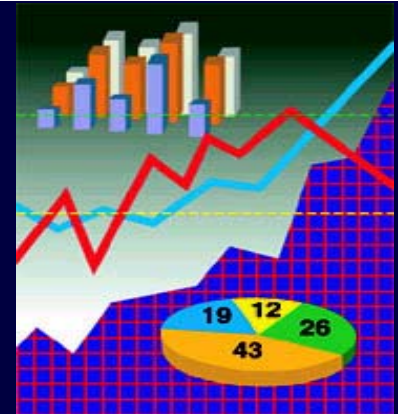


WHEN WILL THE DOWNTURN END?



WALT CUSTER
CUSTER CONSULTING GROUP
www.custerconsulting.com
May 2001

Continuous Improvement

"News" = New

(today's complete presentation is available electronically)

Walt's Concern

"Don't Shoot the Messenger"

**Industry Data Supplement
where to get it?**

**Compromising pictures of Tony & Denny are
now commercially available**

This Downturn

What caused it?

How bad is it?

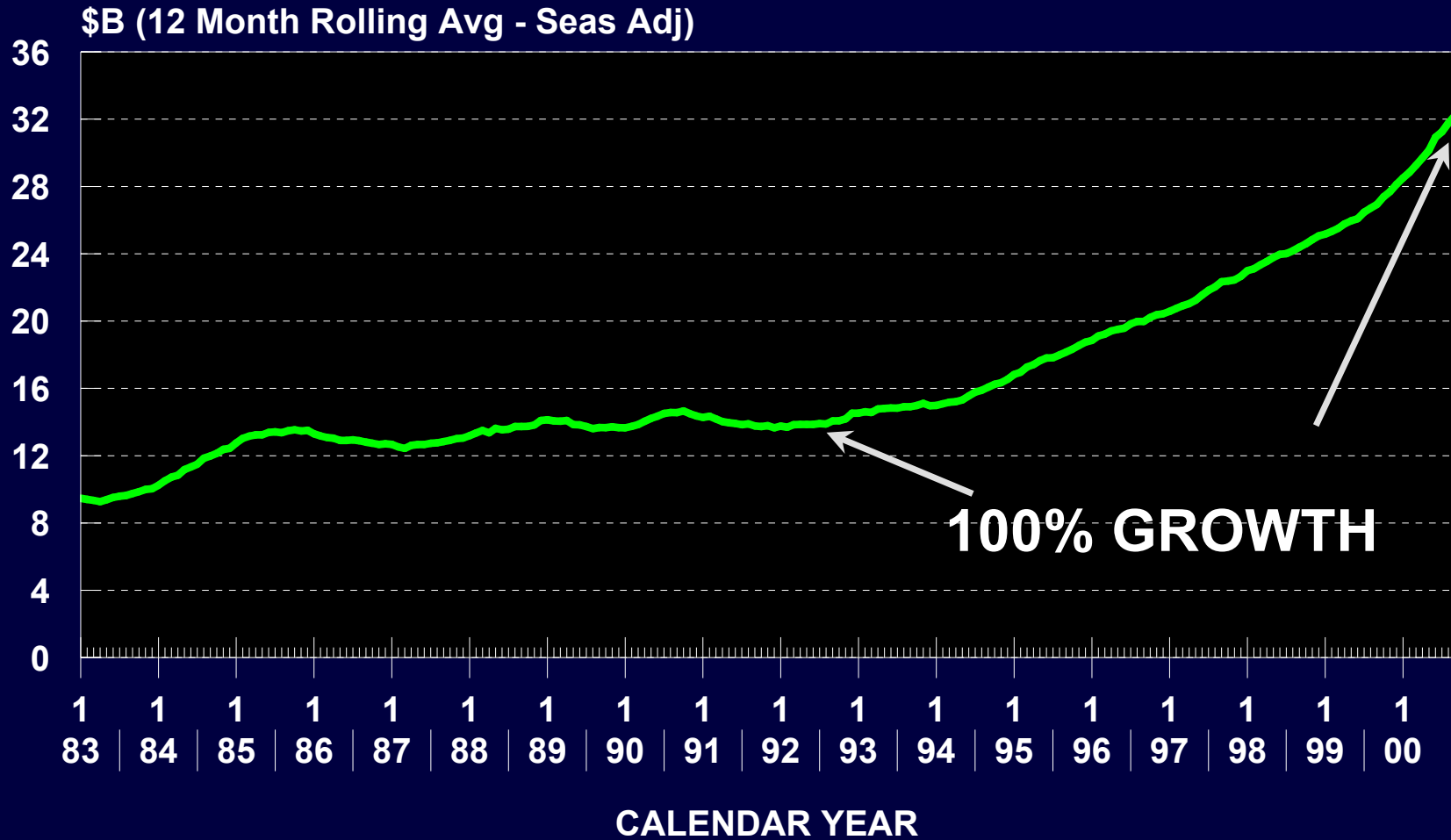
**When can we expect a
recovery?**

**What
Caused It?**

**A Step
Back
to Last
Summer**

US ELECTRONIC EQUIPMENT ORDERS

COMMUNICATION, COMPUTER & OFFICE,
MILITARY, INSTRUMENTS



<http://www.census.gov/indicator/www/m3/>

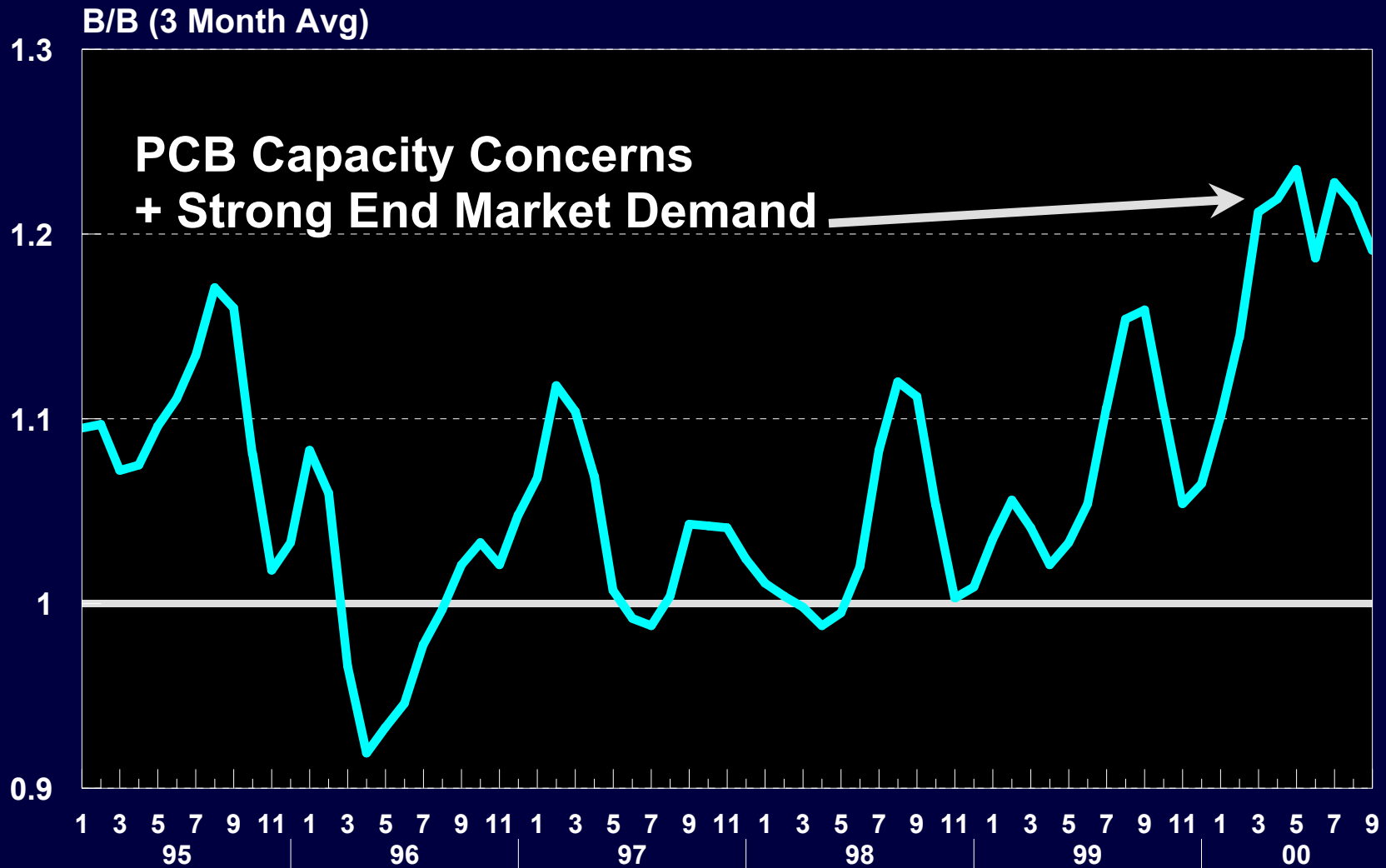
Electronic Equipment Order Growth

Computer & Office, Communications, Measurement & Control and Military



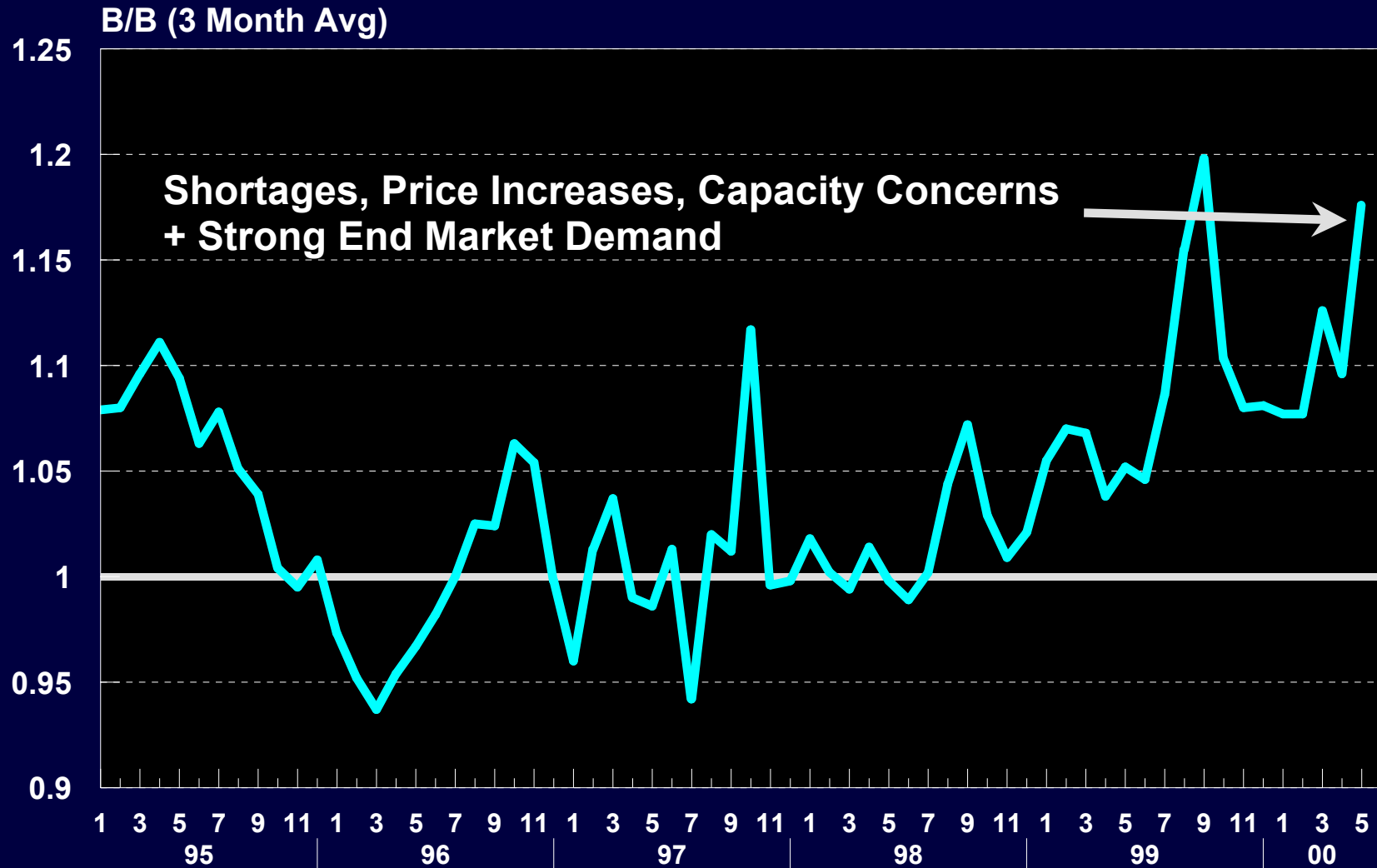
Rigid PCB Book/Bill

N. America



U.S. Electronic Component Book/Bill Ratio

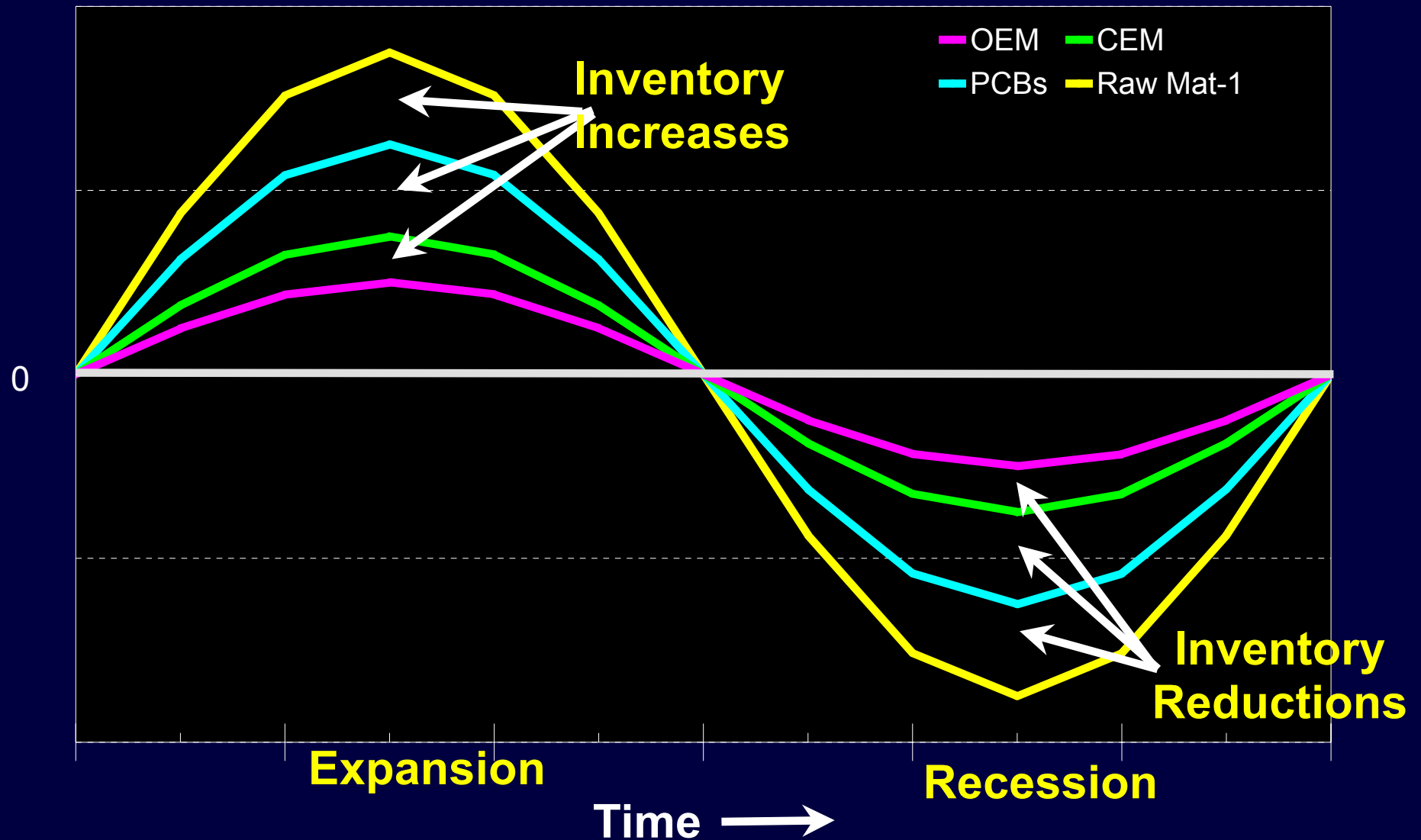
3-Month Average



BUSINESS CYCLE

SUPPLY CHAIN EFFECT

%Growth



2000

Strong Equipment Demand

Telecom

Internet Infrastructure/Dot.coms

Semiconductor Fab

Cell Phones

Industrial Electronics

Shortages & Capacity Fears

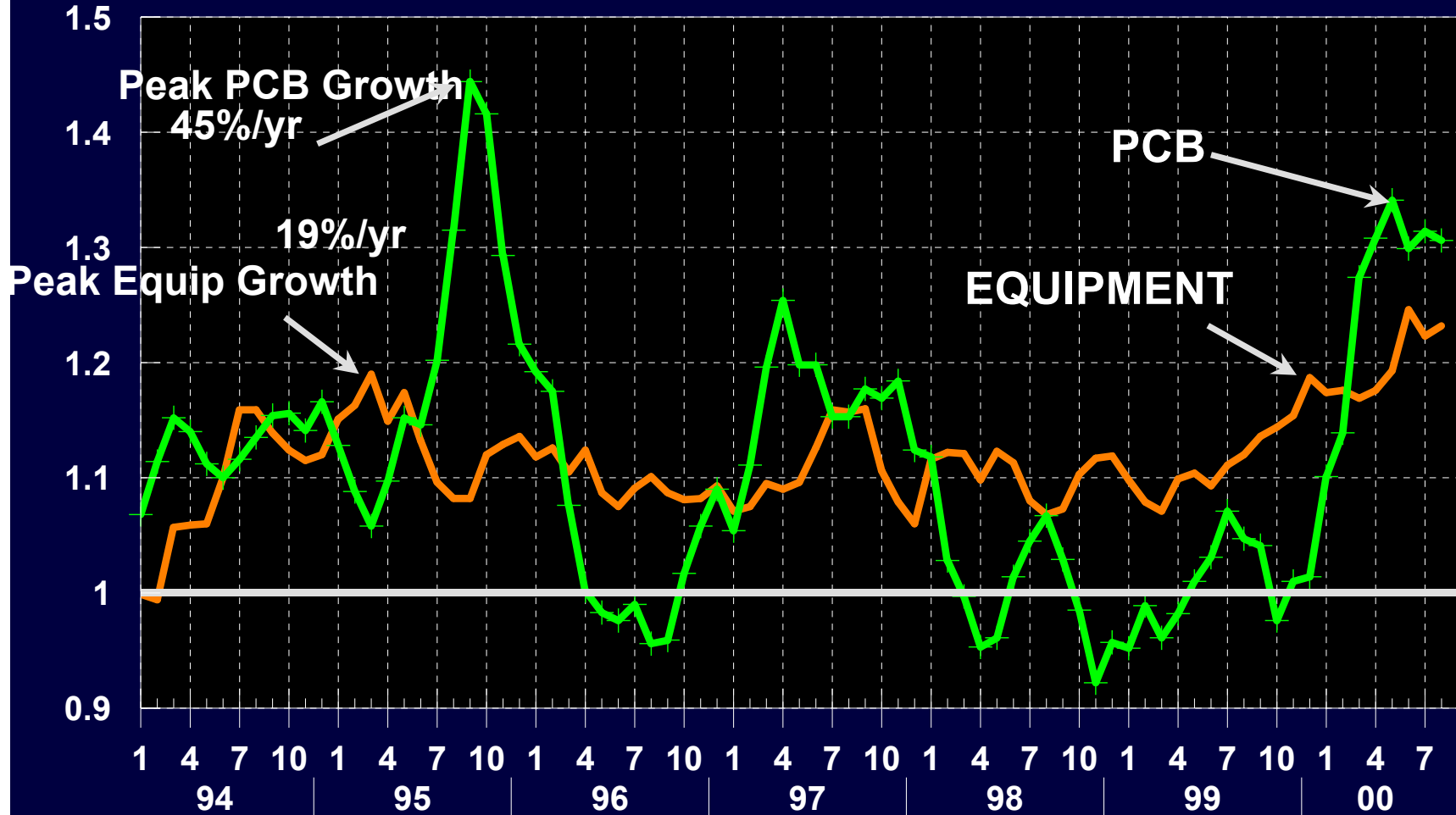
Double / Over-ordering Components

Inventory Builds - including CEMs

U.S. ELECTRONIC EQUIPMENT vs PCBs

\$ BOOKINGS GROWTH

3/12 RATE OF CHANGE



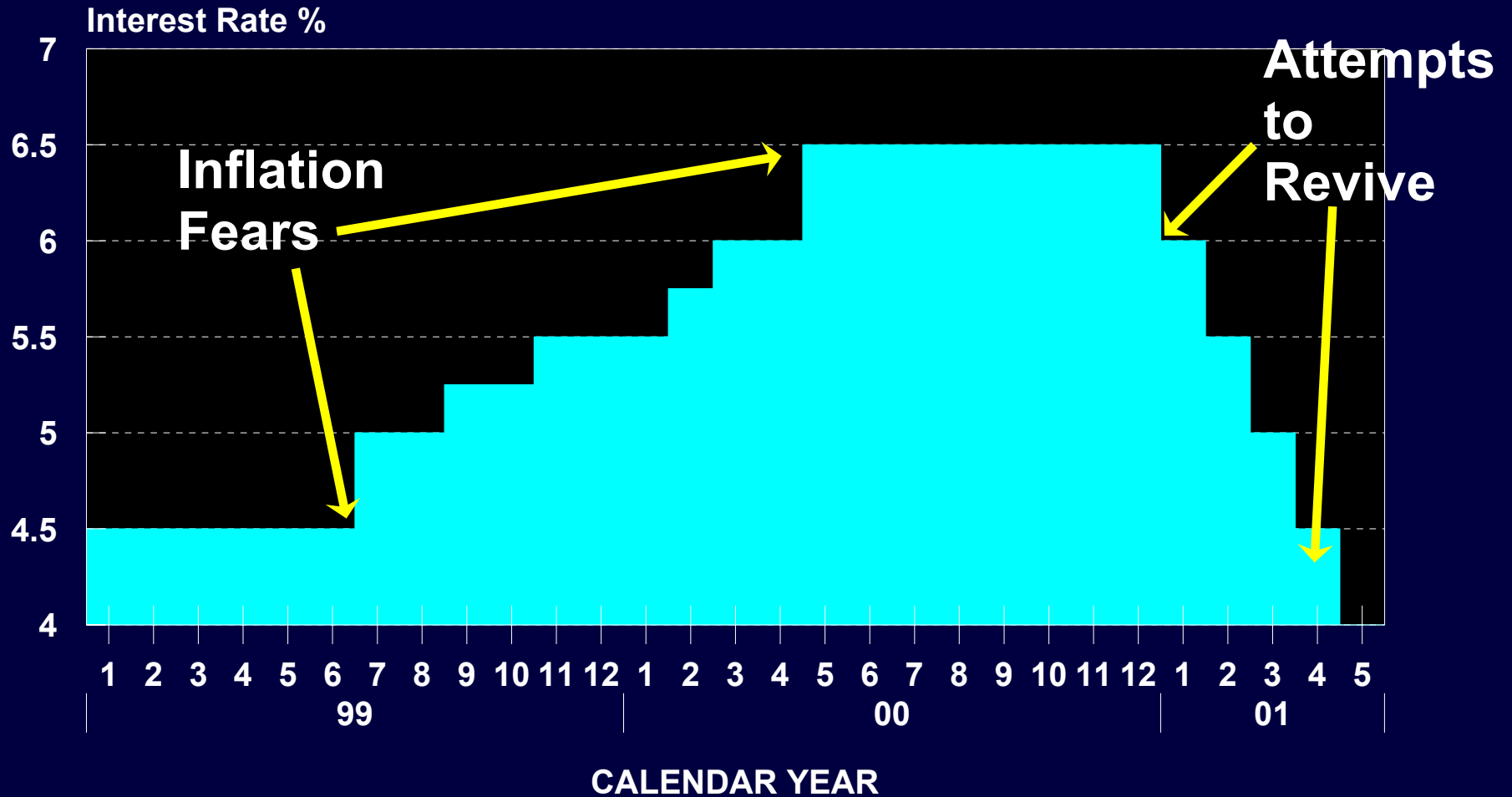
November 2000 TMRC

**Walt warns of a
coming slowdown**

Current Electronics Situation

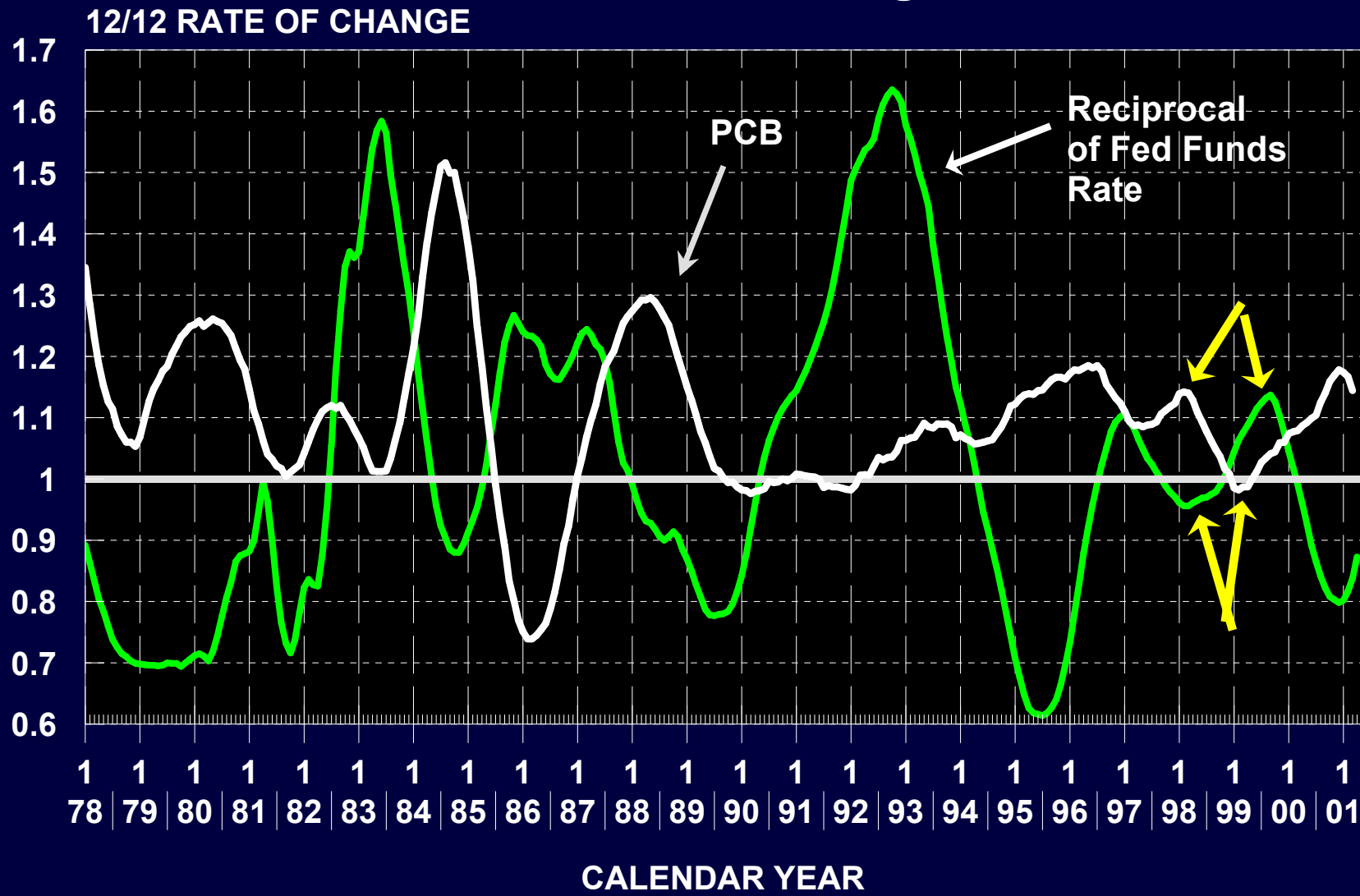
Federal Interest Rate Adjustments

U.S. FEDERAL FUNDS RATE



PCB Shipments vs Interest Rates

18-Month Lag

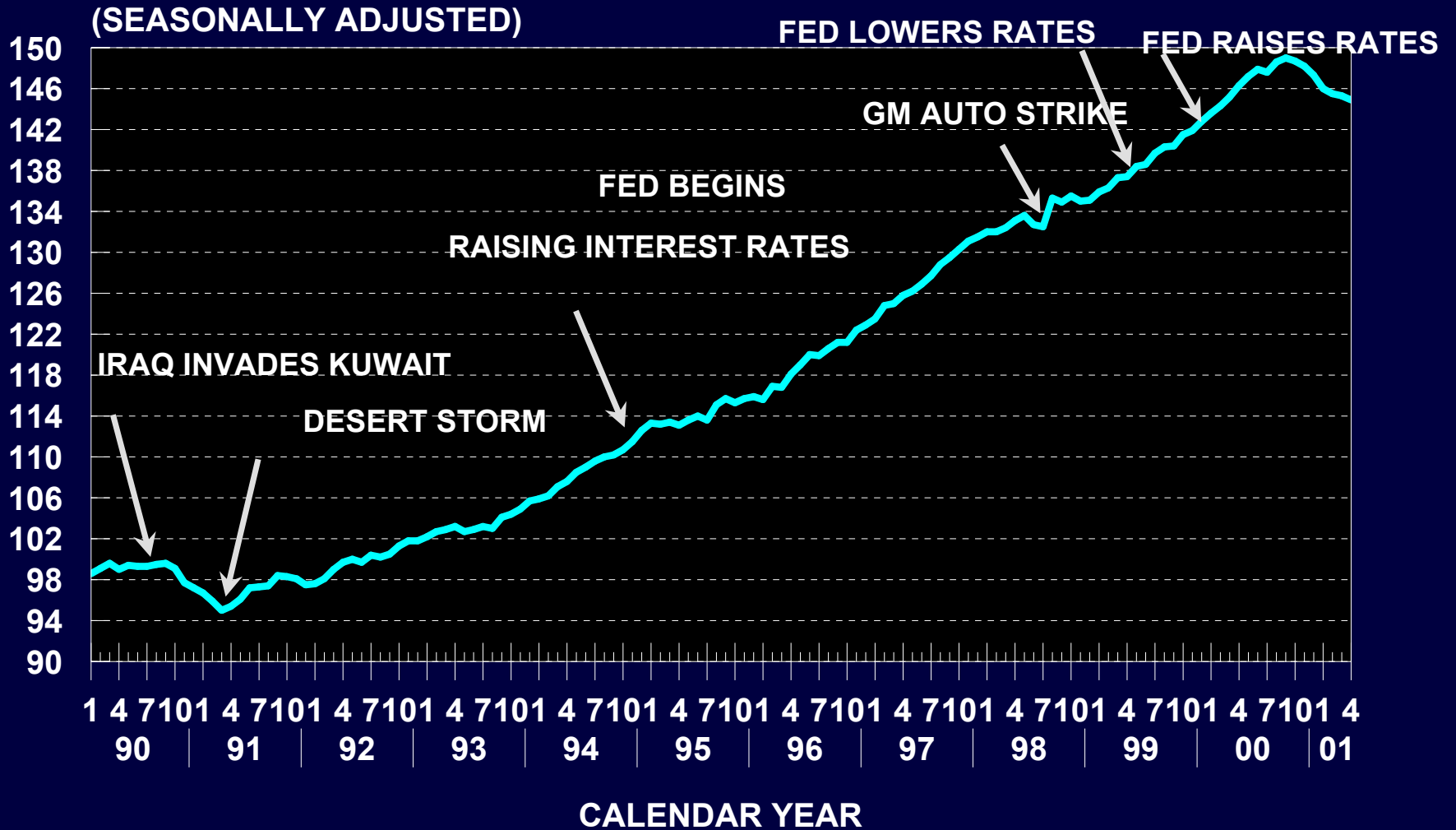


Data: IPC T/MRC & U.S. Federal Reserve Board
<http://www.federalreserve.gov/releases/h15/data.htm>

Conclusion

**Federal Interest Rate
Adjustments take
about 18 months to
produce results**

U.S. INDUSTRIAL PRODUCTION INDEX (1987=100)



INDUSTRIAL PRODUCTION - WORLD

% CHANGE vs ONE YEAR EARLIER

BRITAIN	-0.1 Mar
FRANCE	+1.9 Mar
GERMANY	+1.4 Mar
ITALY	-0.3 Mar
NETHERLANDS	+2.0 Mar
SPAIN	-3.7 Mar
EURO area	+3.8 Feb
RUSSIA	+3.6 Mar
CANADA	+1.5 Feb
USA	-1.0 Apr
CHINA	+11.5 Apr
MALAYSIA	+0.5 Mar
SINGAPORE	+6.4 Mar
S KOREA	+6.2 Mar
TAIWAN	-4.4 Mar
THAILAND	-1.8 Mar
JAPAN	-2.9 Mar

GDP Growth

Constant \$ Growth Rates Converted @ Constant Exchange Rates

	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>98-03</u>
World	3.2	4.4	2.6	3.4	3.8	3.5
USA	4.2	5.0	1.9	3.3	3.6	3.6
W Europe	2.2	3.4	2.6	2.7	2.9	2.8
Japan	0.8	2.0	1.1	2.1	2.6	1.7
Four Tigers	7.5	8.4	4.8	5.6	6.3	6.5

