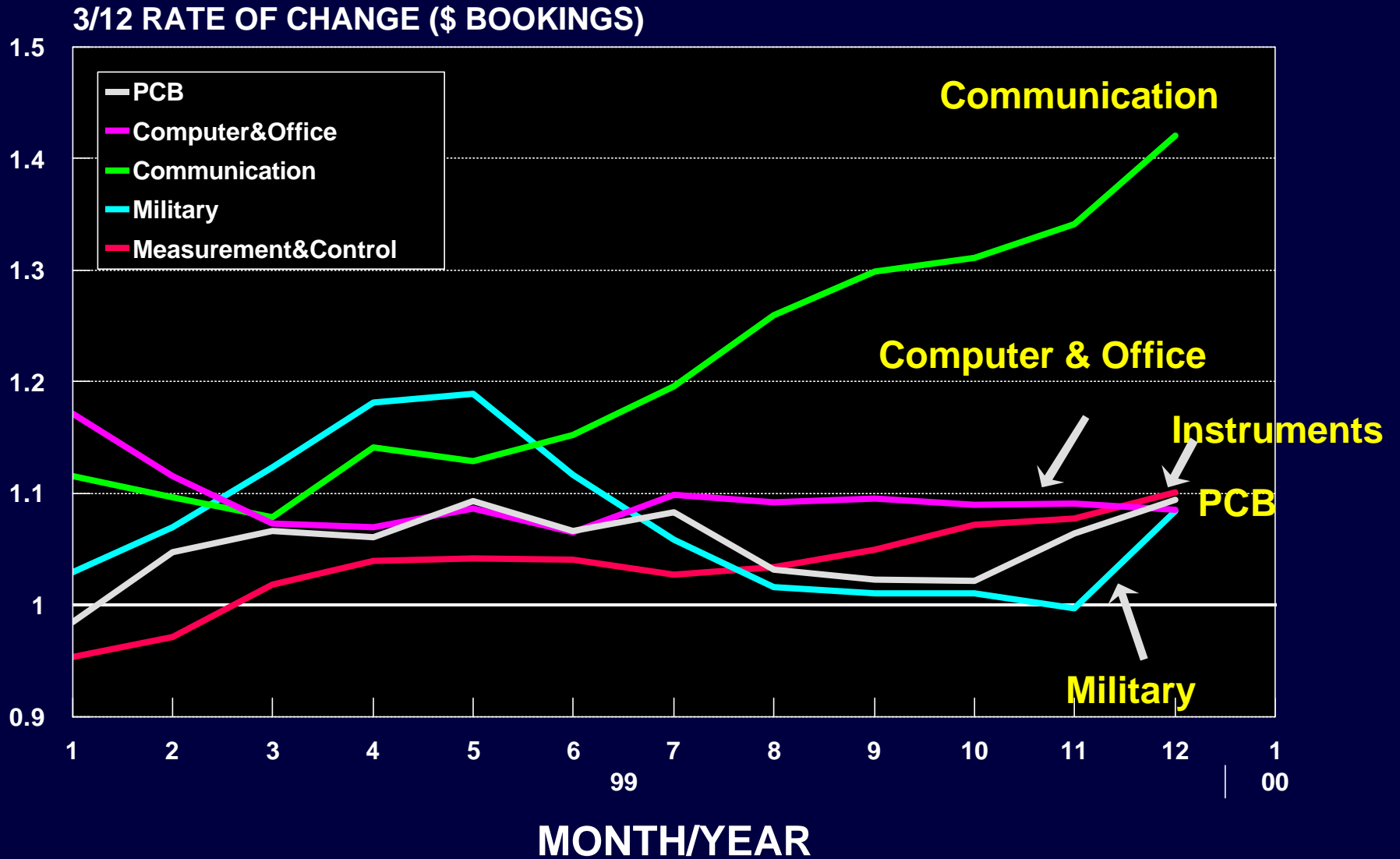
# U.S. ELECTRONIC EQUIPMENT vs PCBs

## \$ BOOKINGS GROWTH

3/12 RATE OF CHANGE



# US RIGID PCB vs ELECTRONIC EQUIPMENT BOOKINGS



# PRESENT GROWTH RATES (%)

## U.S. ECONOMY & ELECTRONICS INDUSTRY

	LATEST MONTH	ANNUAL GROWTH RATE	3-MONTH GROWTH RATE
RIGID PCB BOOKING \$	12/99	106.2	109.4
RIGID PCB SHIPMENT \$	12/99	106.0	105.0
LAMINATE+PREPREG SHIPMENTS SF	12/99	107.6	110.4
ELECTRONIC COMPONENTS BOOK \$	12/99	117.8	116.5
<b>ELECTRONIC EQUIPMENT BOOKINGS \$</b>			
COMPUTER & OFFICE	12/99	108.0	108.5
COMMUNICATIONS	12/99	123.6	142.0
MEASURE/CONTROL INSTRUMENTS	12/99	105.3	110.1
MILITARY (SEARCH & NAVIG)	12/99	108.4	108.4
TOTAL ELECTRONIC EQUIPMENT	12/99	112.2	118.6
INDUSTRIAL PRODUCTION	1/00	103.8	104.8

NOTE: 3 month growth rates compare most recent  
3 months to same 3 months one year earlier

# Summary

- **Inventory corrections, reduced equipment exports, global PCB overcapacity and unfavorable exchange rates were all key causes for the flat 1998 US market.**
- **1999 was a better year both in the USA & globally. An Asia recovery and outstanding growth in communication equipment were key factors.**
- **All key industrial countries' economies are growing. Interest rates are being raised to limit future inflation.**
- **Passive component shortages are serious problem. Massive cel phone growth has impacted global component availability.**
- **Personal computer induced seasonality continues.**
- **Modest (7-9%) domestic PCB growth is likely for 2000. Longer term, sporadic "double digit" cyclical peaks in PCB demand will continue.**

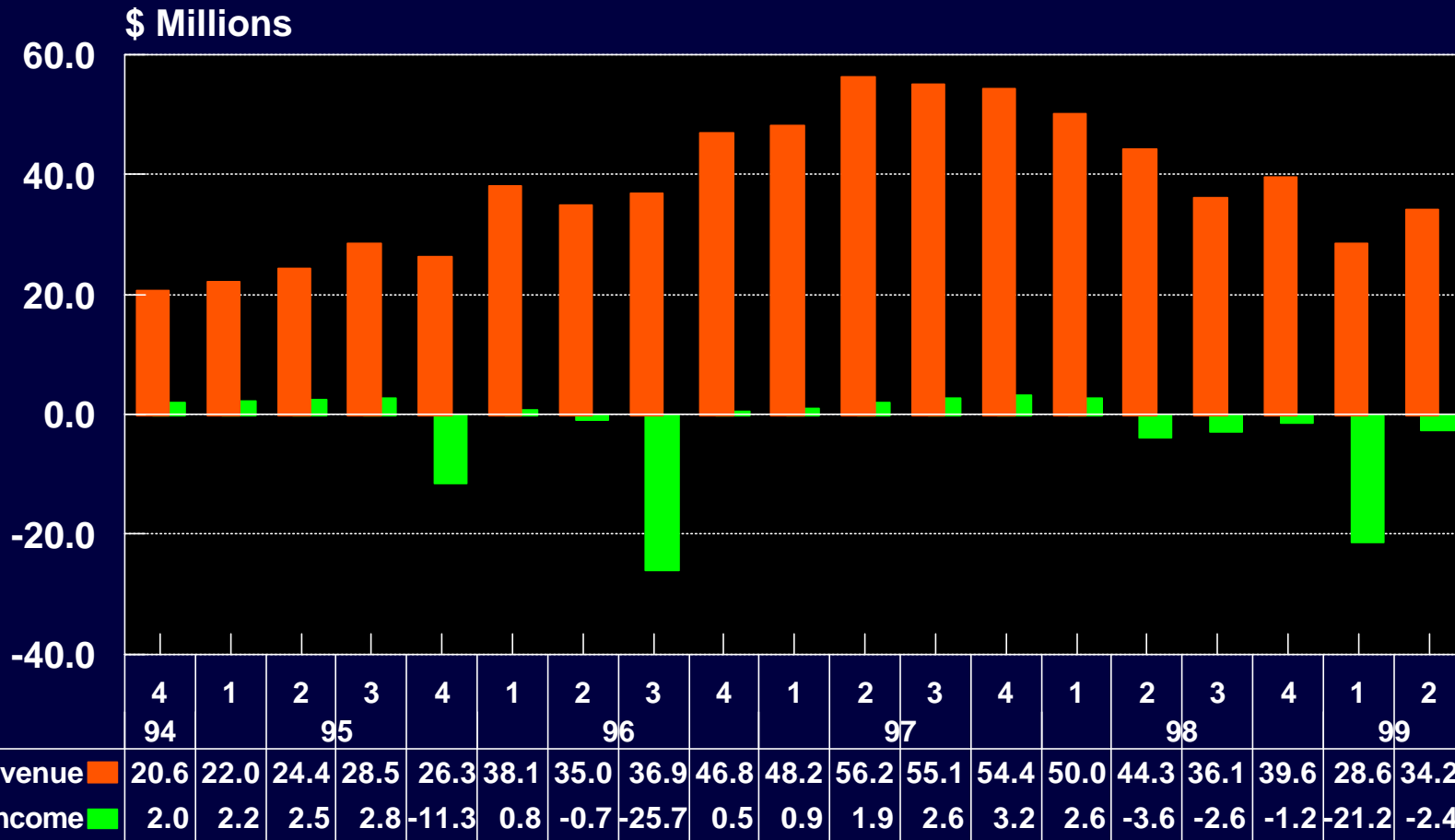
# **SALES & EARNINGS of PUBLICLY TRADED**

**PCB, CONTRACT ASSEMBLY,  
SEMICONDUCTOR  
& EQUIPMENT COMPANIES**

**WALT CUSTER**

# ADFLEX

## Revenue & Net Income



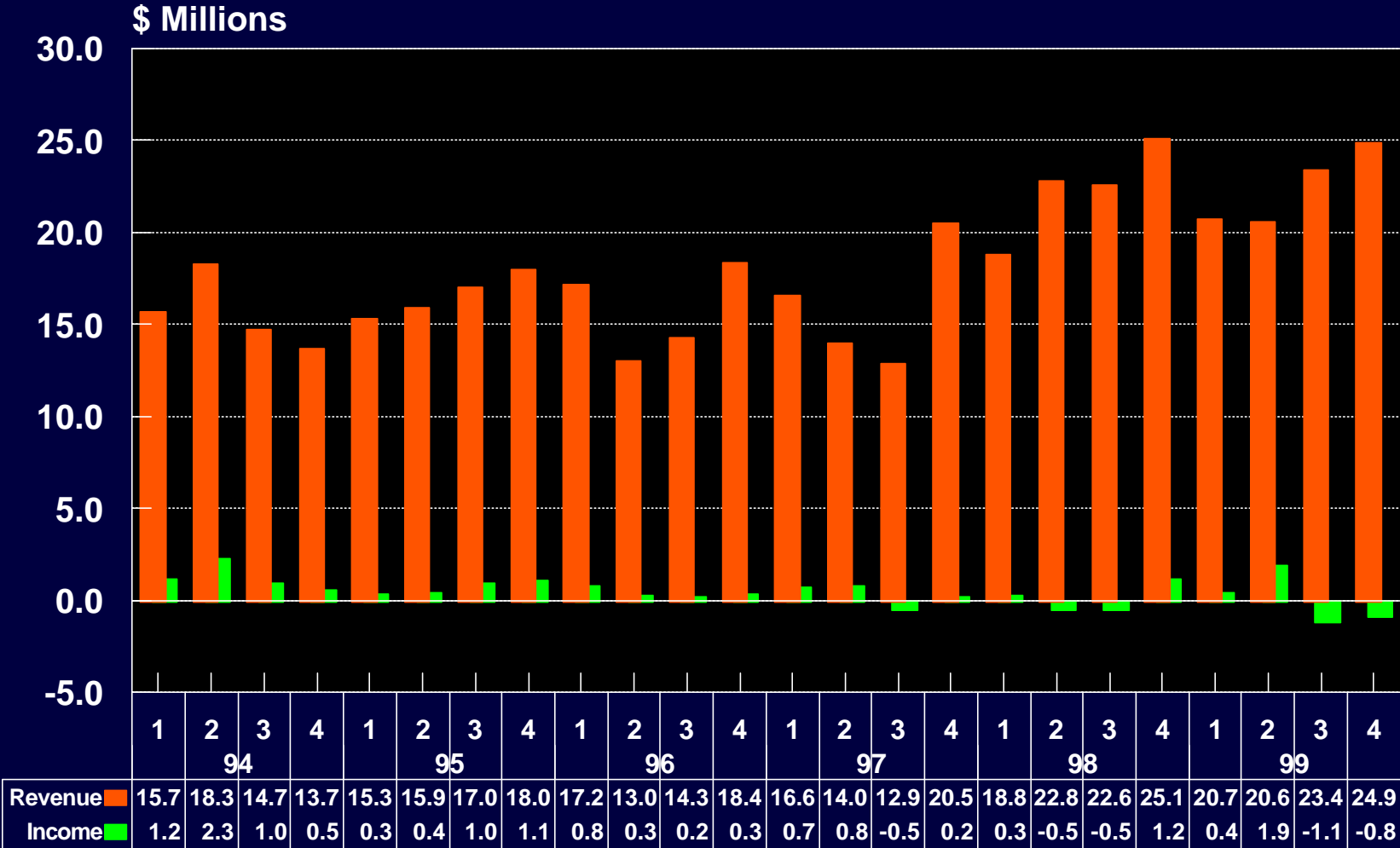
CY

FY = CY

ADFLEX

# CIRCUIT SYSTEMS

## Revenue & Net Income



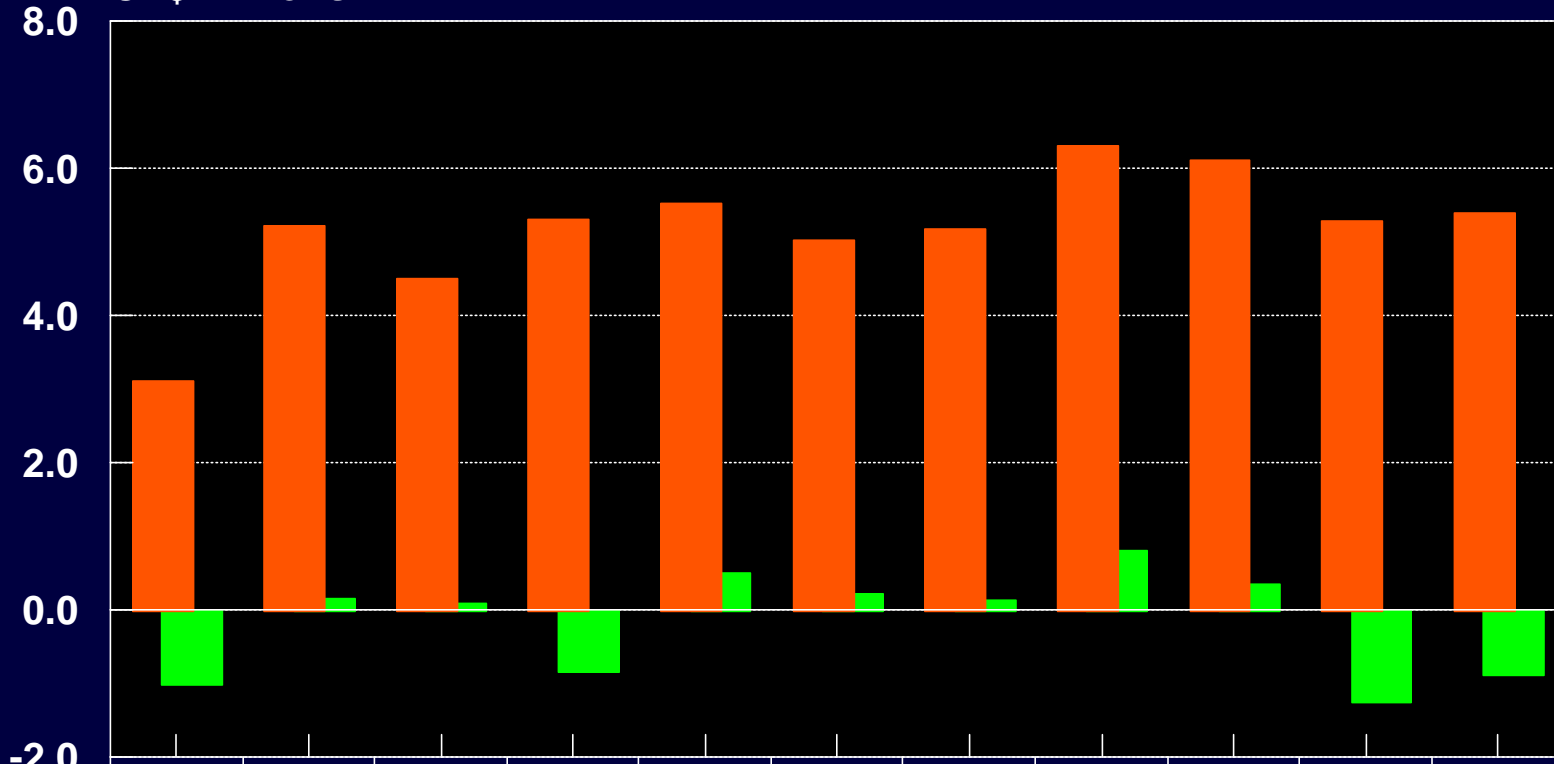
FY ends Apr 30

CSYI

# Circuit World

## Revenue & Net Income

CY\$ Millions



	97				98			99			
	1	2	3	4	1	2	3	4	1	2	3
Revenue	3.1	5.2	4.5	5.3	5.5	5.0	5.2	6.3	6.1	5.3	5.4
Income	-1.0	0.2	0.1	-0.8	0.5	0.2	0.1	0.8	0.3	-1.2	-0.9

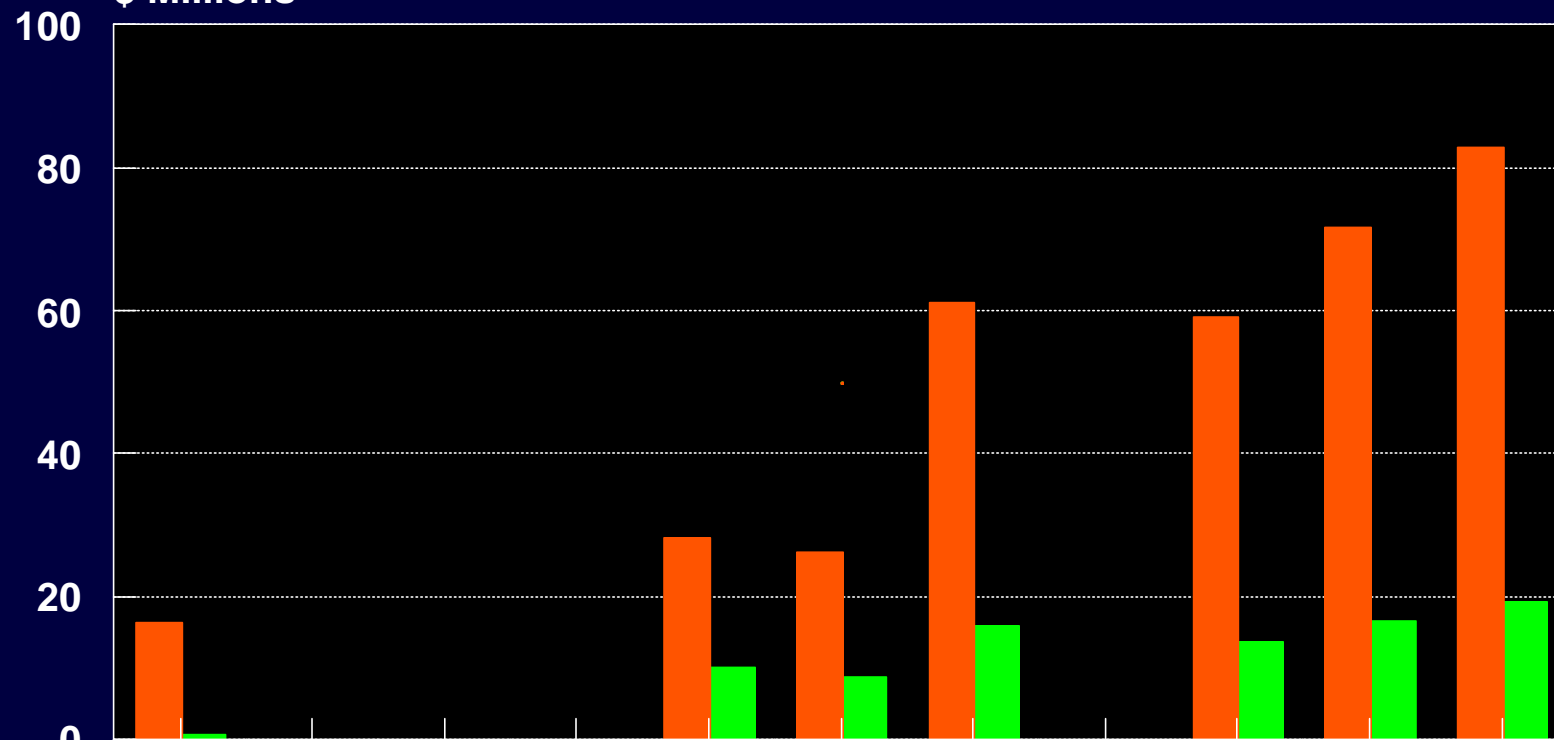
FY=CY

T:CCW

# DYNAMIC DETAILS, INC

## Revenue & EBITDA

\$ Millions



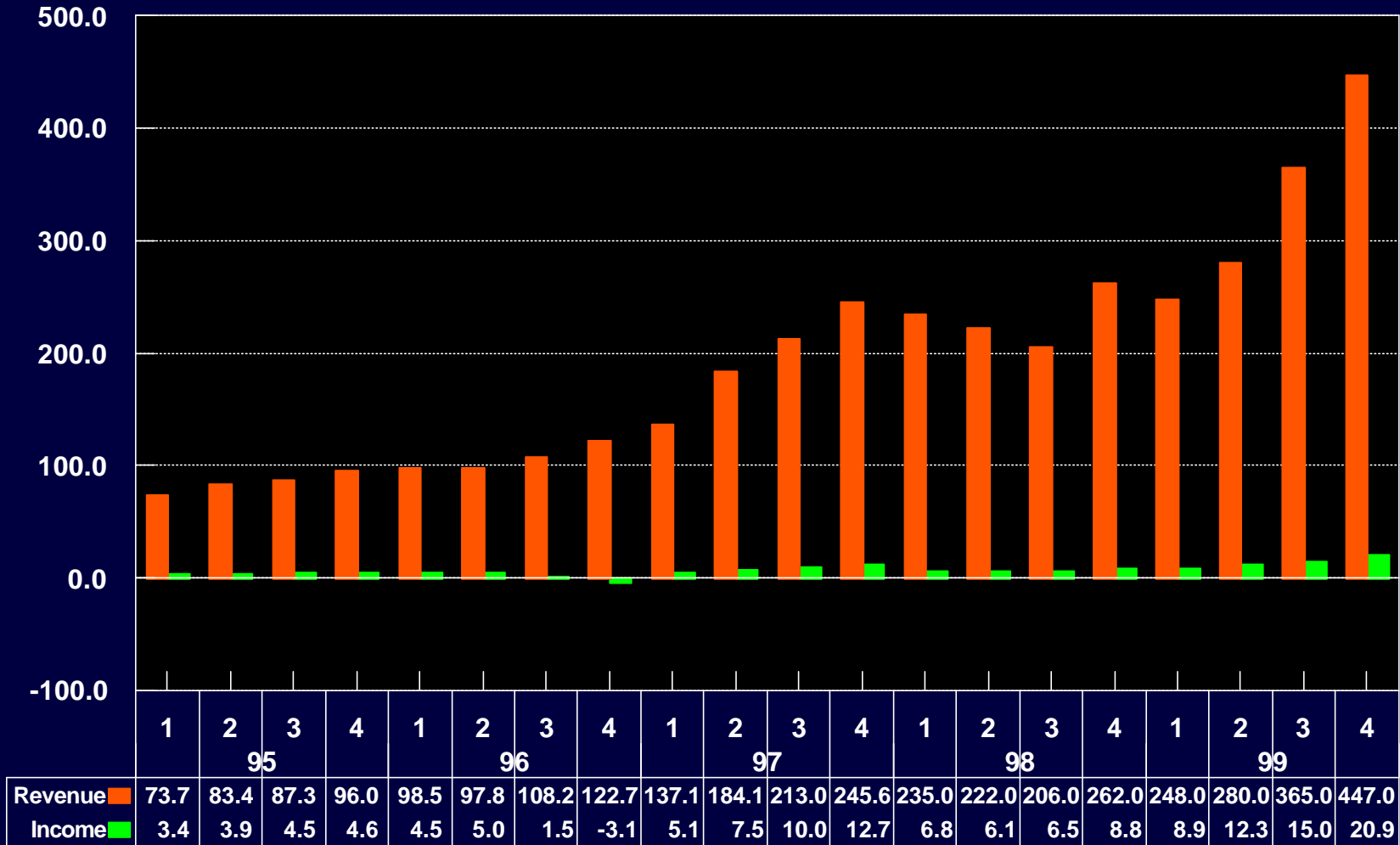
Revenue ■  
EBITDA ■

	1	2	3	4	1	2	3	4	1	2	3	
			97				98				99	
Revenue	16.3				28.2	26.3	61.2		59.2	71.7	82.9	
EBITDA	0.8				10.1	8.8	15.9		13.8	16.7	19.3	