Electronic Equipment Order Growth

Computer & Office, Communications, Measurement & Control and Military



4/2001

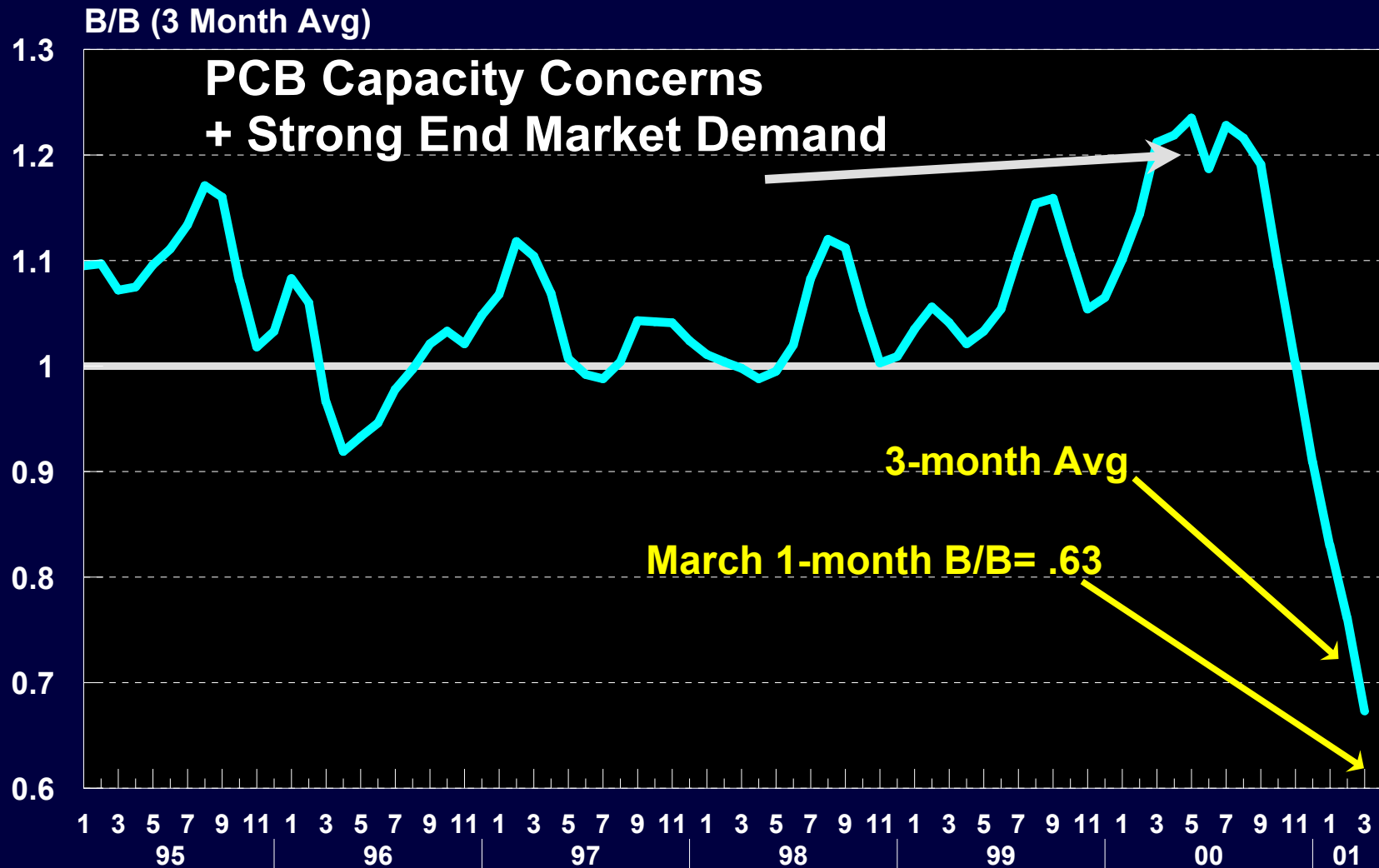
<http://www.census.gov/indicator/www/m3/>

Recent Job Cutbacks - Announced

DaimlerChrysler	26,000
Motorola	22,000
Lucent Technologies	16,000
Nortel Networks	15,000
Delphi Automotive Systems	11,500
Verizon	10,000
Solectron	8,200
Cisco	5,000
Compaq	5,000
Intel	5,000
Xerox	4,000
Ericsson LM	3,300
Gateway	3,000
Seagate	2,000
Dell	1,700
Hewlett-Packard	1,700
3Com	1,200

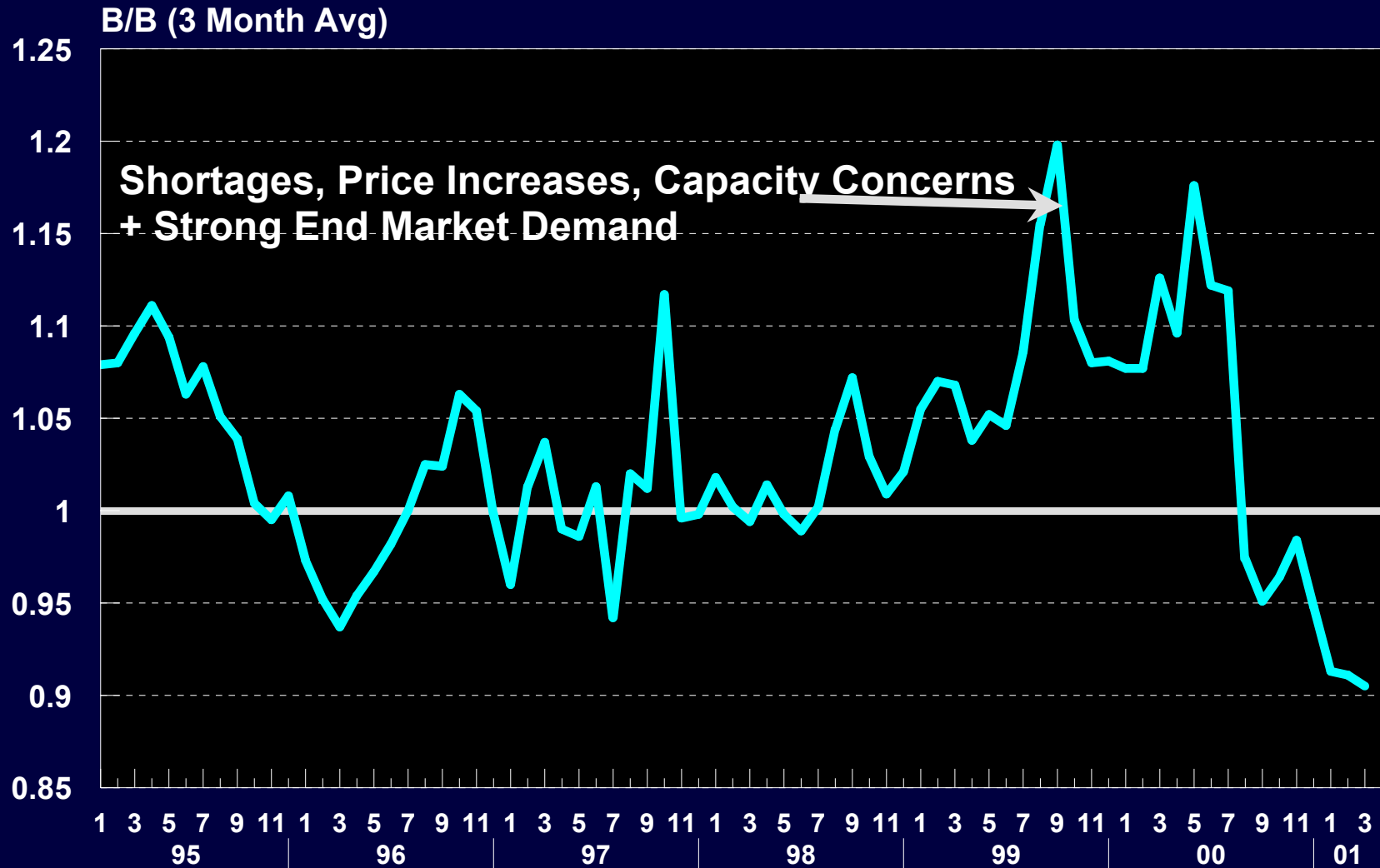
Rigid PCB Book/Bill

N. America

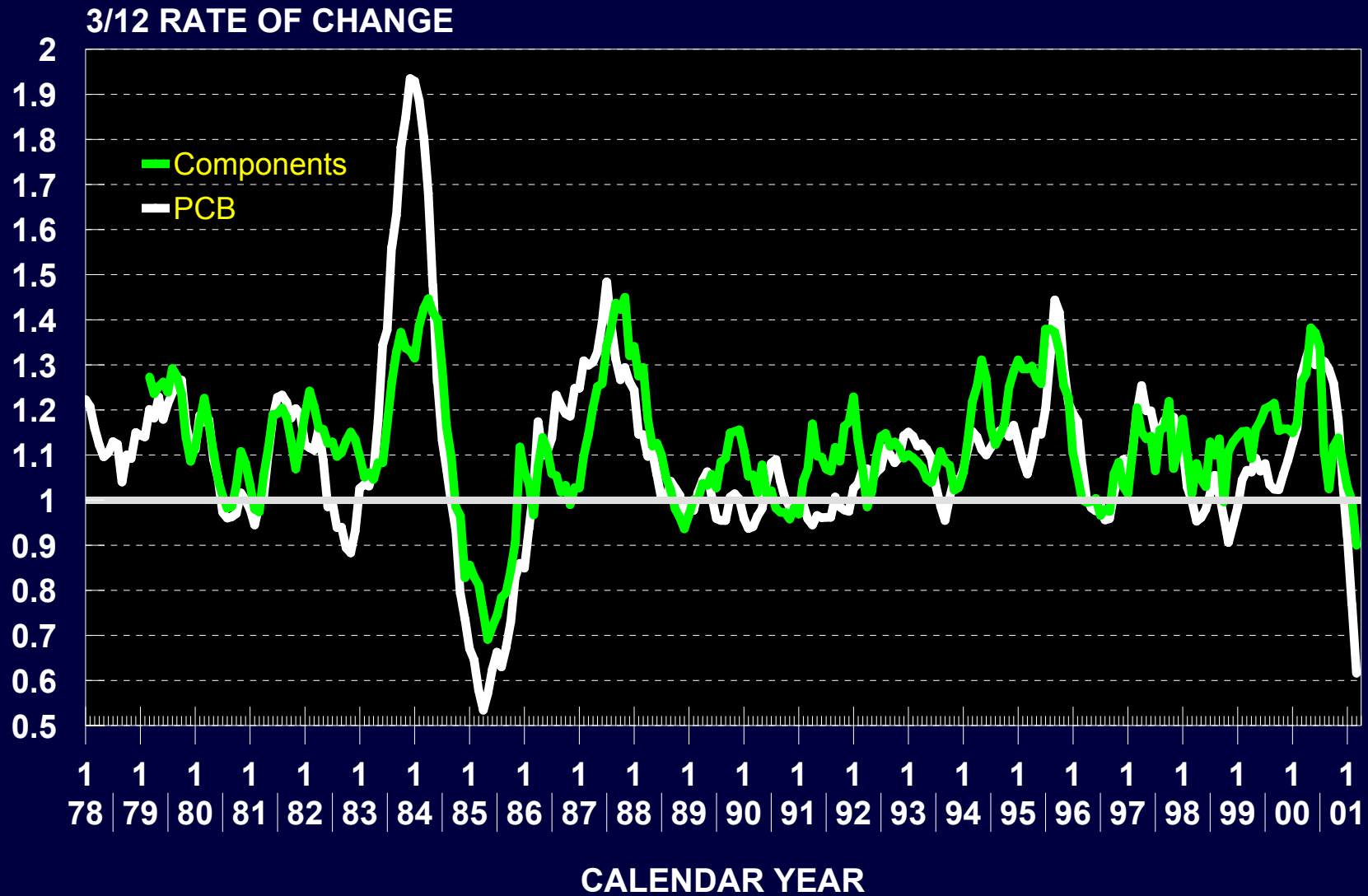


U.S. Electronic Component Book/Bill Ratio

3-Month Average



U.S. PCB vs Electronic Component Orders

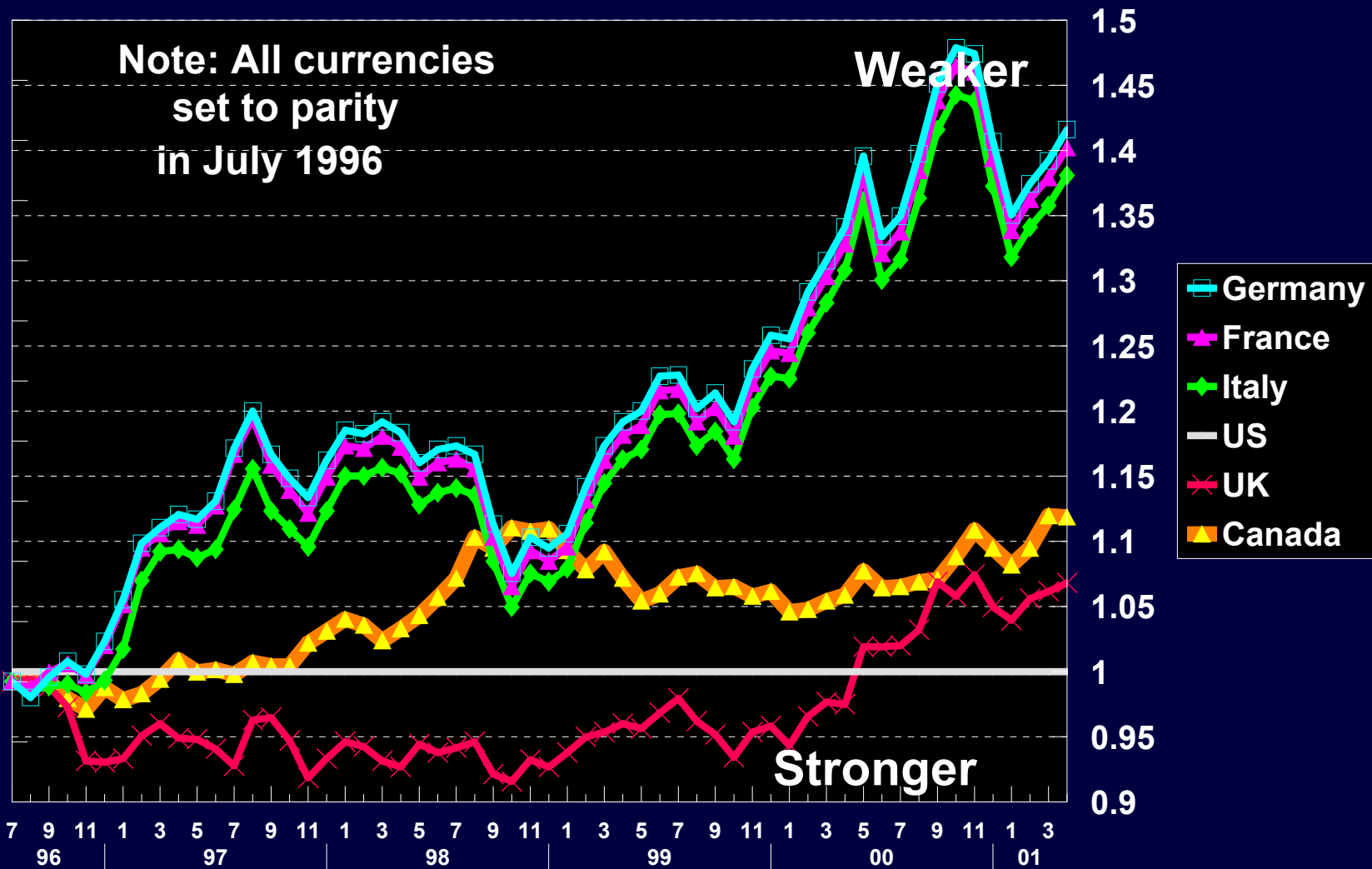


Data: IPC T/MRC & <http://www.census.gov/indicator/www/m3/>

Exchange Rates

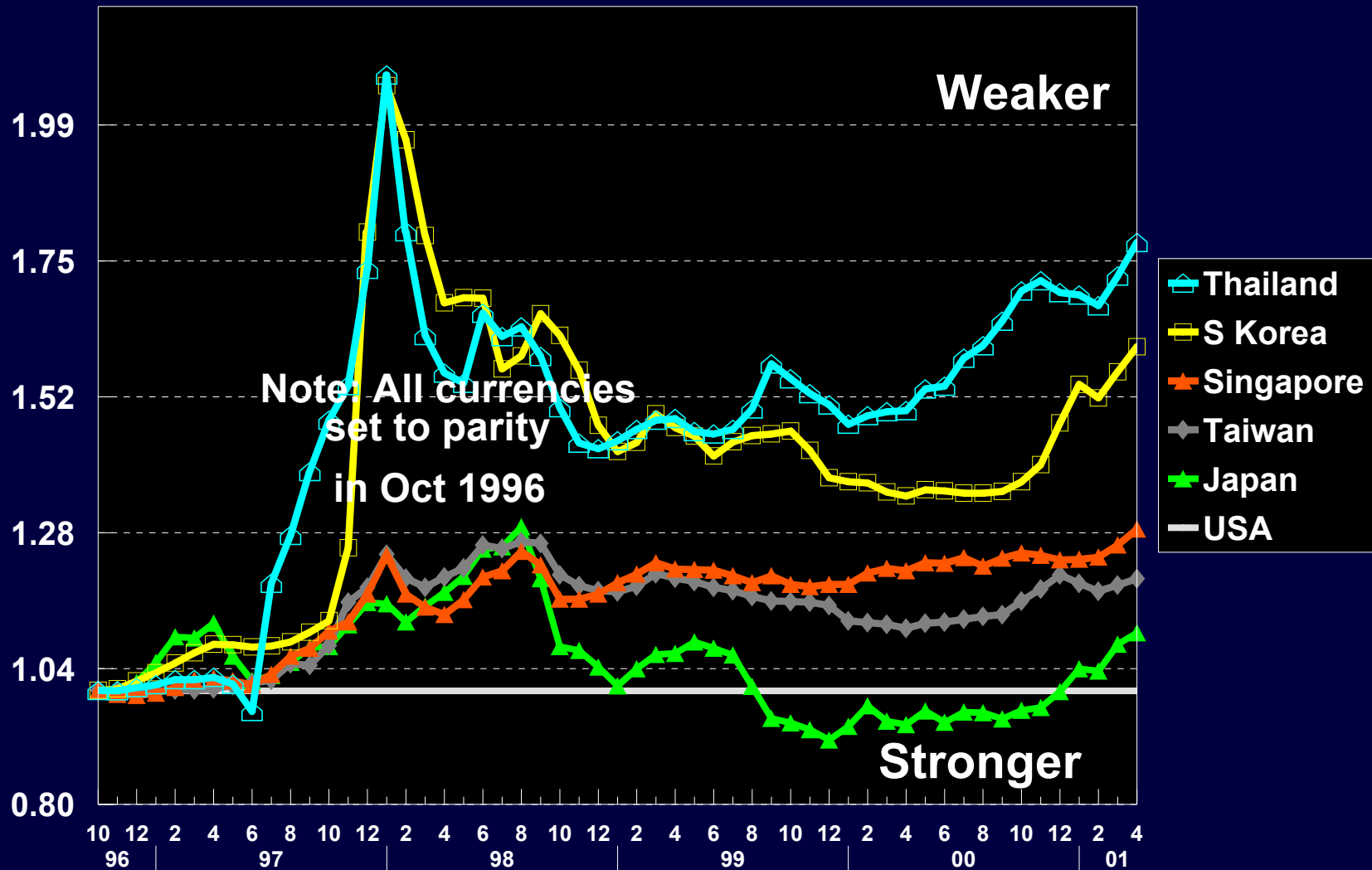
EUROPEAN EXCHANGE RATES vs US \$

7/96 = 1.00



SE ASIA EXCHANGE RATE vs US \$

10/96 = 1.00



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

BROADBAND INTERNET

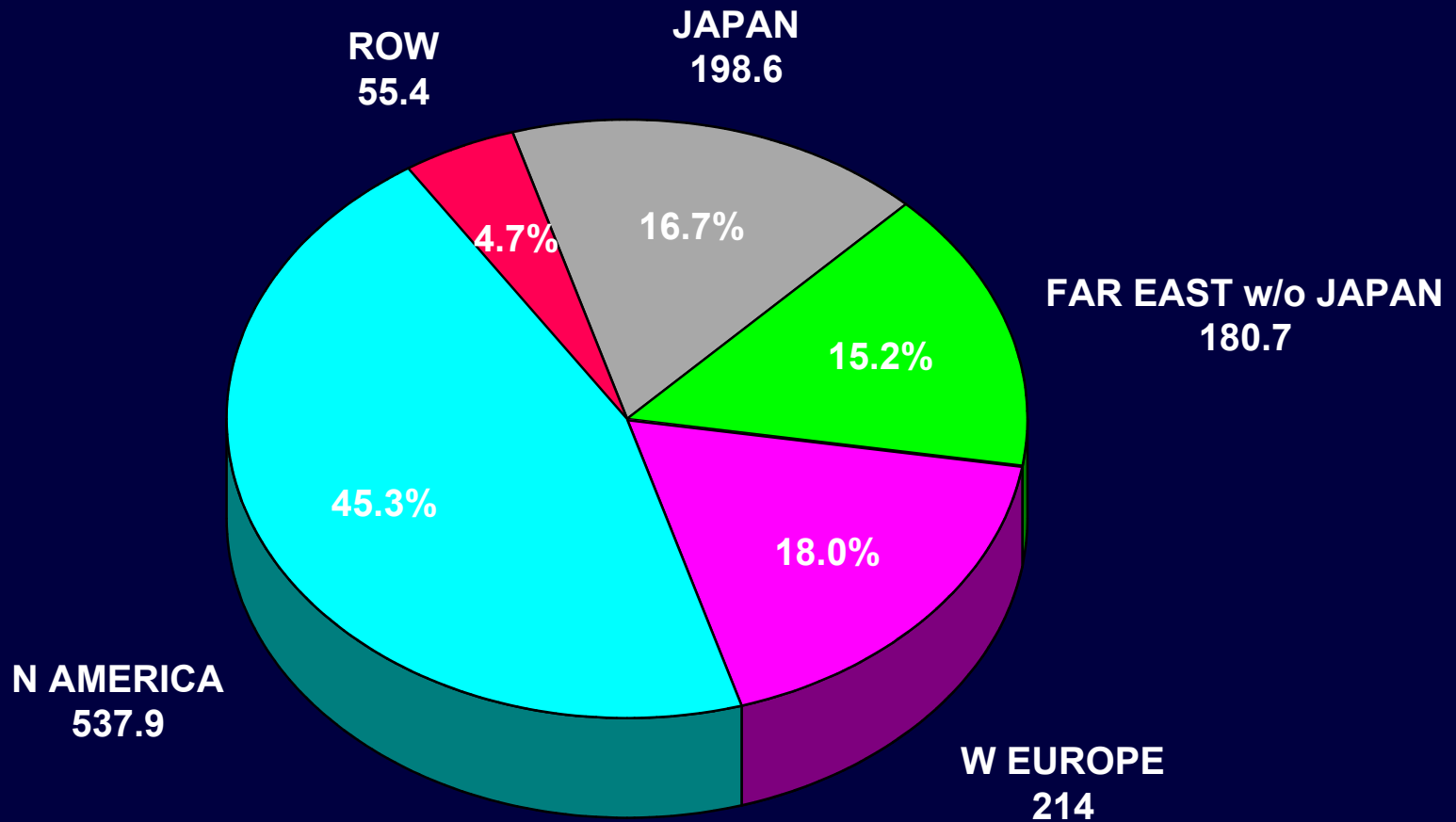
E-BUSINESS & E-LEARNING INFRASTRUCTURE

DATA STORAGE - MASSIVE INCREASE IN NEED

Electronic Equipment

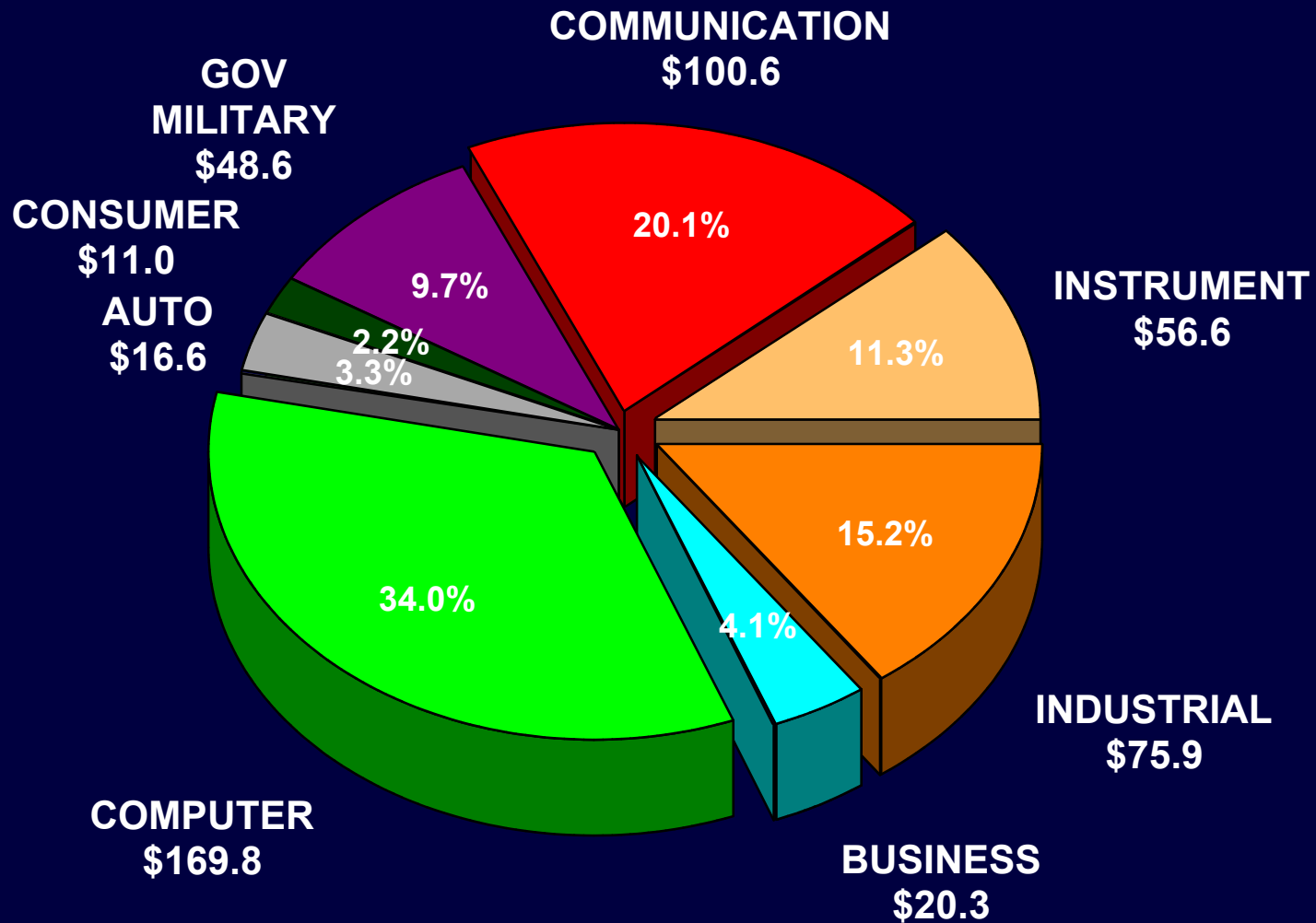
WORLD ELECTRONIC EQUIPMENT PRODUCTION

2000



TOTAL \$1,187 Billion

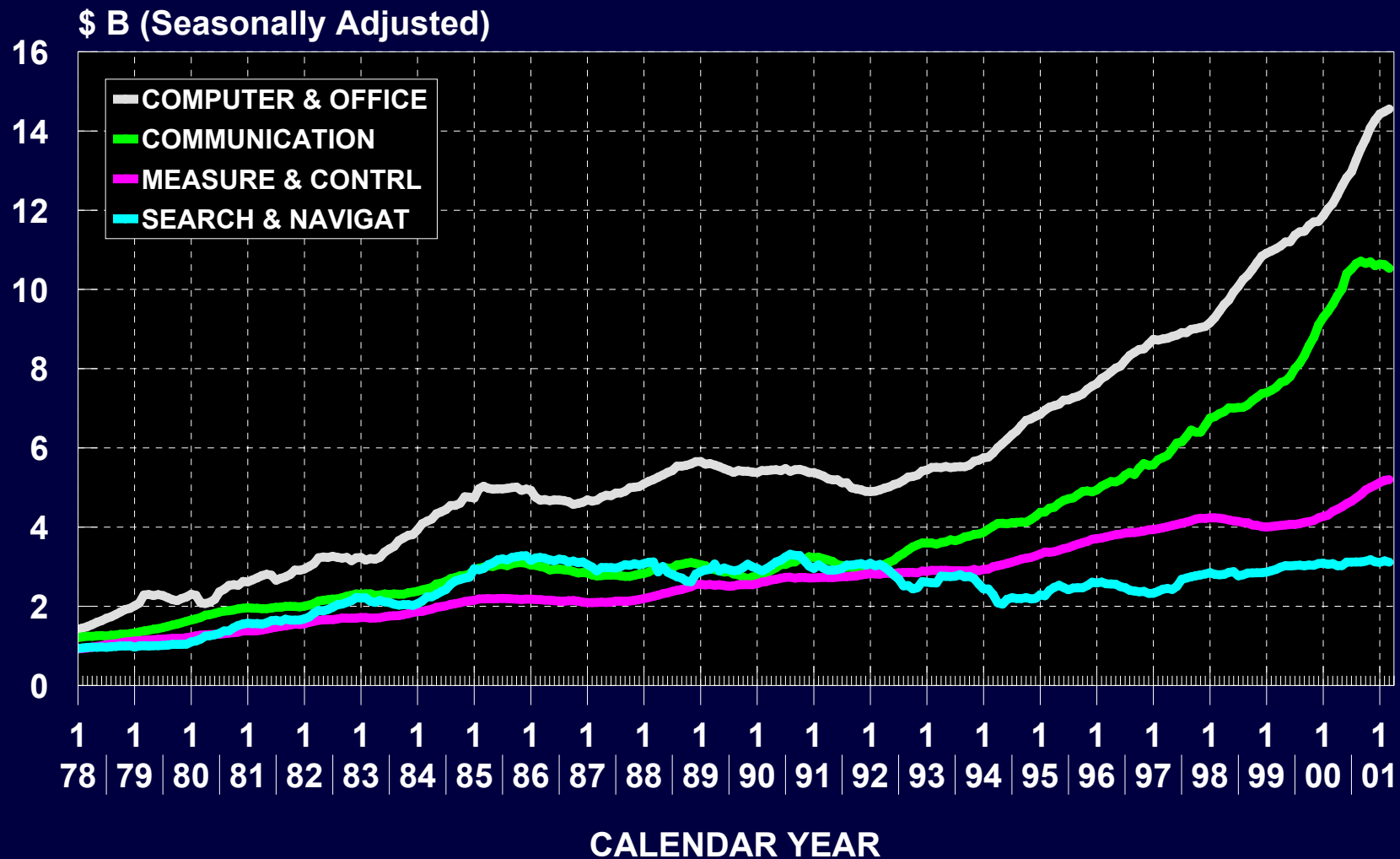
US PRODUCTION OF ELECTRONIC EQUIPMENT 2000 ESTIMATE (\$B)



TOTAL = \$500 Billion

US ELECTRONIC EQUIPMENT BOOKINGS

12 MONTH ROLLING AVERAGE



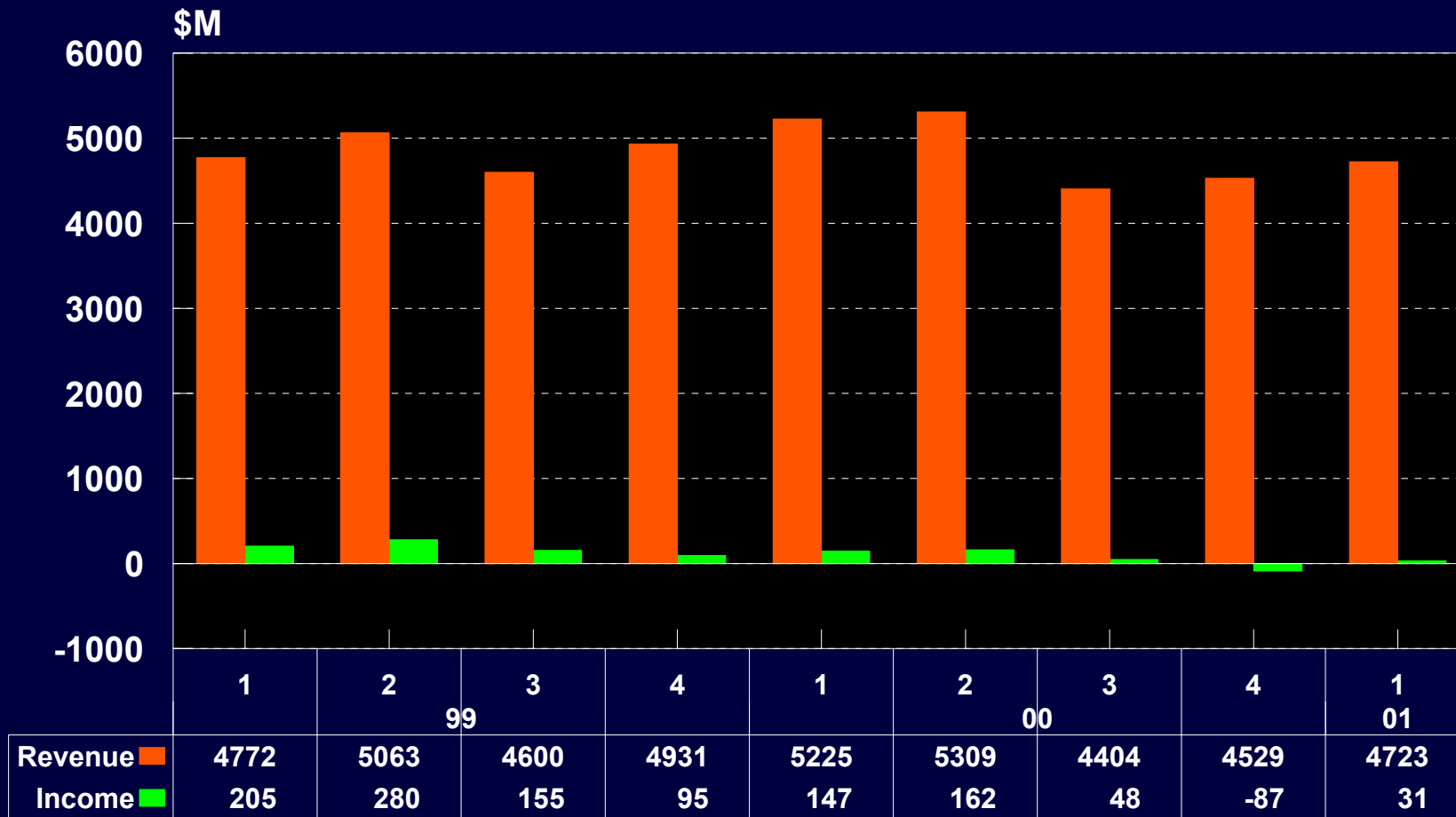
<http://www.census.gov/indicator/www/m3/>