CY

FY=CY

# DII Group (DOVatron) Revenue & Net Income



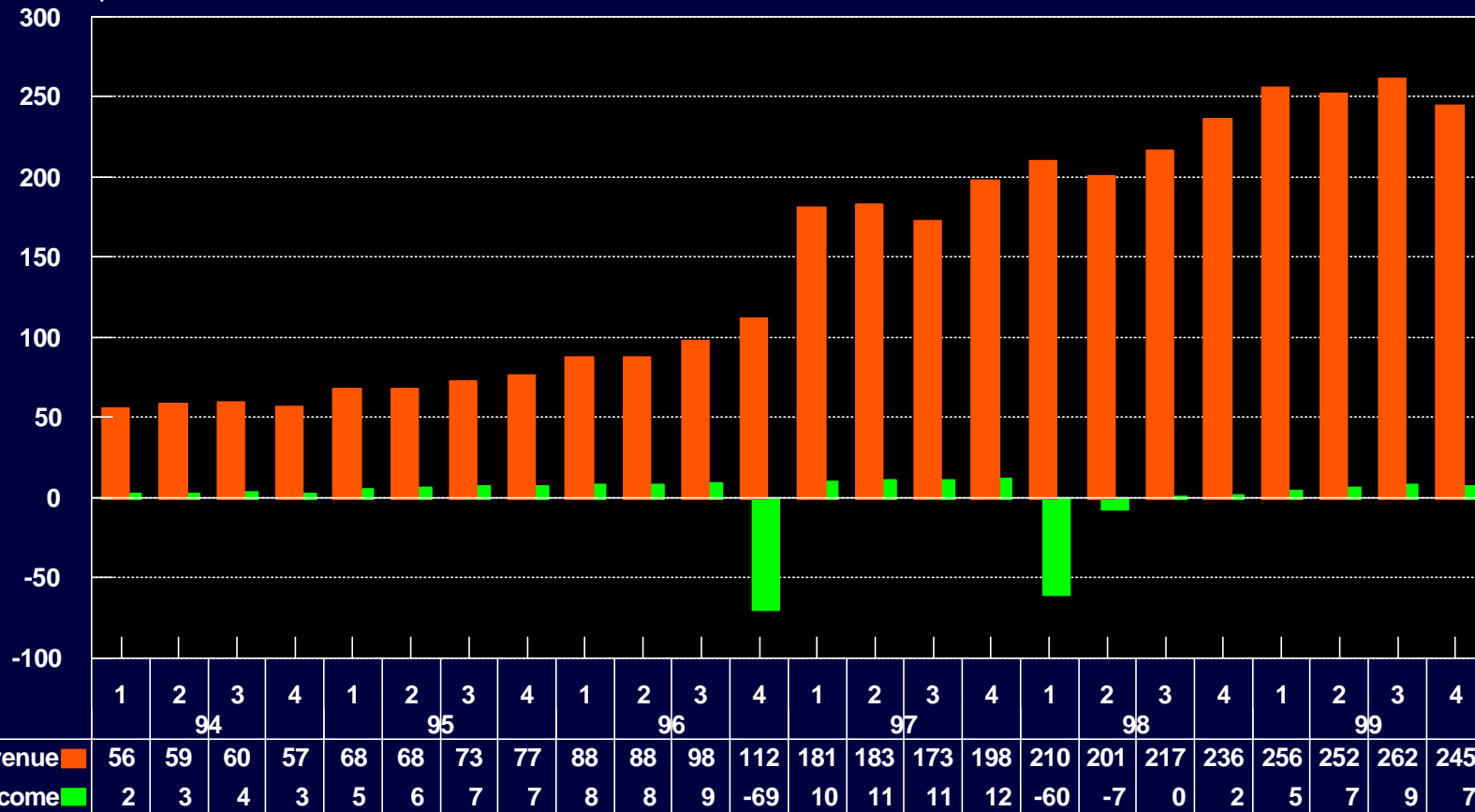
DIIG: FY=CY

DIIG

# HADCO

## Revenue & Net Income

\$ Millions



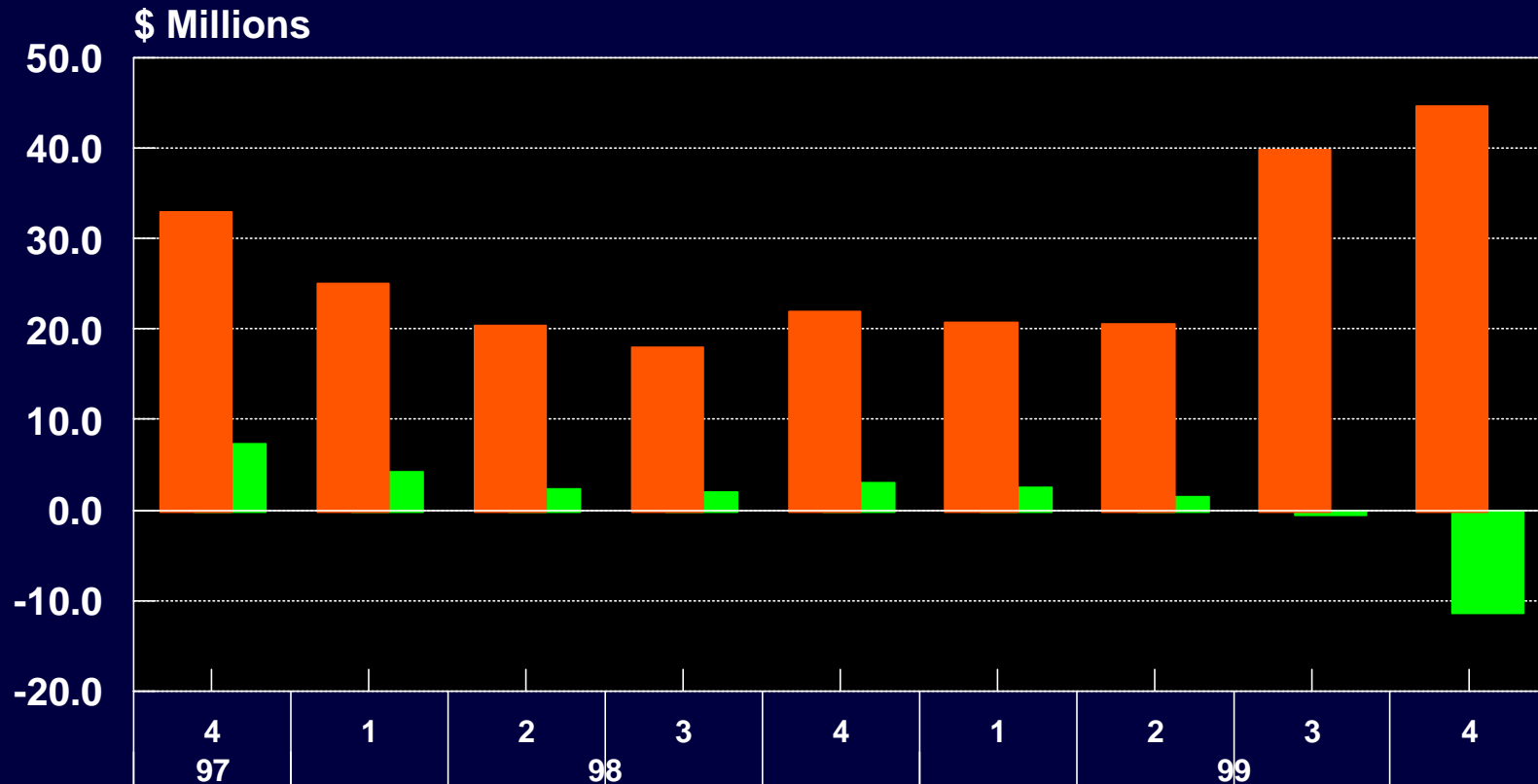
CY

HDC

FY ends October 31

# INNOVEX

## Revenue & Net Income



Revenue	33.0	25.1	20.3	17.9	22.0	20.7	20.6	39.8	44.7
Income	7.3	4.3	2.4	2.0	3.0	2.5	1.5	-0.5	-11.2

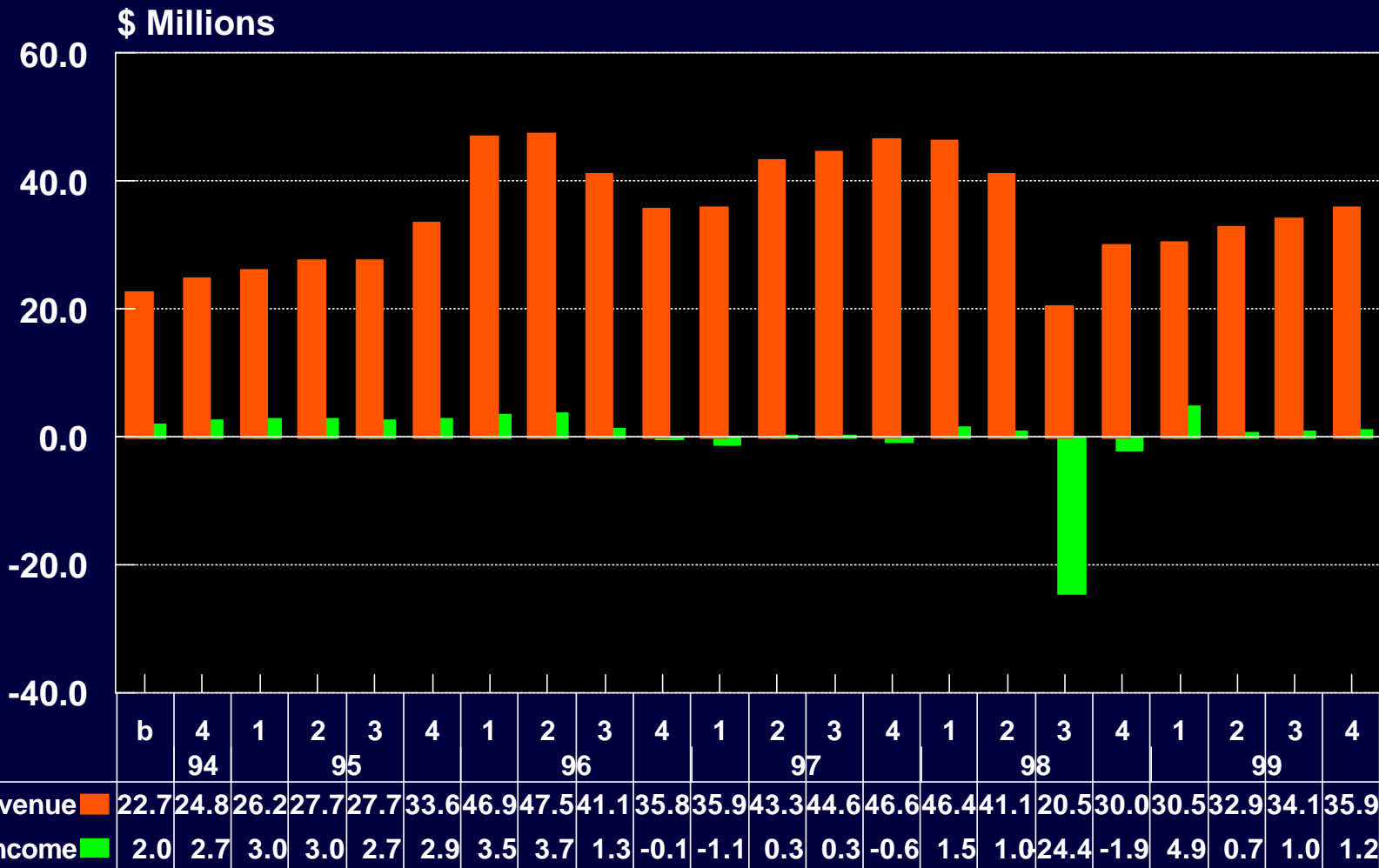
CY

FY ends September

INVX

# MERIX

## Revenue & Net Income



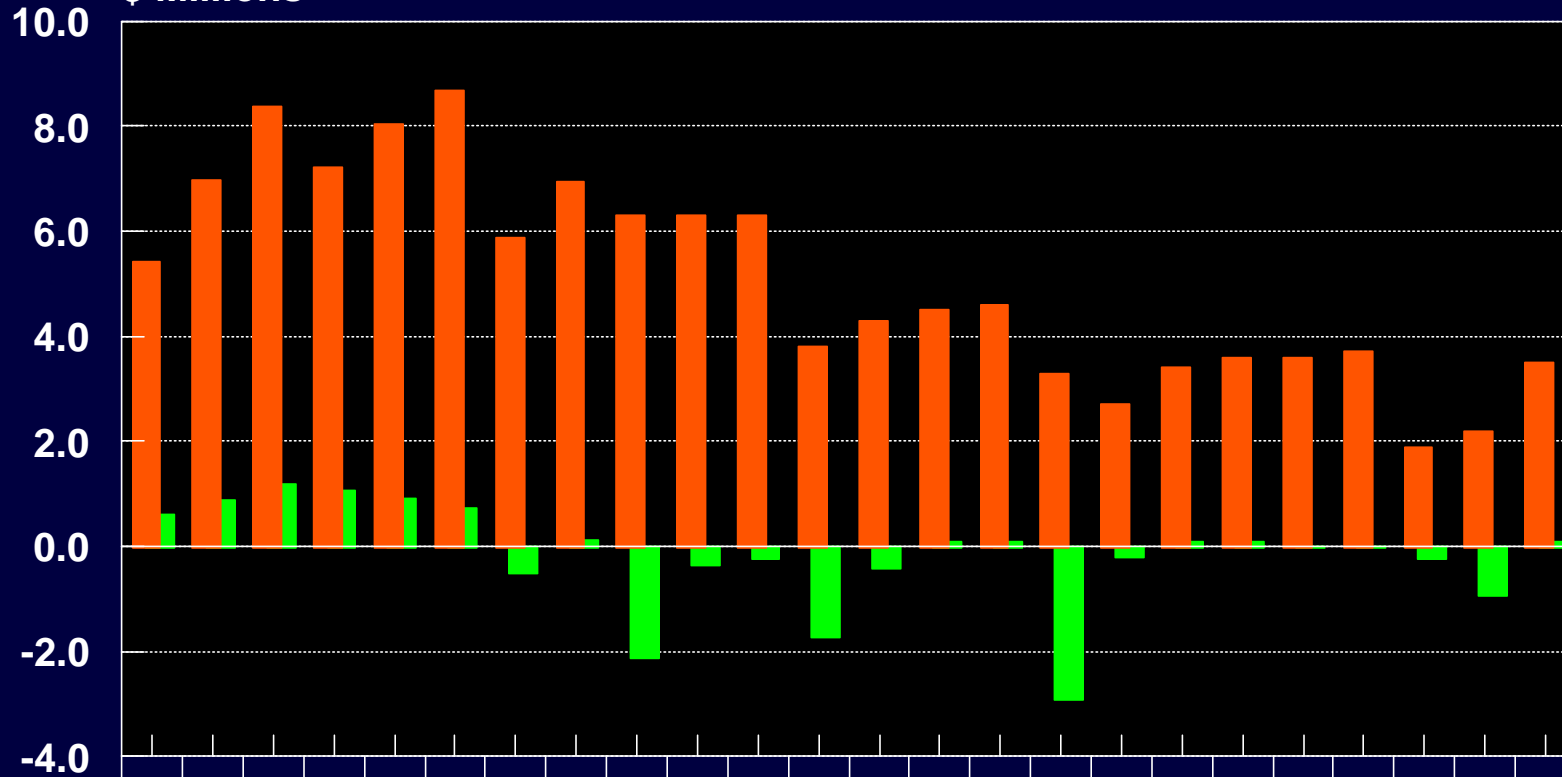
MERIX

FY ends May

# M-WAV

## Revenue & Net Income

\$ Millions



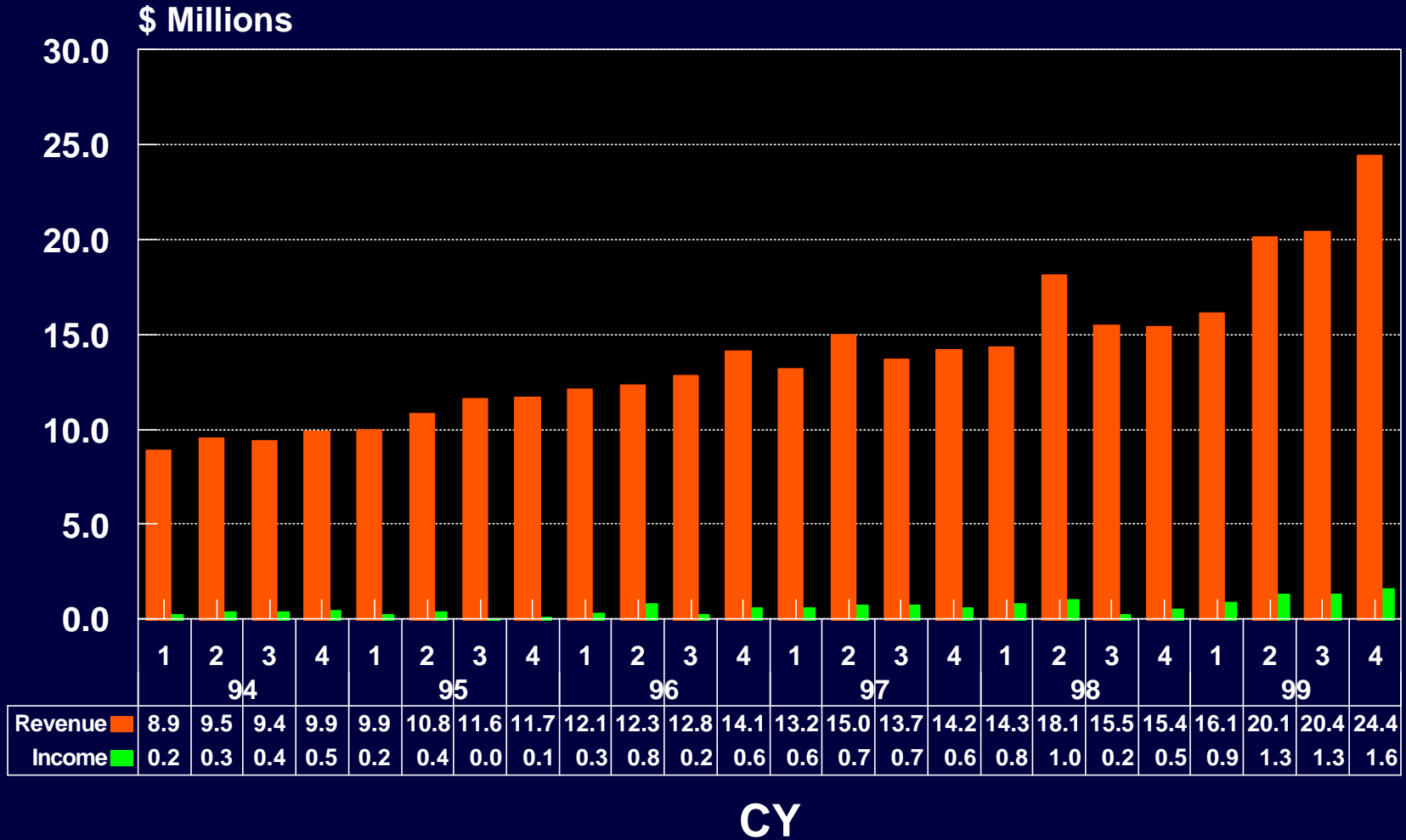
Revenue	5.4	7.0	8.4	7.2	8.0	8.7	5.9	6.9	6.3	6.3	6.3	3.8	4.3	4.5	4.6	3.3	2.7	3.4	3.6	3.6	3.7	1.9	2.2	3.5
Income	0.6	0.9	1.2	1.1	0.9	0.7	-0.5	0.1	-2.1	-0.3	-0.2	-1.7	-0.4	0.1	0.1	-2.9	-0.2	0.1	0.1	0.0	0.0	-0.2	-0.9	0.1

FY = CY

MWAV

# PARLEX

## Revenue & Net Income

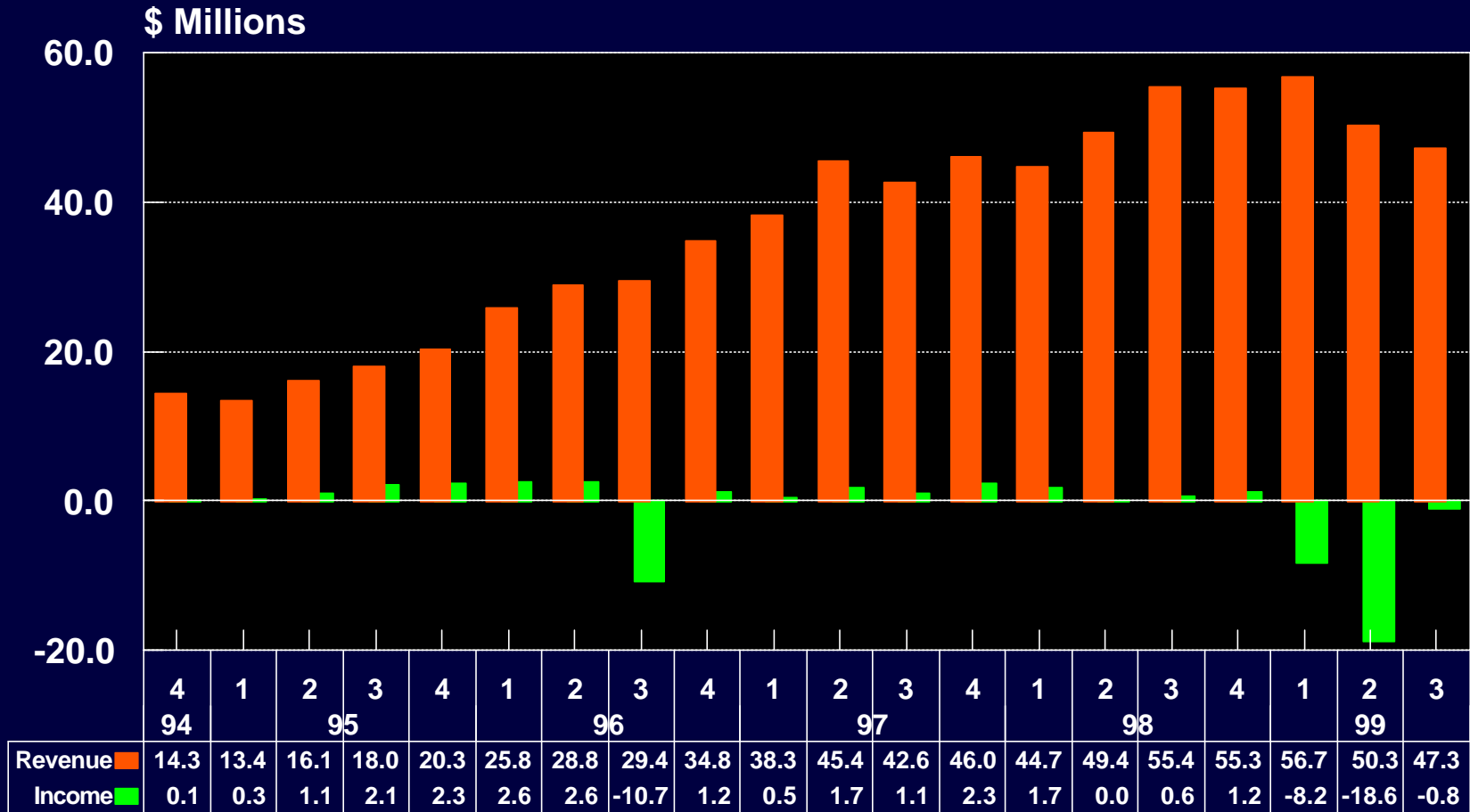


FY ends June 30

PRLX

# PRAEGITZER

## Revenue & Net Income



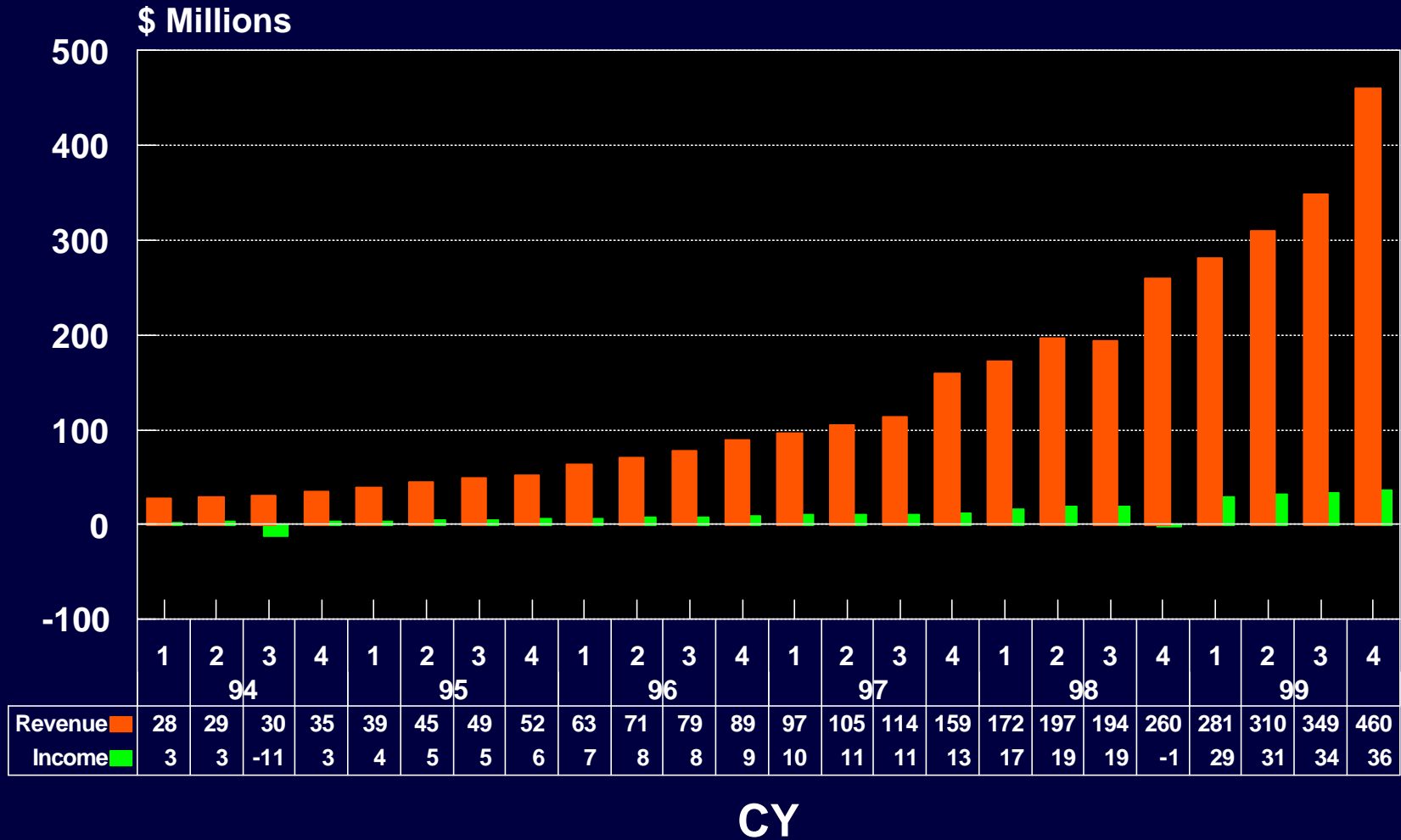
CY

FY ends June 30

PGTZ

# SANMINA

## Revenue & Net Income

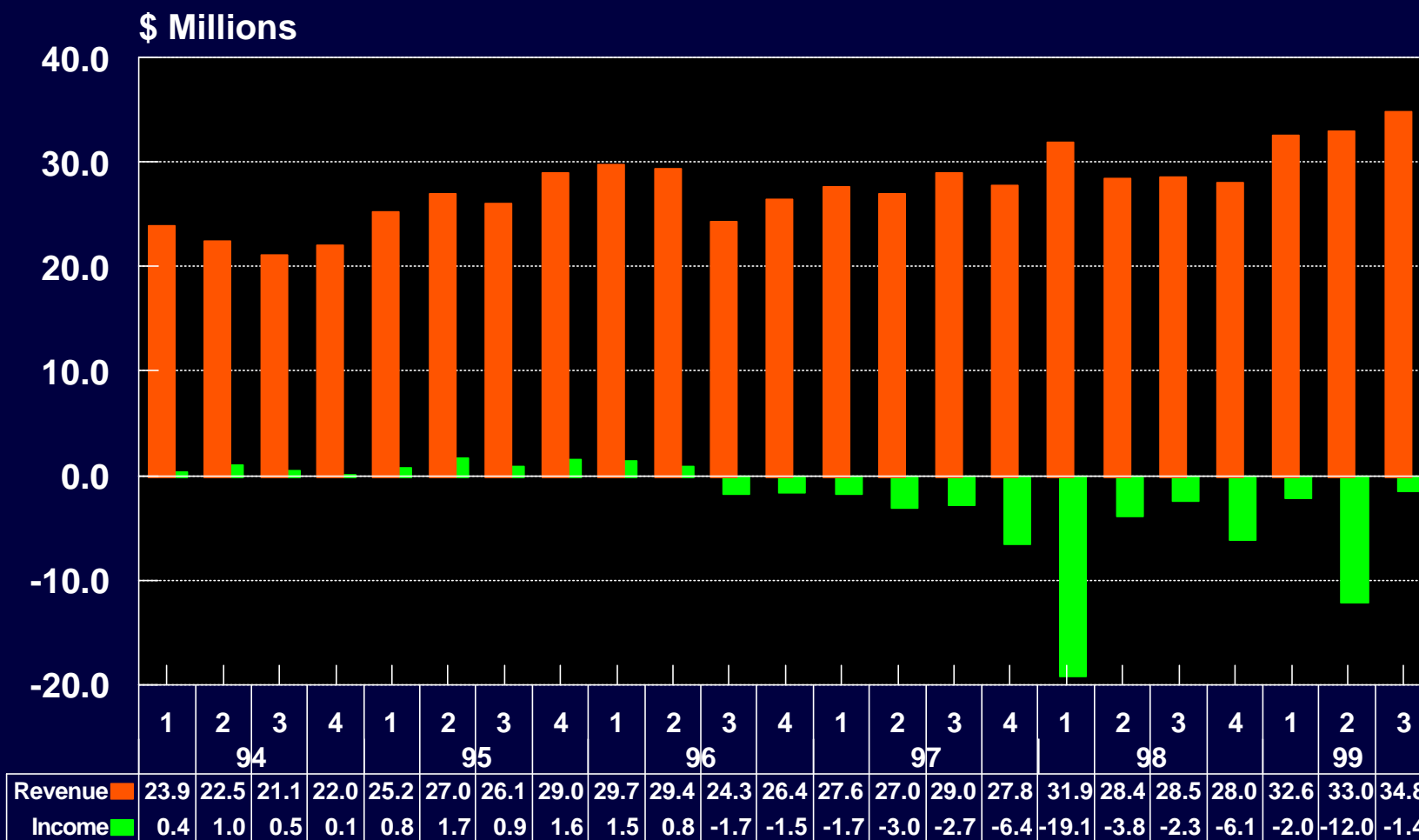


FY ends September 30

SANMINA

# SHELDAHL

## Revenue & Net Income

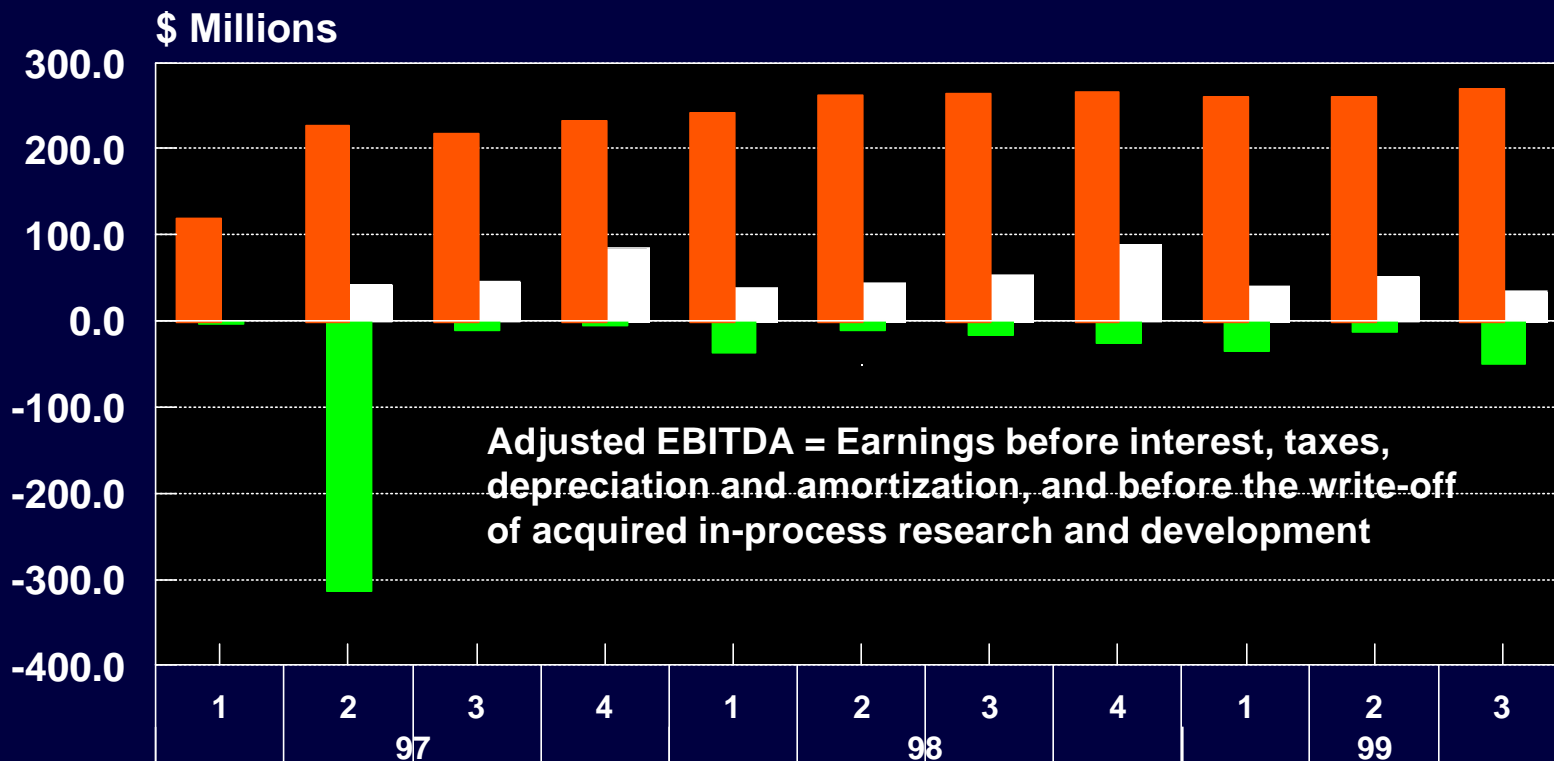


CY

SHEL

# VIASYSTEMS

## Revenue & Income



Revenue	119.9	226.8	216.8	232.0	242.4	261.9	263.0	265.0	260.0	260.0	270.0
Net Income	-2.3	-311.9	-9.4	-3.9	-35.6	-9.3	-15.7	-24.1	-34.2	-10.9	-48.2
Adj EBITDA		41.5	45.2	84.6	37.1	43.5	52.7	86.8	38.2	50.8	32.7

CY

Sources: 10Q & 10K reports and company press releases

# ACT Manufacturing

## Revenue & Net Income



FY=CY

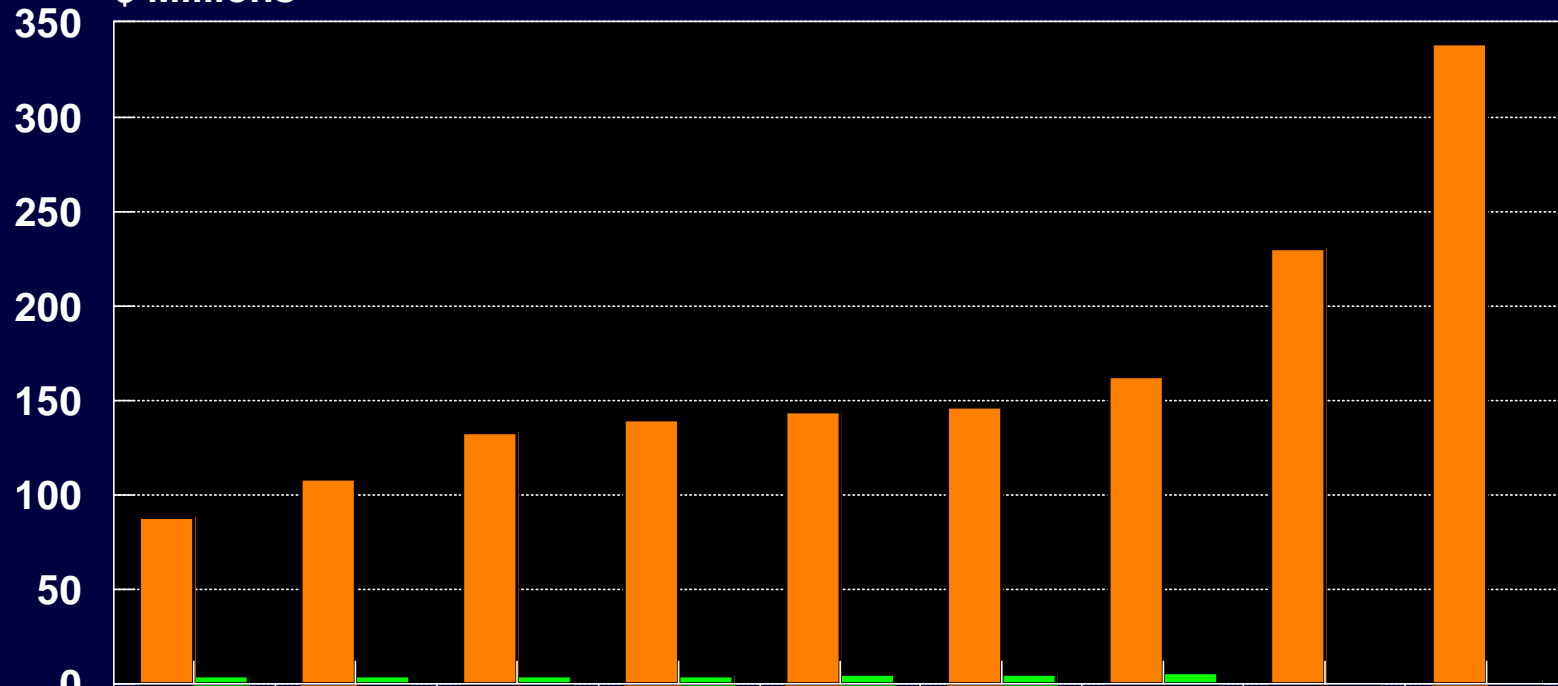
CY

ACTM

# Benchmark Electronics

## Revenue & Net Income

\$ Millions



Revenue	88.2	108.1	132.6	139.7	143.7	146.6	162.6	229.9	338.8
Income	4.2	3.7	3.7	4.2	4.7	5	5.6	1.3	1.3