5/01

Automotive Electronics

Visteon

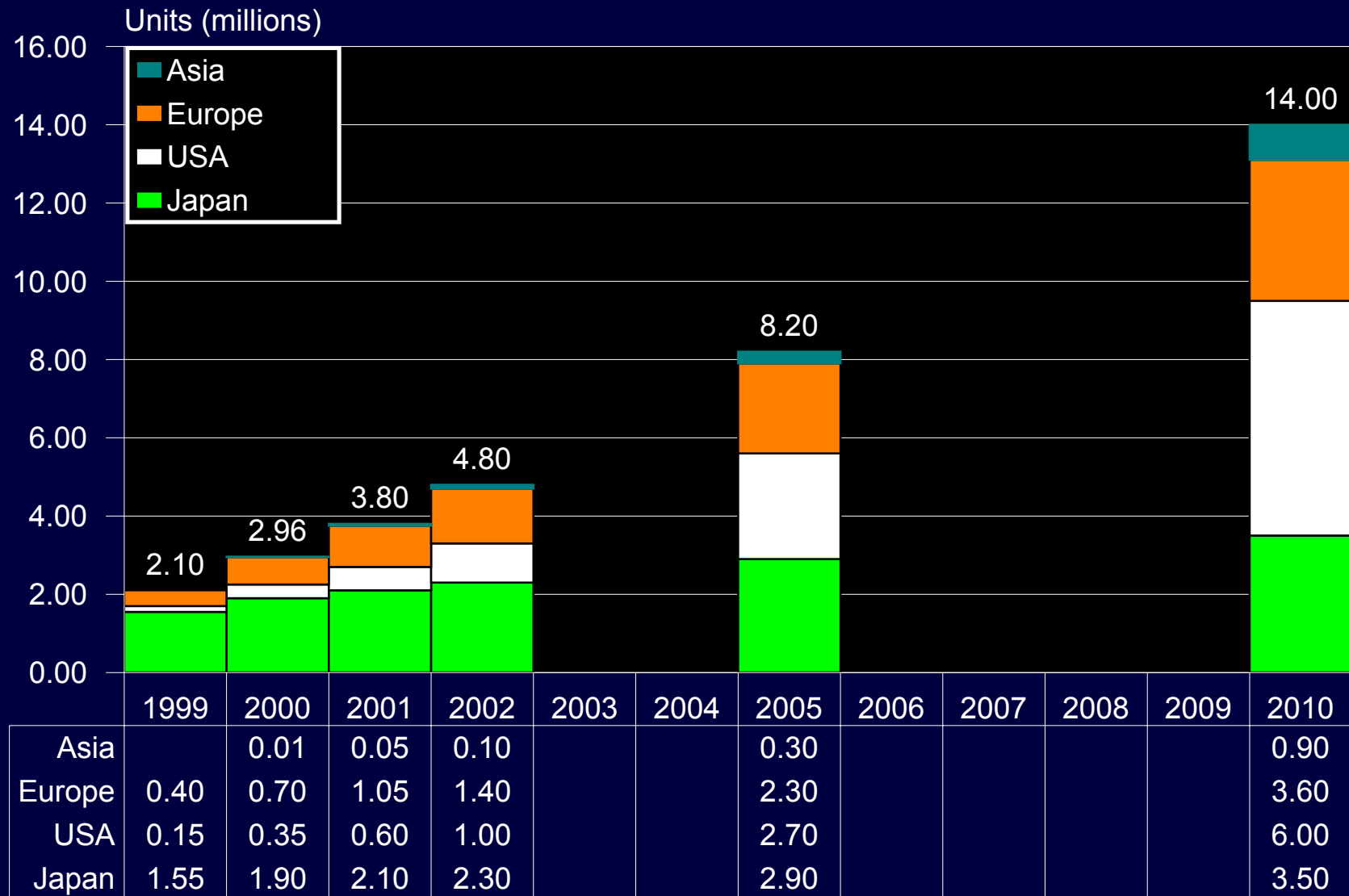
Revenue & Net Income



CY

VC

Car Navigation Systems World Market



Automotive Electronics

Down but stable

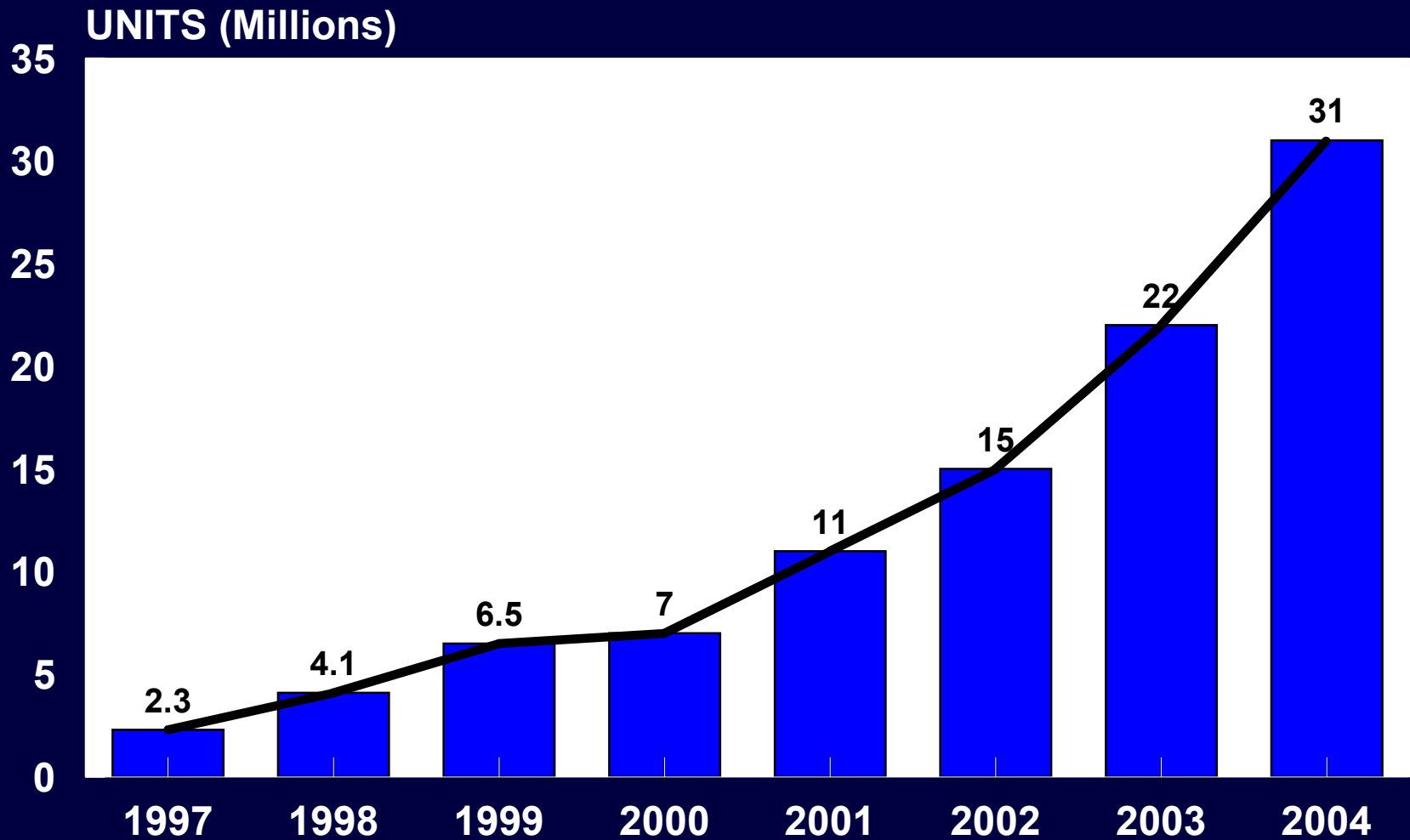
Visibility -new model year

Increasing electronic content

Consumer Electronics

DIGITAL CAMERA MARKET

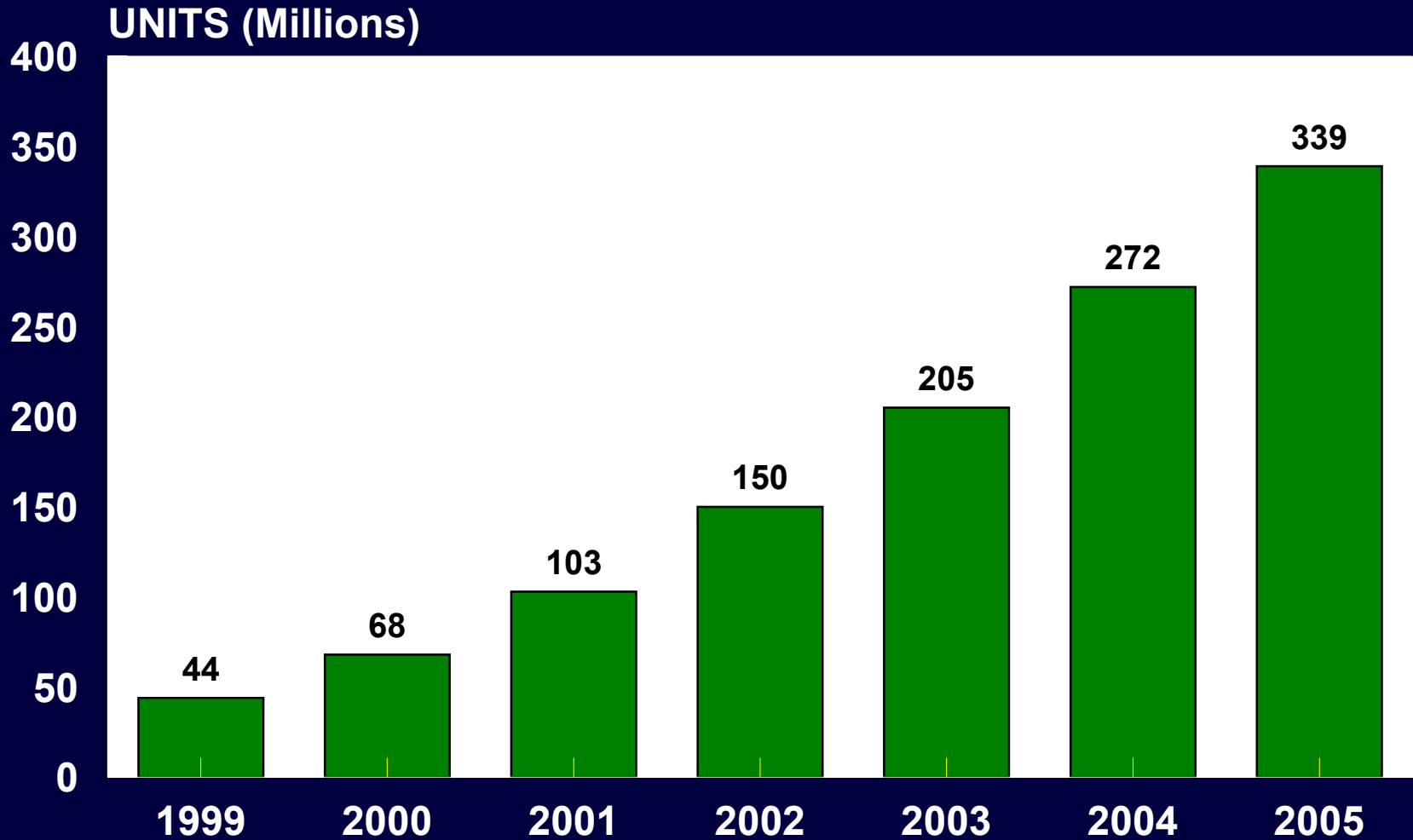
WORLD SHIPMENTS



Dataquest 11/98, IDC 1/2001

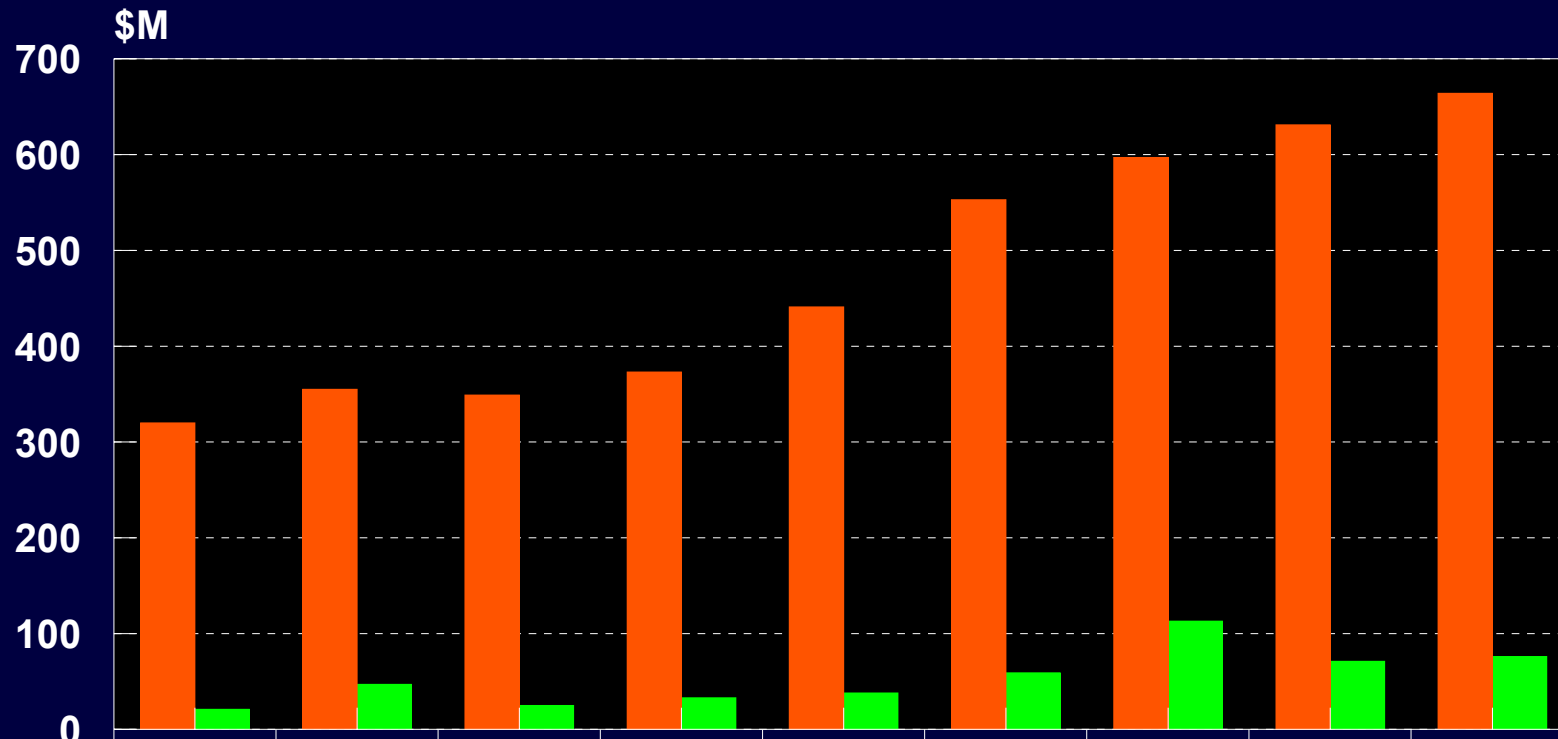
Digital Set-top Boxes

World Installed Base



Scientific-Atlanta

Revenue & Net Income



	1	2	3	4	1	2	3	4	1
	99				00				01
Revenue	320	355	349	373	441	553	597	631	664
Income	21	47	25	33	38	59	113	71	76

CY

SFA

Microsoft Xbox - 11/2001, \$299

Four game controller ports for multiplayer gaming and to enable other peripherals, ranging from game pads to voice-activated headsets

Multilingual audio-video connector for hookup to televisions and home theater systems

Ethernet port for online gaming via a broadband connection

NVIDIA graphics processing unit

Intel 733MHz processor

10 GB internal hard drive

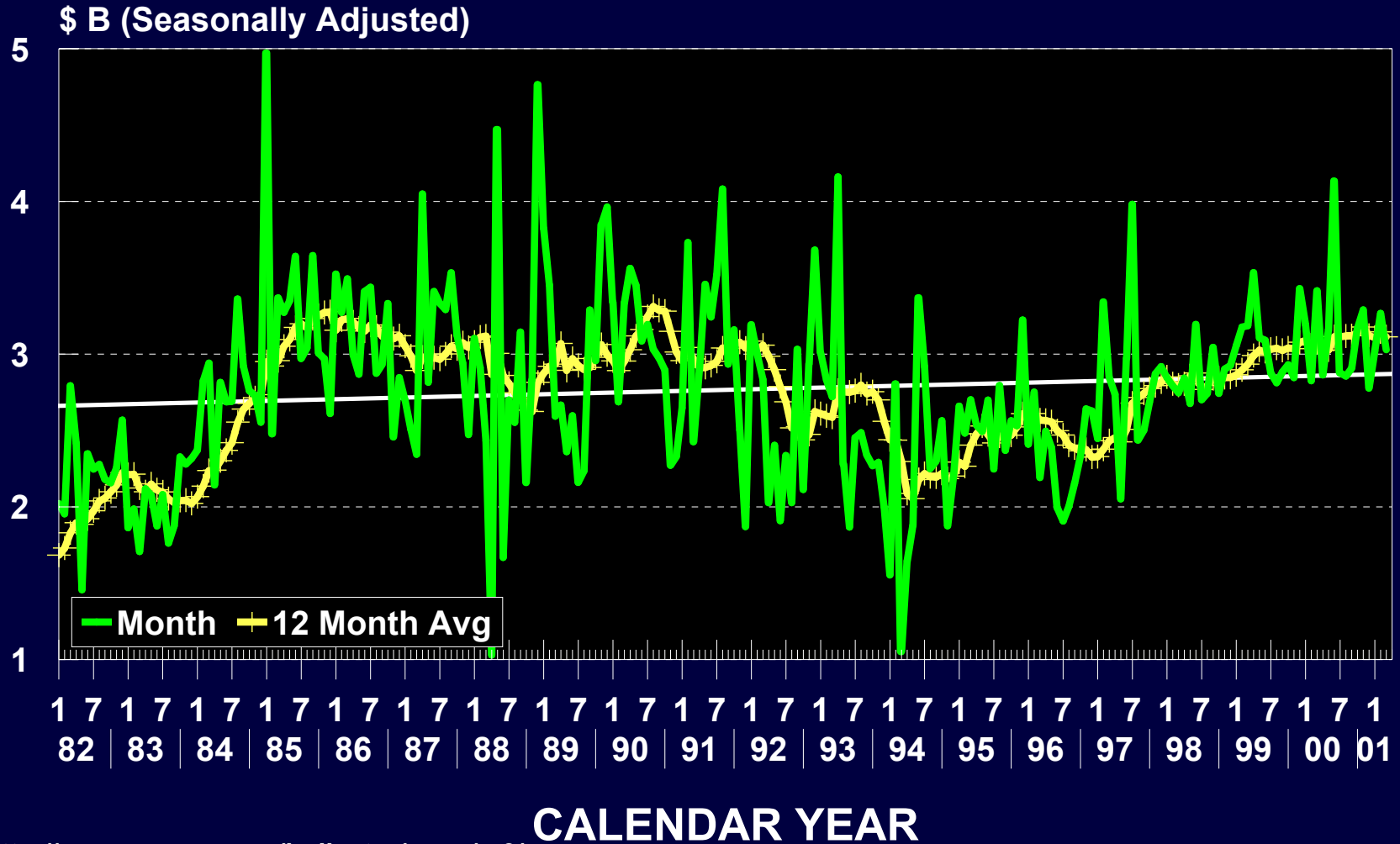
Front-loading DVD tray



Government & Military Electronics

SEARCH & NAVIGATION EQUIPMENT

BOOKINGS PRIMARILY MILITARY ELECTRONICS



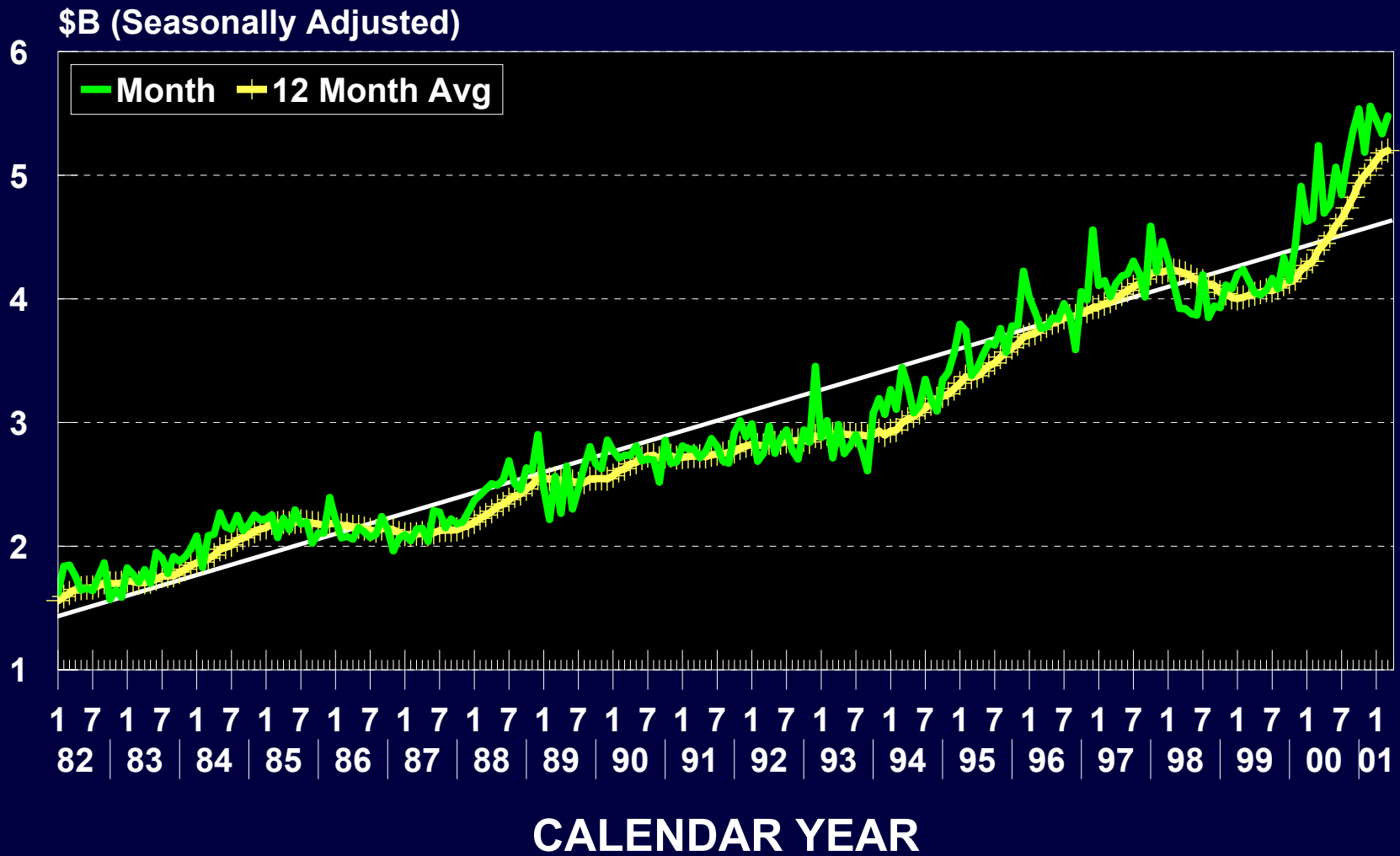
Government & Military Electronics

Fewer PCB makers

Stable markets

Instruments & Control Equipment

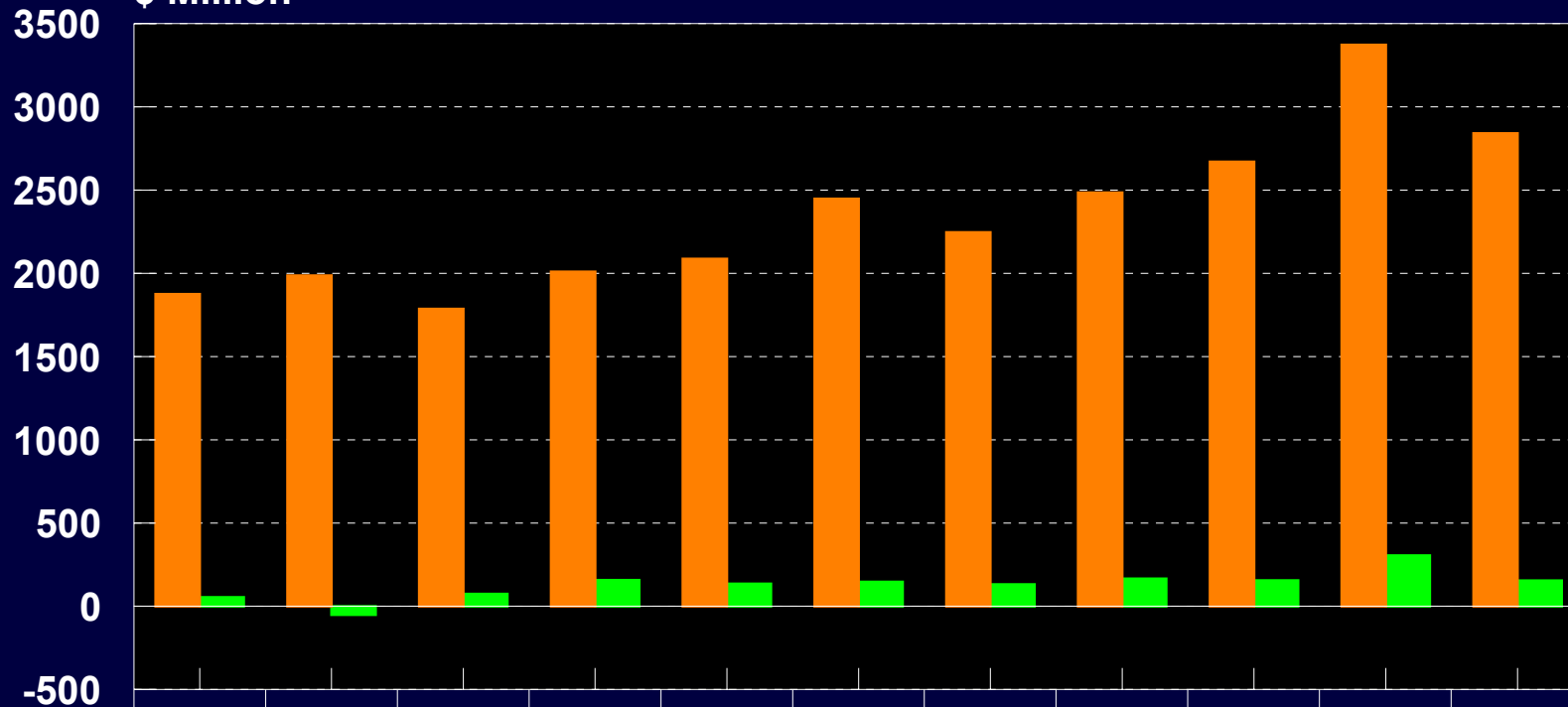
MEASUREMENT & CONTROL EQUIPMENT BOOKINGS



Agilent Technologies

Revenue & Net Income

\$ Million



Revenue

1875

1987

1786

2010

2087

2448

2246

2485

2670

3372

2841

Income

54

-51

74

157

135

146

131

166

155

305

154

CY

A

FY ends Oct31

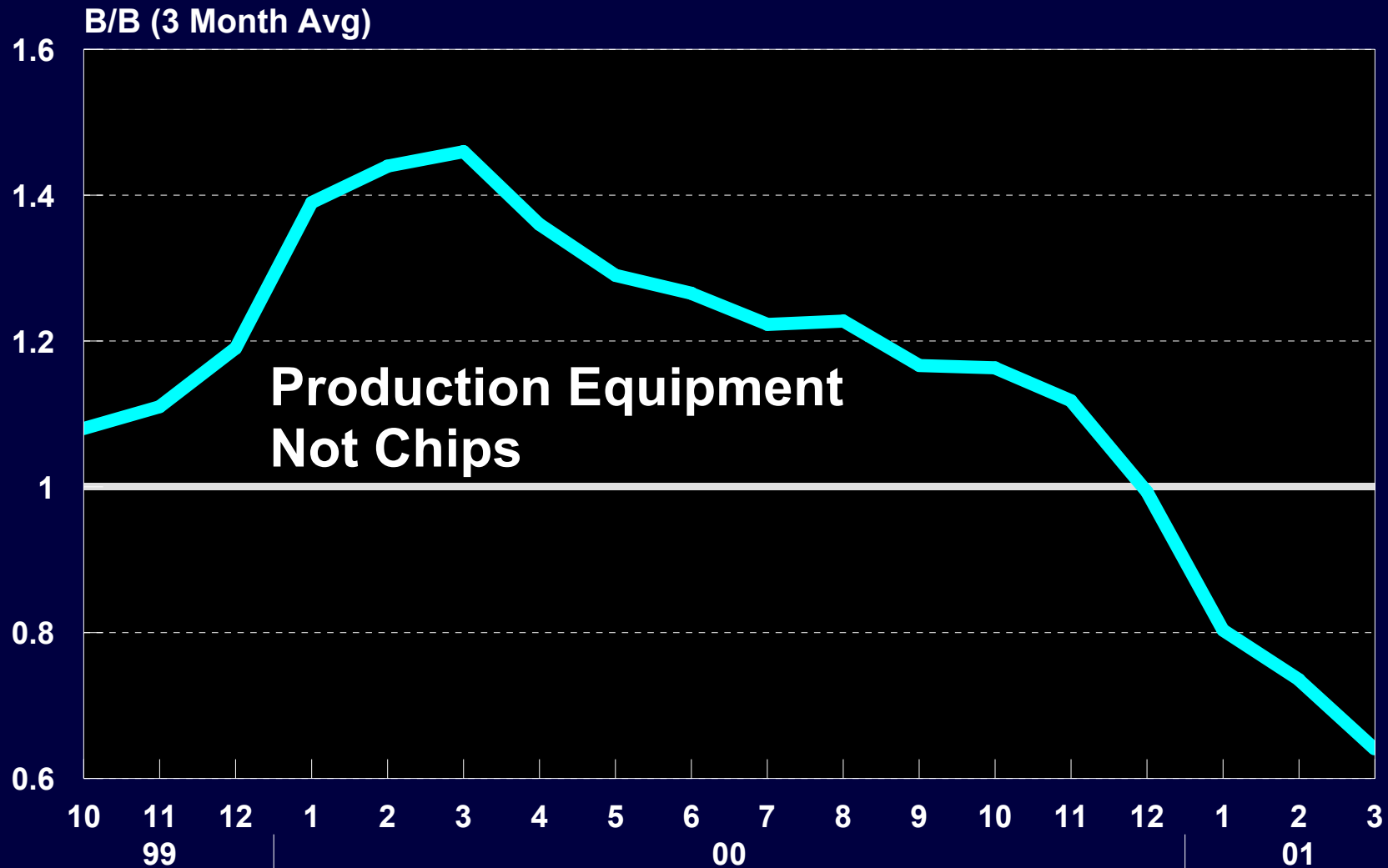
Semiconductor Fab

Top 10 Semiconductor Equipment Suppliers 2000 Sales in \$Billion

		<u>2000/1999 % Growth</u>
Applied Materials	10.460	89%
Tokyo Electron Ltd.	5.142	89%
Nikon	2.432	70%
Teradyne	2.044	69%
ASM Lithography	2.016	58%
KLA-Tencor	2.003	91%
Advantest	1.865	95%
Lam Research	1.627	82%
Canon	1.418	90%
Dainippon Screen	1.390	115%

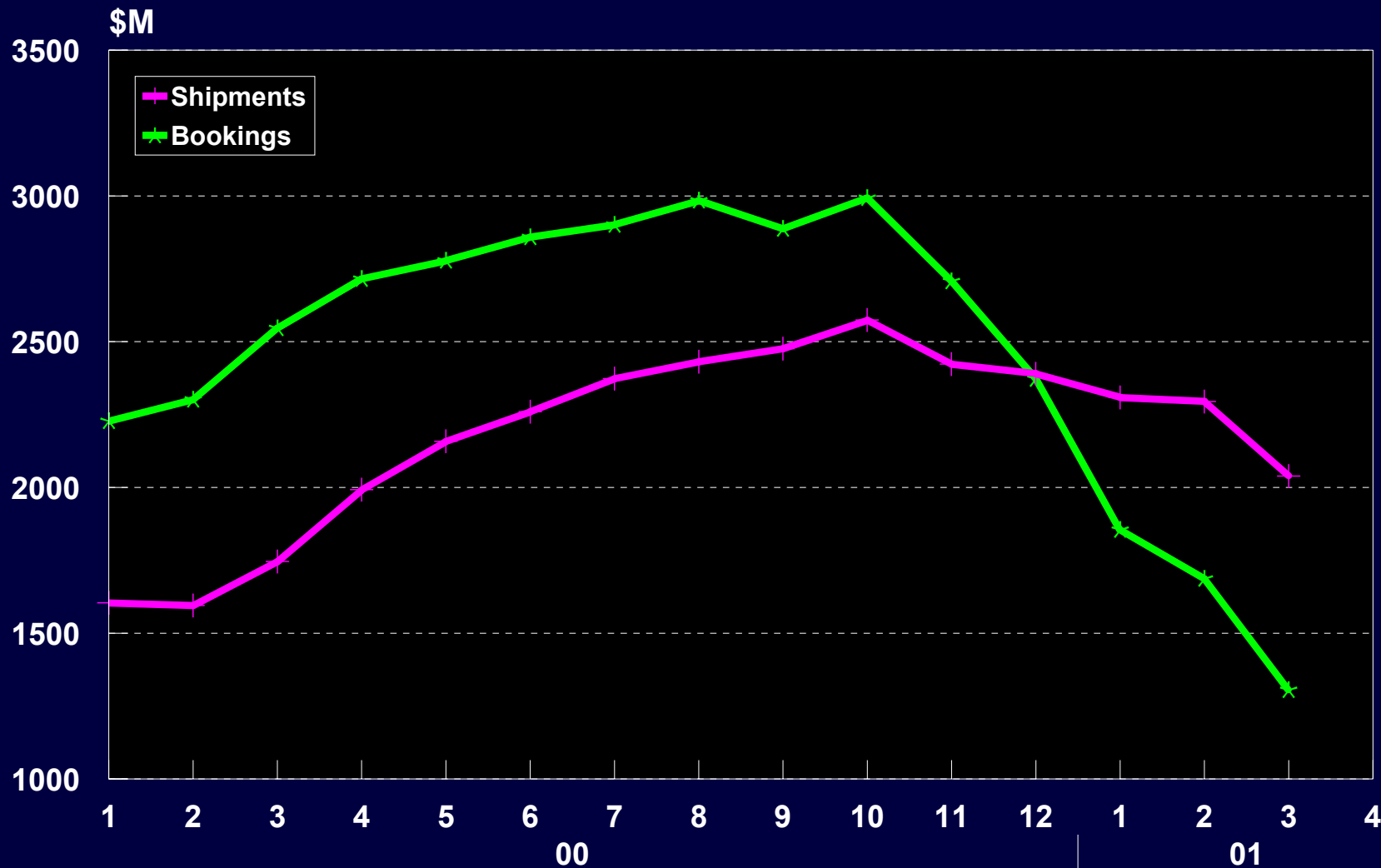
Source: VLSI Research Inc. 2/2001

N American Semiconductor Equipment Industry Book/Bill Ratio



SOURCE Semiconductor Equipment and Materials International
<http://www.semi.org>

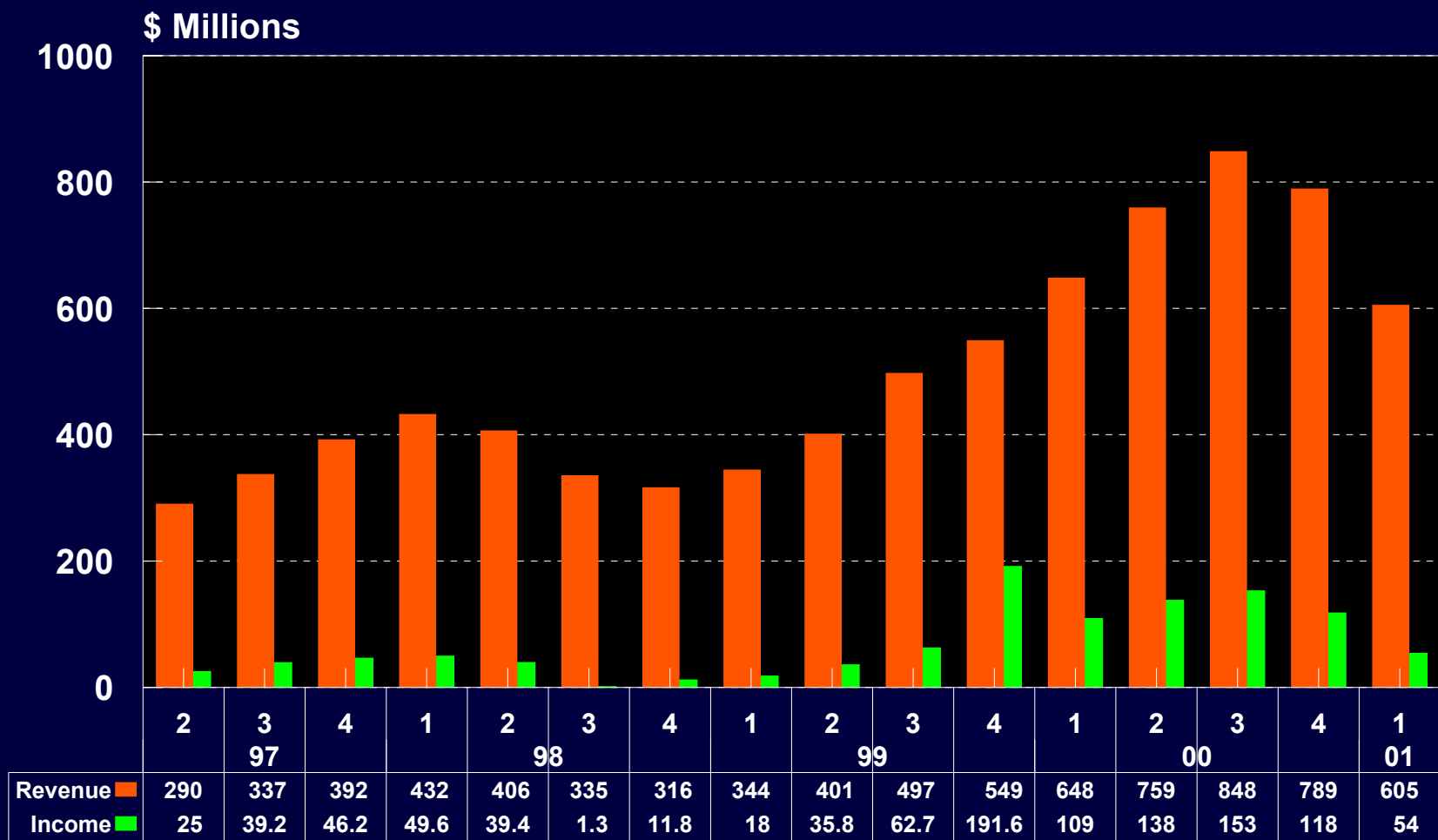
N American Semiconductor Equipment Industry Shipments & Orders



SOURCE Semiconductor Equipment and Materials International
<http://www.semi.org>

Teradyne

Revenue & Net Income



CY

TER

Communications Equipment

Top Eight Worldwide Telecommunications Equipment Manufacturers (\$B)

	<u>2000 Revenue</u>	<u>1999 Revenue</u>	<u>Constant \$ Growth (%)</u>	<u>Local Currency Growth (%)</u>
Nortel	29.8	21.0	41.6	41.6
Ericsson	27.7	24.0	15.4	28.1
Nokia	27.2	20.1	35.4	57.0
Lucent*	25.8	33.8	-23.5	-23.5
Cisco	23.9	15.0	59.3	59.3
Siemens**	22.8	20.0	14.5	32.5
Motorola	22.8	19.7	15.3	15.3
Alcatel***	21.6	17.1	26.6	46.8
Top 8 Total	201.6	170.7	18.1	-

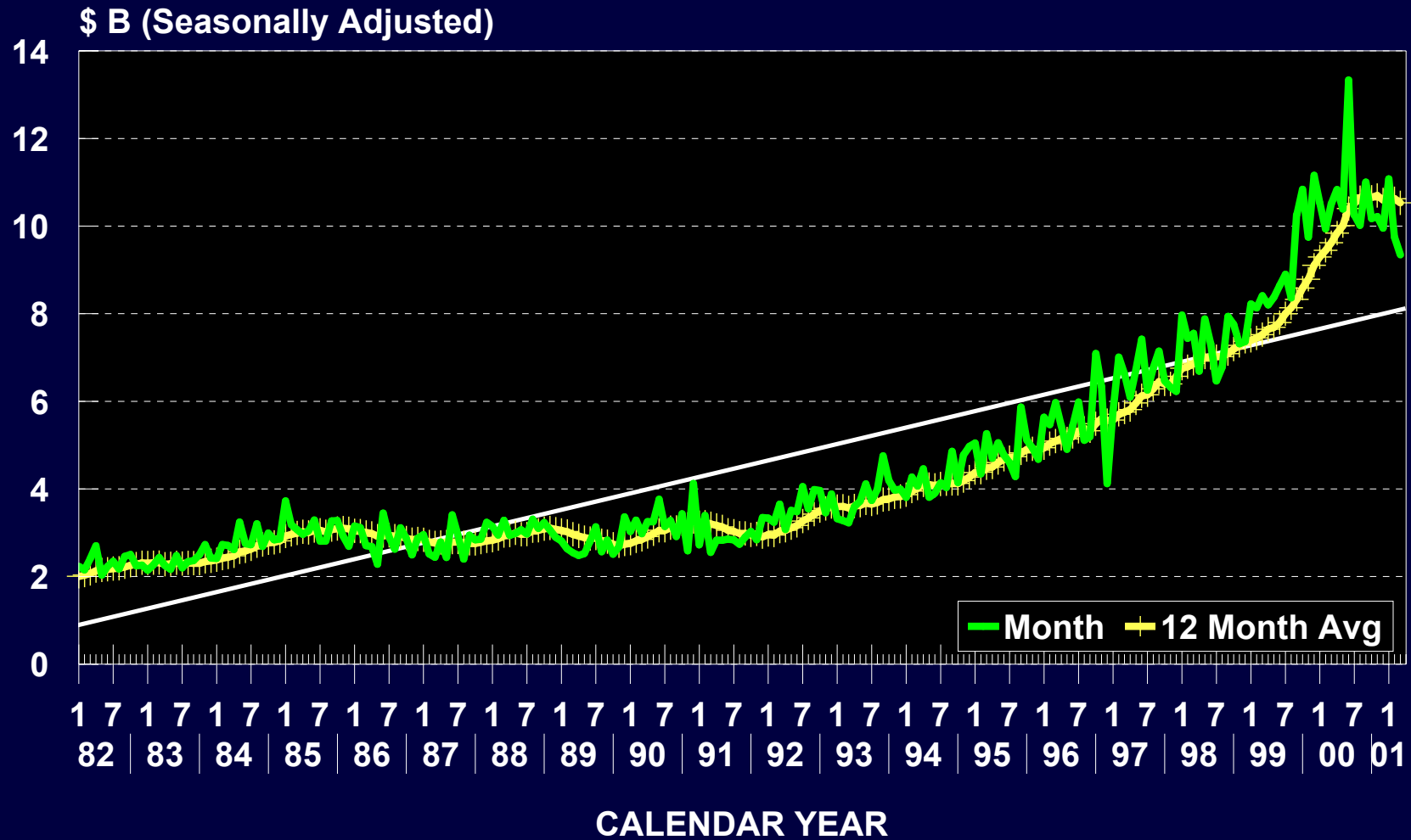
* Lucent 2000 figures exclude Avaya; combined figure would be \$33.2 billion

** Siemens 1999 figure re-estimated because of exchange rate updates

*** Alcatel 1999 figure re-established to exclude components business

Dataquest 4/2001

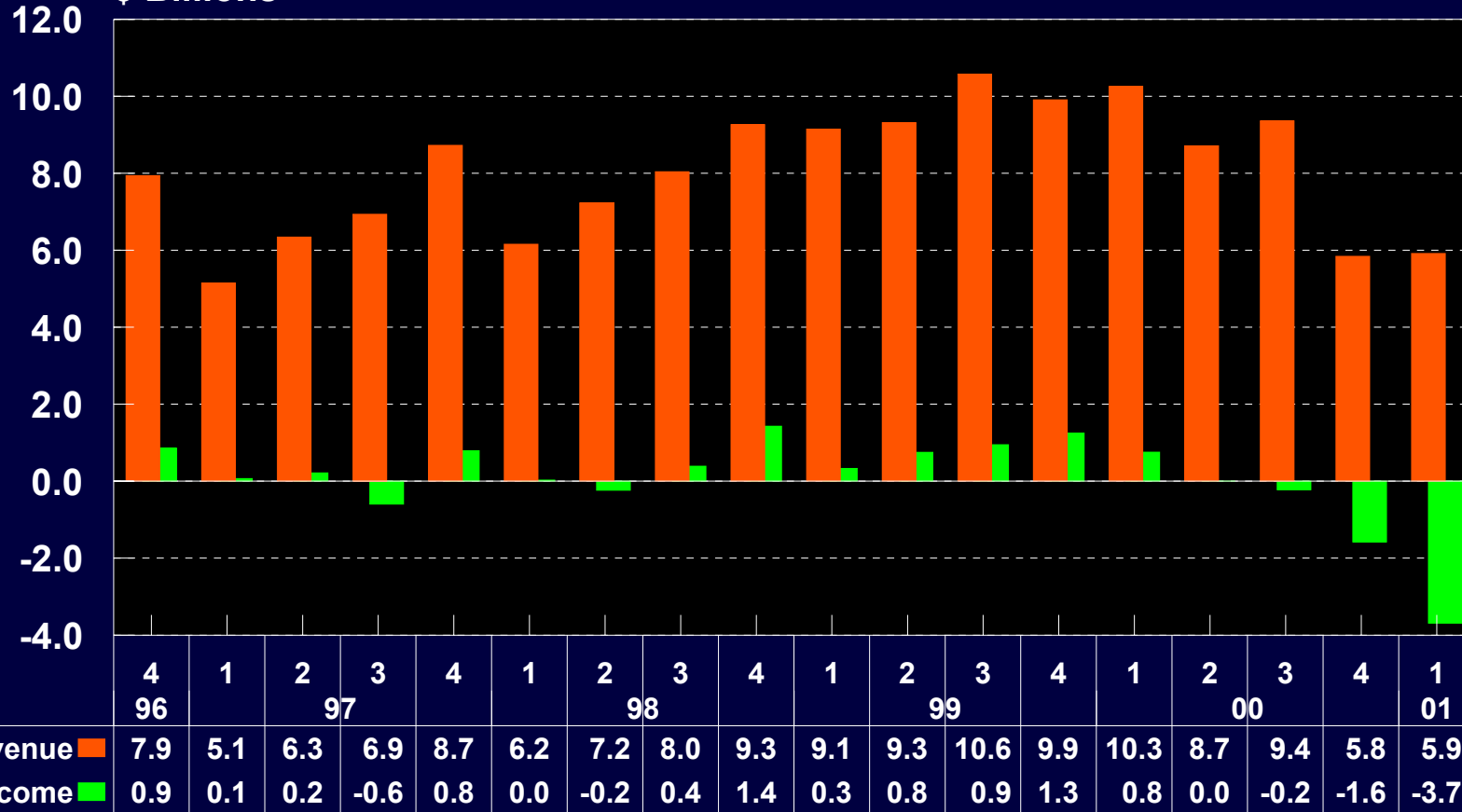
COMMUNICATIONS EQUIPMENT BOOKINGS



Lucent Technologies

Revenue & Net Income

\$ Billions



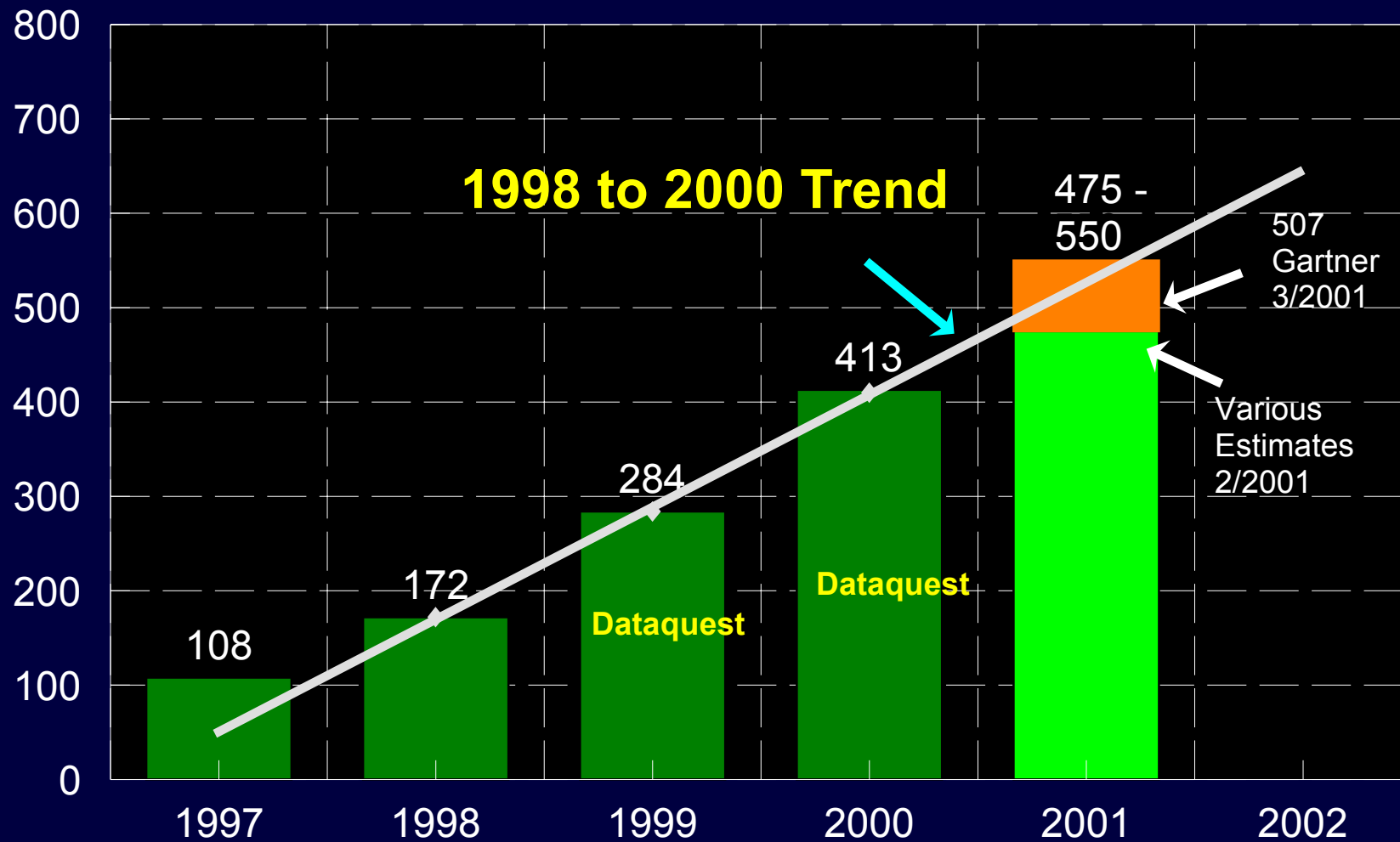
CY

FY ends September

LU

WORLD CELLULAR PHONE GROWTH

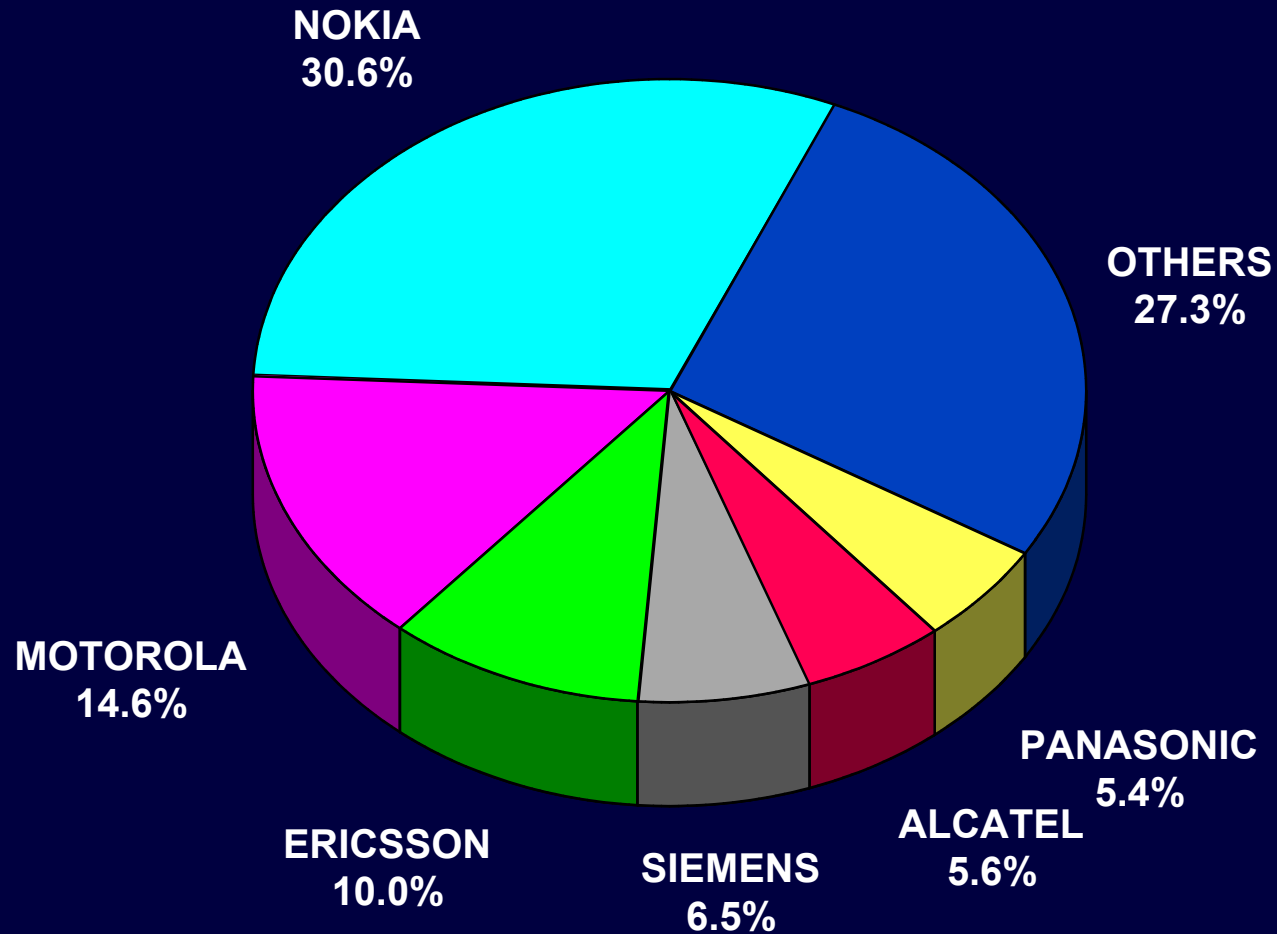
TOTAL SALES - ANALOG & DIGITAL



Dataquest 2/2000 & 2/2001; Nokia, Ericsson & others 2/2001, Gartner 3/2001

WORLD CELLULAR PHONE SALES

2000

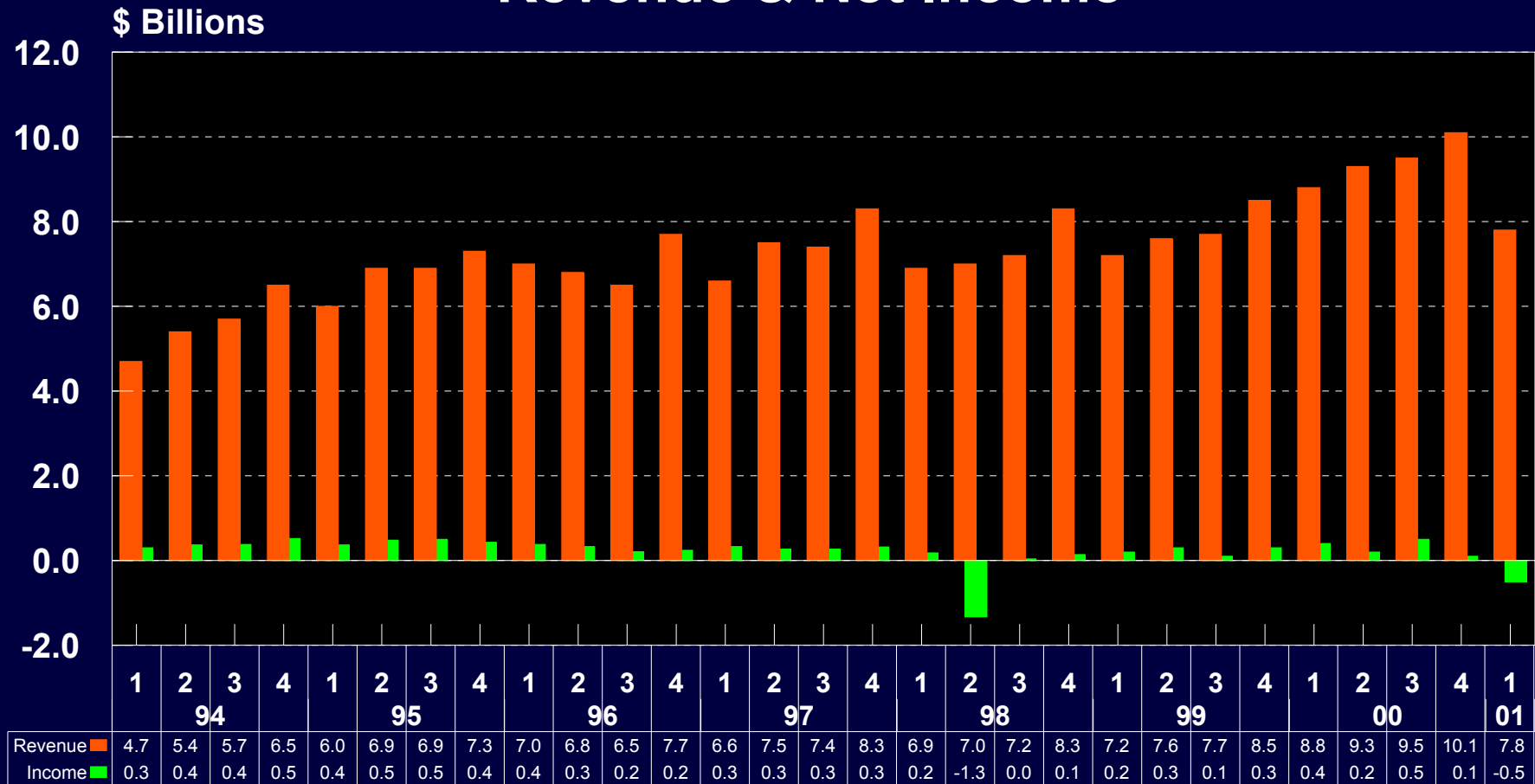


Dataquest 2/2001

TOTAL: 413 MILLION UNITS

Motorola

Revenue & Net Income



CY

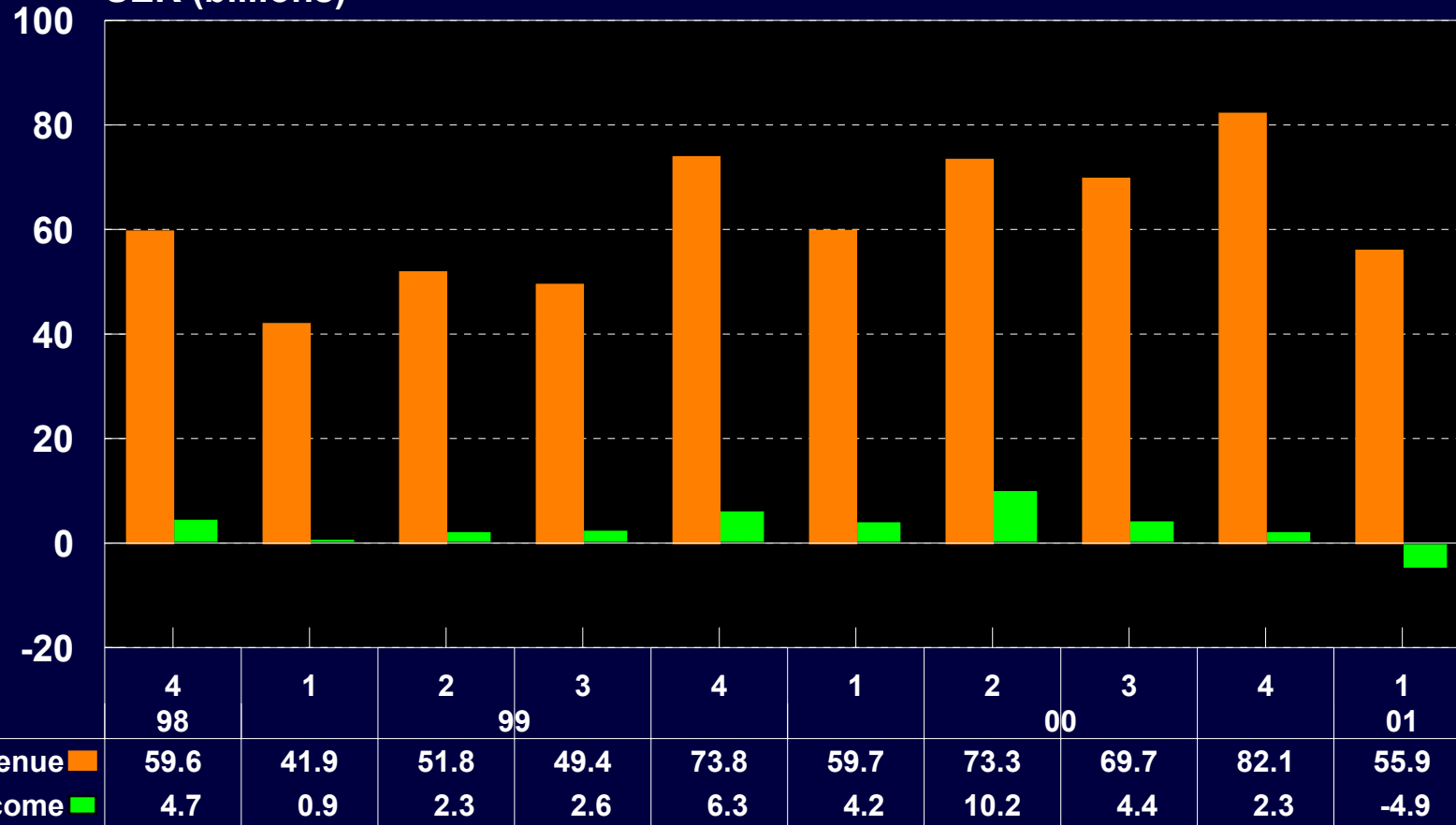
FY=CY

MOT

L.M. Ericsson

Revenue & Net Income

SEK (billions)