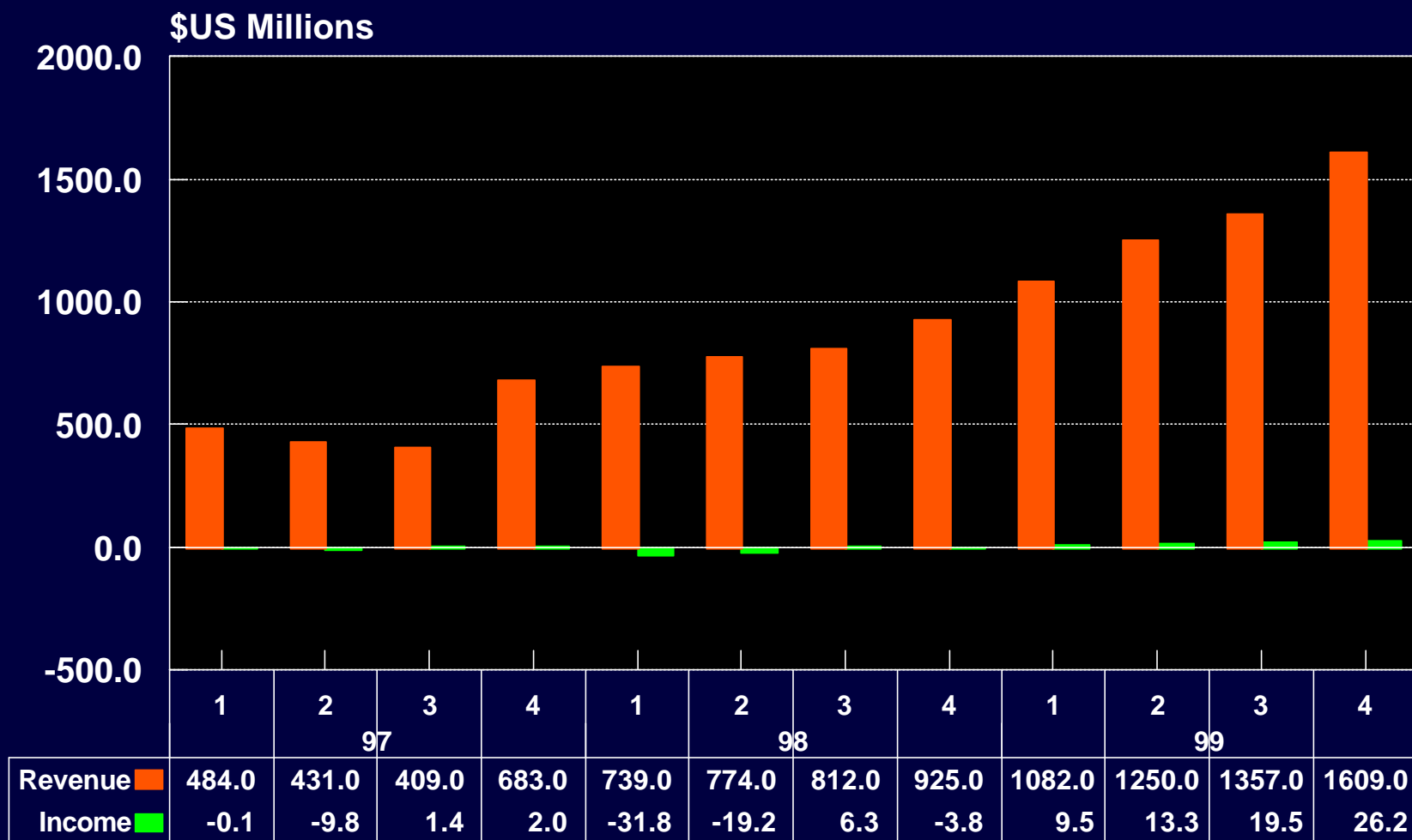
FY=CY

CY

BHE

# Celestica

## Revenue & Net Income



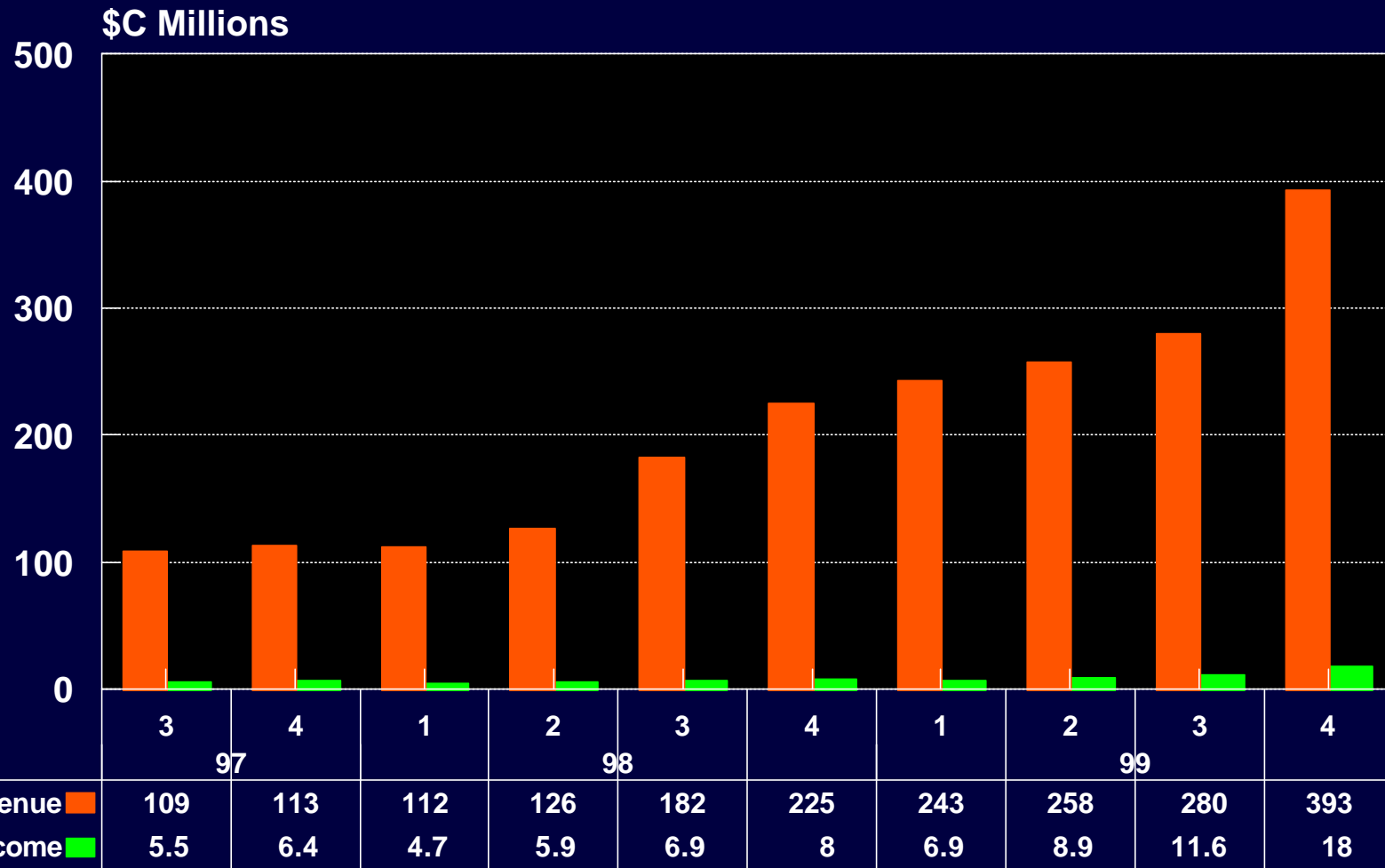
FY=CY

CY

CLS

# C-MAC INDUSTRIES

## Revenue & Net Income



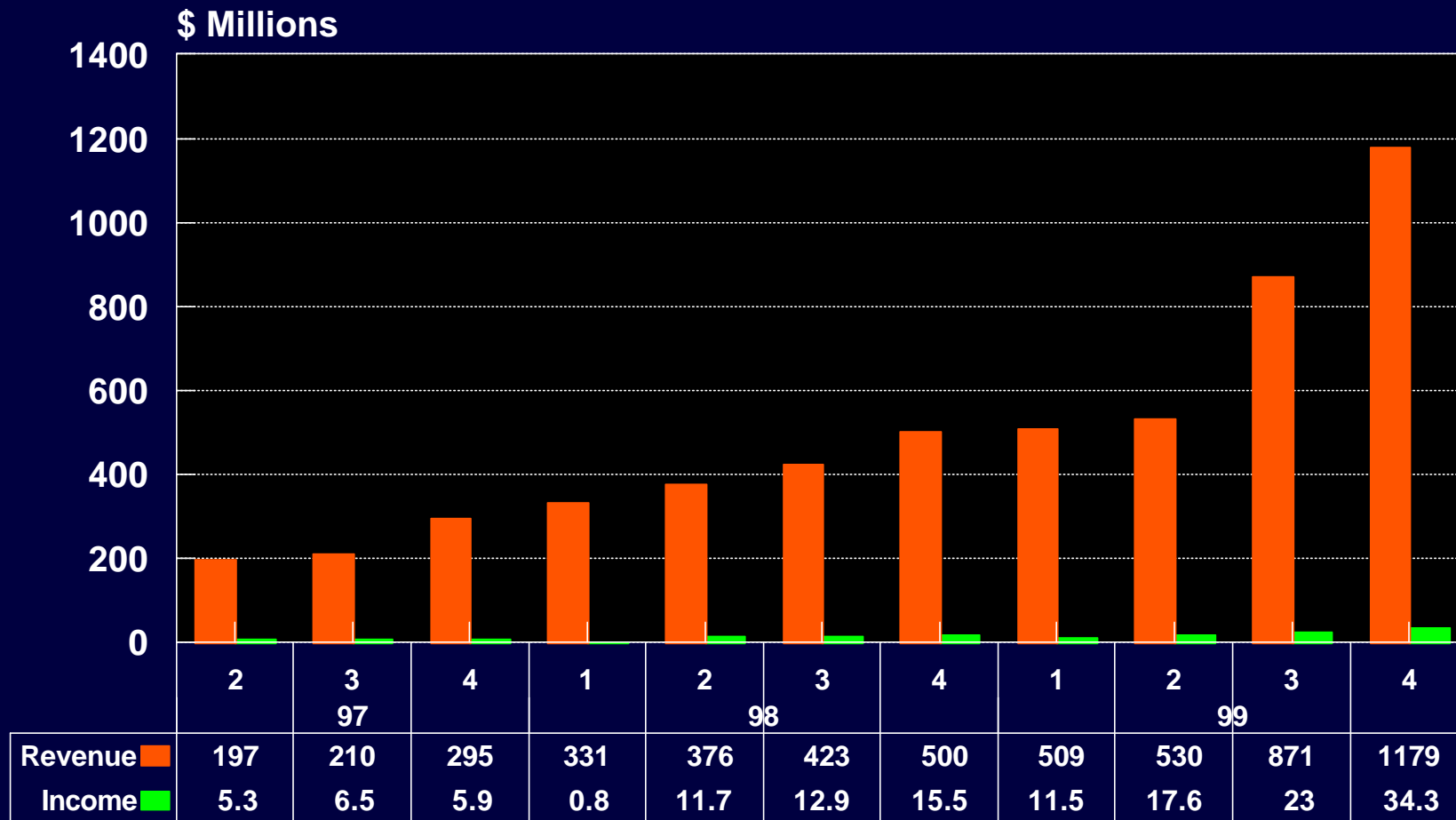
FY=CY

CY

T:CMS

# Flextronics

## Revenue & Net Income



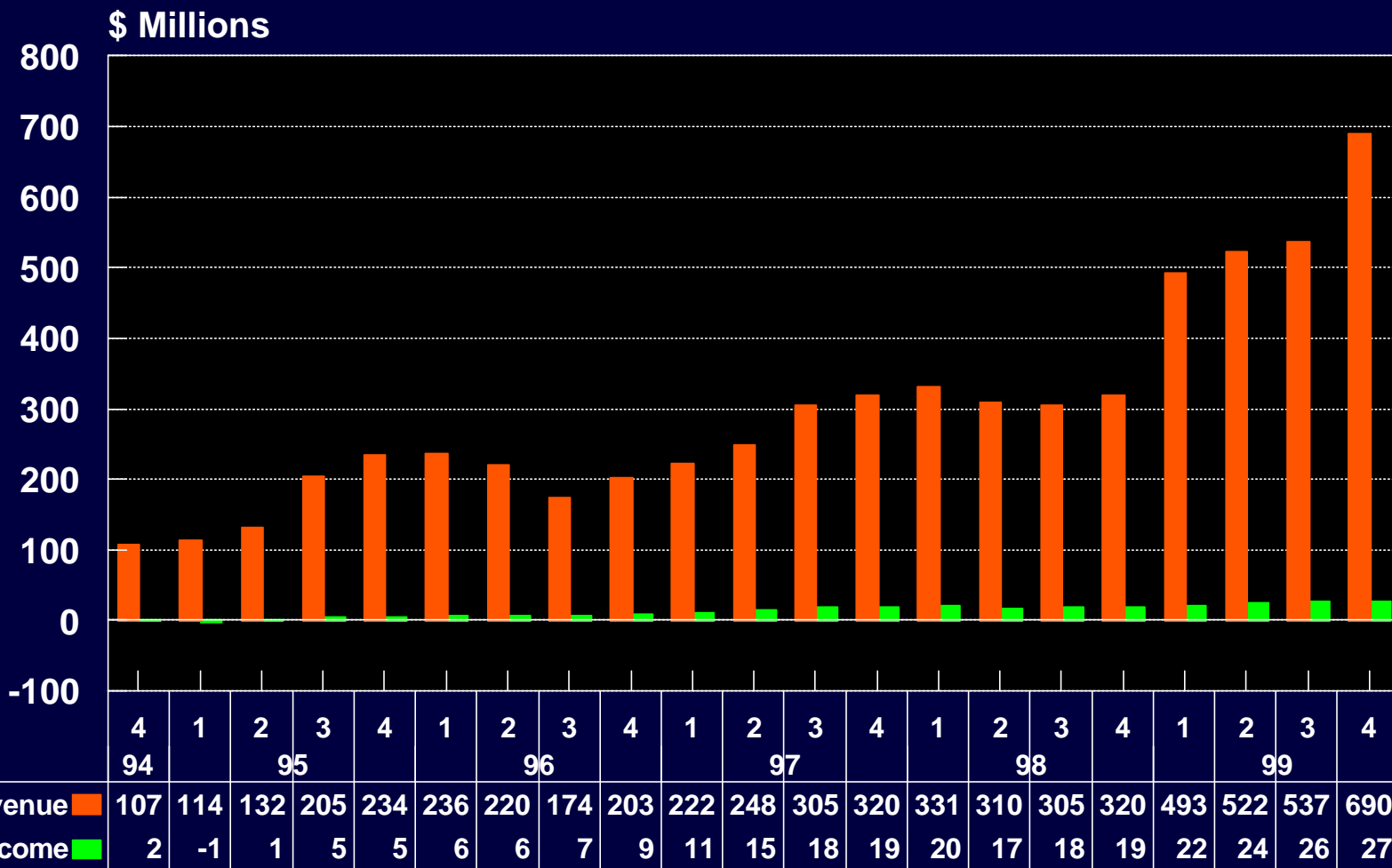
FY ends 3/31

CY

FLEX

# JABIL CIRCUIT INC

## Revenue & Net Income



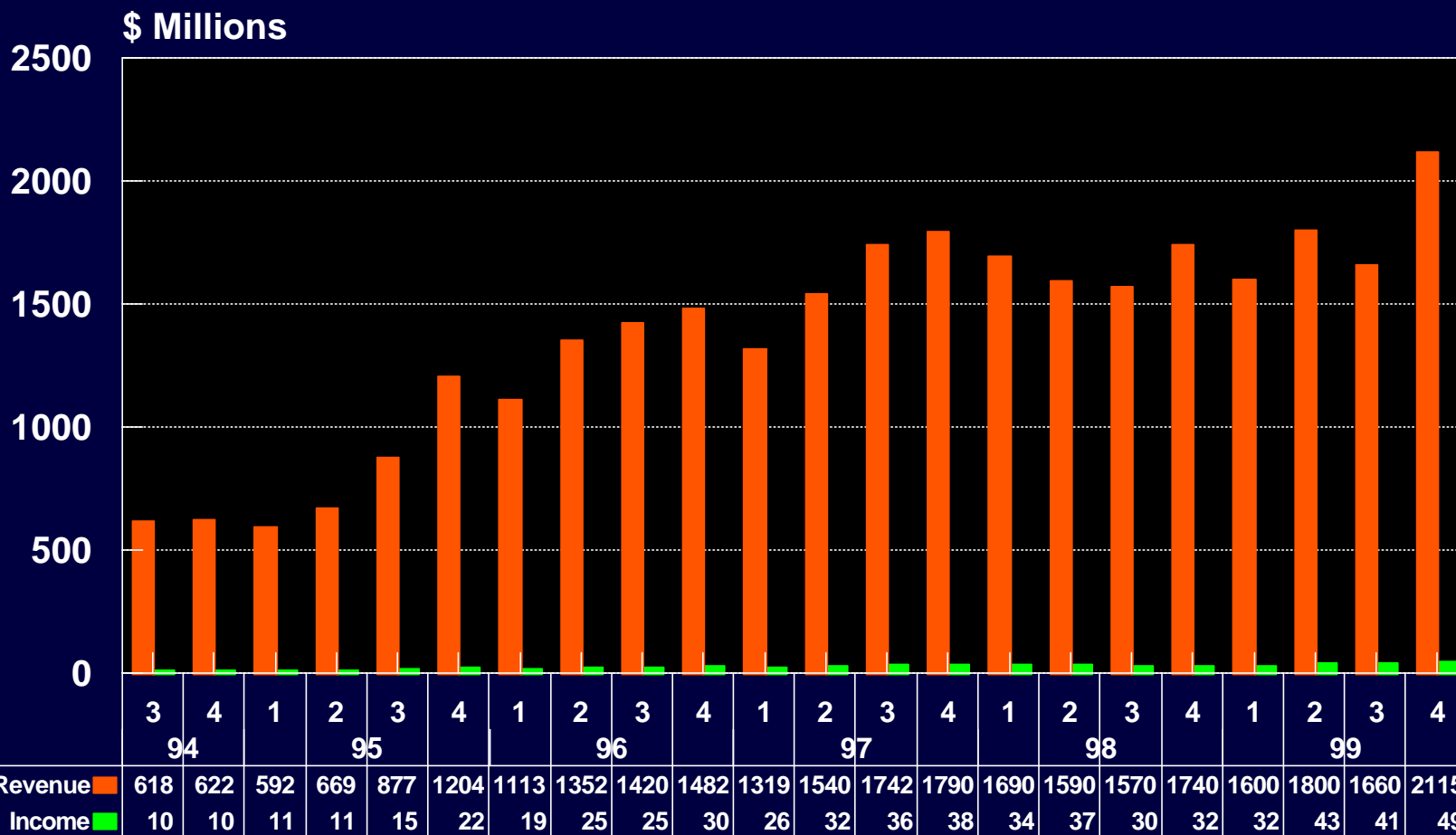
CY

FY ends August

JBIL

# SCI Systems

## Revenue & Net Income



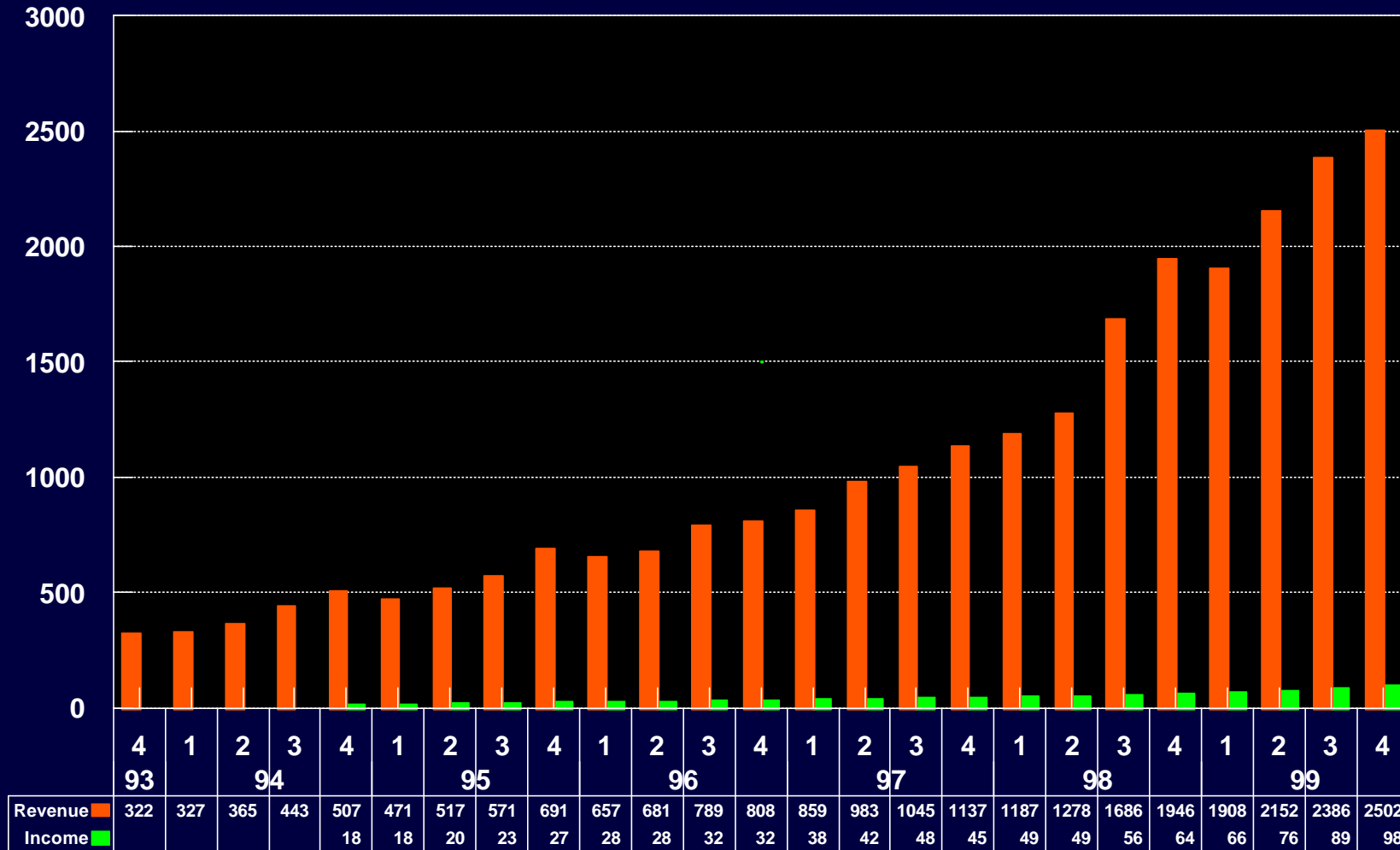
FY ends 6/30

CY

SCI

# SOLECTRON

## Revenue & Net Income

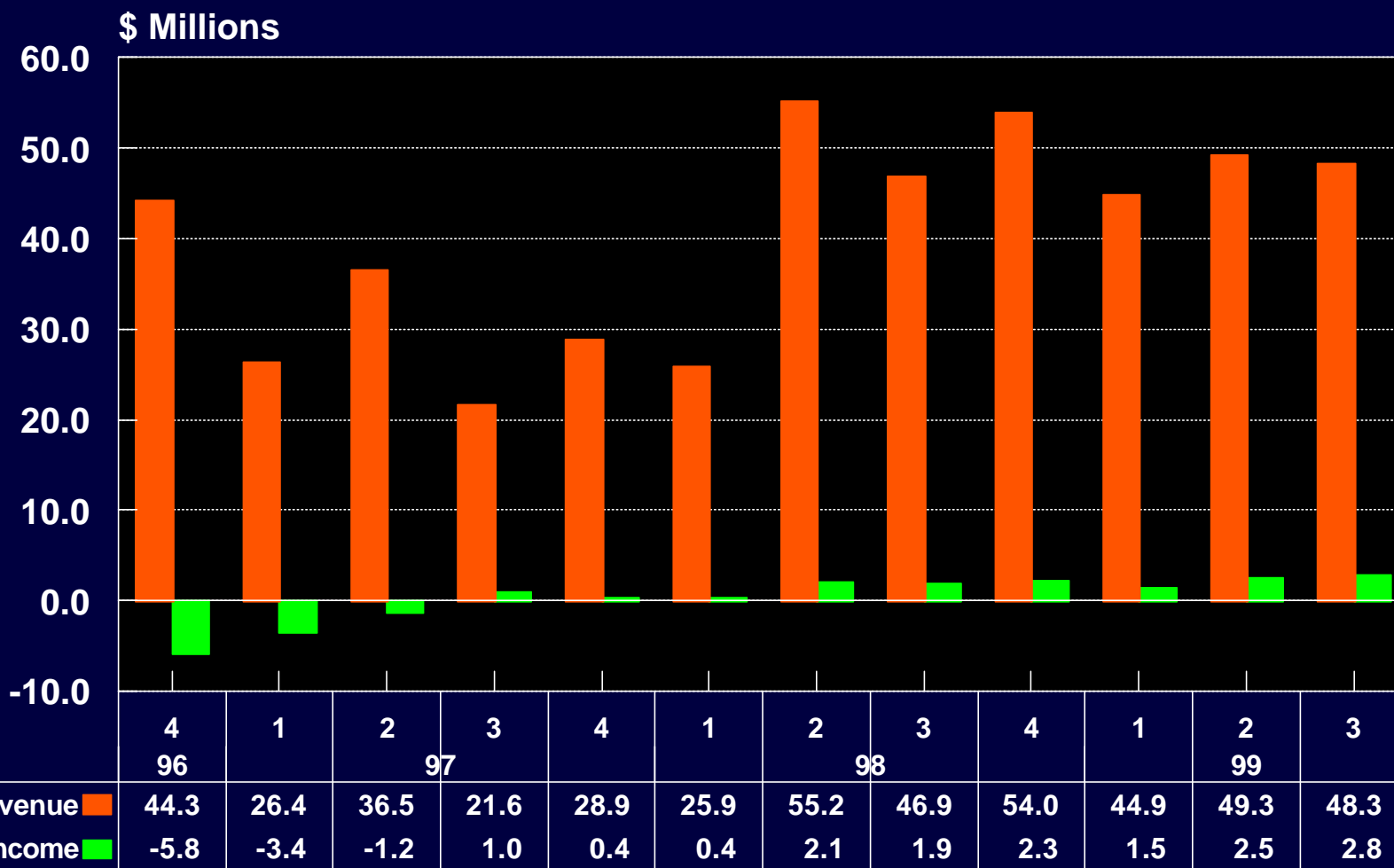


FY ends in August

SLR

# Sypris Solutions (formerly Group Technologies)

## Revenue & Net Income

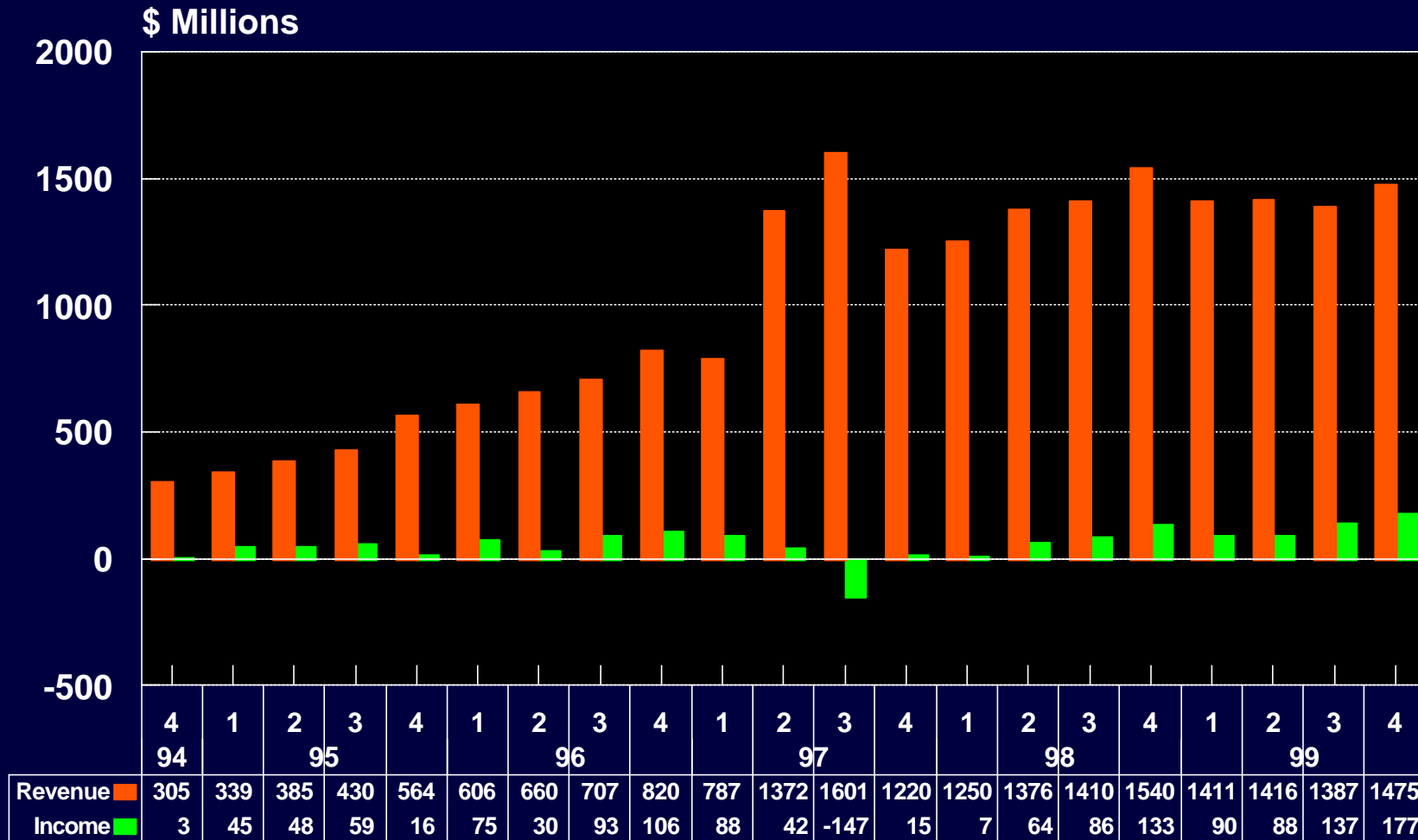


CY

SYPR

# 3COM CORP.

## Revenue & Net Income



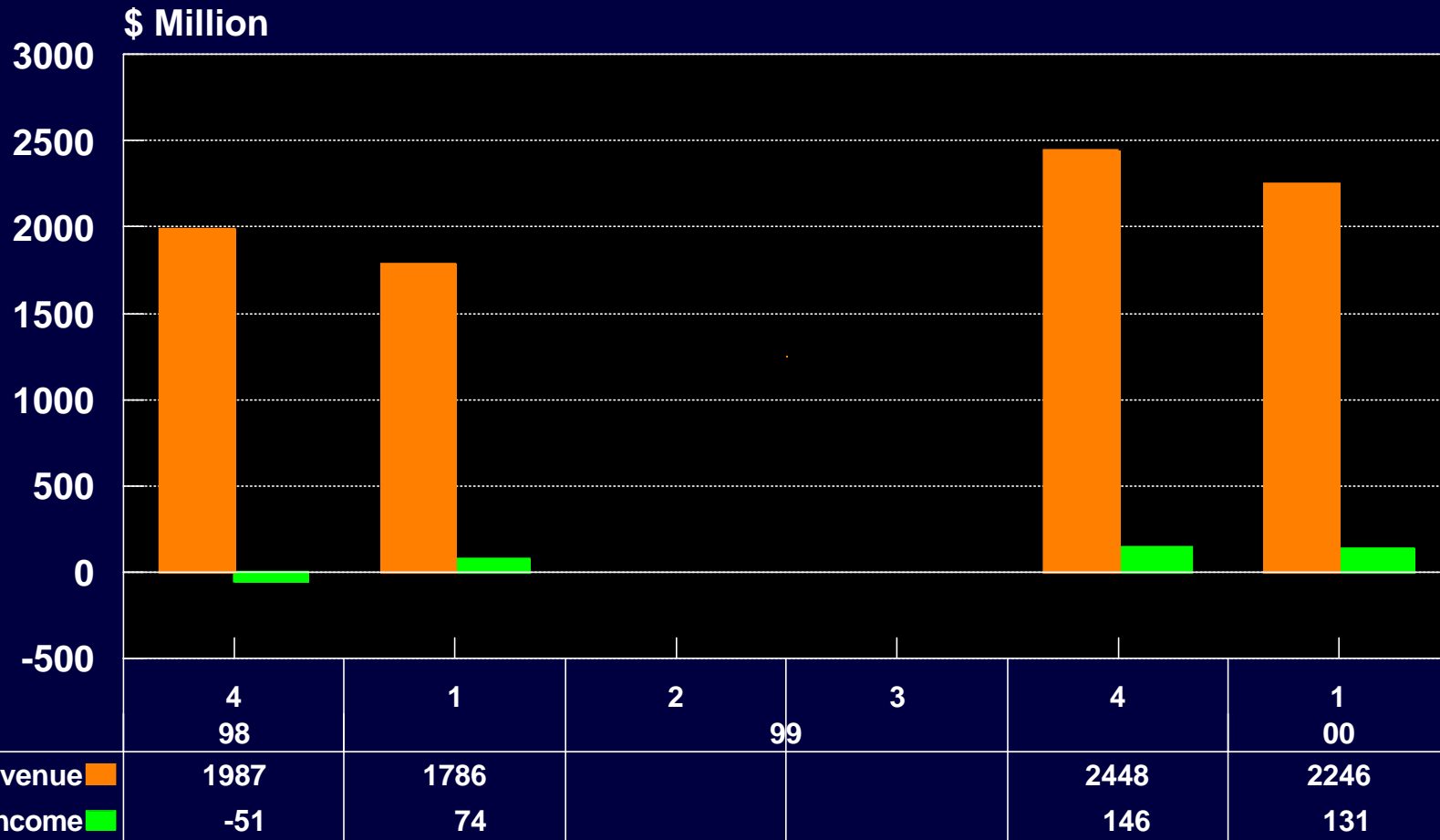
FY ends May

CY

COMS

# Agilent Technologies

## Revenue & Net Income



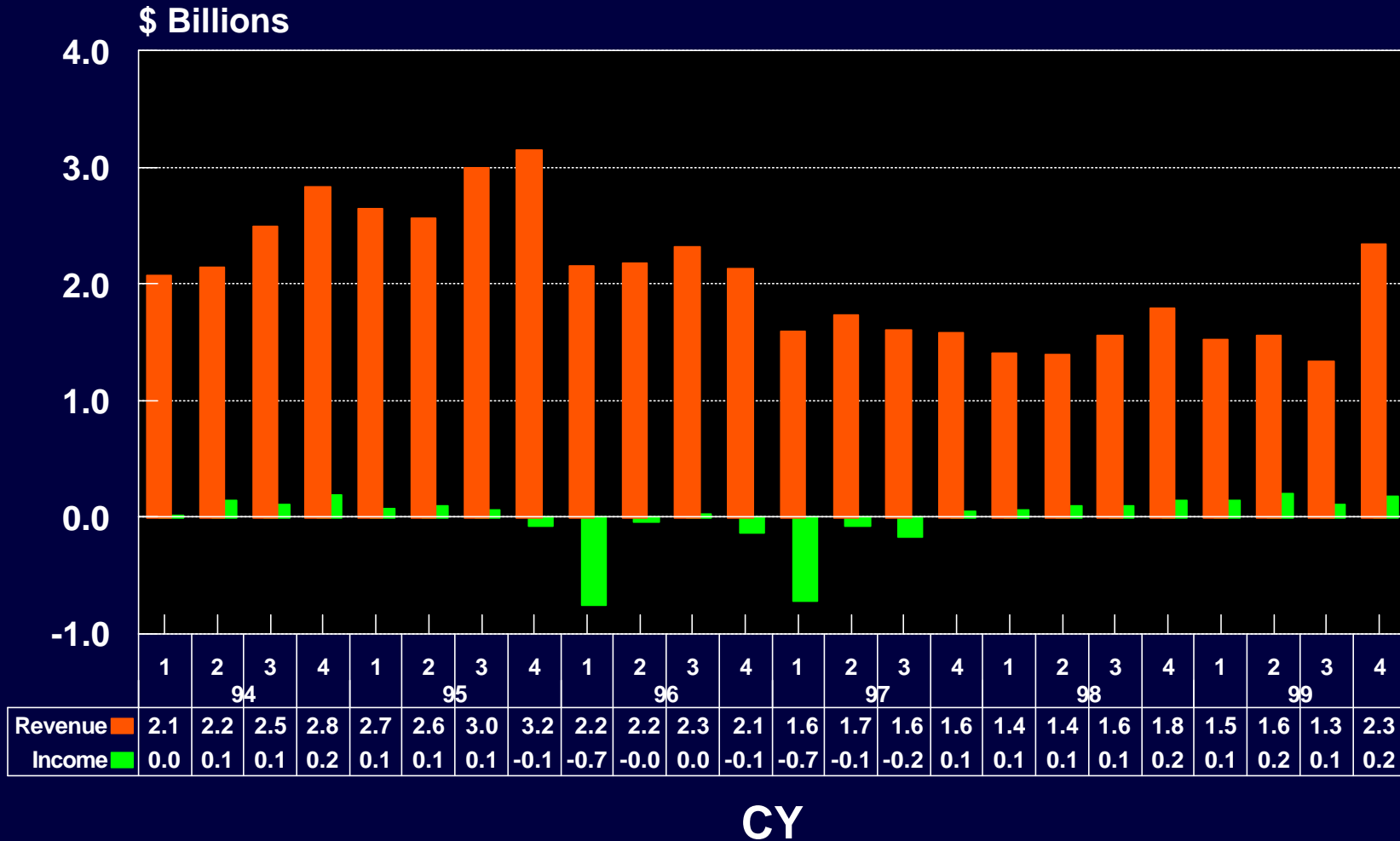