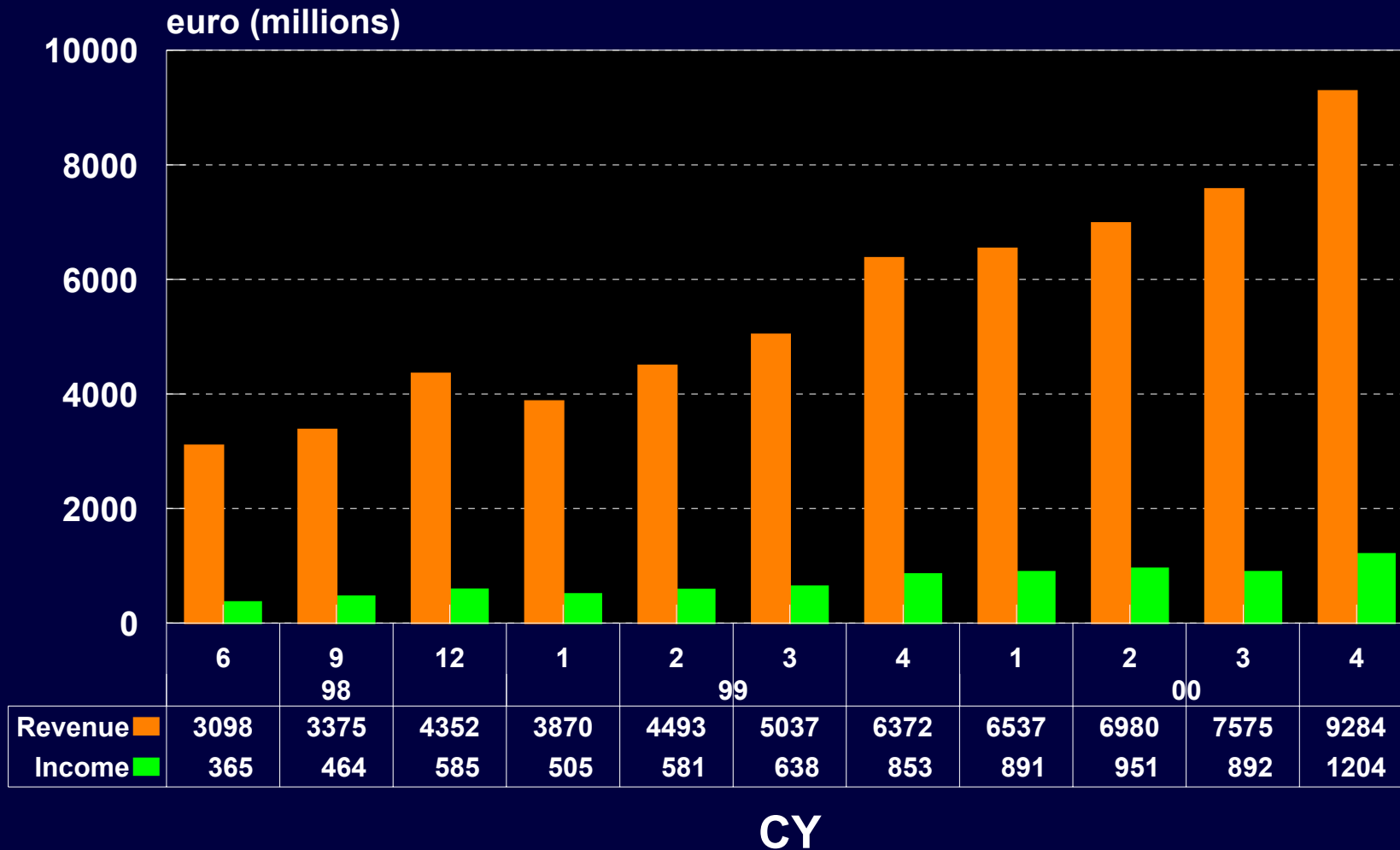
CY

ERICSSON

FY=CY

Nokia

Revenue & Net Income



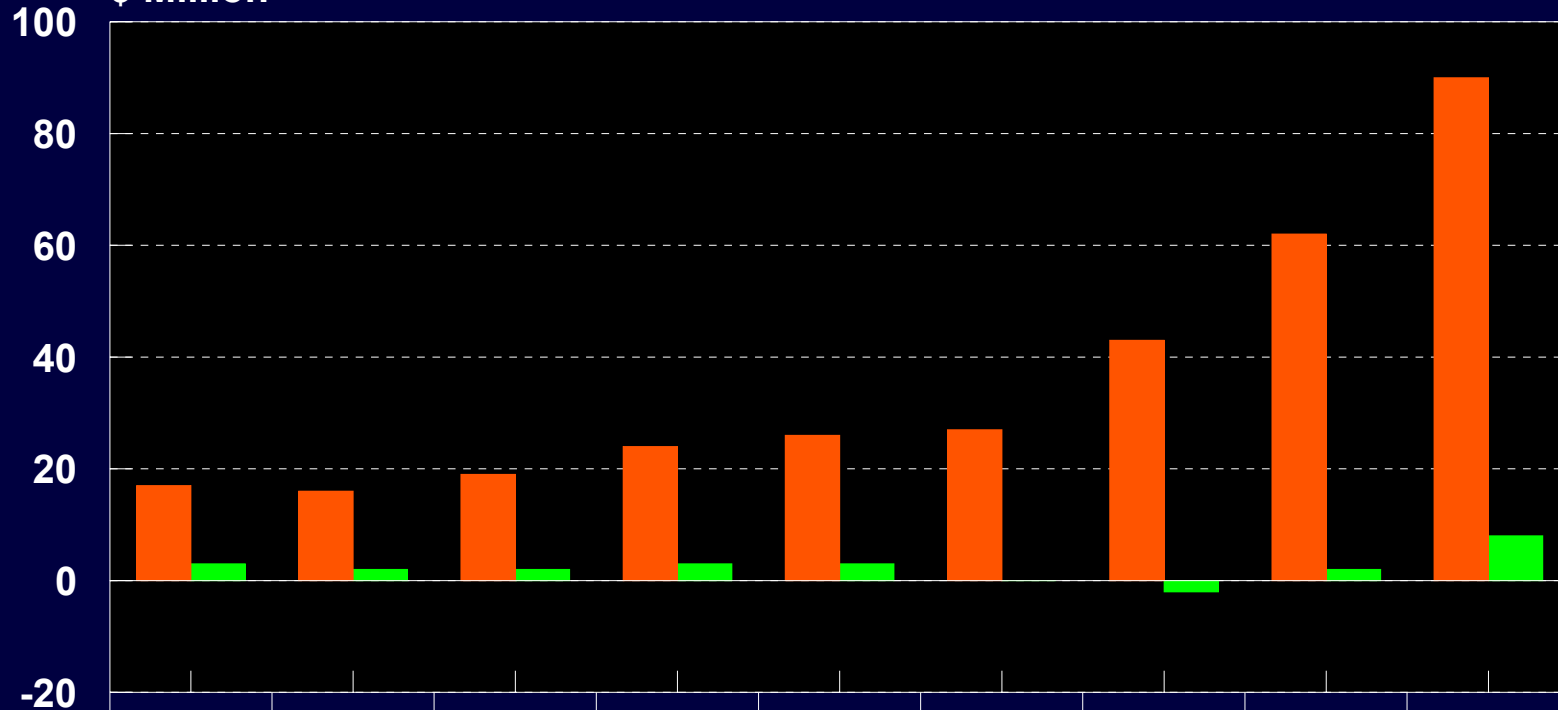
FY=CY

NOK

Research in Motion (RIM)

Revenue & Net Income

\$ Million



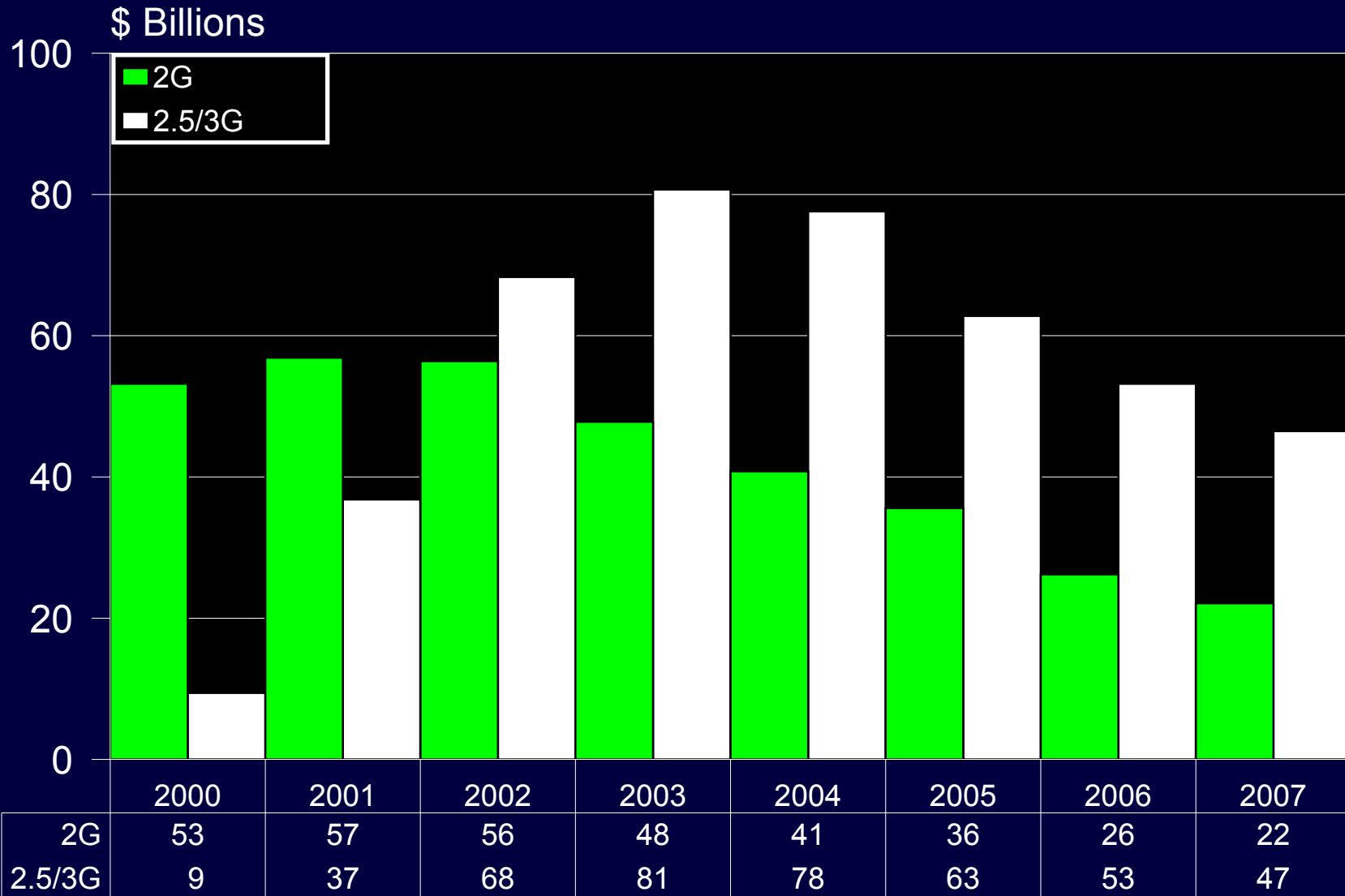
Revenue ■
Income ■

	1	2	3	4	1	2	3	4	1
	99			00			01		
Revenue	17	16	19	24	26	27	43	62	90
Income	3	2	2	3	3	0	-2	2	8

CY

RIMM

2G and 2.5G/3G Wireless Infrastructure World Revenue

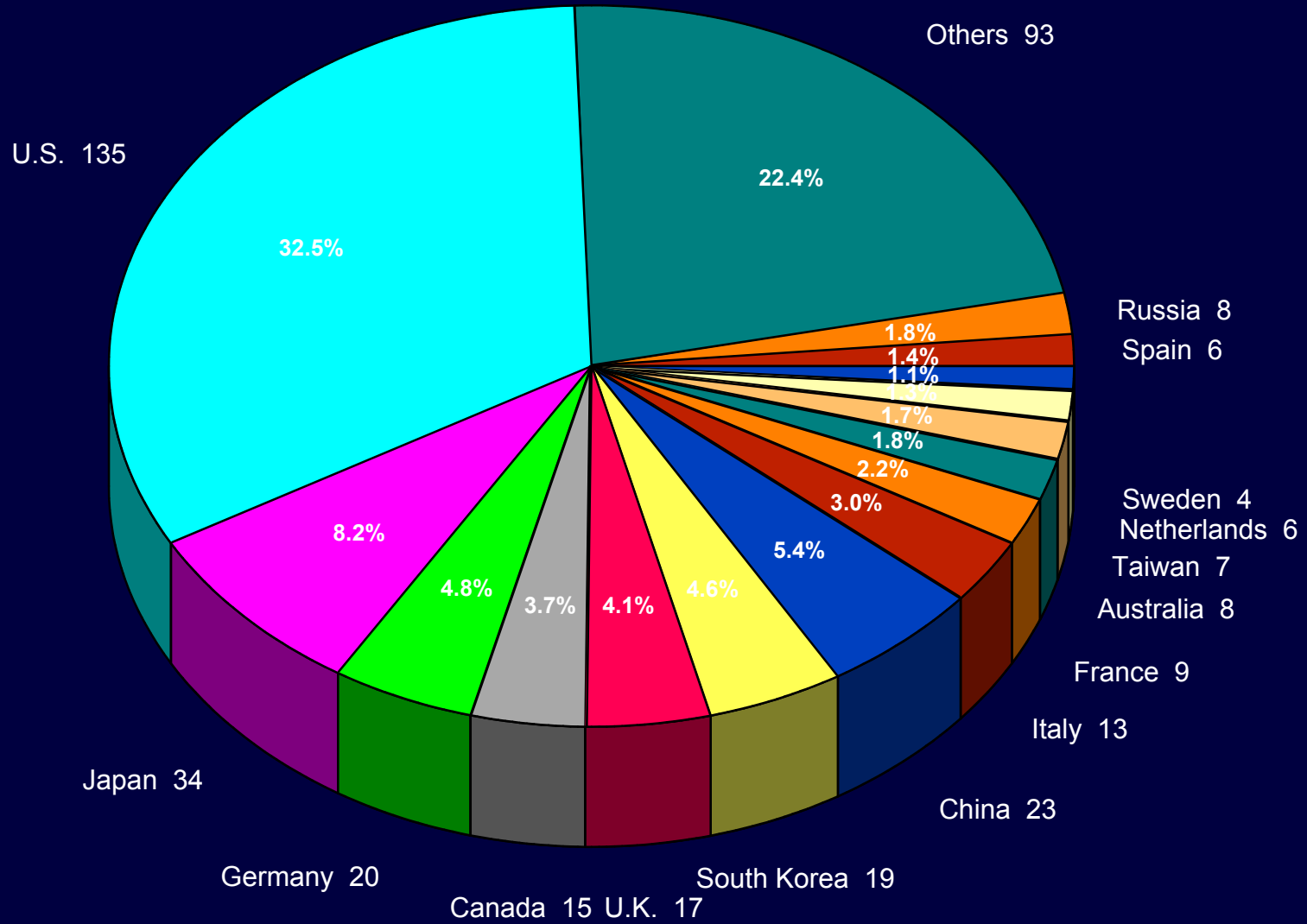


All the technology now packed into a mobile phone, such as batteries, flash memory chips, microprocessors and LCDs, could have filled a whole office floor less than 30 years ago.

Internet

World Internet Users

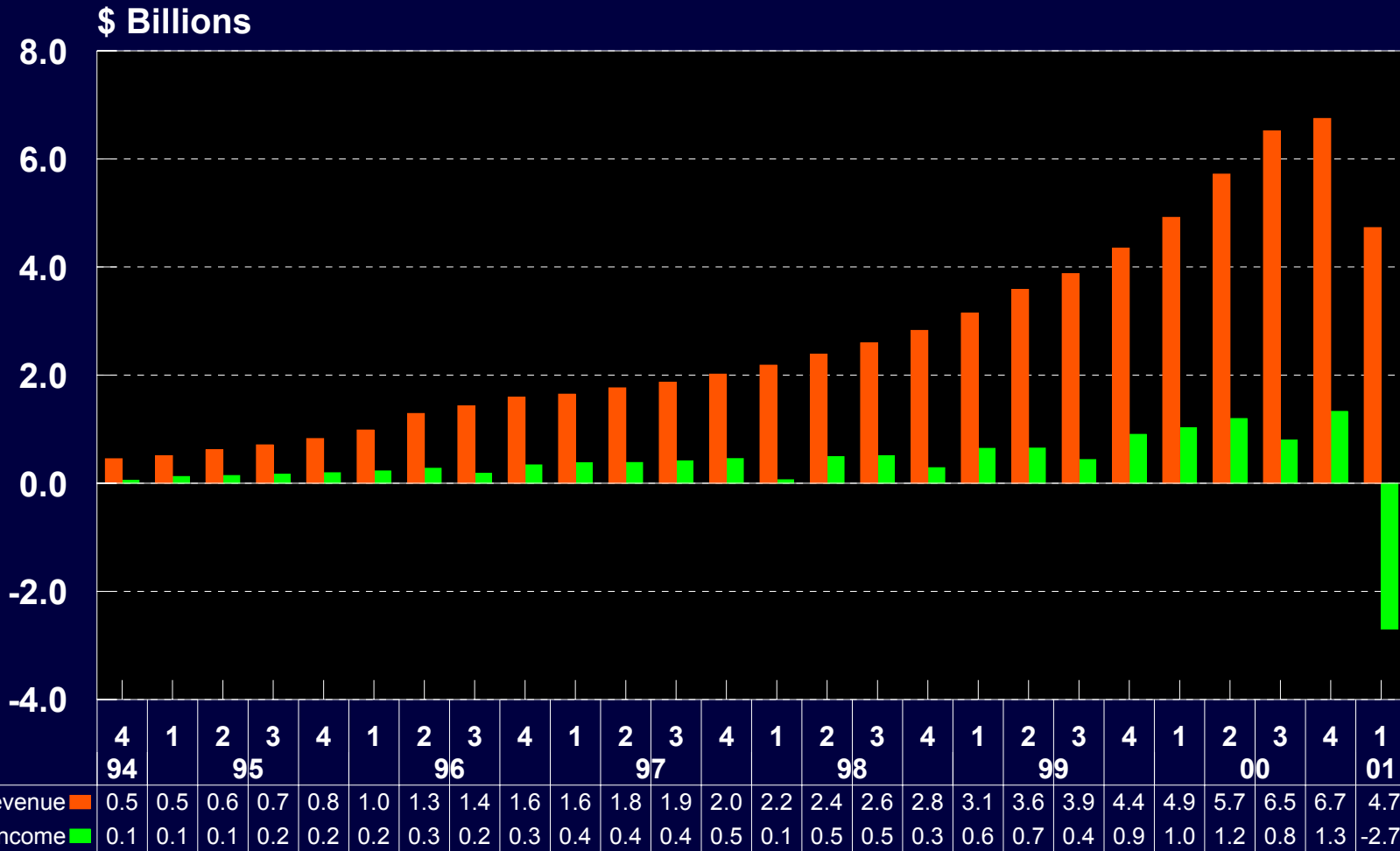
2000



TOTAL: 414 Million

CISCO SYSTEMS

Revenue & Net Income



CY

CSCO

Cisco Eyes Key Markets

VOIP

Wireless LAN

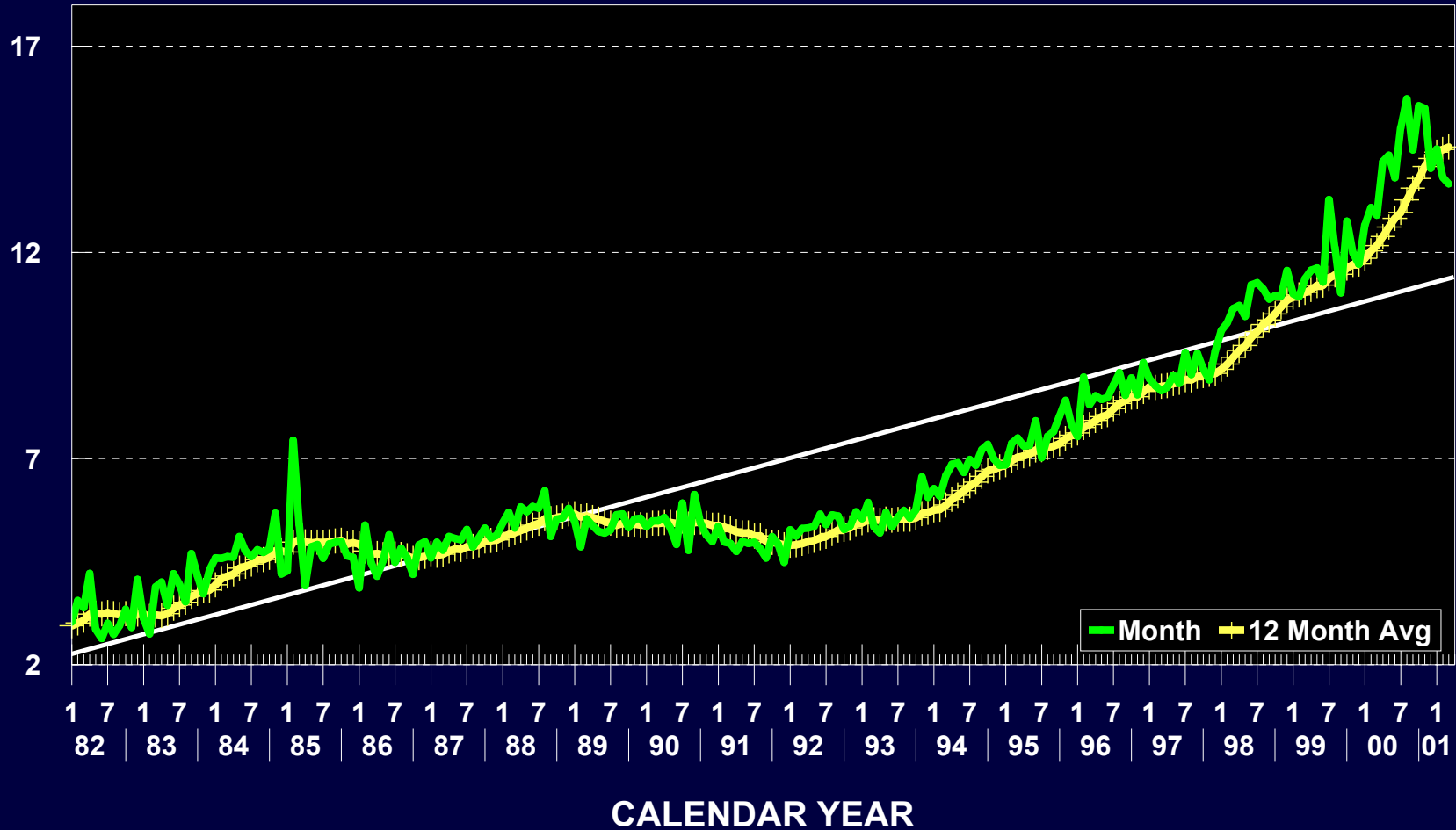
Content Networking

Streaming Media

Computer & Office Equipment

COMPUTER & OFFICE EQUIPMENT BOOKINGS

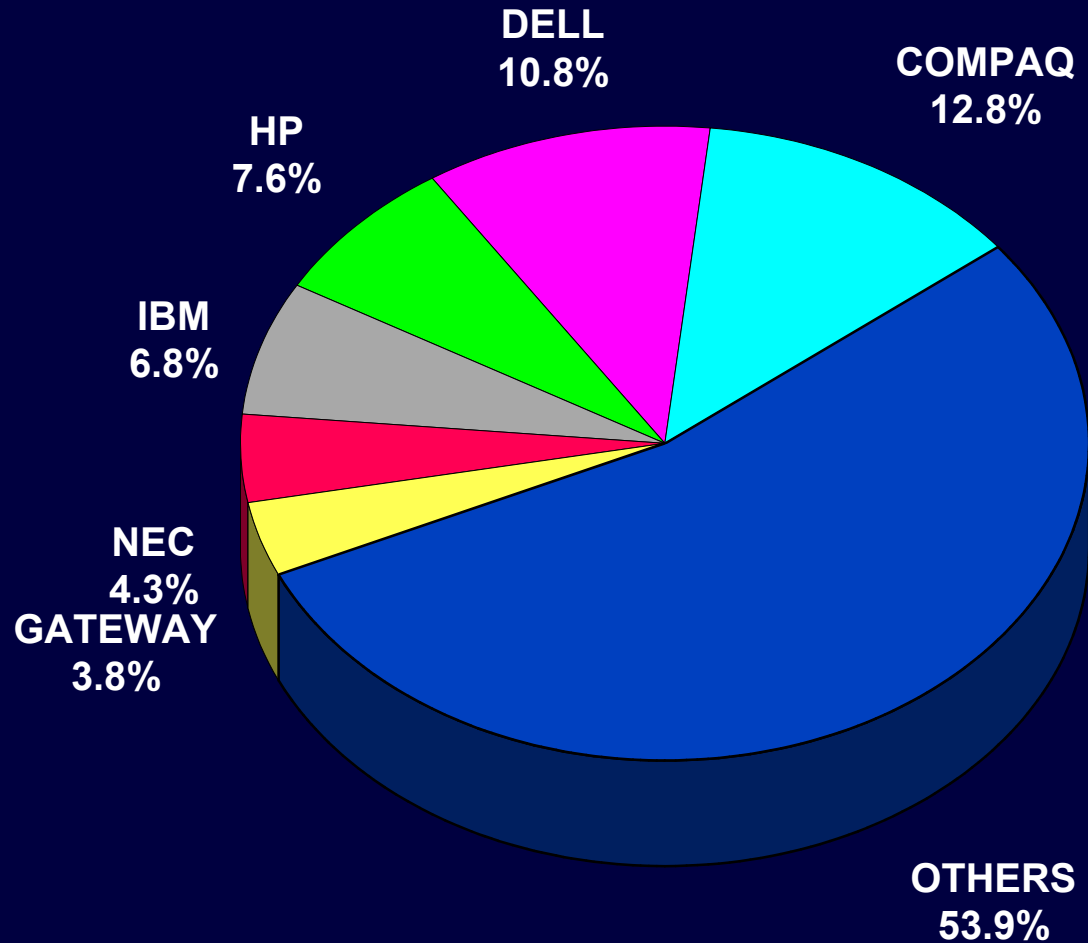
\$B (Seasonally Adjusted)



<http://www.census.gov/indicator/www/m3/>
5/2001

WORLD PERSONAL COMPUTER MARKET

2000



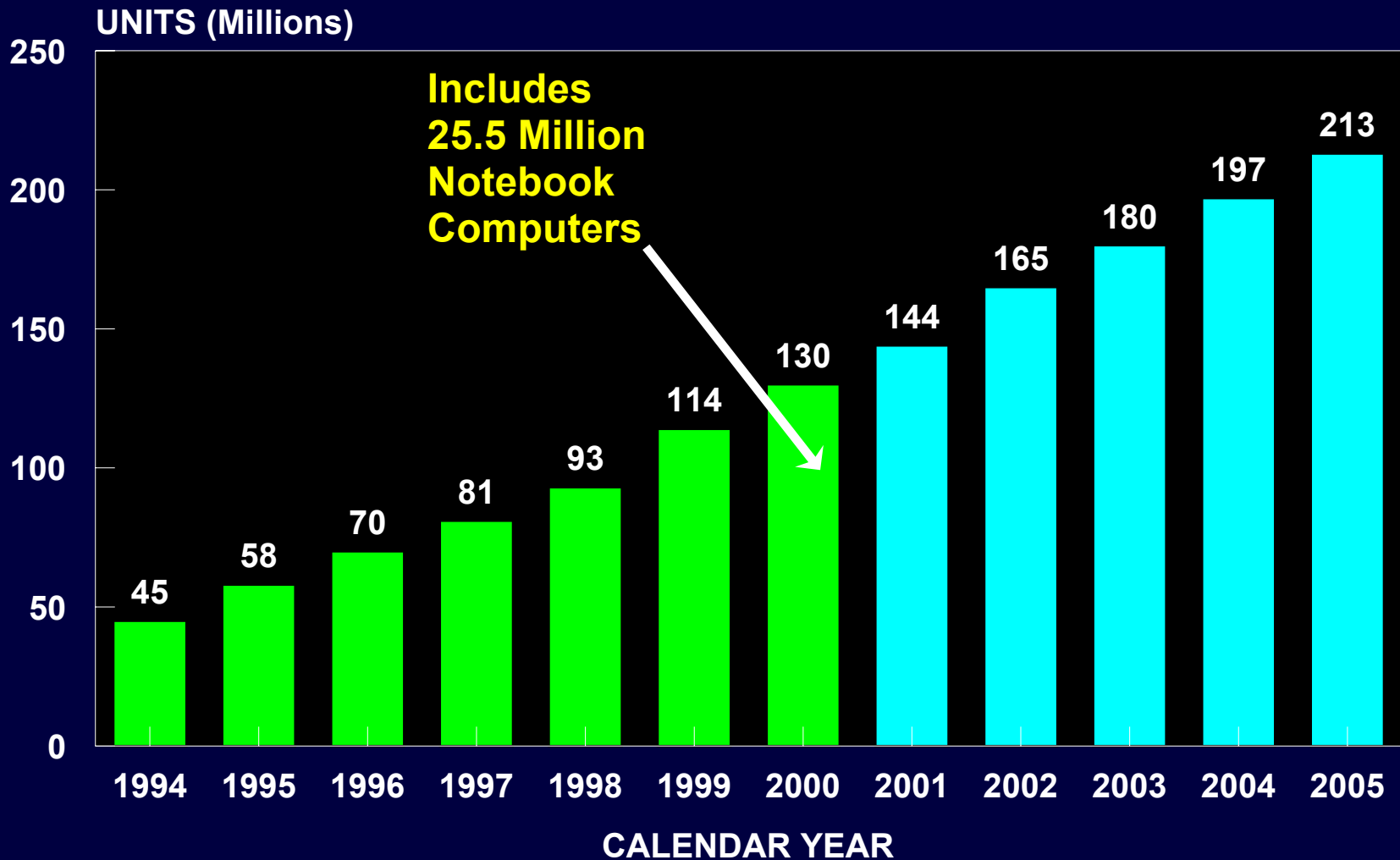
DATAQUEST 3/2001

Preliminary, Servers not included

TOTAL: 130.5 M UNITS

PERSONAL COMPUTER GROWTH

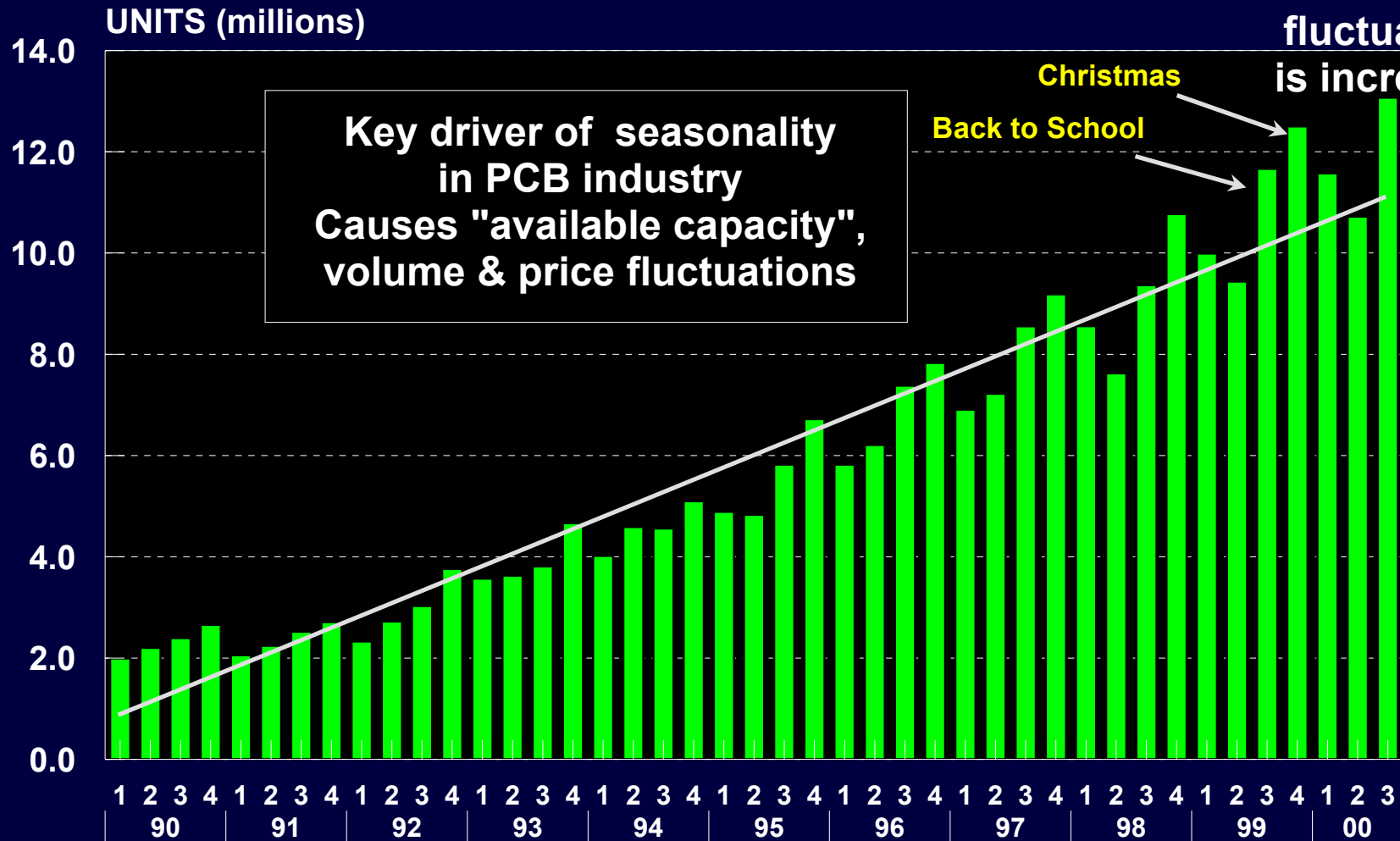
GLOBAL SALES



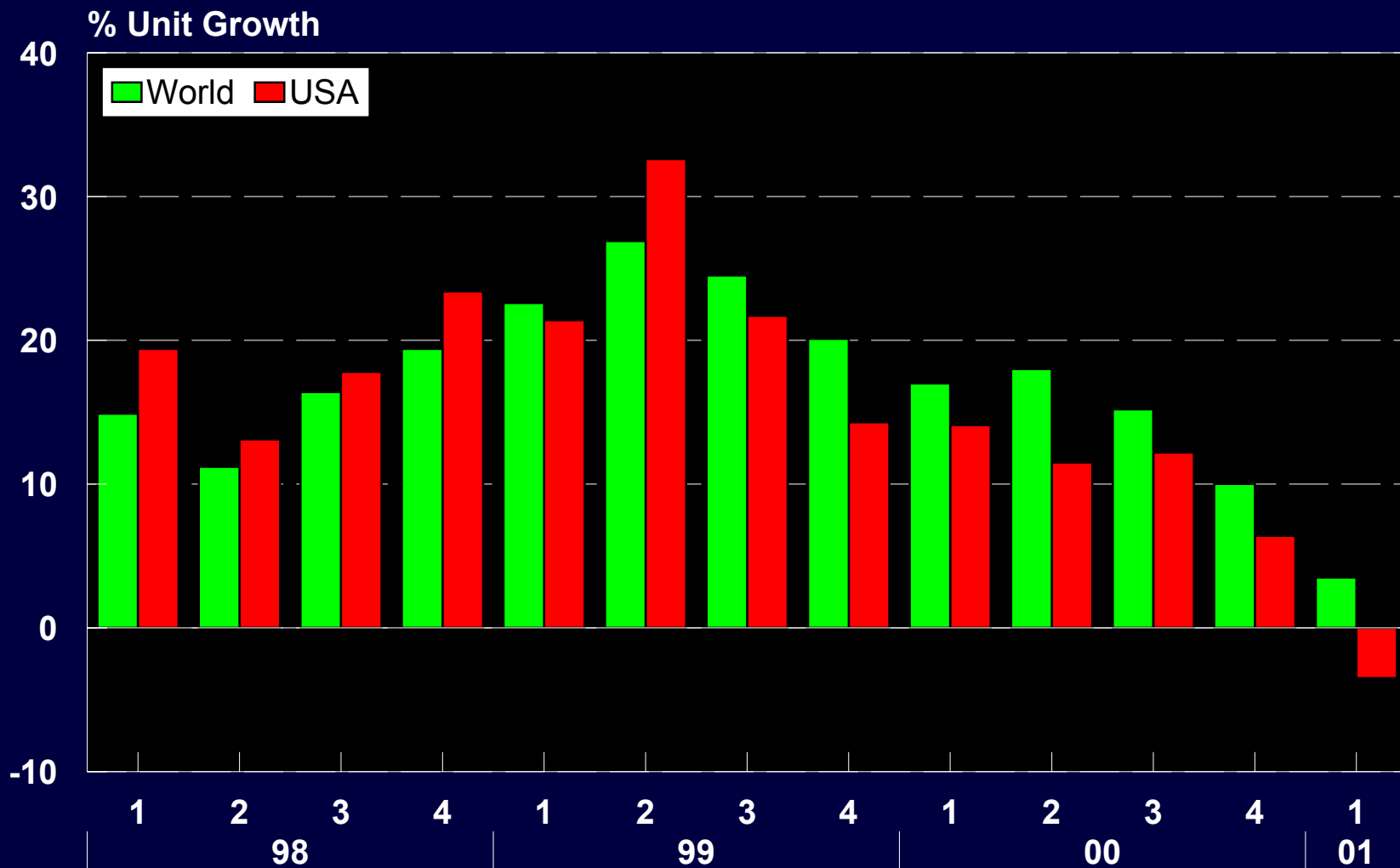
EBN:IDC, John Peedie Assoc 8/97, Dataquest 3/2001
Desktops, Notebooks, Ultraportables - does not include Servers

MICROCOMPUTER SHIPMENTS TO THE U.S.