CY

CS

FY ends Oct31

# Apple Computer

## Revenue & Net Income

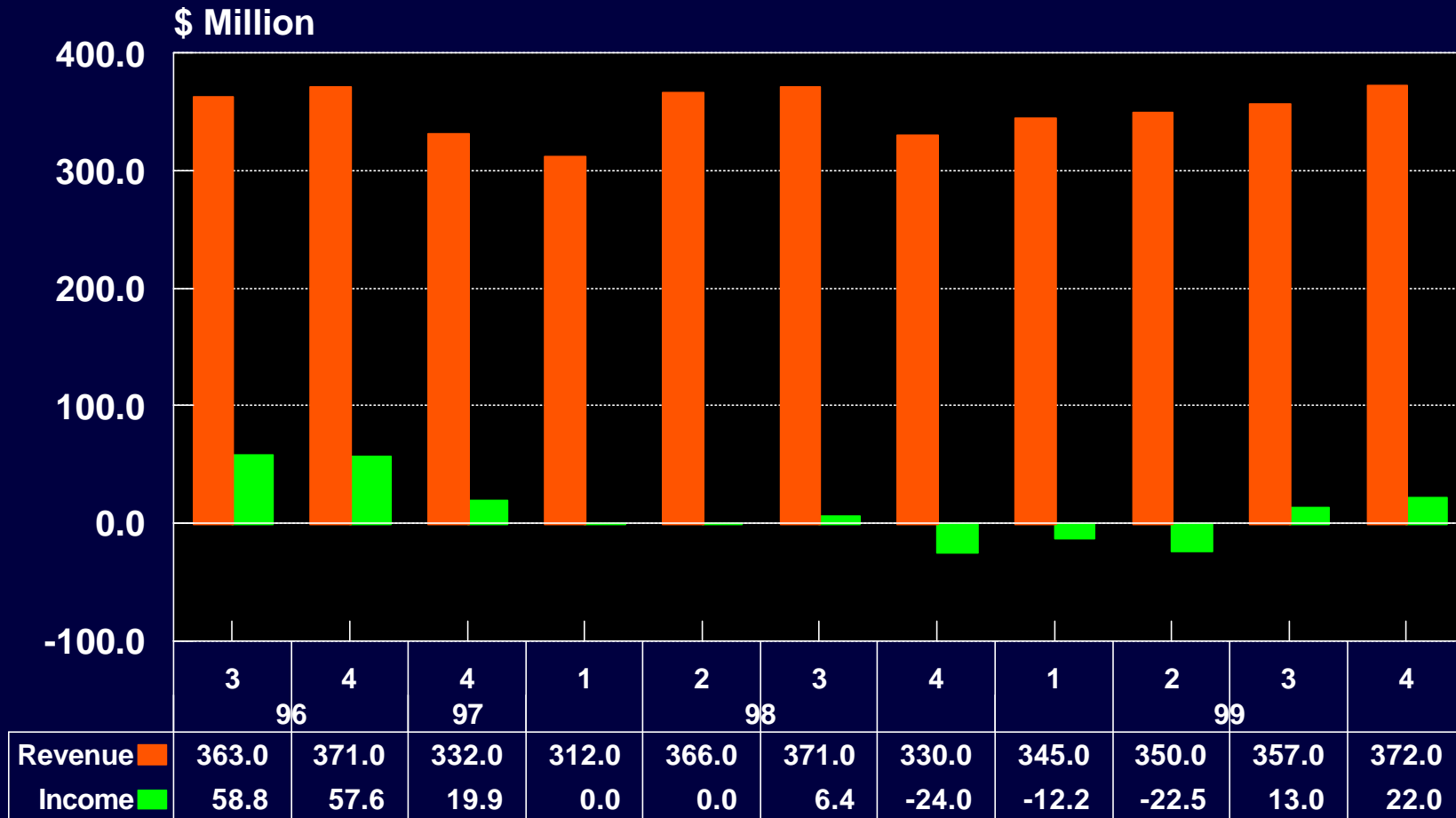


FY ends September

AAPL

# Cabletron

## Revenue & Net Income



CY

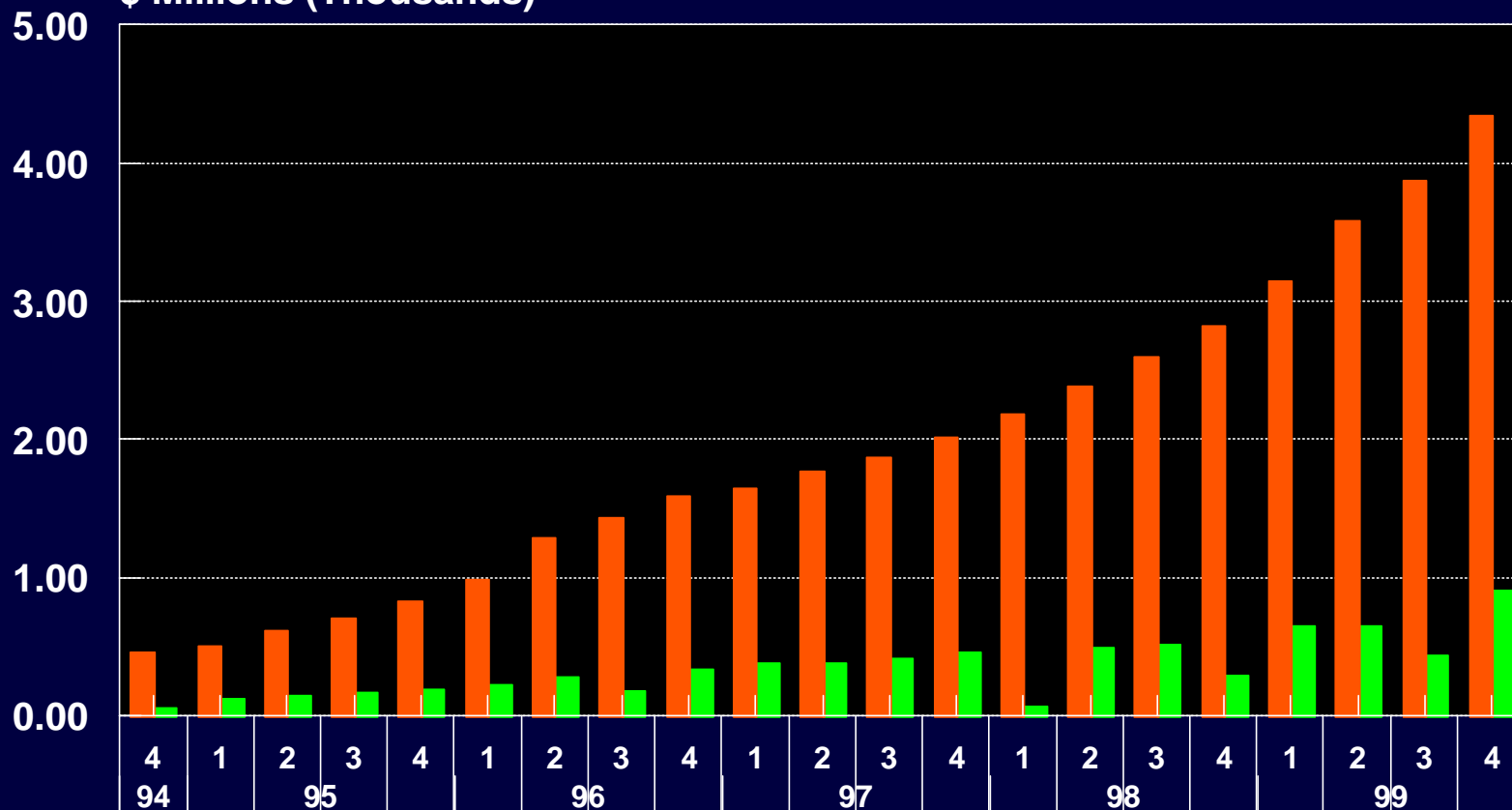
CS

FY ends Feb 28

# CISCO SYSTEMS

## Revenue & Net Income

\$ Millions (Thousands)

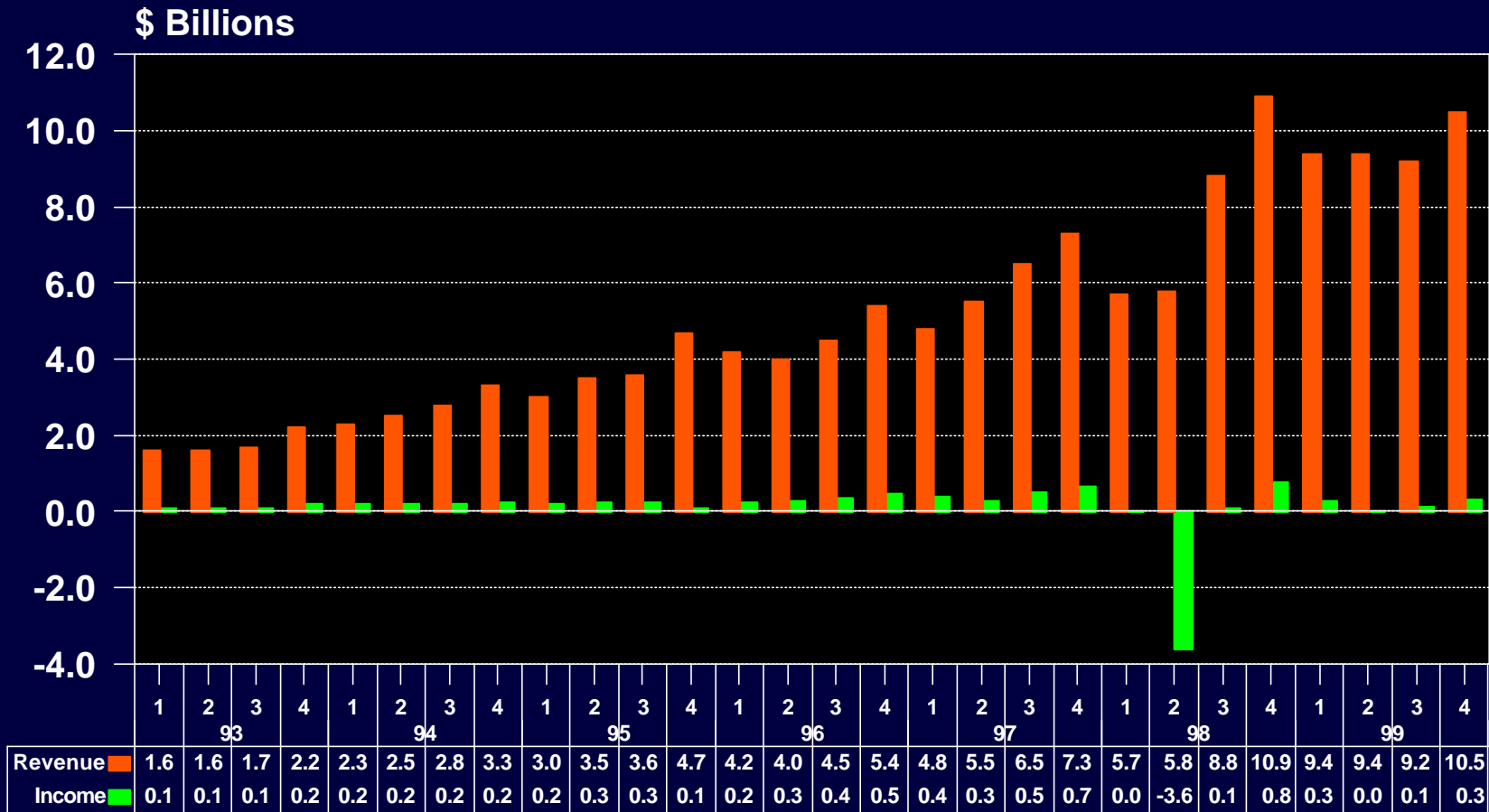


Revenue	0.46	0.51	0.62	0.71	0.83	0.99	1.29	1.43	1.59	1.65	1.77	1.87	2.02	2.18	2.39	2.60	2.83	3.15	3.58	3.88	4.35
Income	0.05	0.13	0.14	0.17	0.20	0.23	0.28	0.18	0.34	0.38	0.38	0.42	0.46	0.07	0.49	0.51	0.29	0.65	0.65	0.44	0.91

CY

CSCO

# Compaq Computer Revenue & Net Income



CY

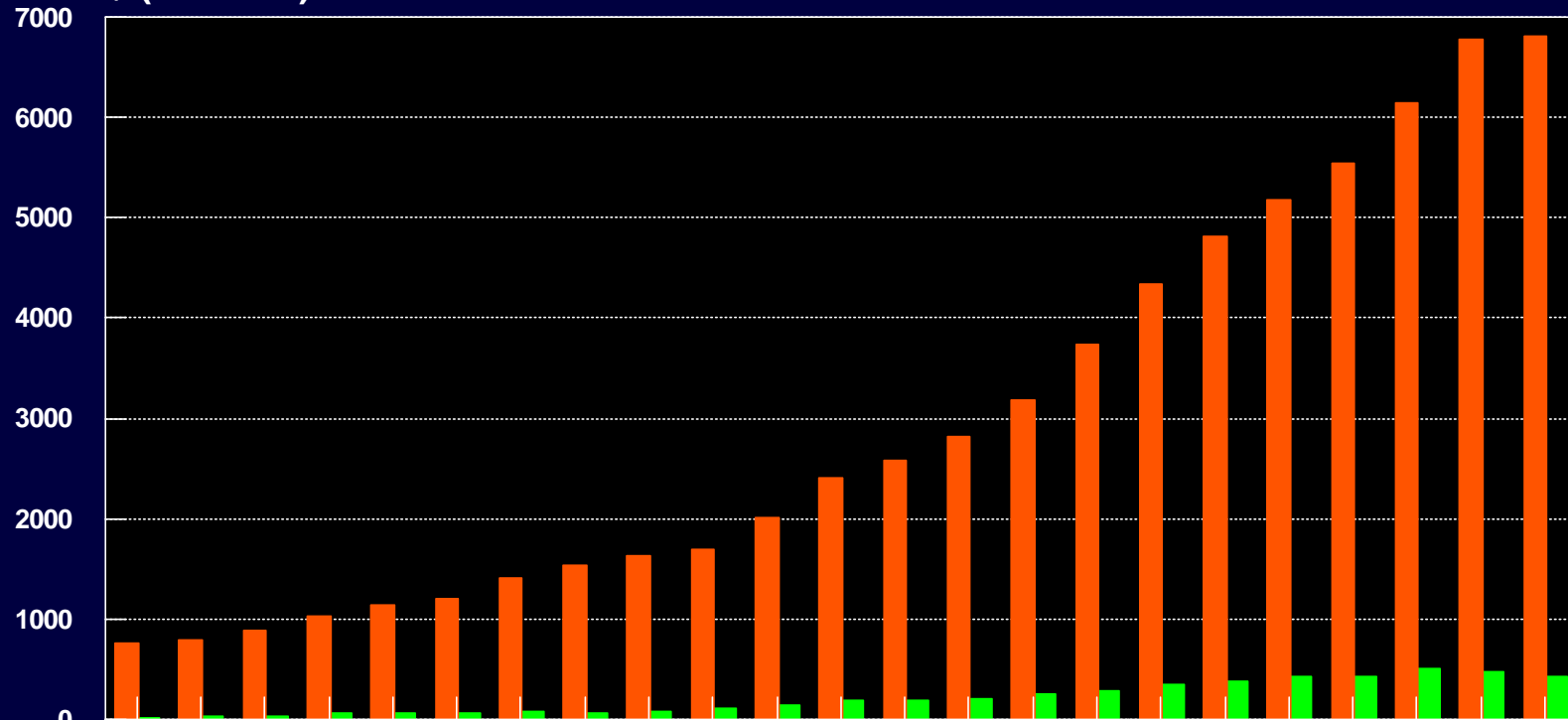
FY=CY

CPQ

# DELL COMPUTER

## Revenue & Net Income

\$ (Millions)



SALES	767	792	885	1033	1136	1206	1416	1539	1638	1690	2019	2412	2588	2814	3188	3737	4331	4818	5173	5537	6142	6784	6801
PROFITS	19	29	41	58	62	65	75	70	82	112	149	188	198	214	248	285	346	384	425	434	507	483	436

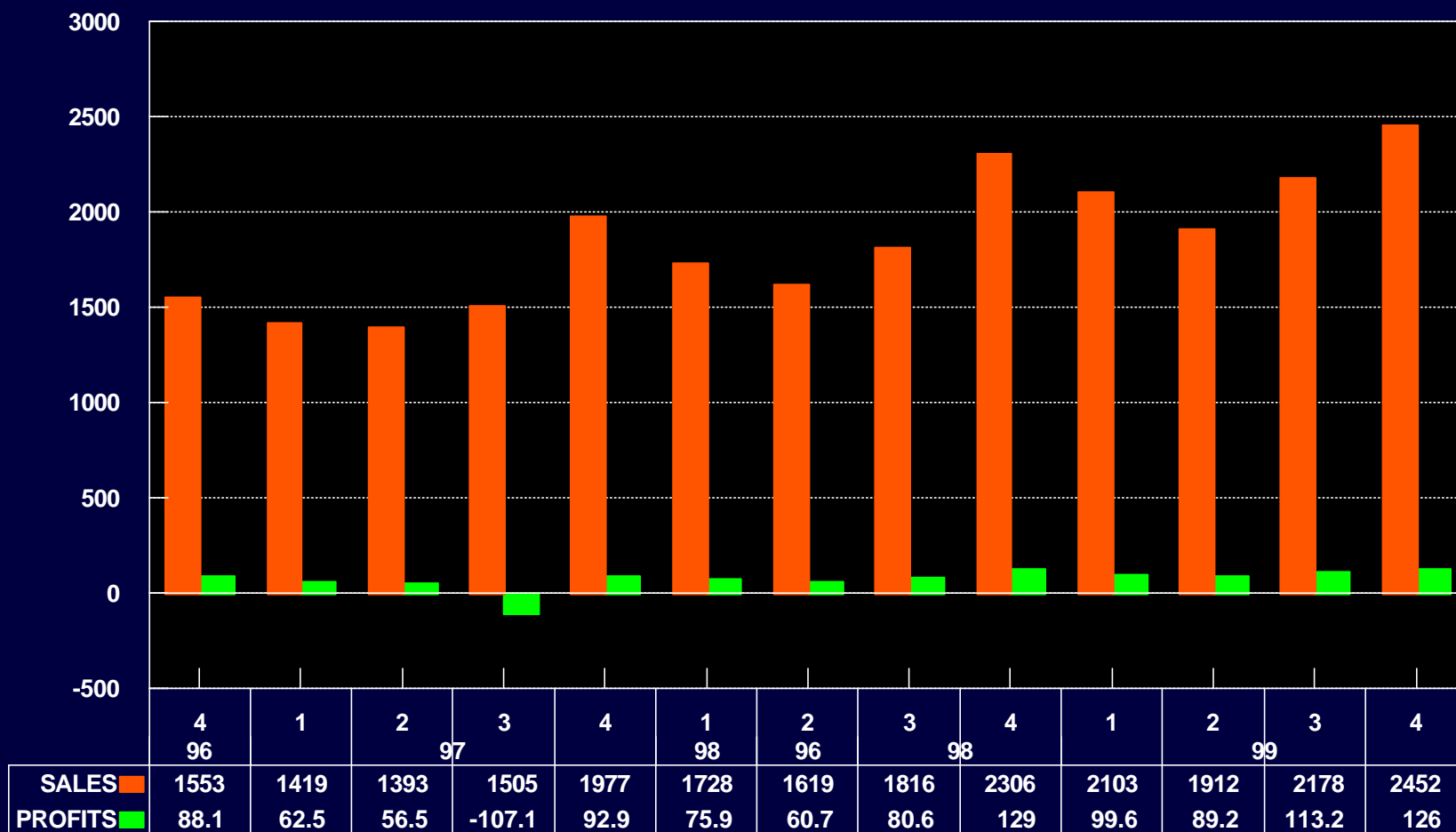
CY

FY ends October

DELL

# Gateway 2000

## Revenue & Net Income



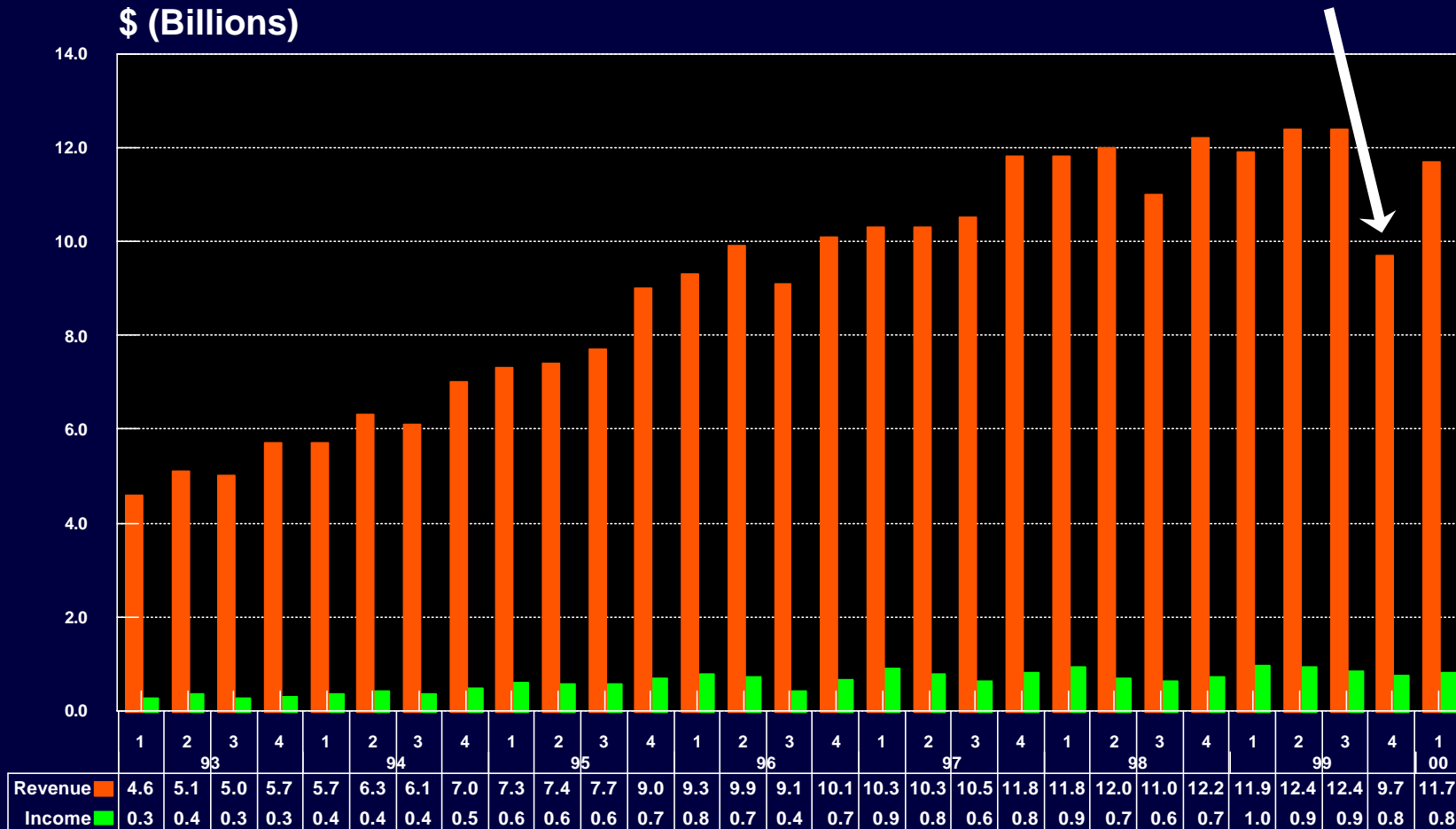
CY

GTW

# Hewlett-Packard

## Revenue & Net Income

Agilent Spinoff



CY

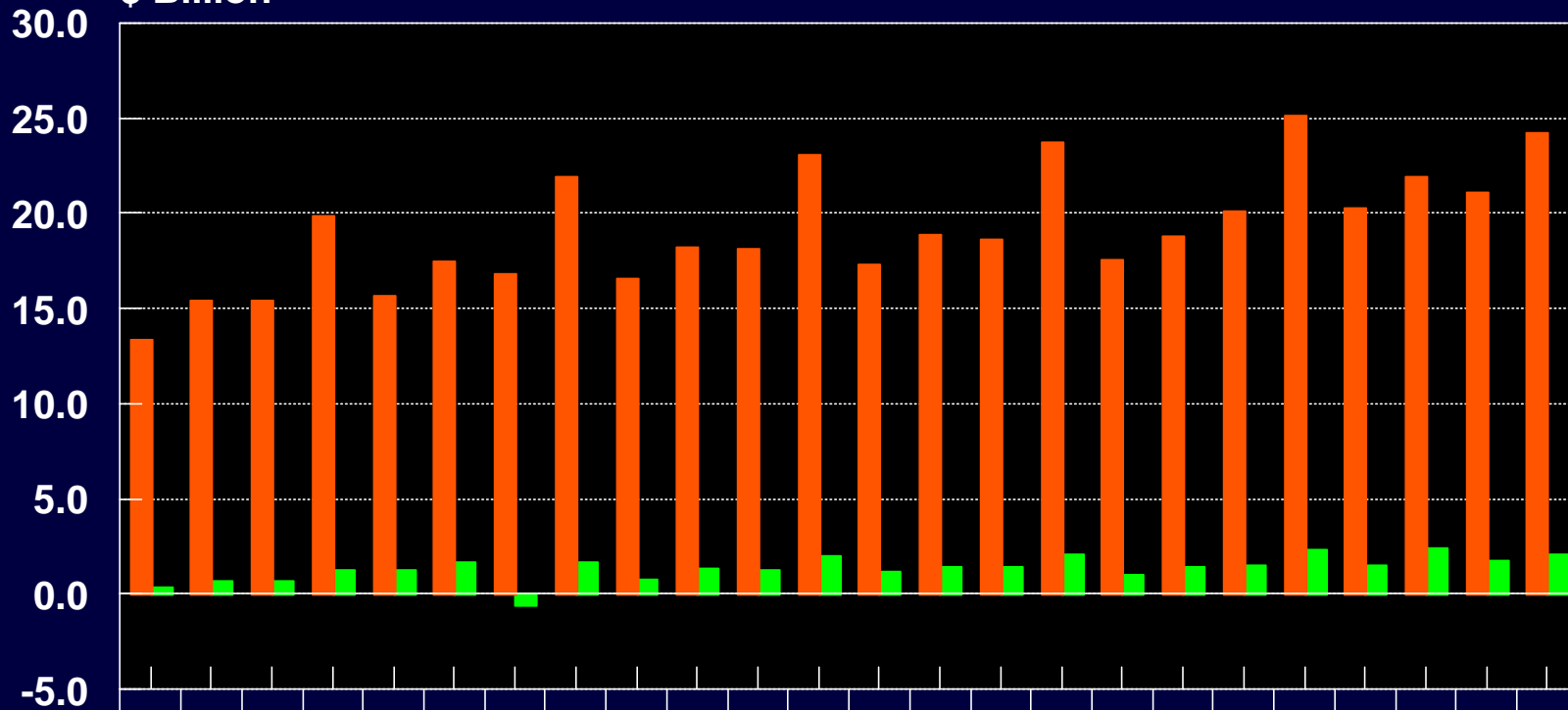
FY ends October

HWP

# IBM

## Revenue & Net Income

\$ Billion



Revenue	13.4	15.4	15.4	19.9	15.7	17.5	16.8	21.9	16.6	18.2	18.1	23.1	17.3	18.9	18.6	23.7	17.6	18.8	20.1	25.1	20.3	21.9	21.1	24.2
Income	0.4	0.7	0.7	1.2	1.3	1.7	-0.5	1.7	0.8	1.4	1.3	2.0	1.2	1.5	1.4	2.1	1.0	1.5	1.5	2.4	1.5	2.4	1.8	2.1

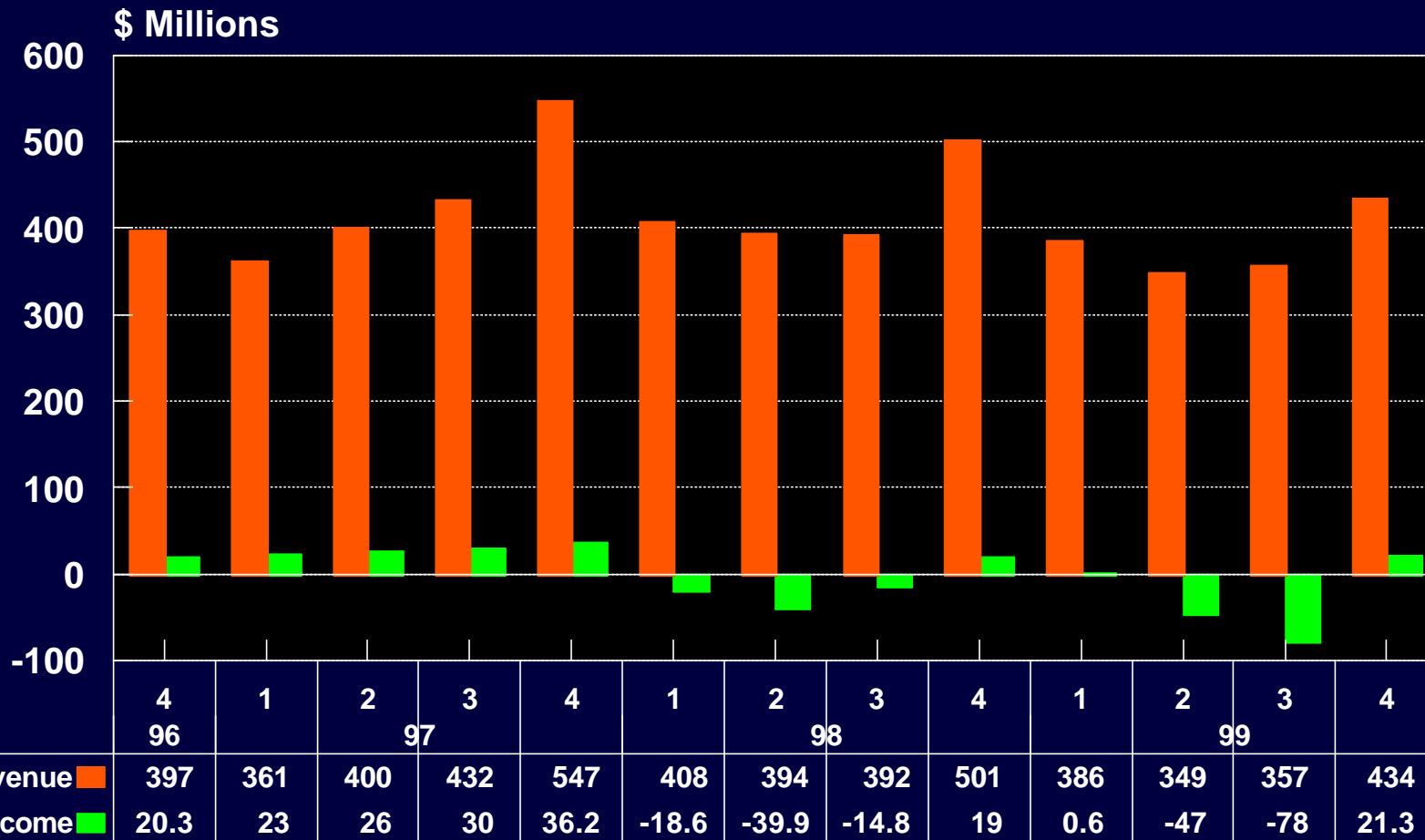
CY

FY=CY

IBM

# Iomega

## Revenue & Net Income



CY

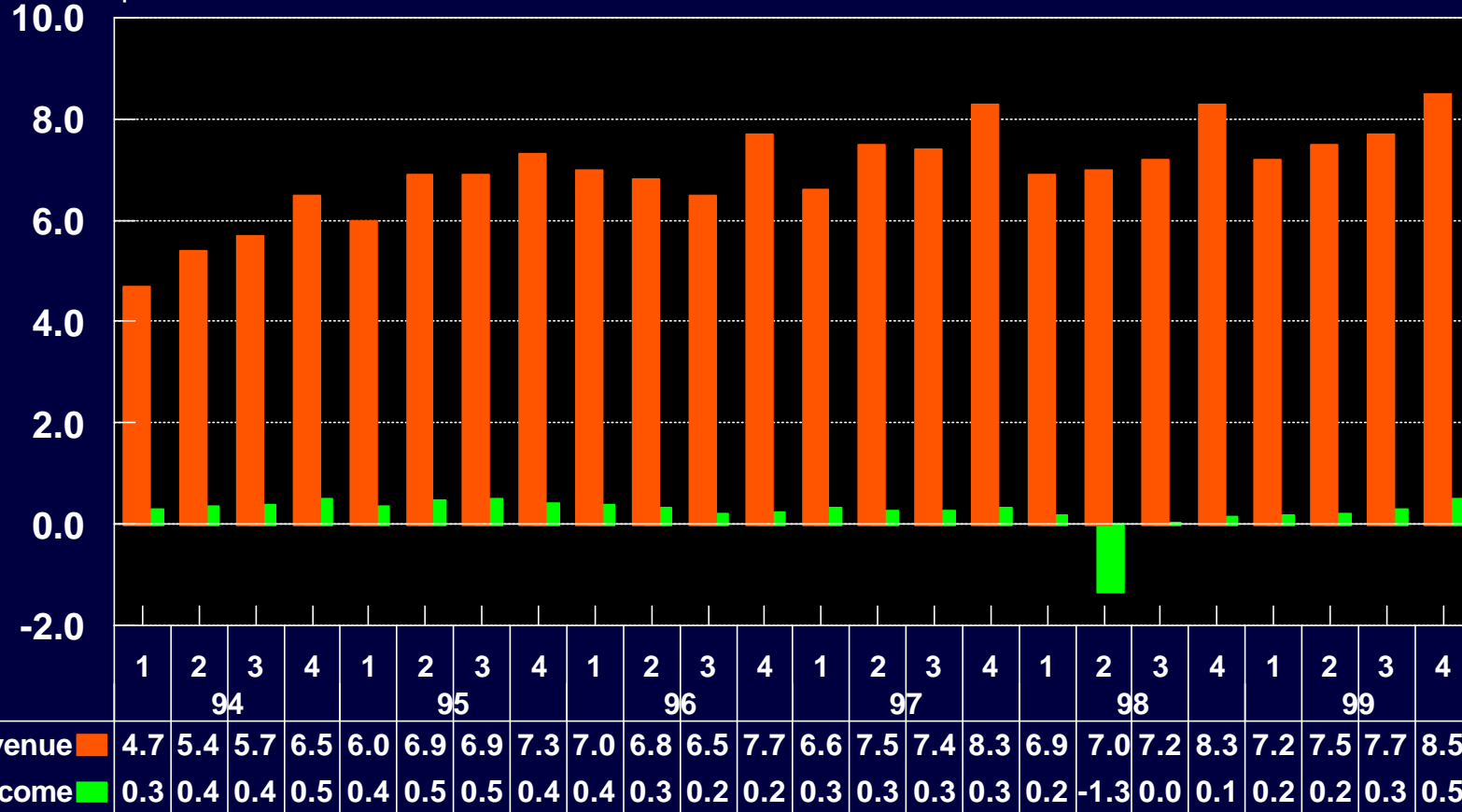
FY = CY

IOM

# Motorola

## Revenue & Net Income

\$ Billions



CY

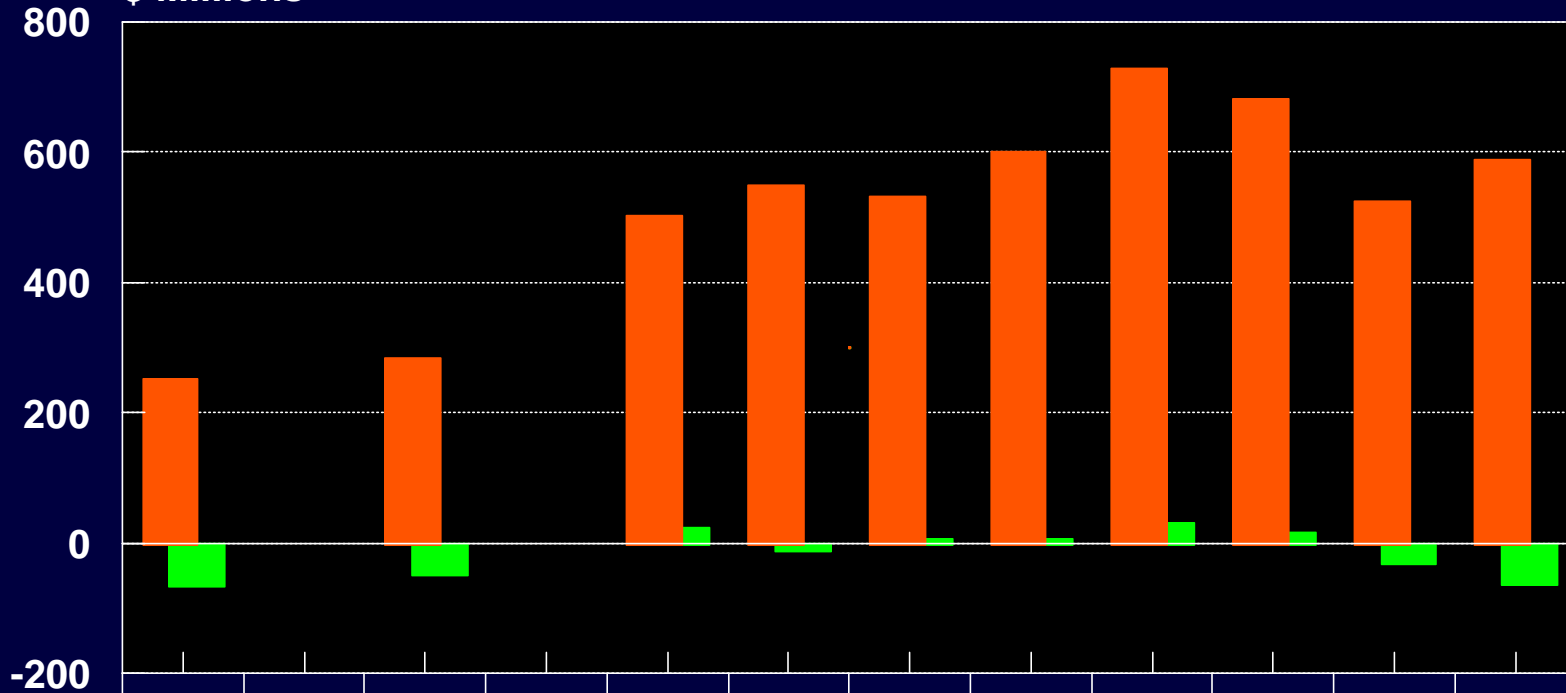
FY=CY

MOT

# Maxtor

## Revenue & Net Income

\$ Millions



	4 96	1 97	2 97	3 97	4 97	1 98	2 98	3 98	4 98	1 99	2 99	3 99
Revenue	253		283		502	550	531	600	728	682	525	589
Income	-64		-47		23	-10	5	6	30	17	-31	-62

CY

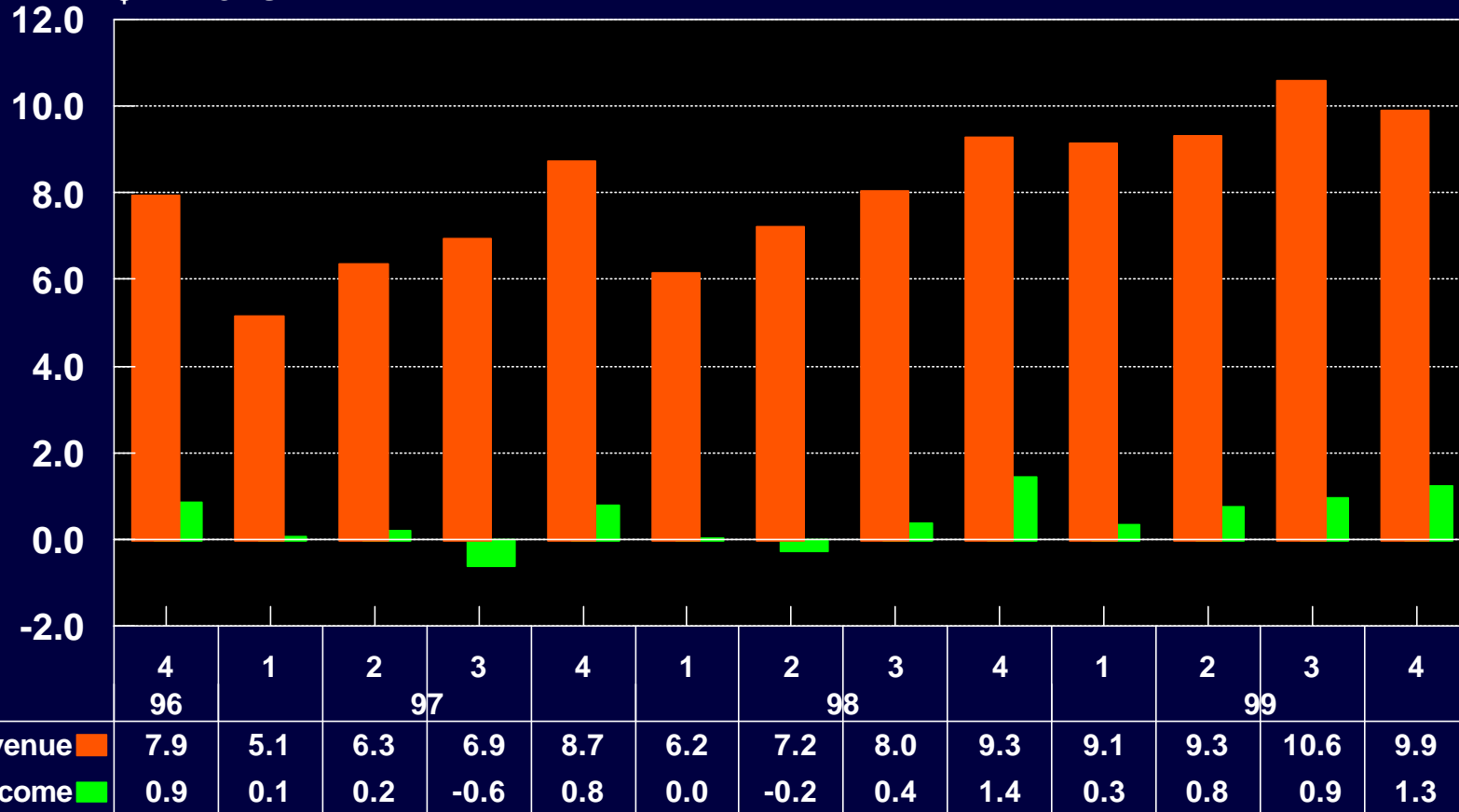
FY ends June

MXTR

# Lucent Technologies

## Revenue & Net Income

\$ Billions



CY

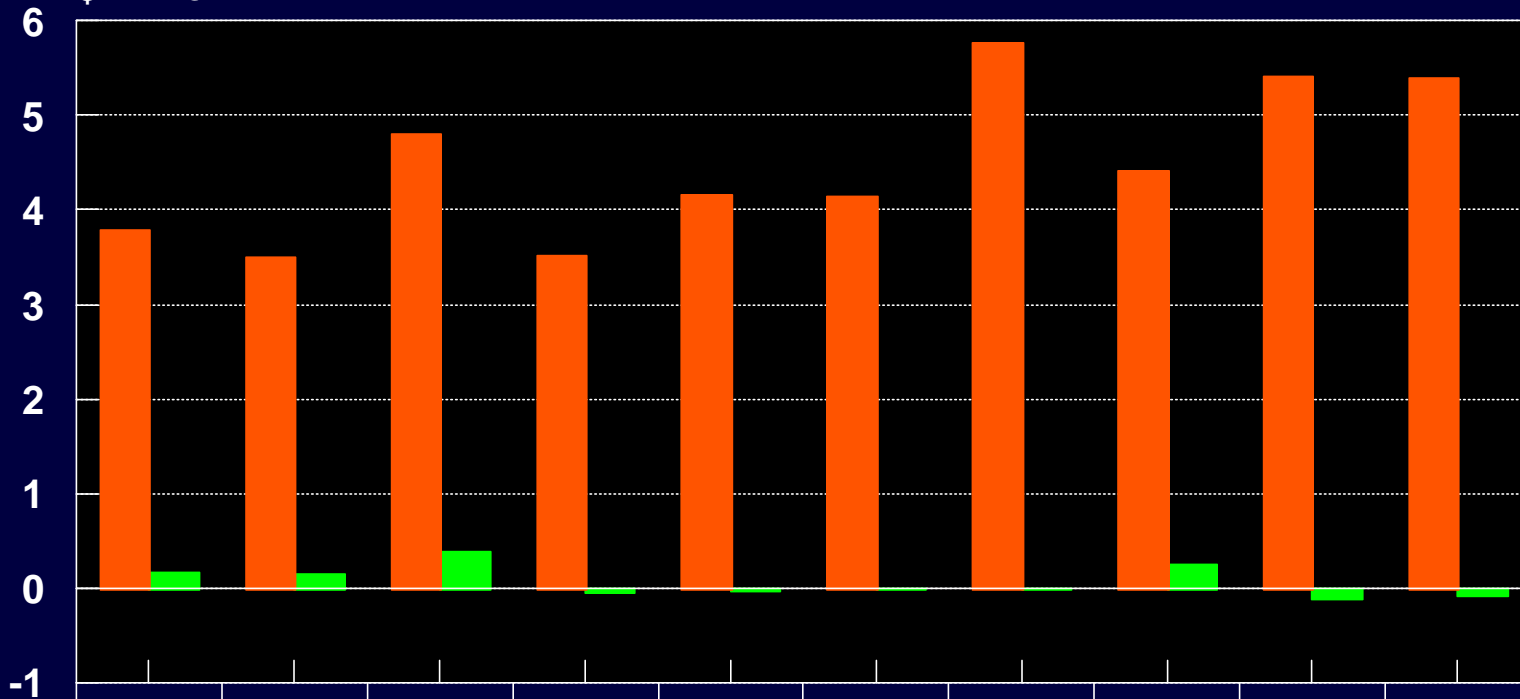
FY ends September

LU

# Nortel Networks

## Revenue & Net Income

\$ Billion



Revenue	3.787	3.498	4.811	3.51	4.156	4.141	5.768	4.418	5.413	5.393
Income	0.169	0.153	0.386	-0.032	-0.025	-0.008	-0.009	0.255	-0.098	-0.079