Magnitude of seasonal fluctuations is increasing

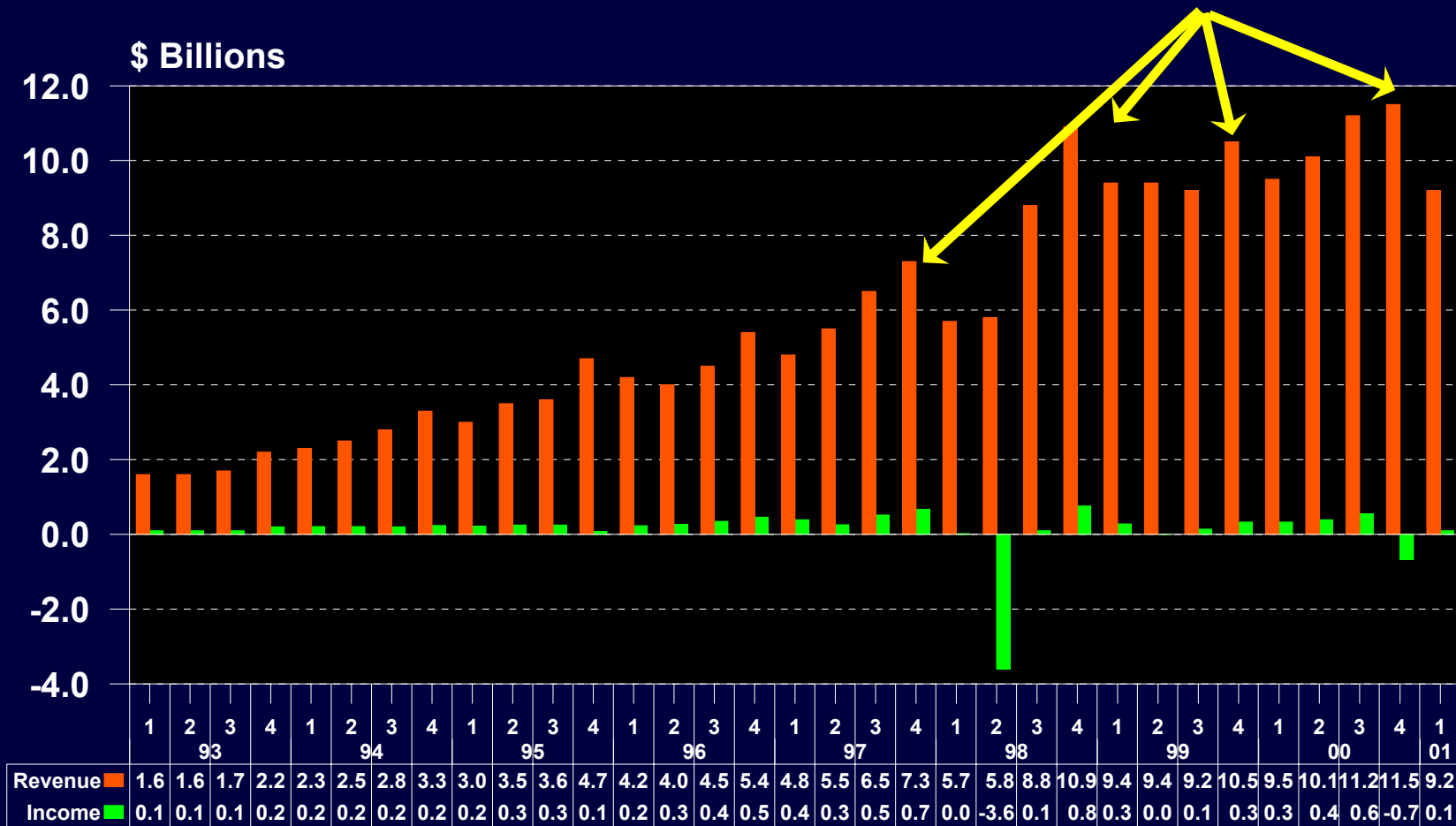


Personal Computer Market Growth World & USA



DataQuest 4/2001

Compaq Computer Revenue & Net Income



CY

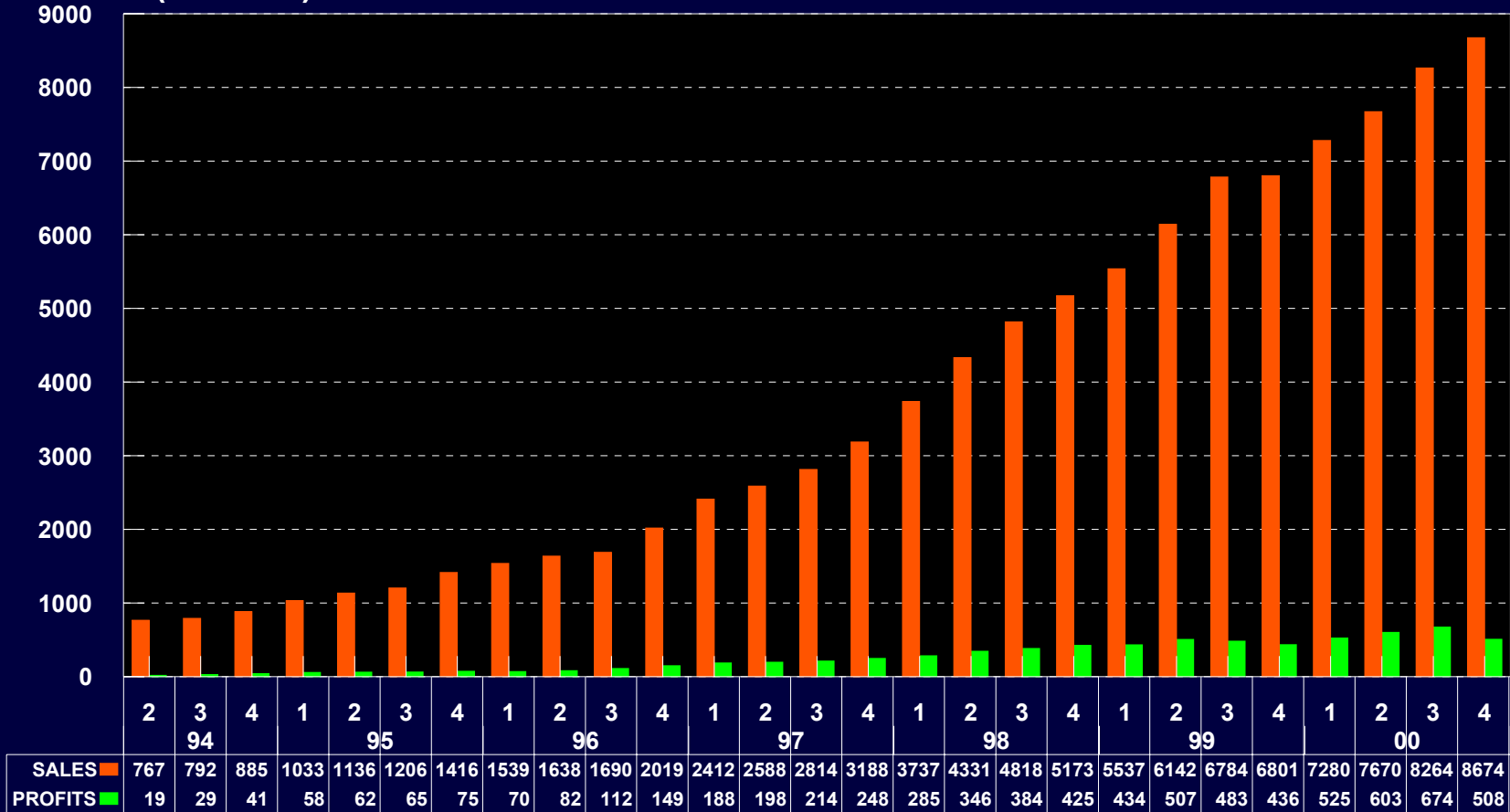
FY=CY

CPQ

DELL COMPUTER

Revenue & Net Income

\$ (Millions)

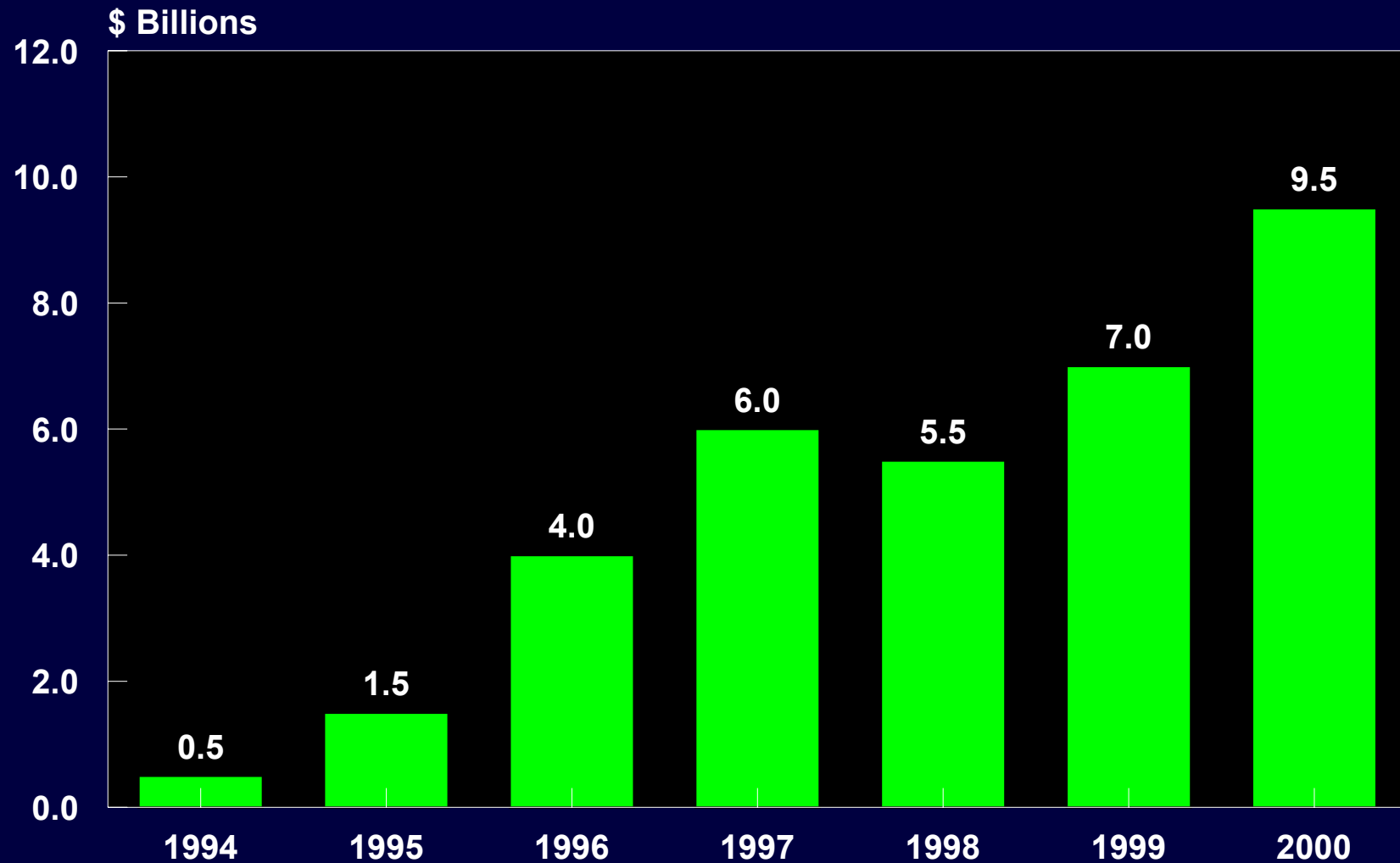


CY

DELL

FY ends October

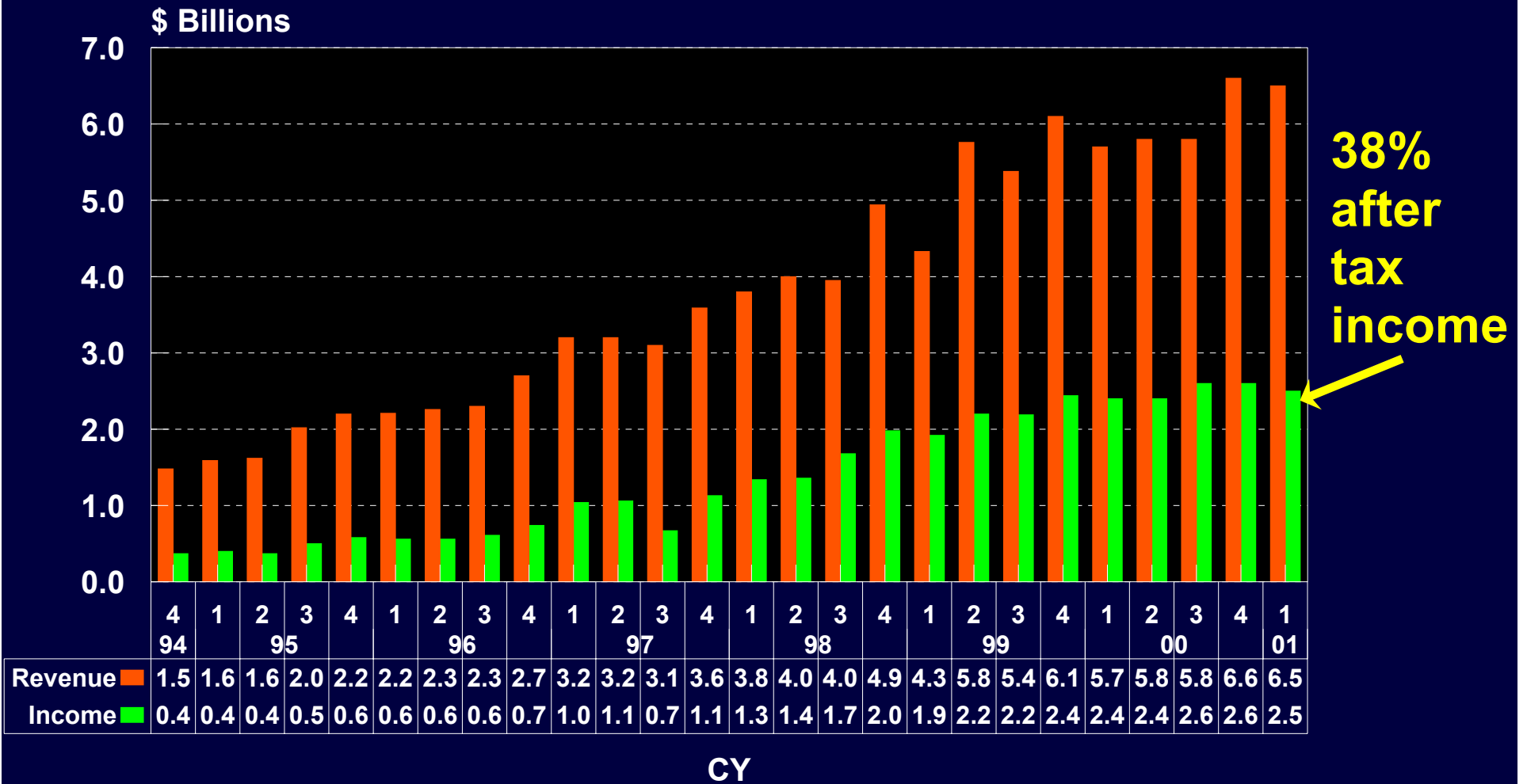
Compaq - Products Procured in Taiwan



Electronic Buyers News 3/99, Compaq 1/01

Microsoft

Revenue & Net Income



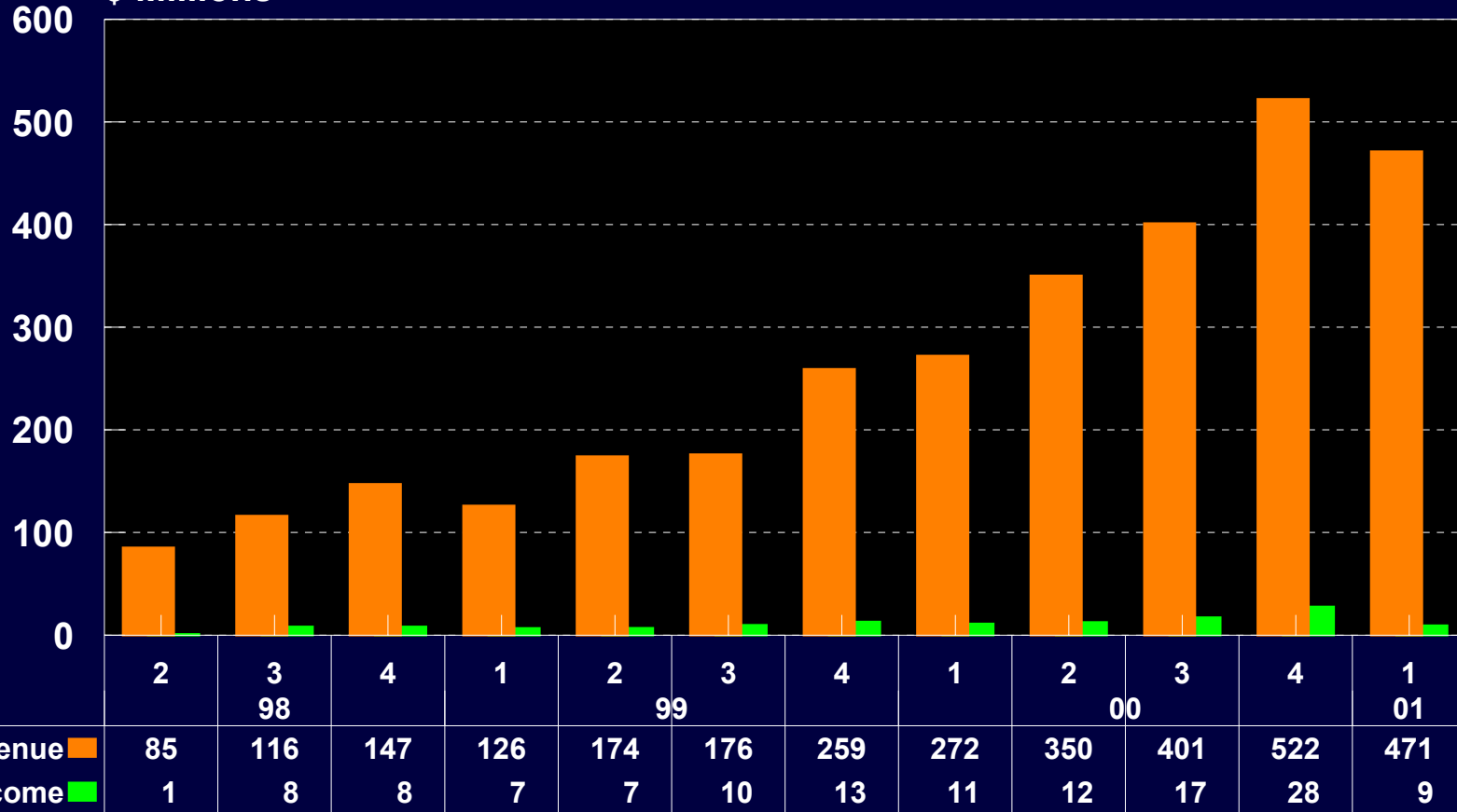
FY ends June

MSFT

Palm Inc

Revenue & Net Income

\$ Millions

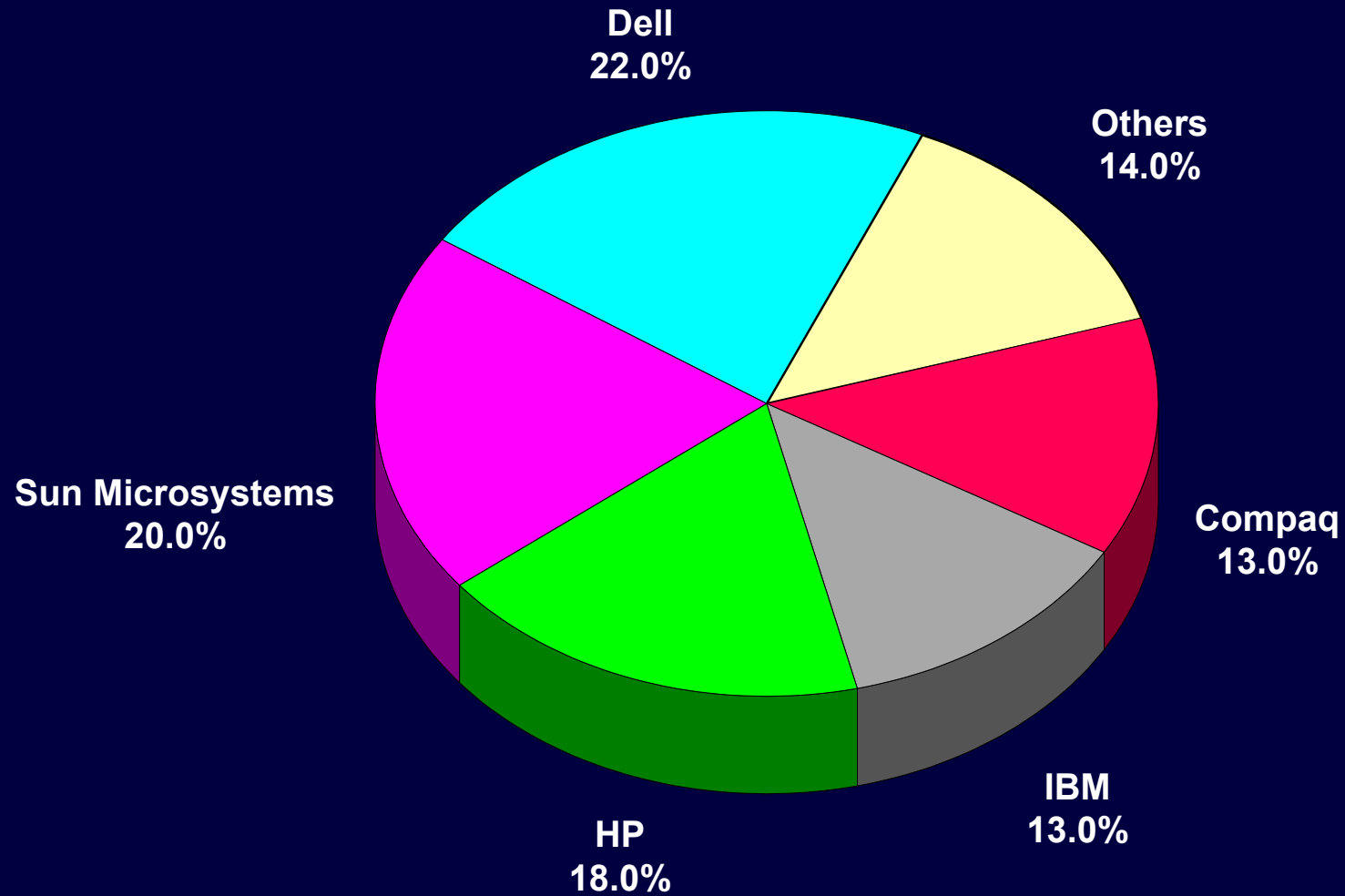


CY

FY ends May

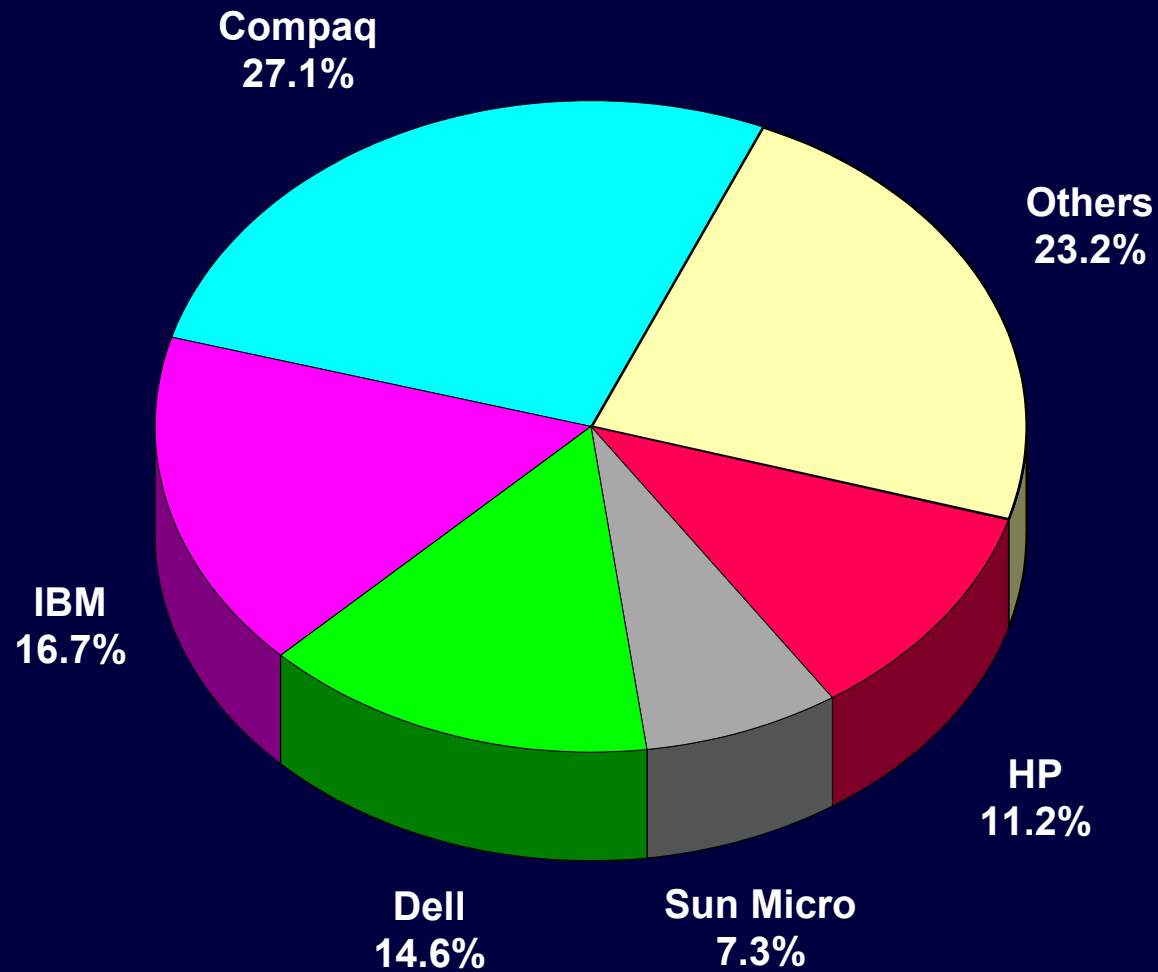
PALM

WORKSTATION WORLD MARKET 2000



2000 Total: 1.7 M Units (up 7% vs 1999)

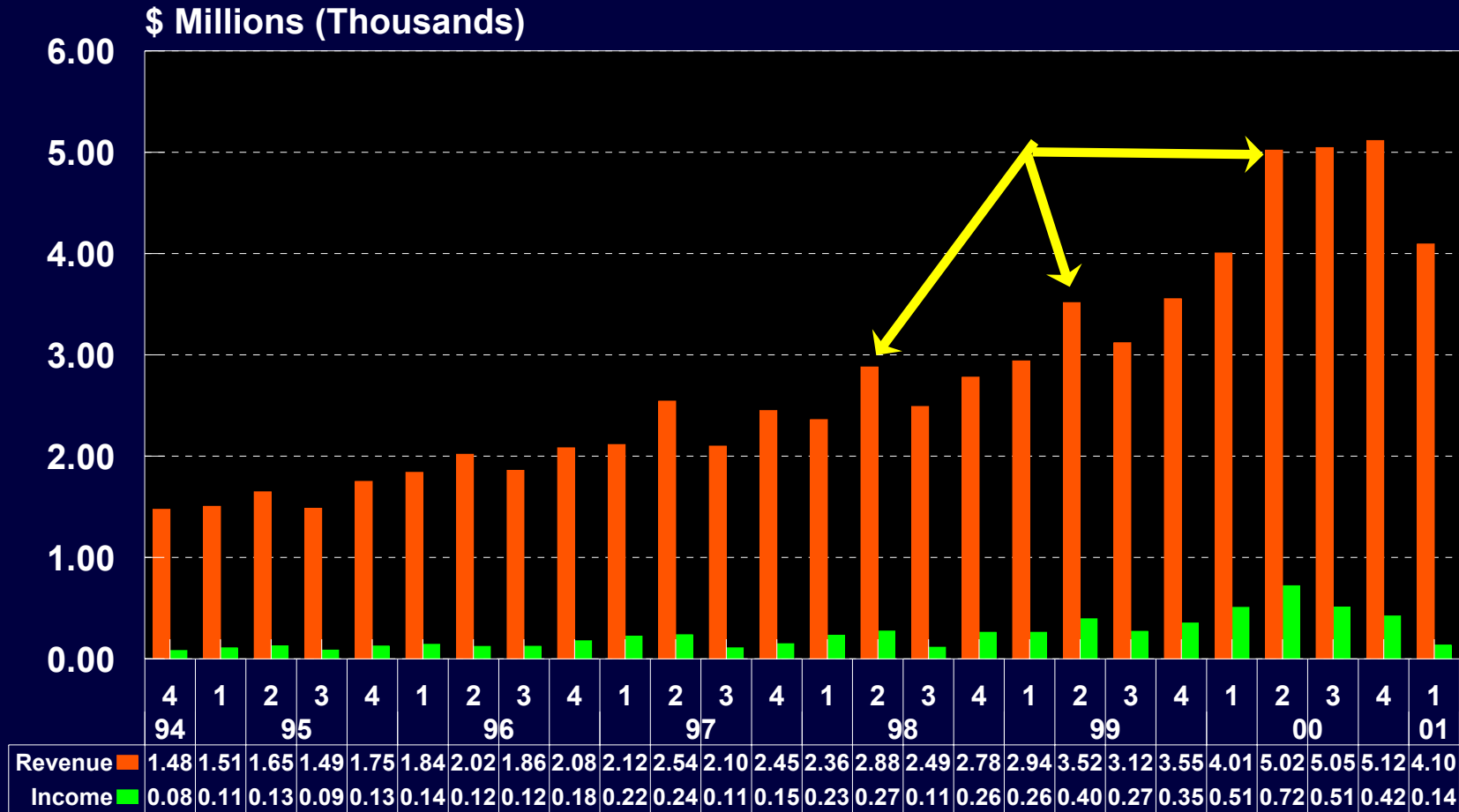
SERVER WORLD MARKET 2000



2000 Total: 3.9 M Units (up 14% vs 1999)

Sun Microsystems

Revenue & Net Income



CY

FY ENDS 6/30

SUNW

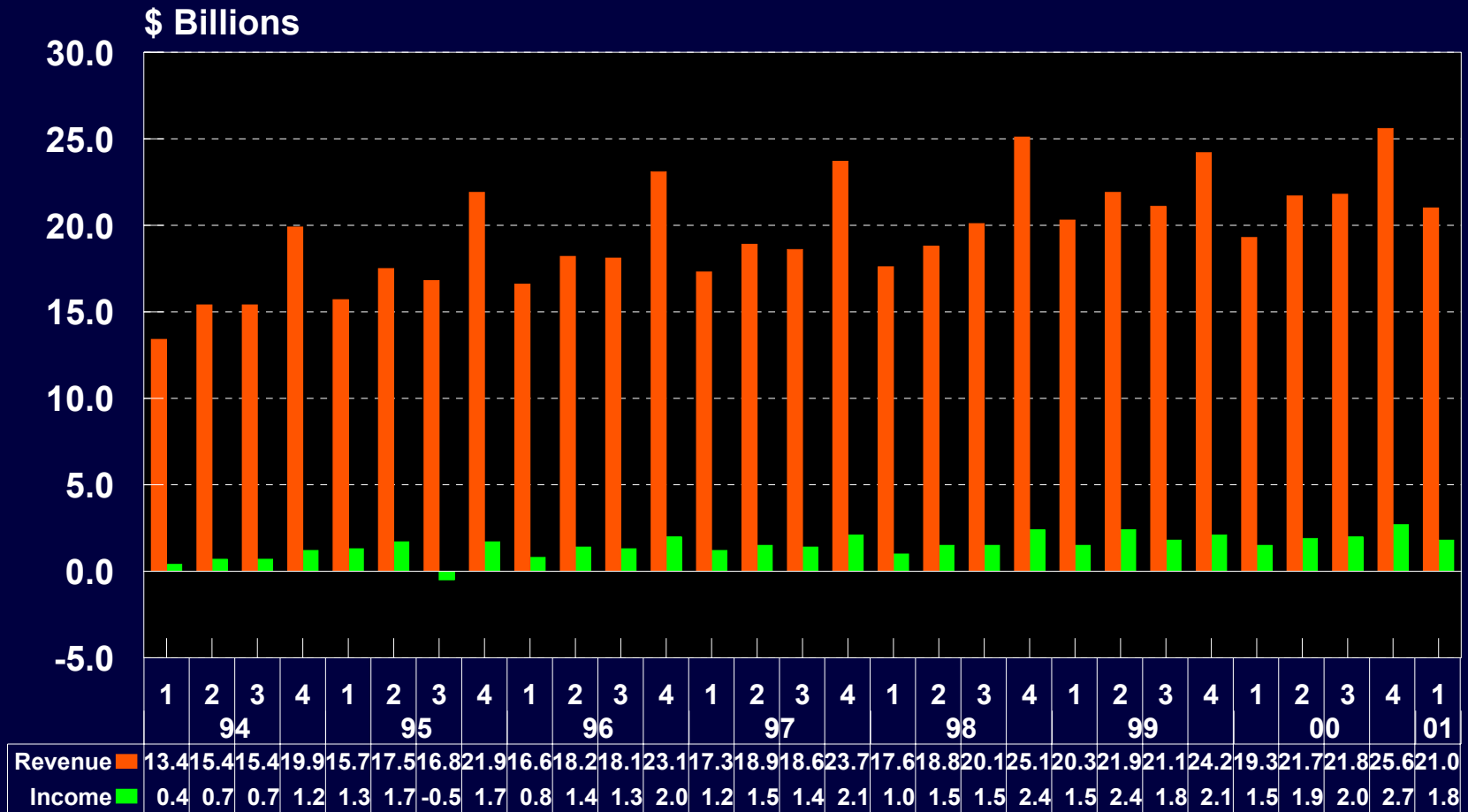
The Internet will be 2000 times larger in five years.

All of the servers in the market today represent less than 4% of the Internet's expected capacity in five years.

John Shoemaker, Exec VP, Sun Microsystems 11/2000

IBM

Revenue & Net Income



CY

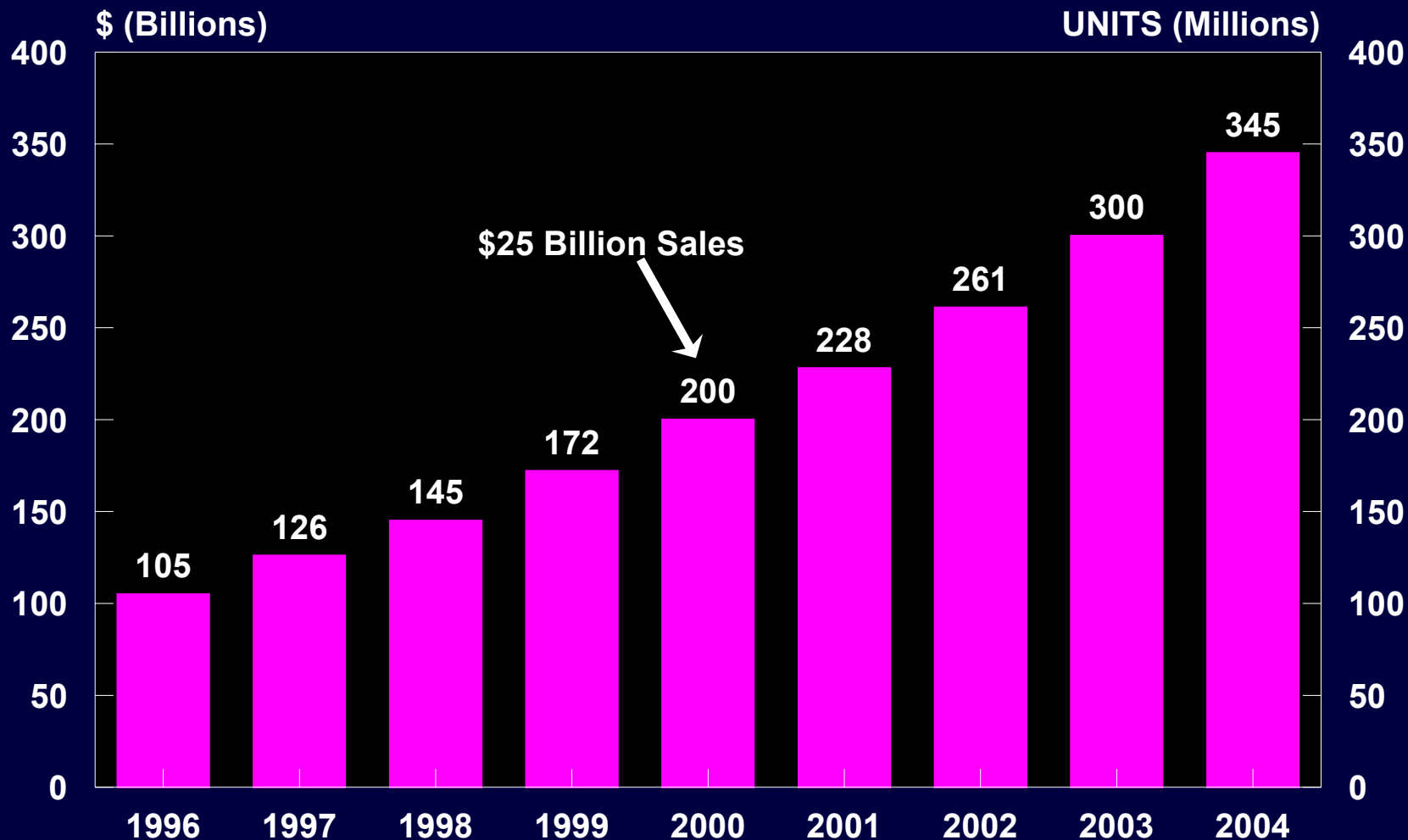
FY=CY

IBM

Computer Peripherals

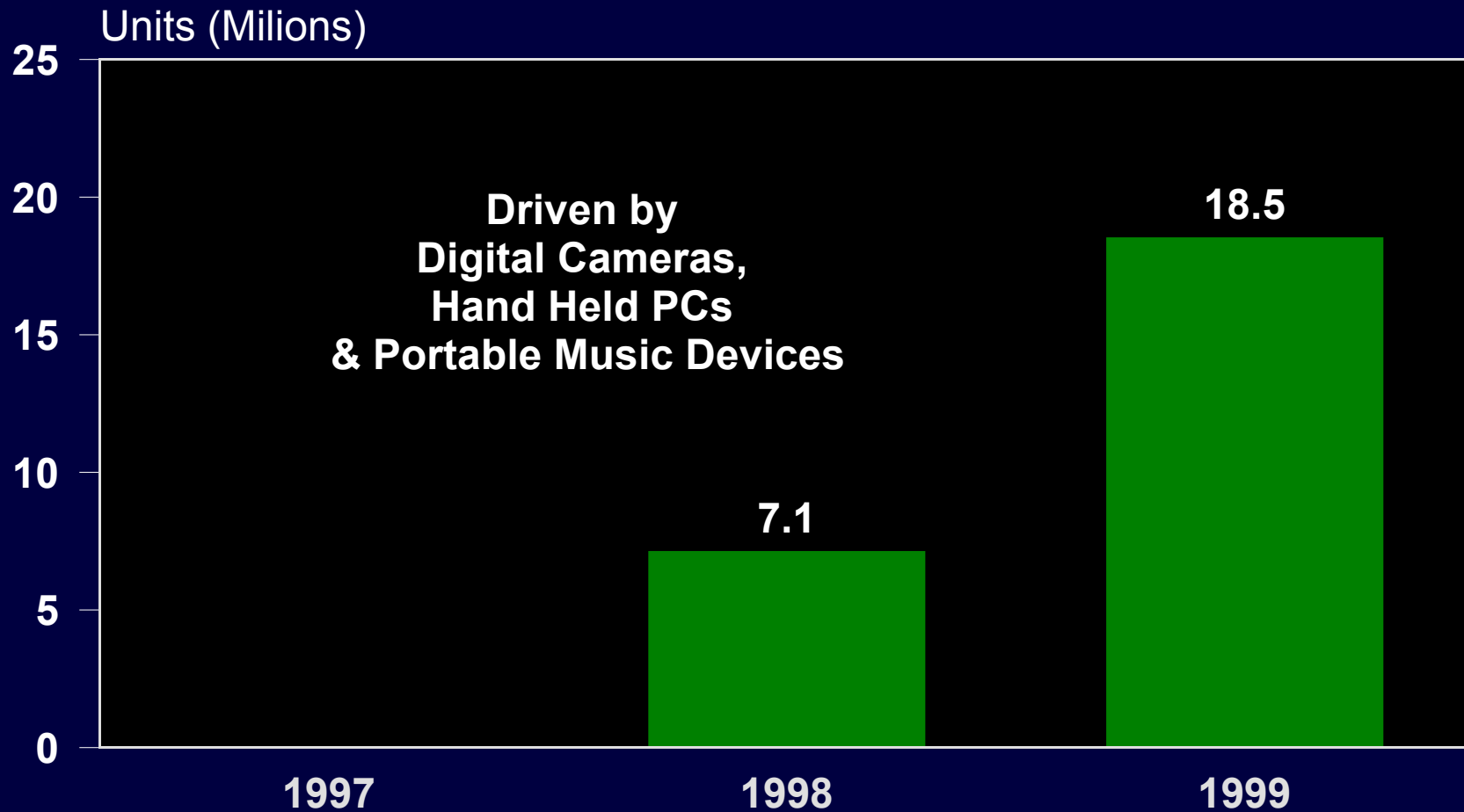
RIGID DISK DRIVES

WORLDWIDE UNIT SHIPMENTS



DISK/TREND 6/98, TrendFocus 2/99, Forward Concepts 4/2000, IDC 11/2000

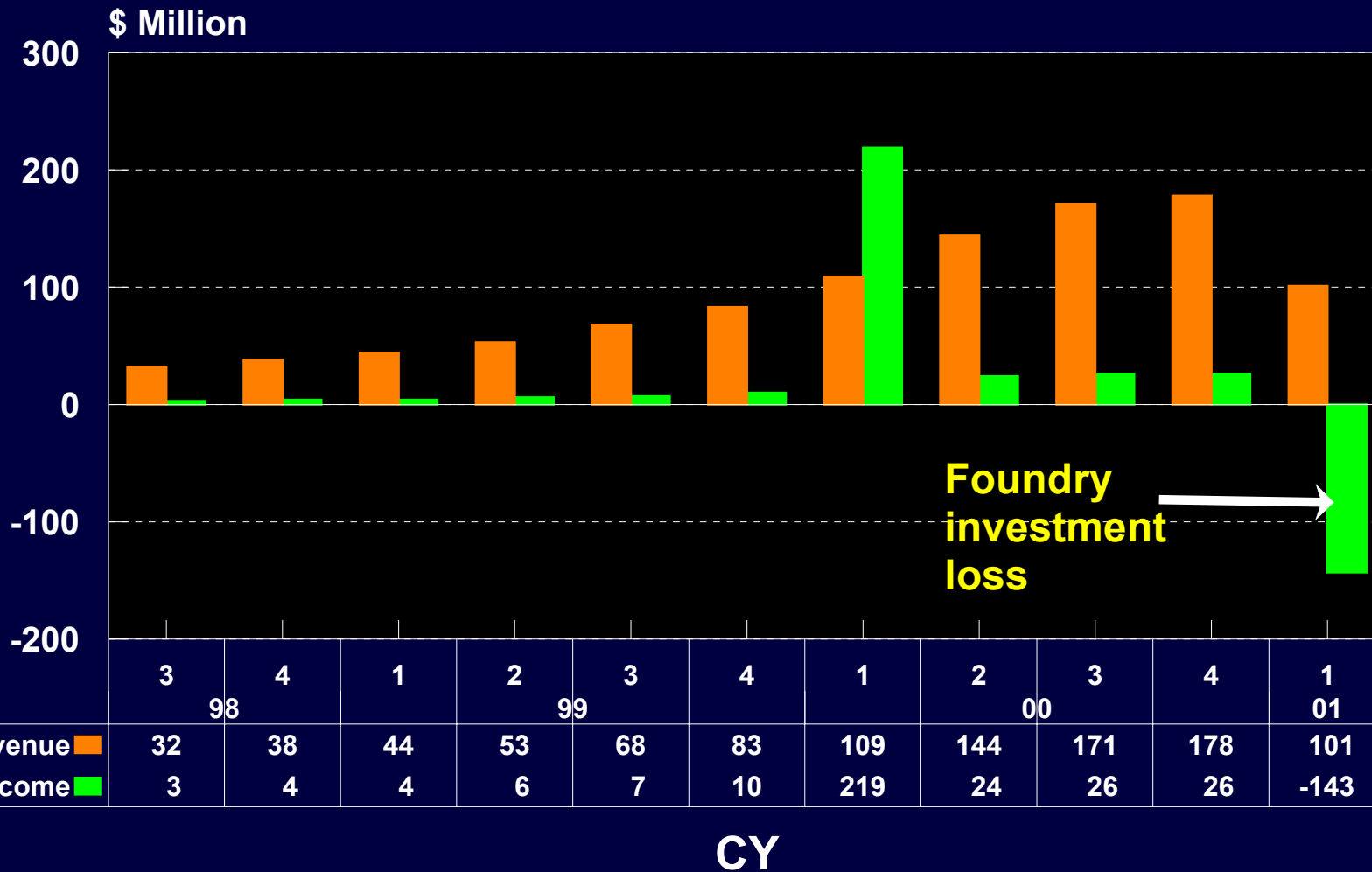
Flash Memory Cards World Shipments



IDC 11/2000

SanDisk

Revenue & Net Income

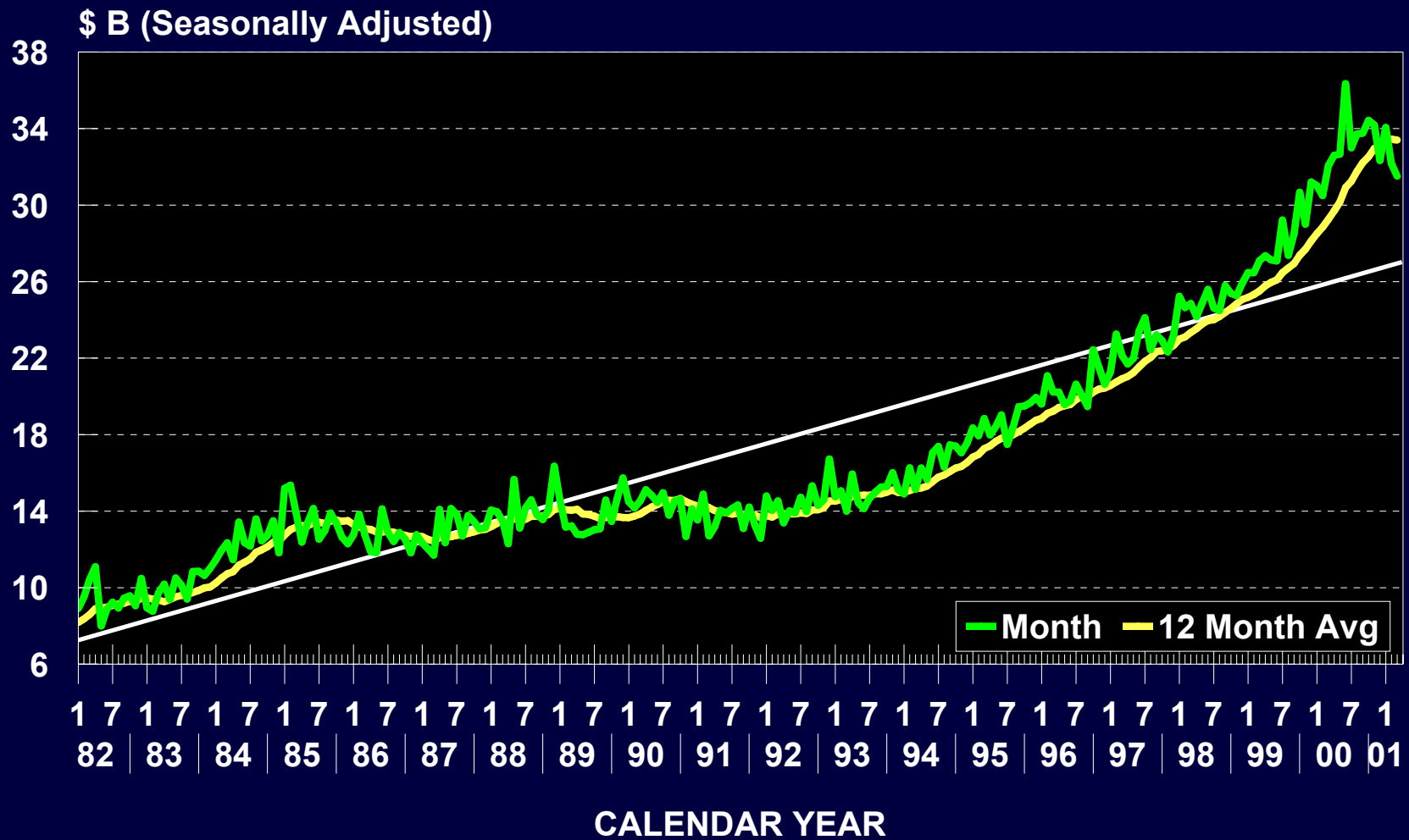


FY = CY

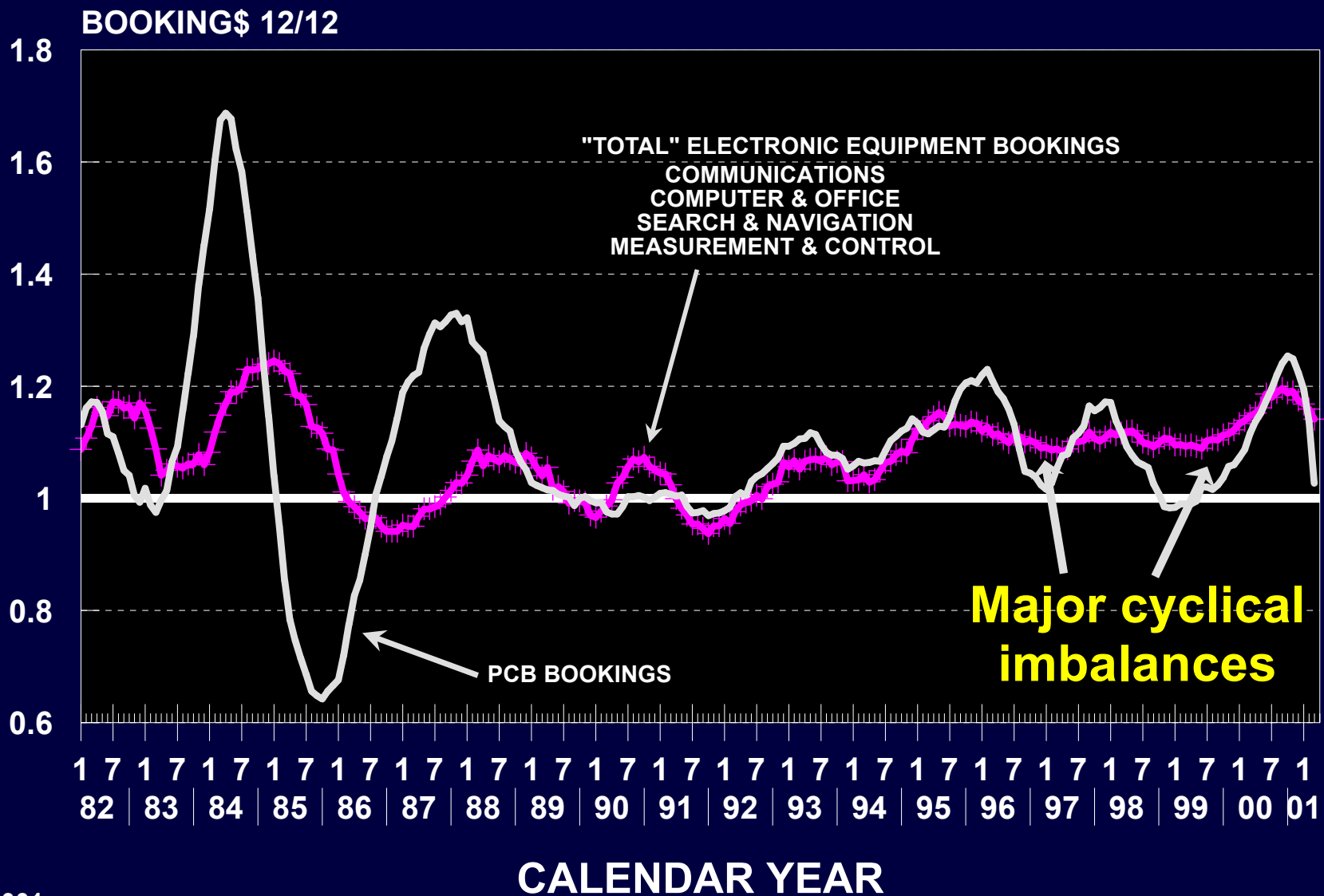
SN DK

Electronic Equipment Summary

TOTAL ELECTRONIC EQUIPMENT BOOKINGS



U.S. PCBs vs Total Electronic Equipment

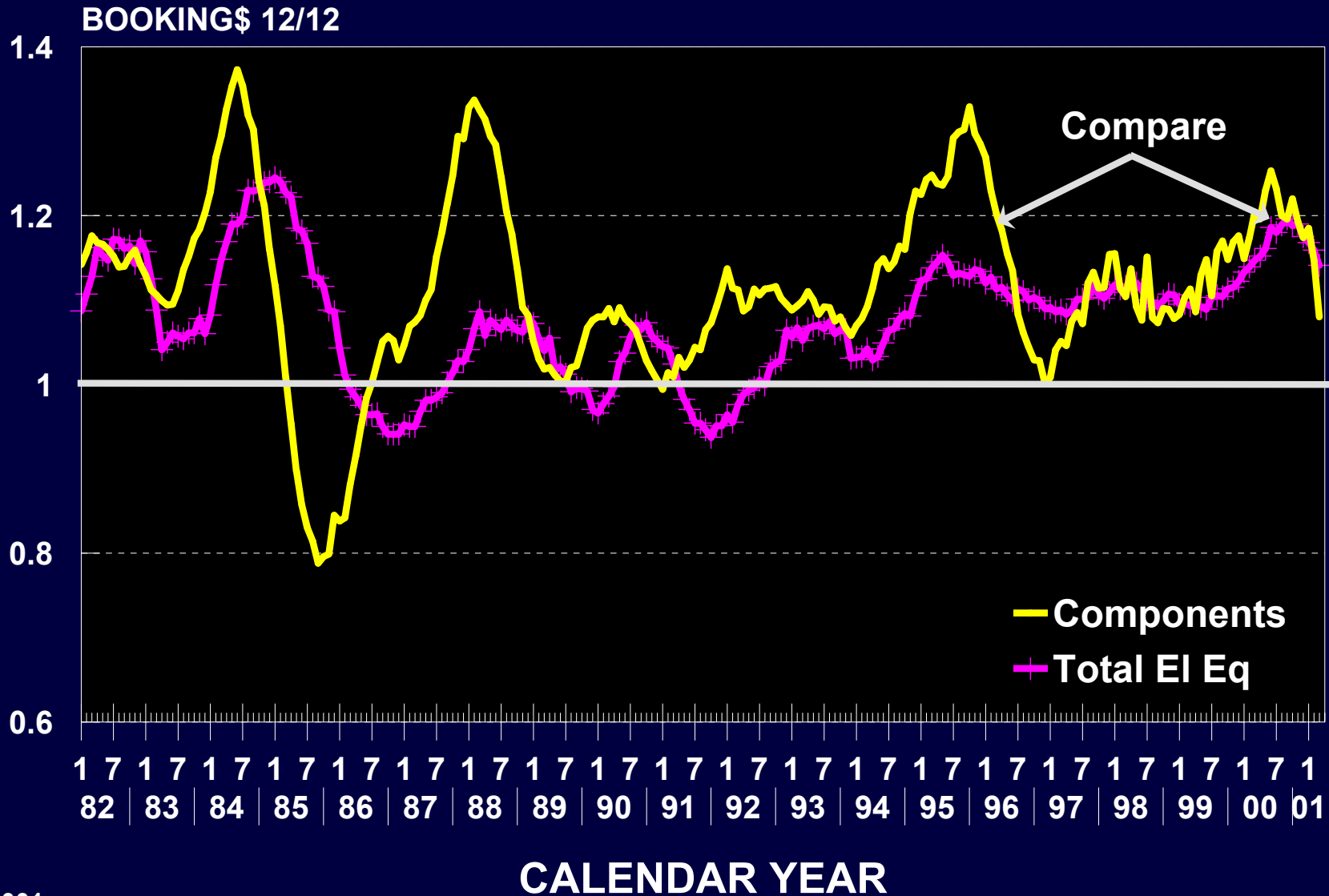


ELECTRONIC COMPONENTS BOOKINGS

\$ B (Seasonally Adjusted)



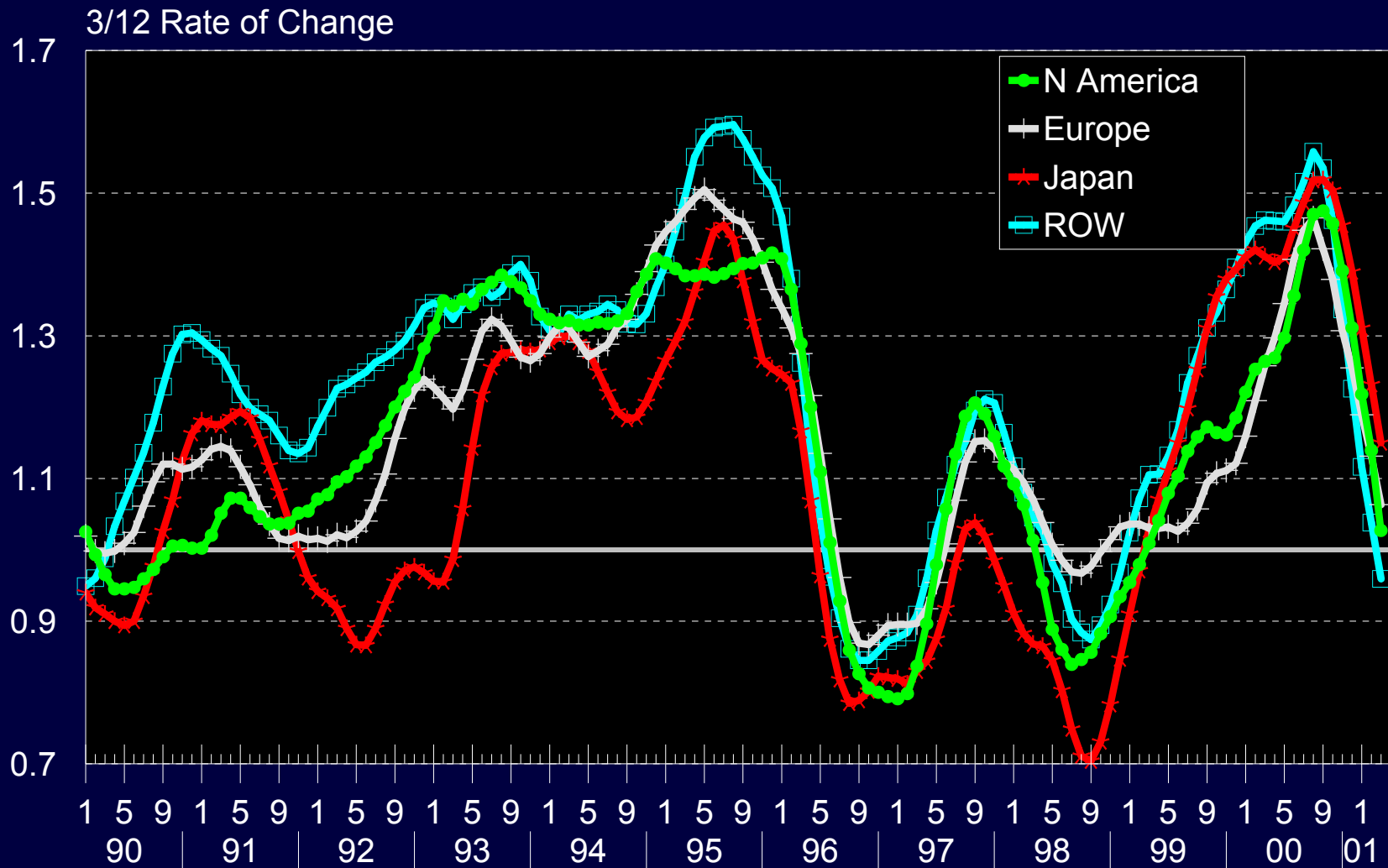
U.S. Electronic Components vs Total Electronic Equipment



Semiconductors

SEMICONDUCTOR GROWTH RATES

TOTAL \$ SHIPMENTS TO AN AREA



Total \$ Shipments From All Countries To An Area
SIA website: www.semichips.org/

MONTHLY SEMICONDUCTOR SHIPMENTS

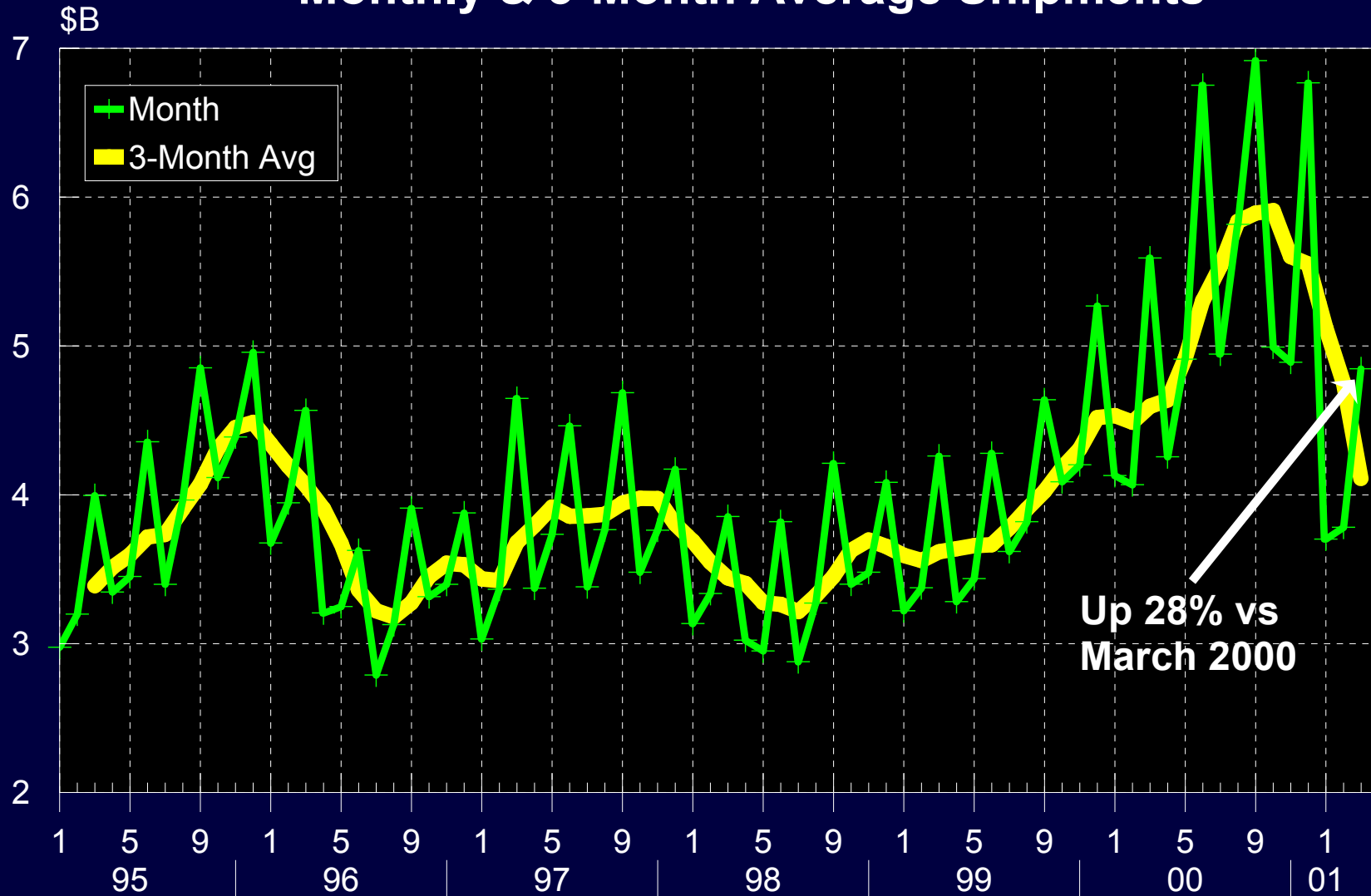
\$ Billions

	<u>3/00</u>	<u>3/01</u>	<u>% CH</u>
Americas	4.60	4.11	-10.6 %
Europe	3.30	3.28	-0.7 %
Japan	3.35	3.59	7.0 %
Asia Pacific	3.82	3.42	- 10.4%
Total	15.07	14.40	-4.5 %