CY

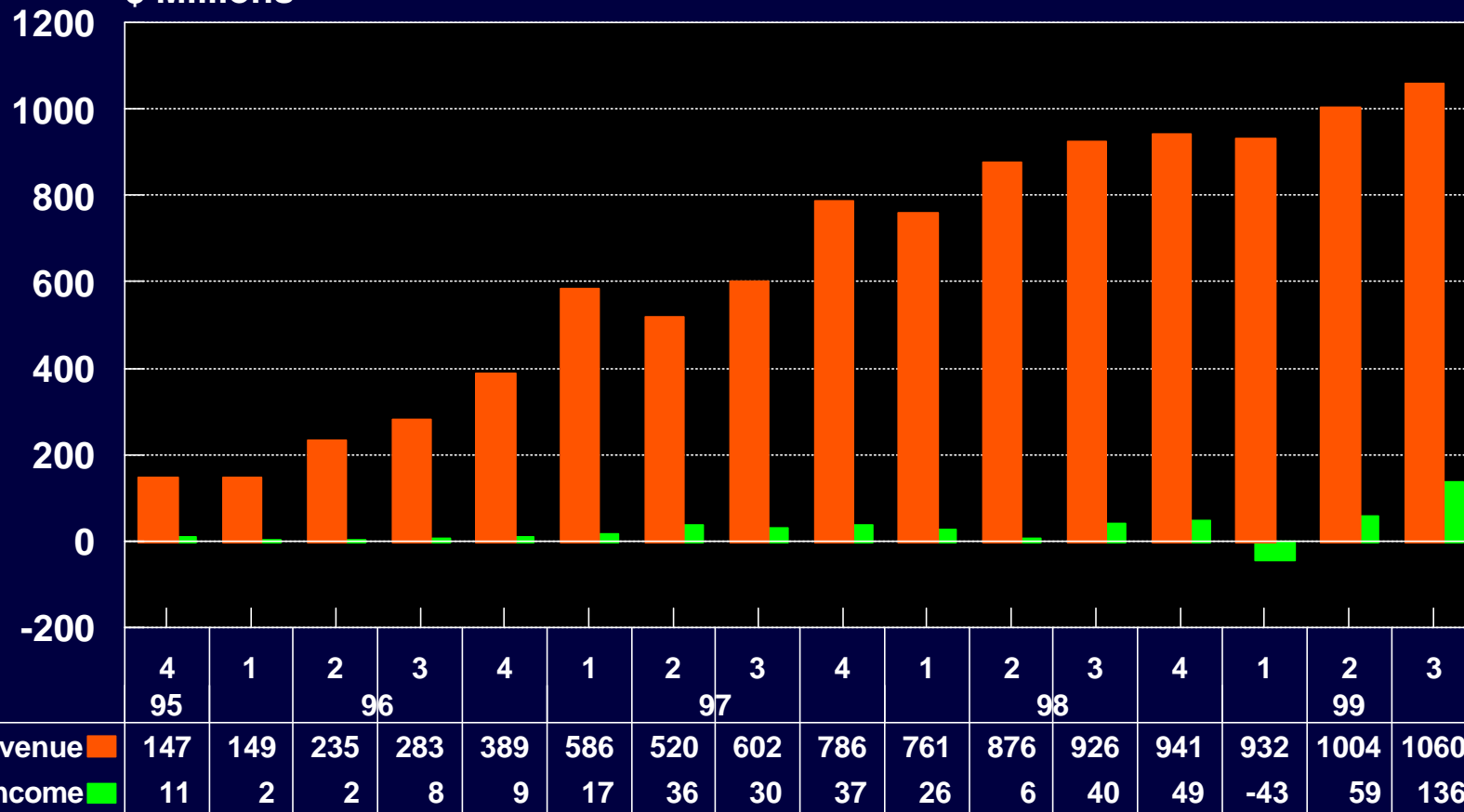
NT

FY=CY

# QUALCOMM

## Revenue & Net Income

\$ Millions



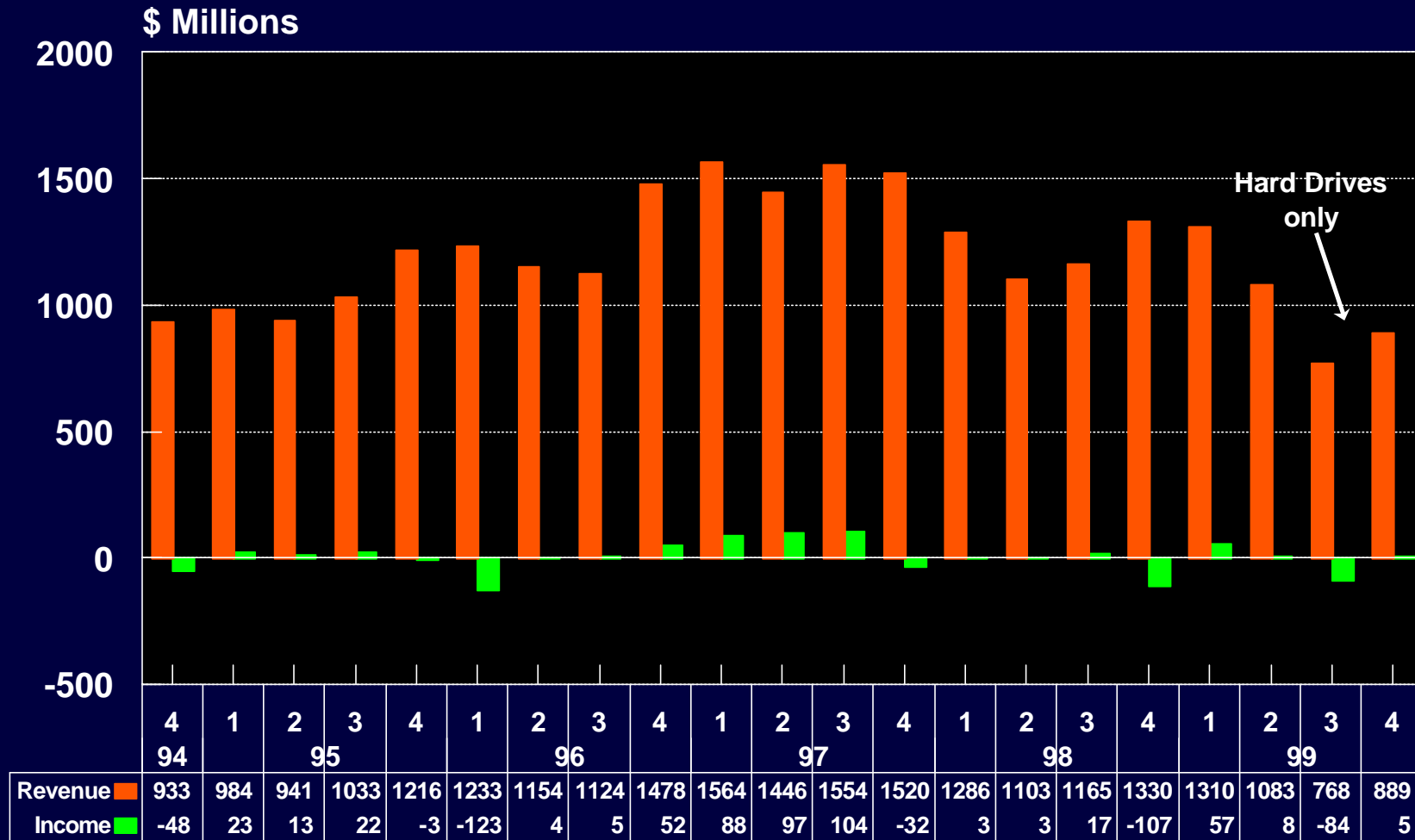
CY

FY ends Sept 30

QCOM

# Quantum Corp

## Revenue & Net Income

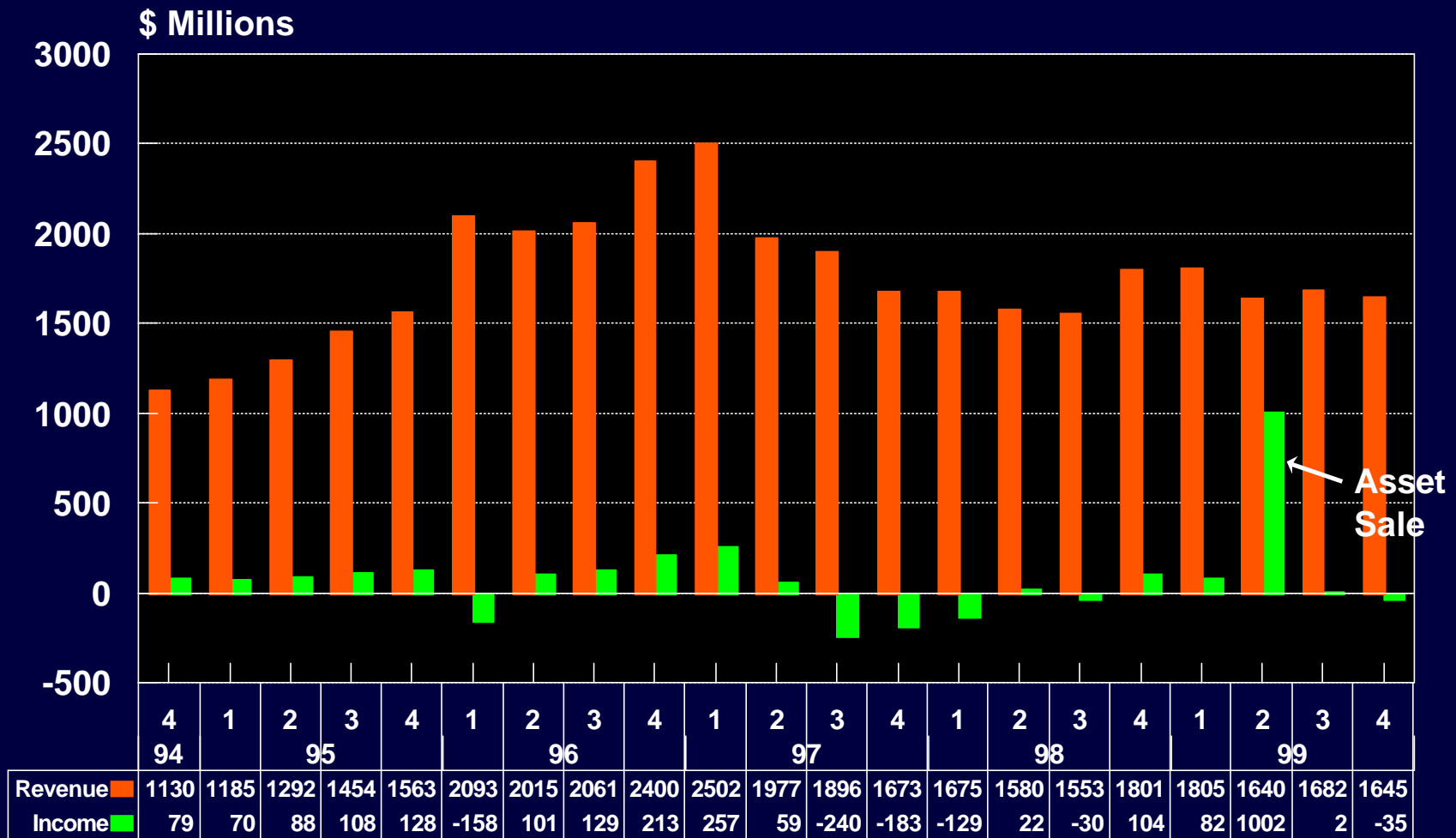


CY

QNTM

# Seagate

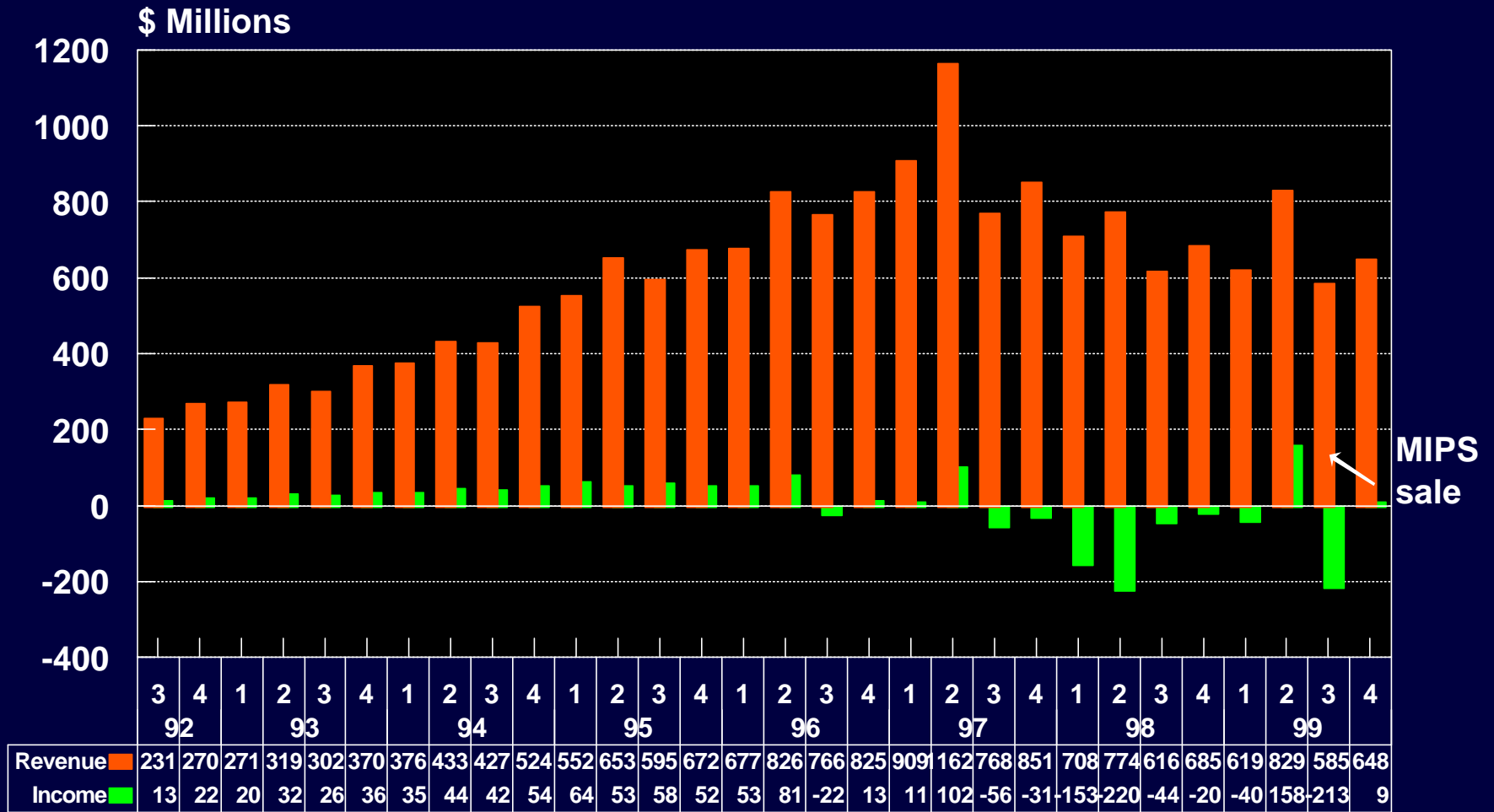
## Revenue & Net Income



CY

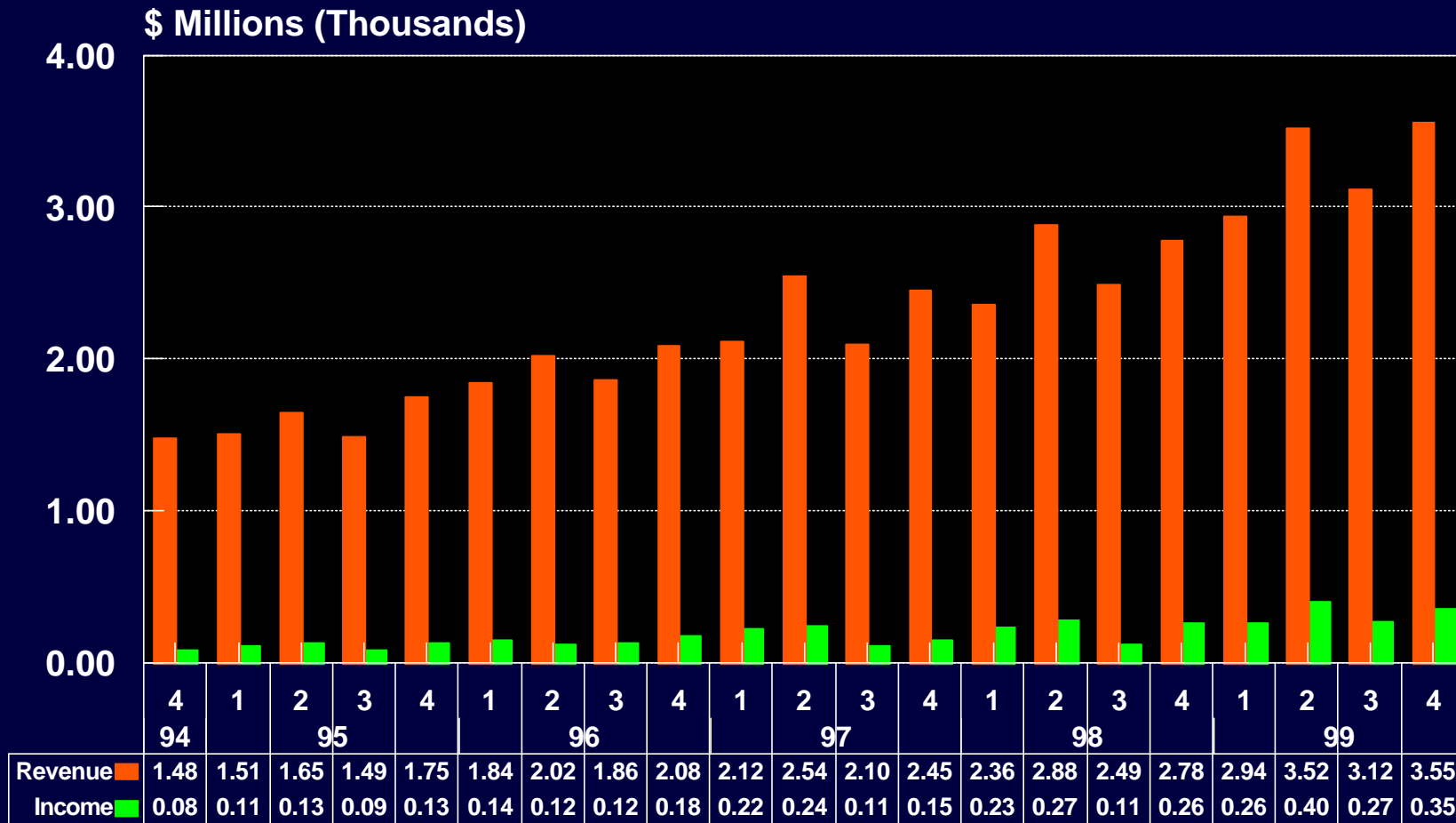
# Silicon Graphics

## Revenue & Net Income



# Sun Microsystems

## Revenue & Net Income



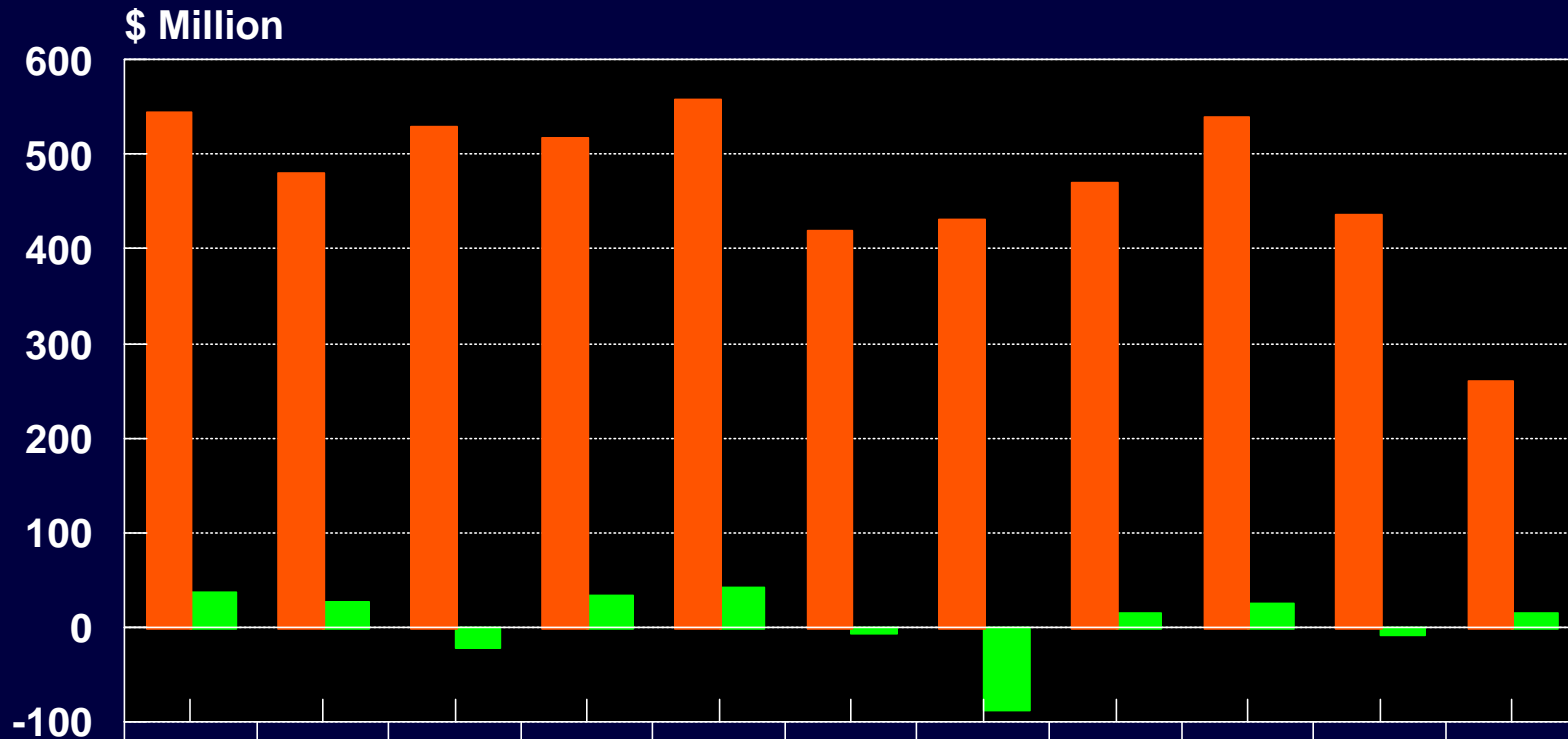
CY

FY ENDS 6/30

SUNW

# Tektronix

## Revenue & Net Income



Revenue	544	481	529	518	558	419	432	471	540	436	261
Income	36.9	26.7	-21.2	34.2	42.6	-4.7	-85.9	14.5	25	-8	15.2

CY

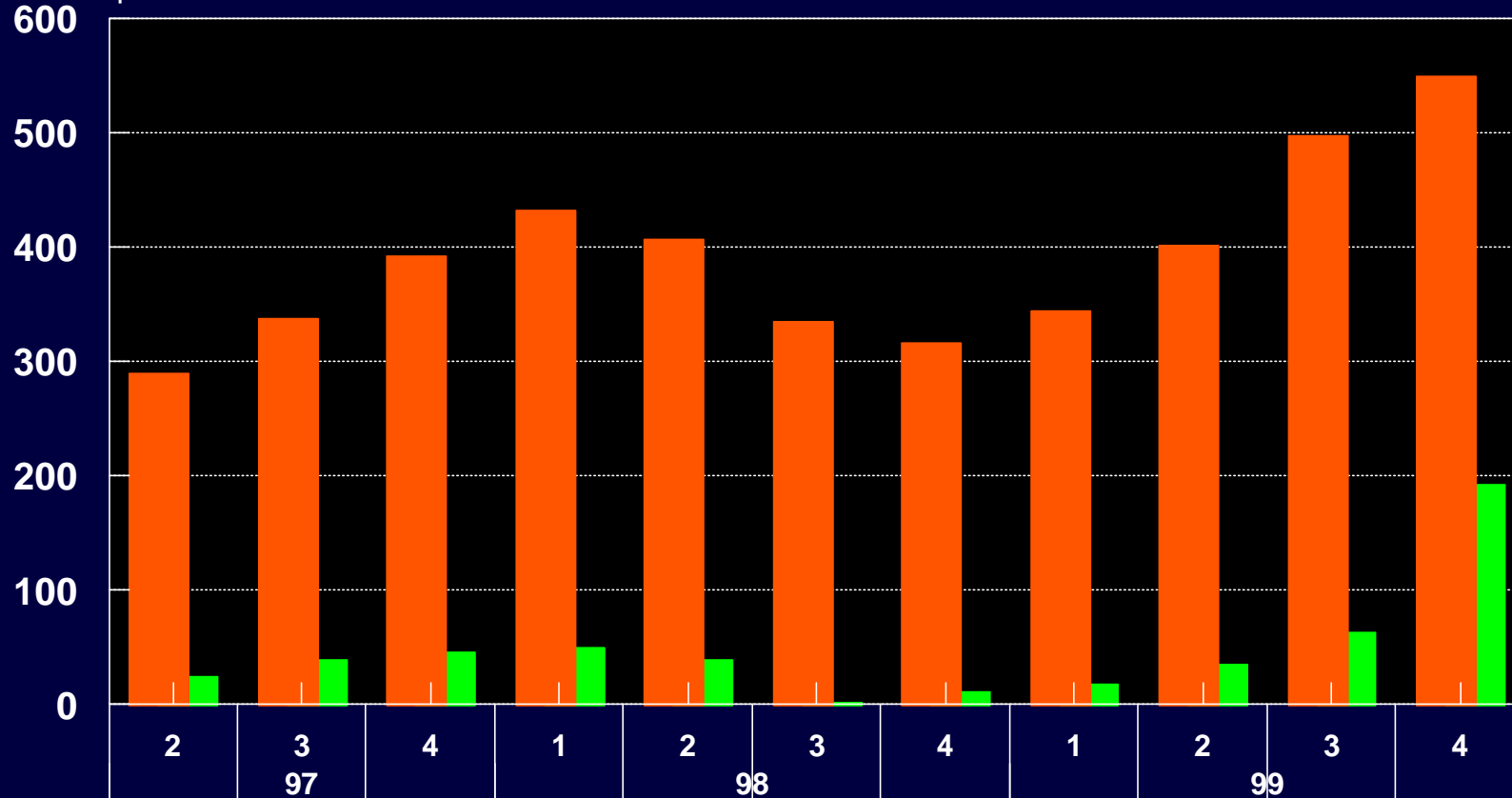
TEK

FY ends May 31

# Teradyne

## Revenue & Net Income

\$ Millions



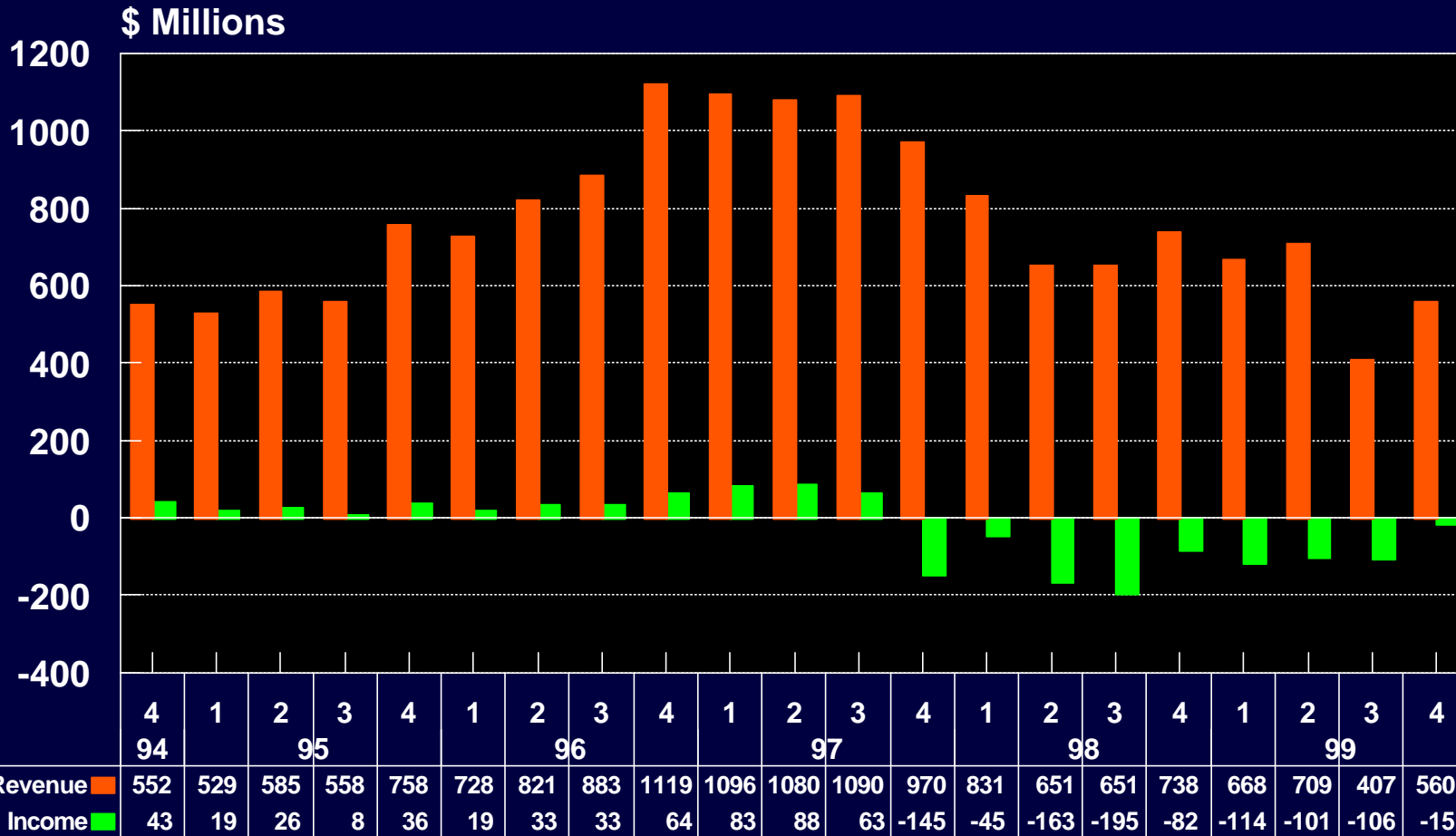
Revenue	290	337	392	432	406	335	316	344	401	497	549
Income	25	39.2	46.2	49.6	39.4	1.3	11.8	18	35.8	62.7	191.6

CY

TER

# Western Digital

## Revenue & Net Income



CY

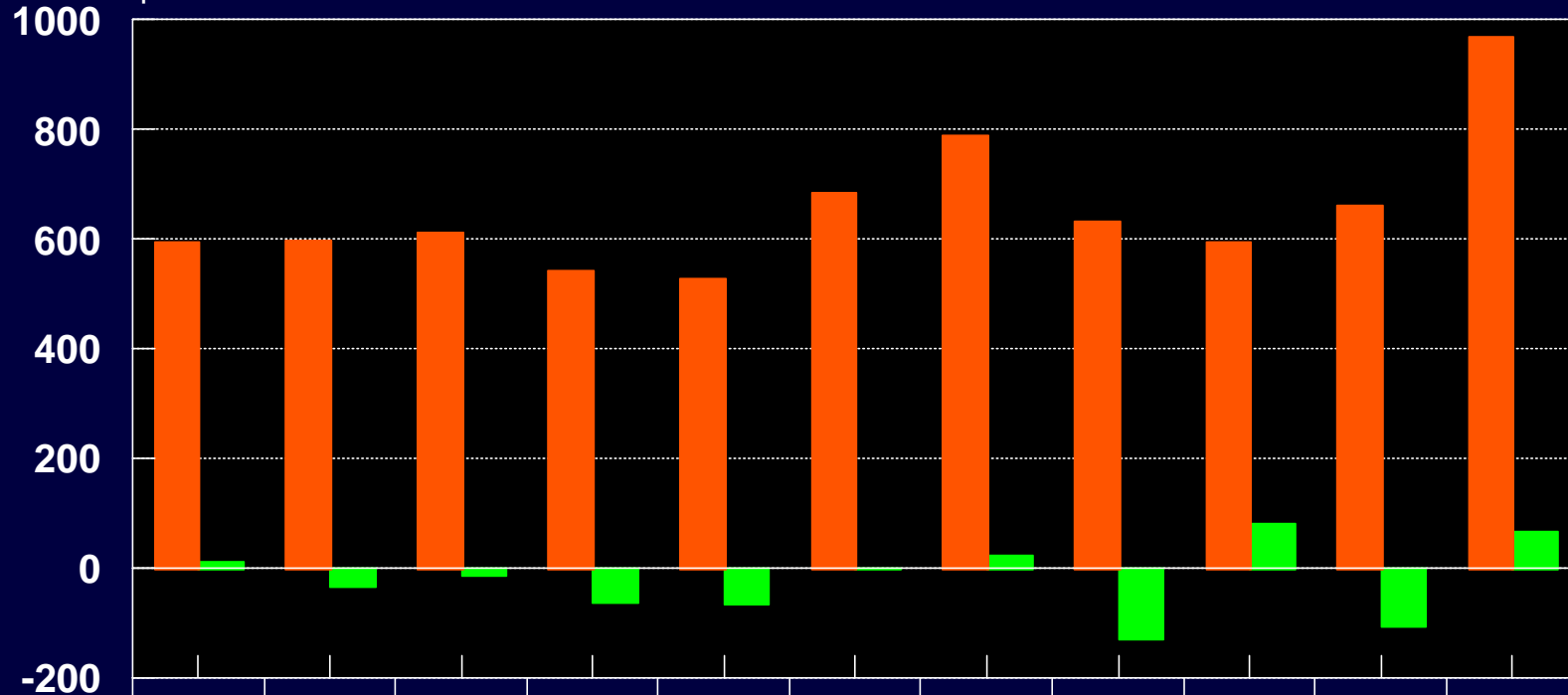
FY ends June

WDC

# Advanced Micro Devices

## Revenue & Net Income

\$ Million



Revenue	595	597	613	541	527	686	789	632	595	662	969
Income	10	-31.7	-12.3	-62.7	-64.6	1	22.3	-128	80	-105	65

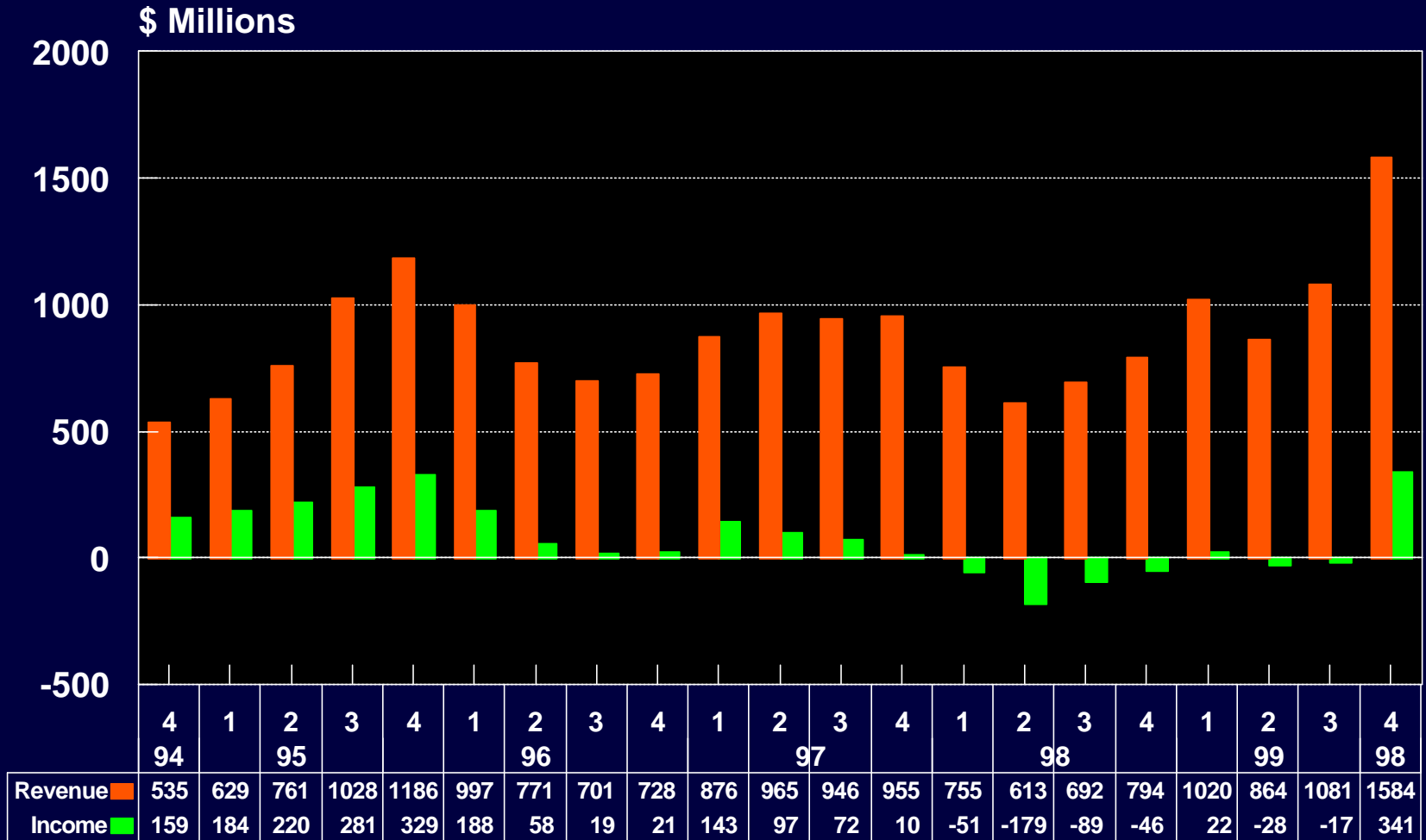
CY

AMD

FY=CY

# MICRON TECHNOLOGY

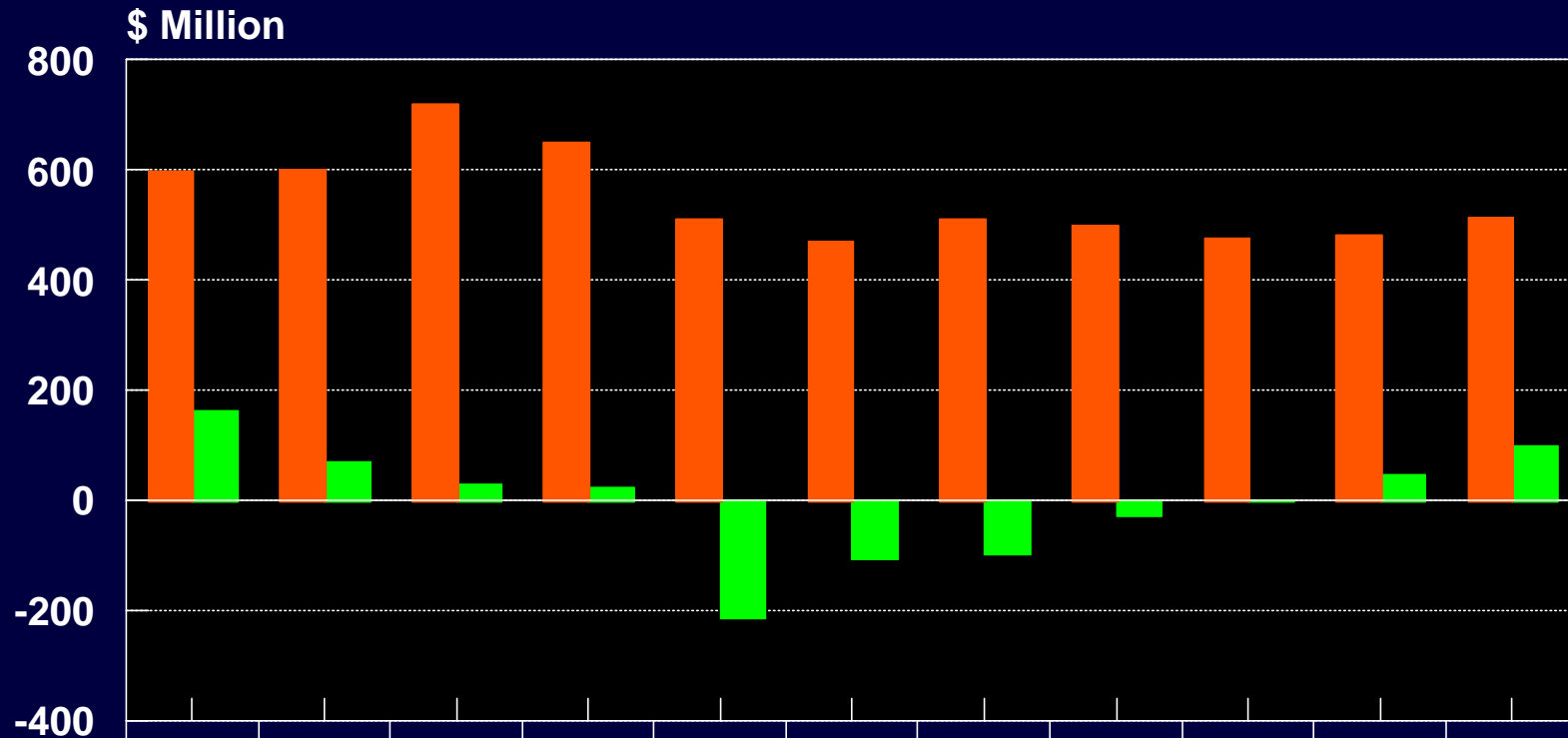
## Revenue & Net Income



CY

MU

# National Semiconductor Revenue & Net Income



Revenue	599	601	720	650	510	470	510	500	477	482	514
Income	162.8	70.1	28.9	22.3	-212.4	-104.8	-94.4	-27.2	0	47	99

CY

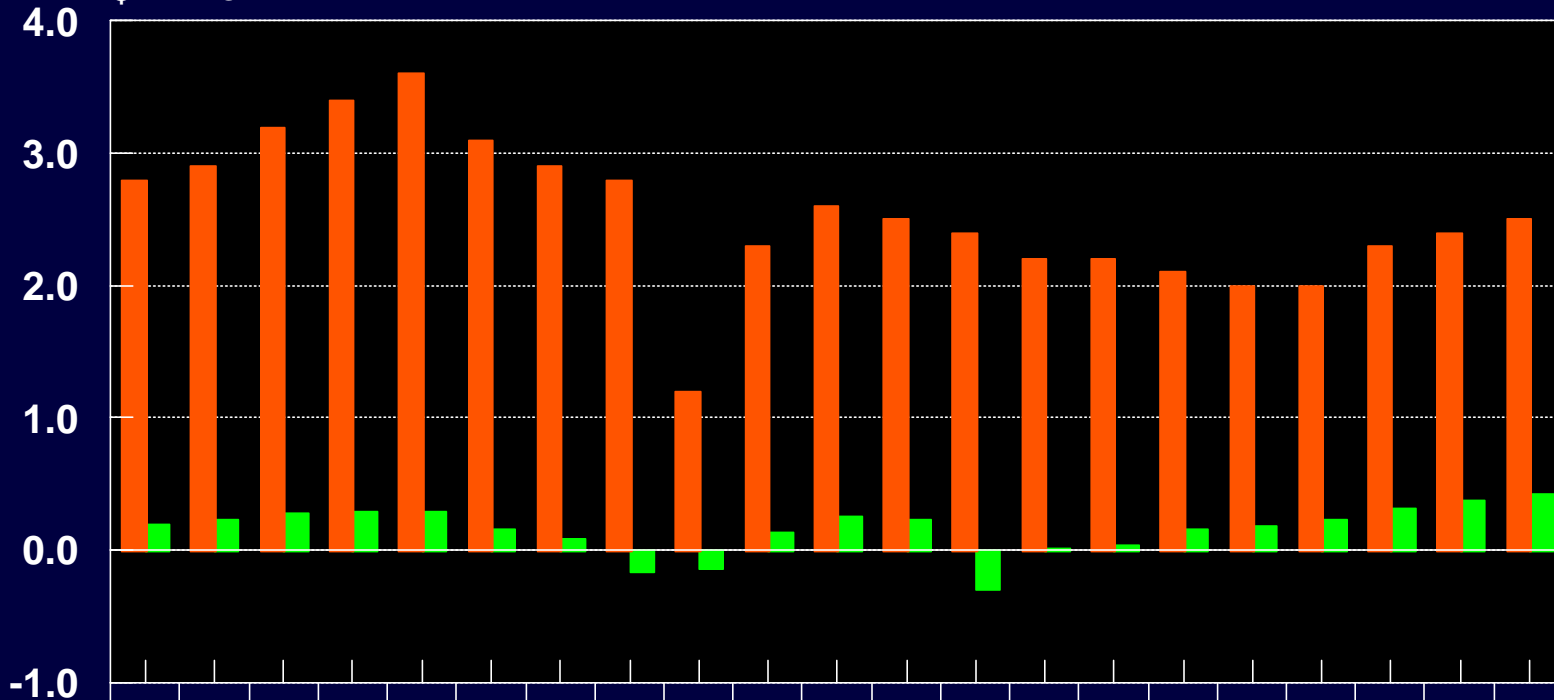
FY ends May 31

NSM

# TEXAS INSTRUMENTS

## Revenue & Net Income

\$ Billion



Revenue	2.8	2.9	3.2	3.4	3.6	3.1	2.9	2.8	1.2	2.3	2.6	2.5	2.4	2.2	2.2	2.1	2.0	2.0	2.3	2.4	2.5
Income	0.2	0.2	0.3	0.3	0.3	0.2	0.1	-0.2	-0.1	0.1	0.3	0.2	-0.3	0.0	0.0	0.2	0.2	0.2	0.3	0.4	0.4

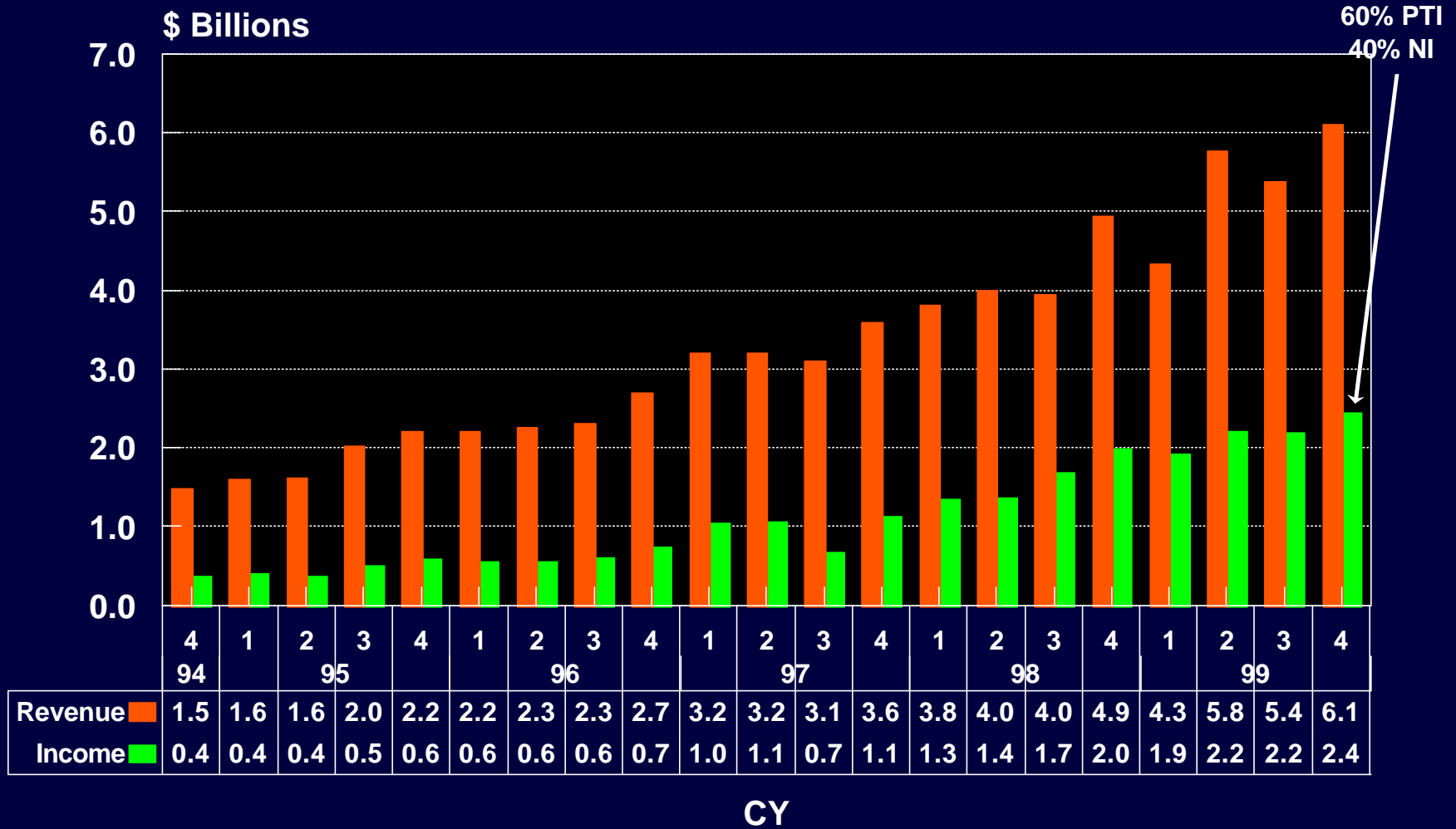
CY

TXN

FY=CY

# Microsoft

## Revenue & Net Income



FY ends June

MSFT