SIA 5/2001 - Monthly data

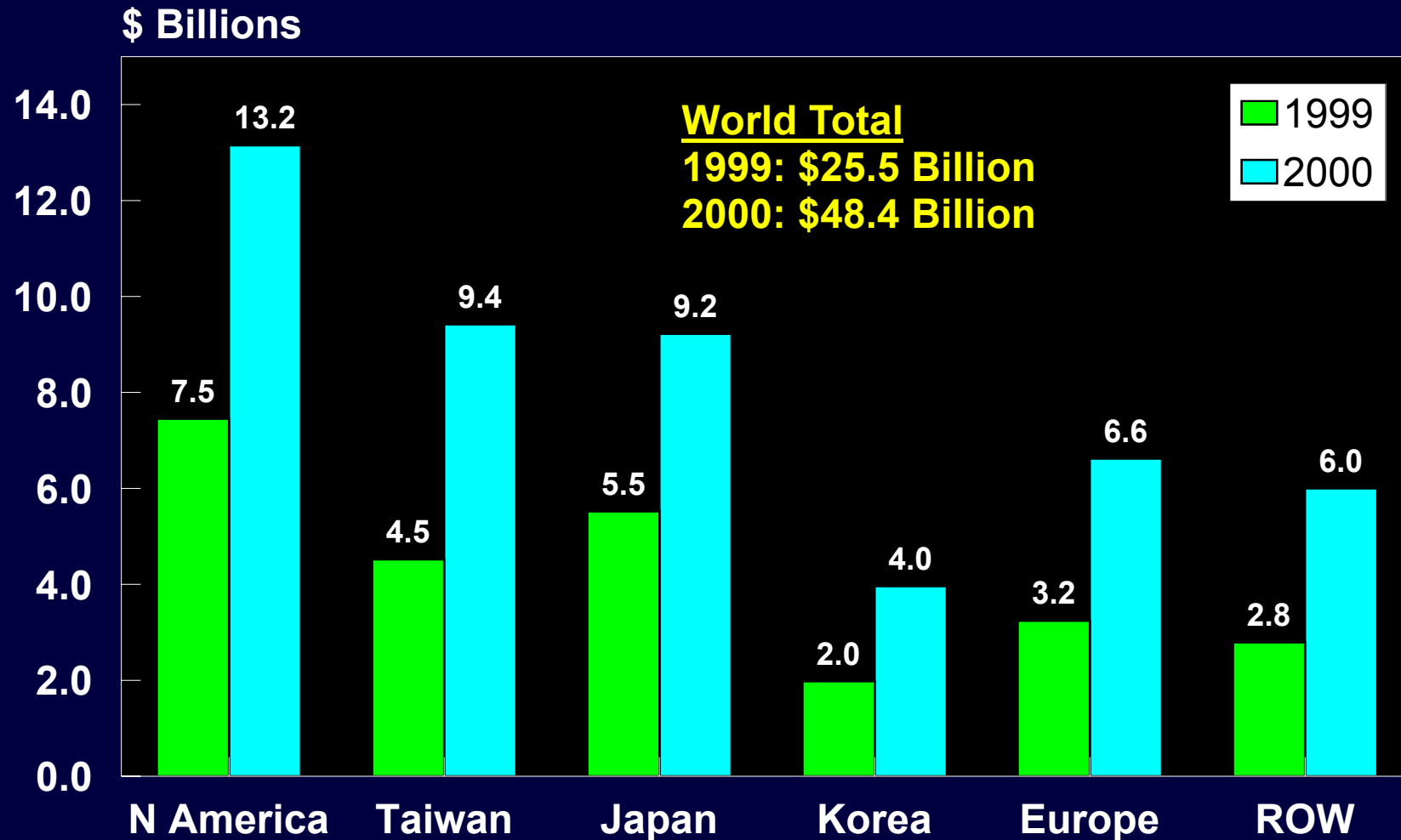
N AMERICAN SEMICONDUCTOR SHIPMENTS

Monthly & 3-Month Average Shipments



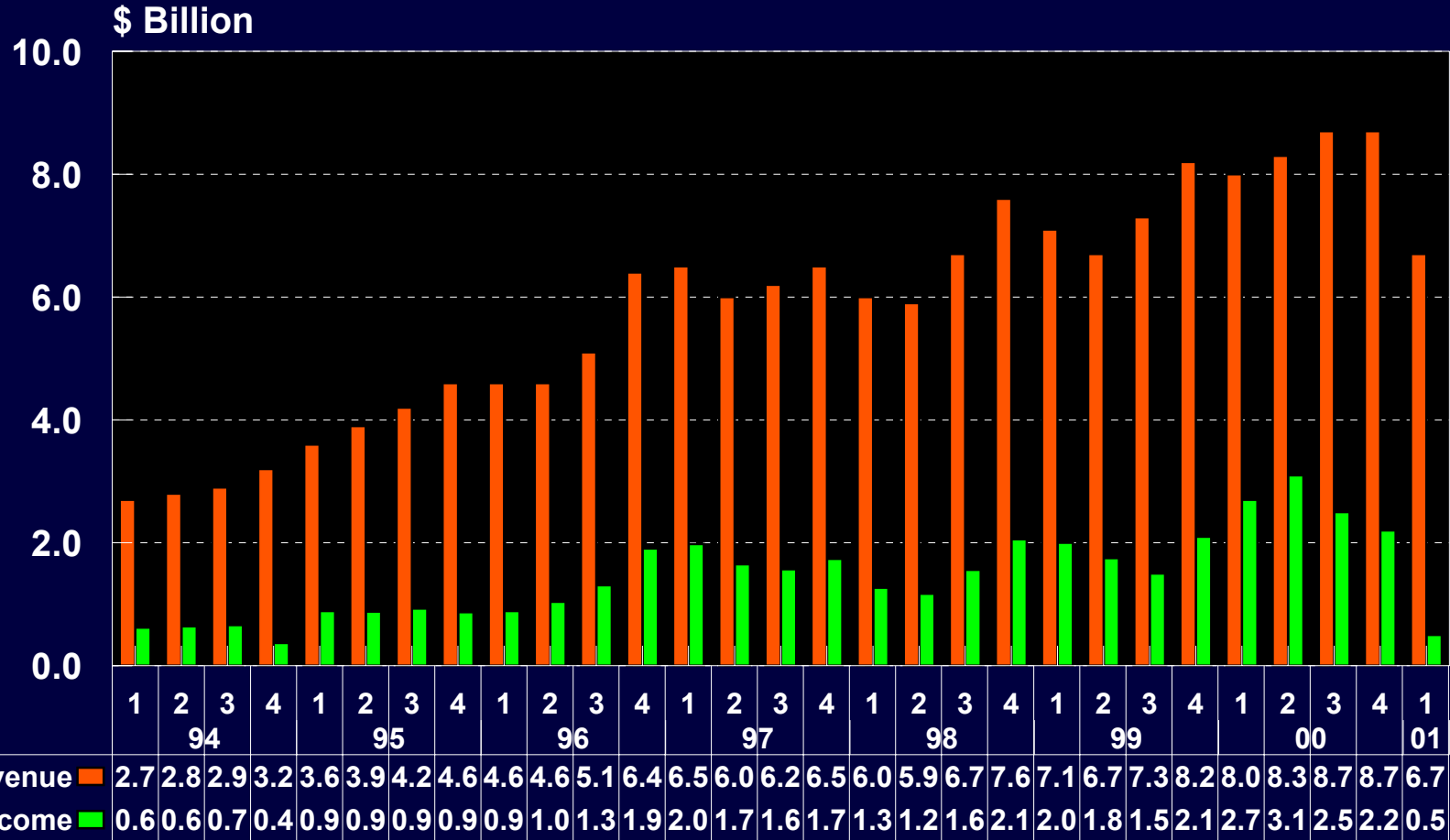
SIA website: www.semichips.org/

World Semiconductor Equipment Sales



Intel

Revenue & Net Income

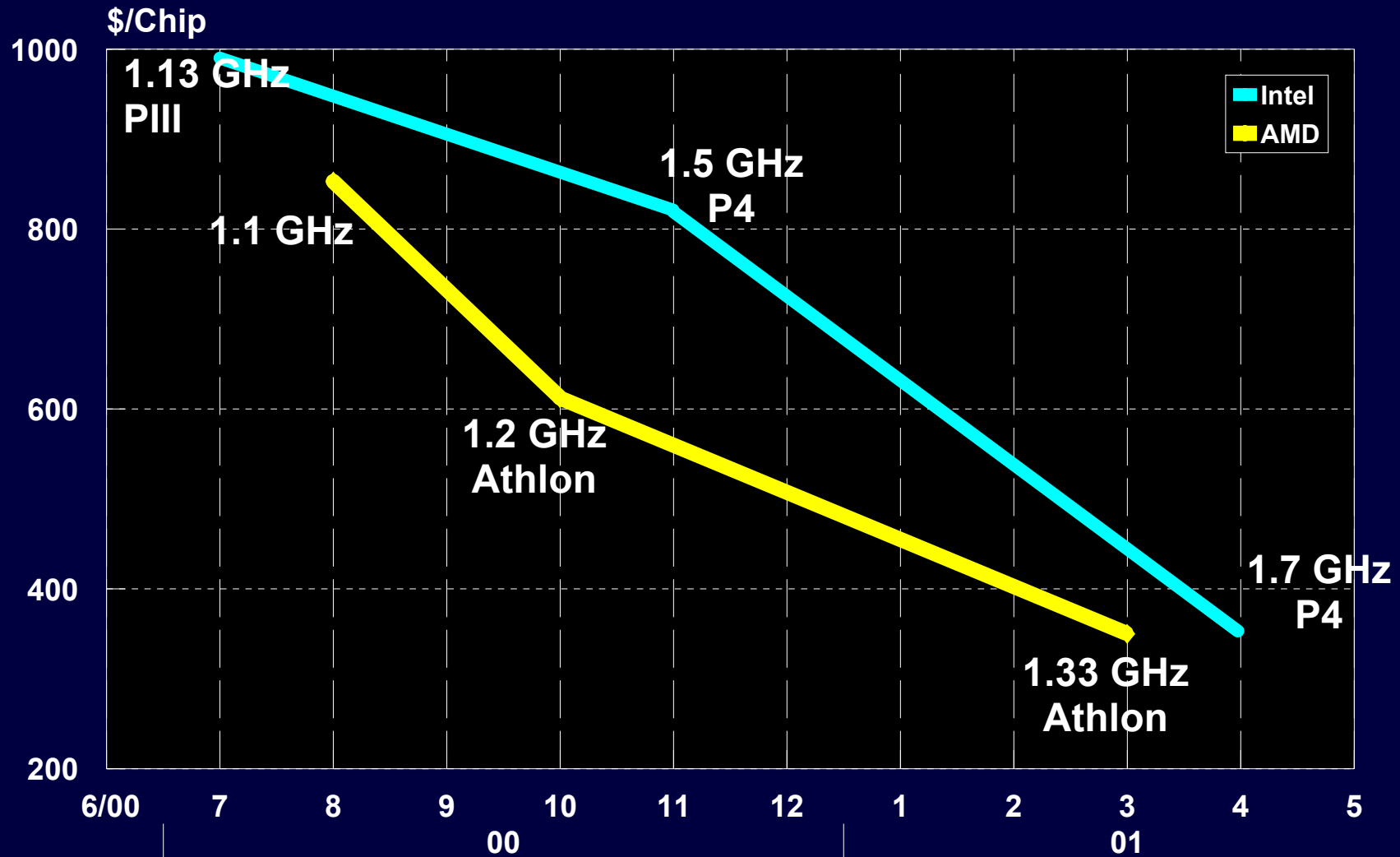


CY

INTC

FY=CY

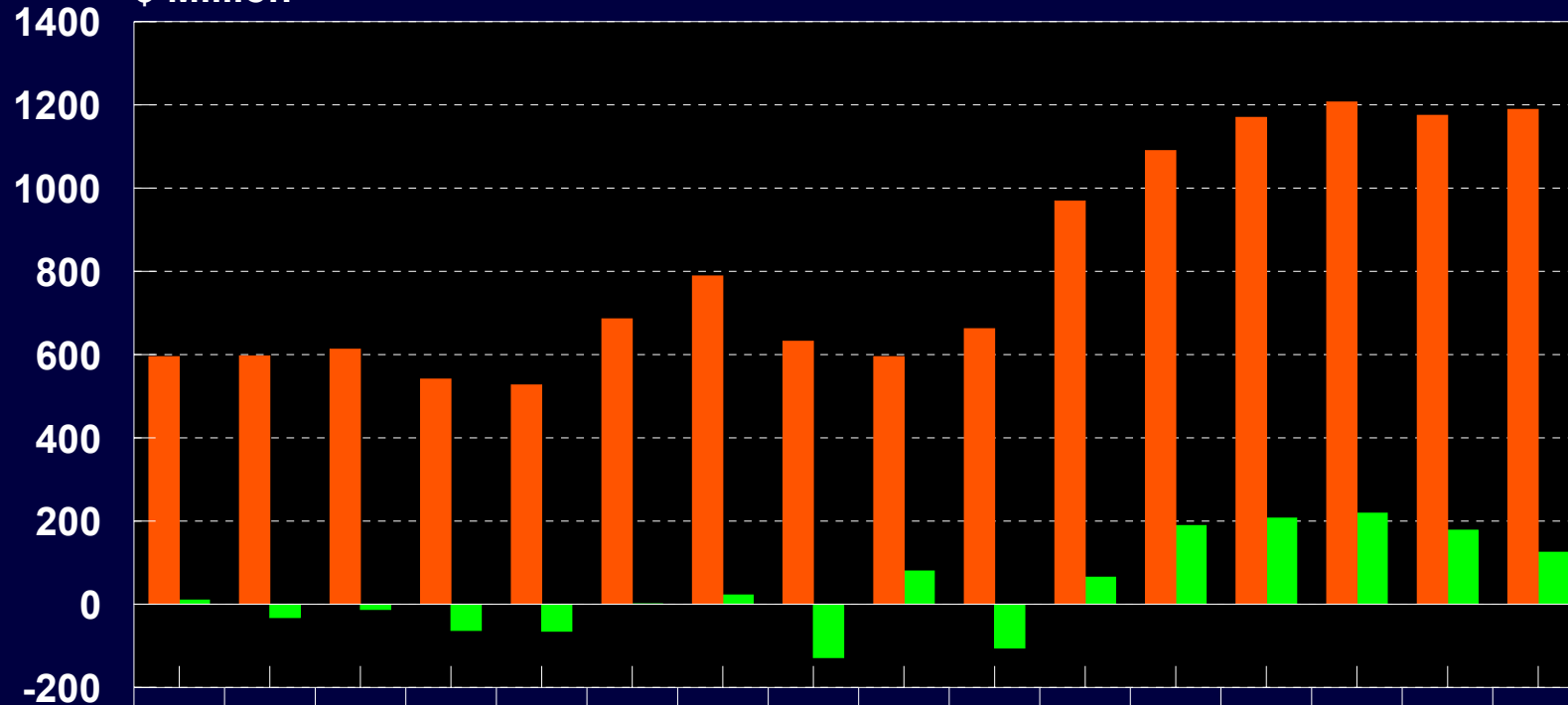
Microprocessor Prices Intel & AMD



Advanced Micro Devices

Revenue & Net Income

\$ Million



Revenue	595	597	613	541	527	686	789	632	595	662	969	1090	1170	1207	1175	1189
Income	10	-31.7	-12.3	-62.7	-64.6	1	22.3	-128	80	-105	65	189	207	219	178	125

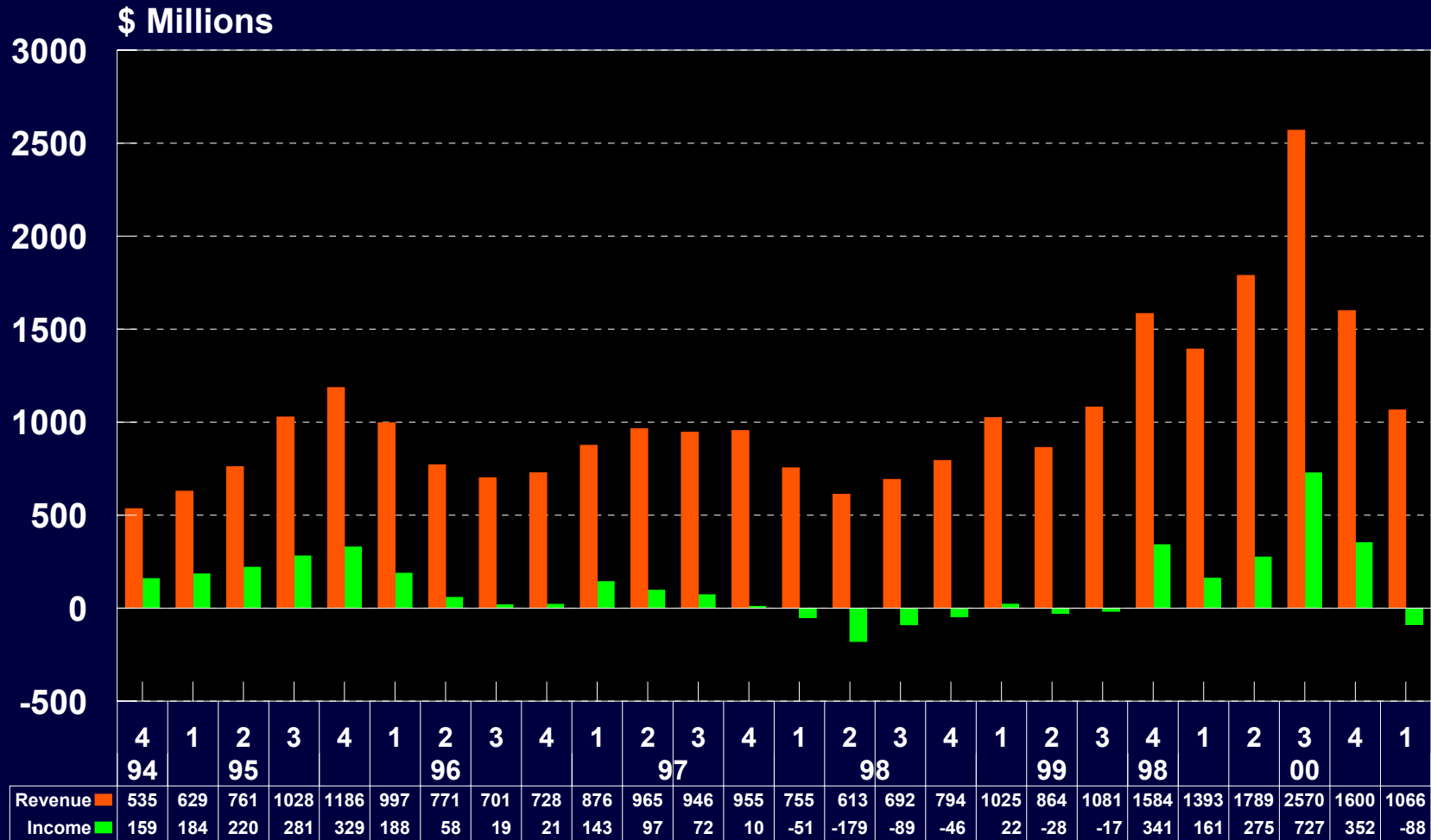
CY

AMD

FY=CY

MICRON TECHNOLOGY

Revenue & Net Income



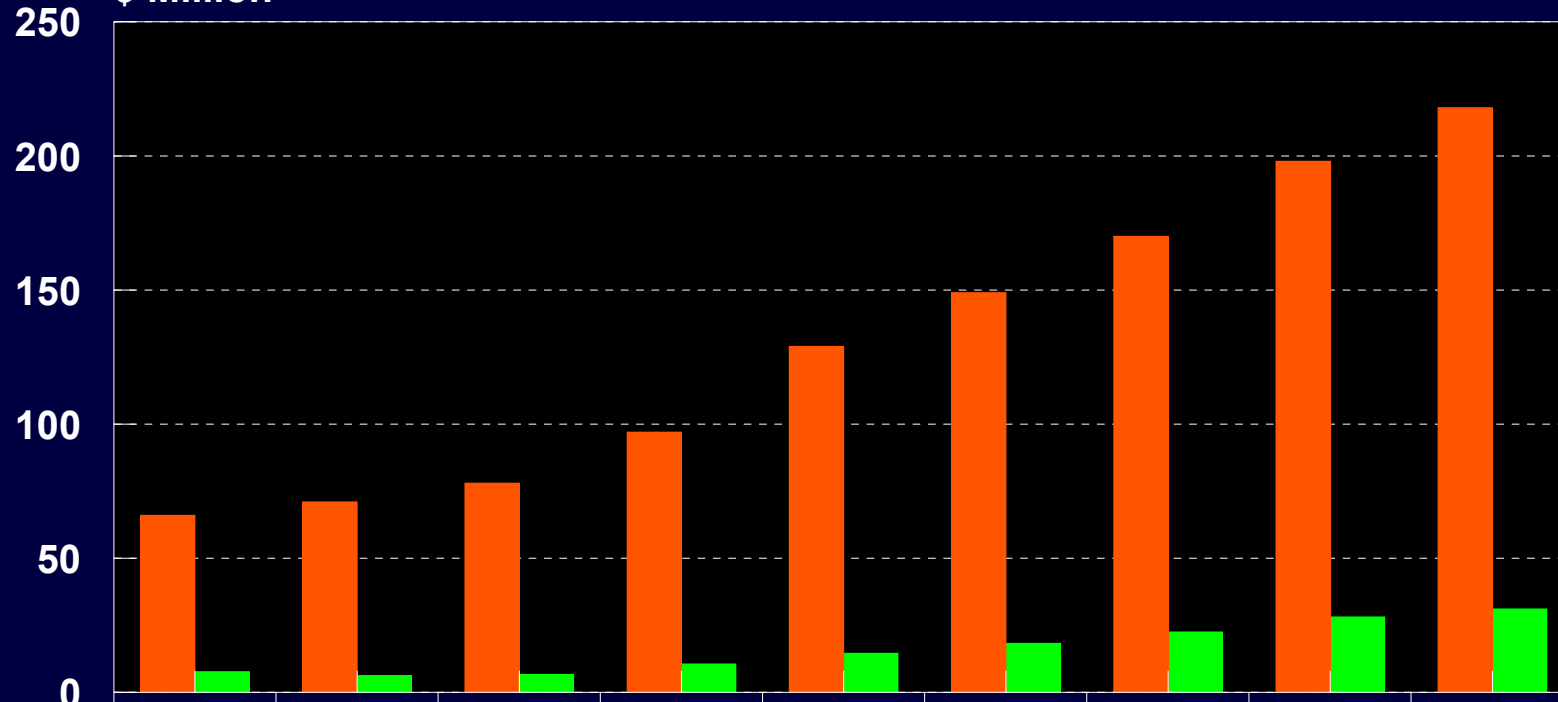
CY

MU

NVIDIA Corp

Revenue & Net Income

\$ Million



Revenue

Income

4

1

2

3

4

1

2

3

4

98

99

00

66

71

78

97

129

149

170

198

218

7.7

6.3

6.7

10.6

14.6

18.3

22.5

28.1

31.1

CY

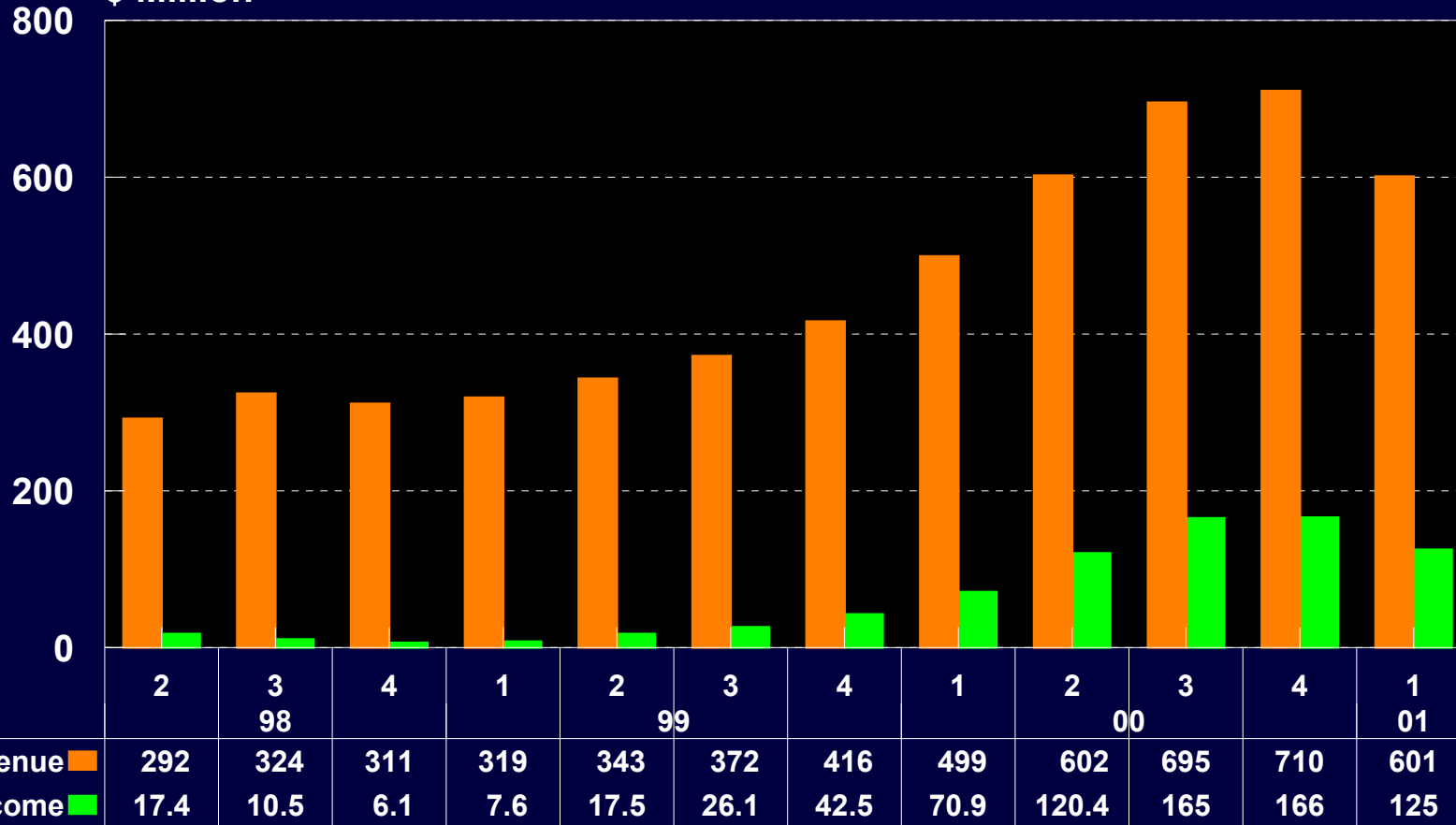
NVDA

FY ends January

AVX Corp

Revenue & Net Income

\$ Million



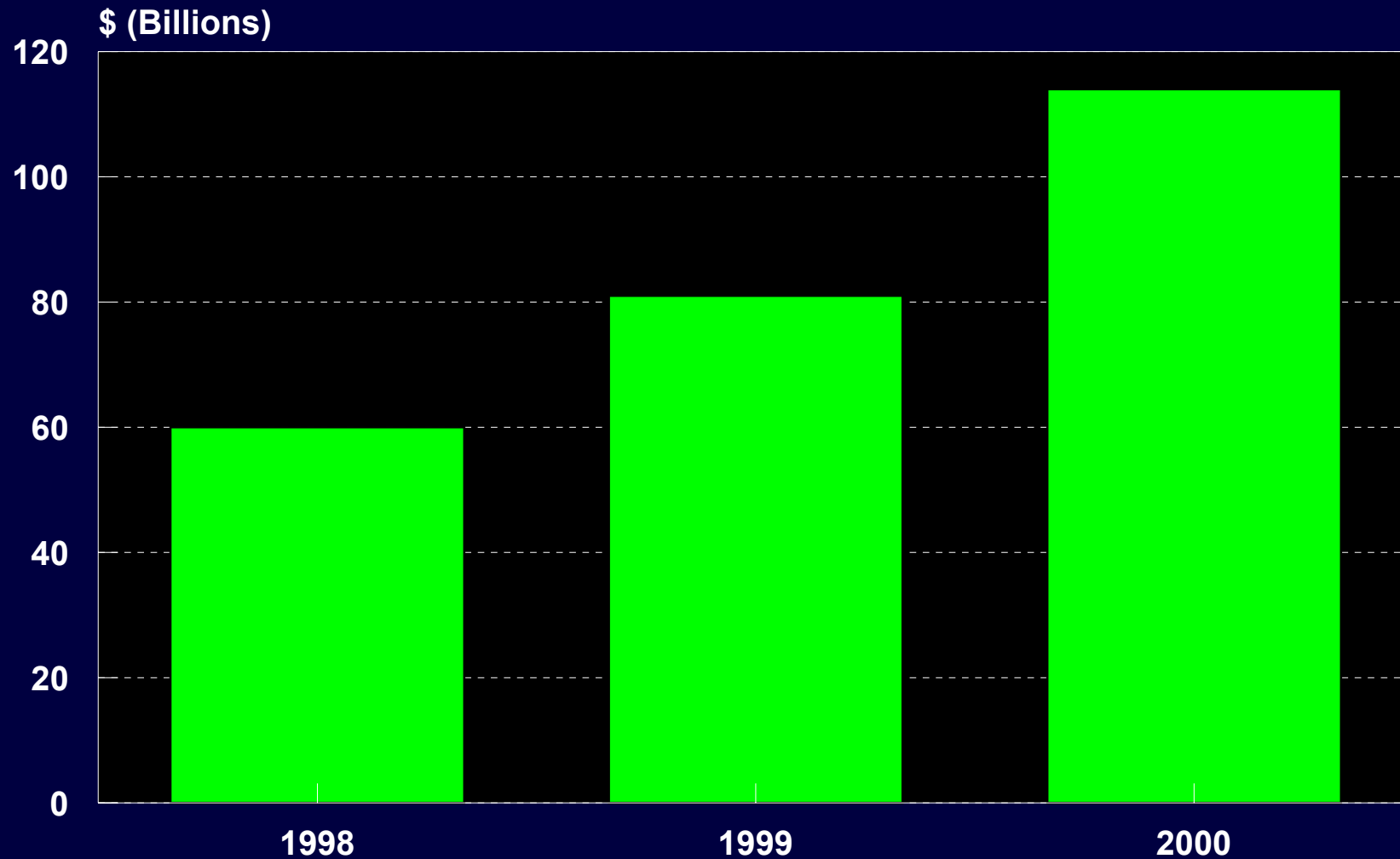
CY

AVX

FY = CY

PCB ASSEMBLY

CONTRACT ELECTRONIC MANUFACTURERS WORLD SALES



EBN : Technology Forecasters 5/00, Manufacturing Marketing Insider 4/01

Top World Contract Electronic Manufacturers 1999 vs 2000

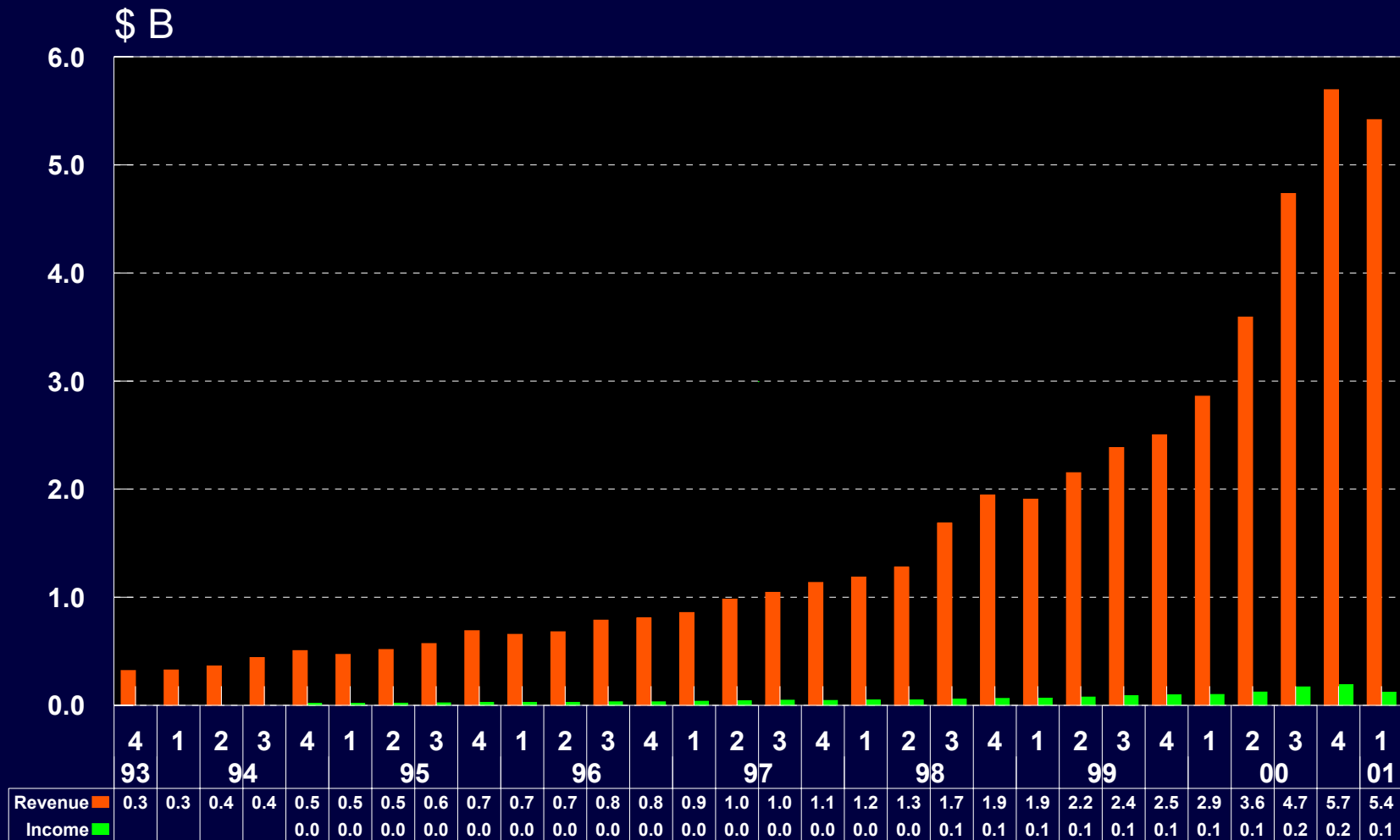
			<u>1999</u>	<u>2000</u>	<u>Grow %</u>
Solectron	SLR	USA	8,948	16,884	89
Flextronics	FLEX	Singapore	3,089	10,369	236
Celestica	CLS	Canada	5,298	9,752	84
SCI Systems	SCI	USA	7,175	9,146	28
Sanmina	SANM	USA	1,400	4,218	201
Jabil Circuit	JBL	USA	2,242	3,998	78
Elcoteq Network	Y.ELC	Finland	803	2,050	155
Manufacturers' Services Ltd	MSV	USA	921	1,757	91
C-MAC Industries	T:CMS	Canada	791	1,715	117
Benchmark Electronics	BHE	USA	879	1,706	94
Total Top 10			31,546	61,595	95%

Sources: Company Data

\$US Millions converted at fluctuating exchange

SOLECTRON

Revenue & Net Income

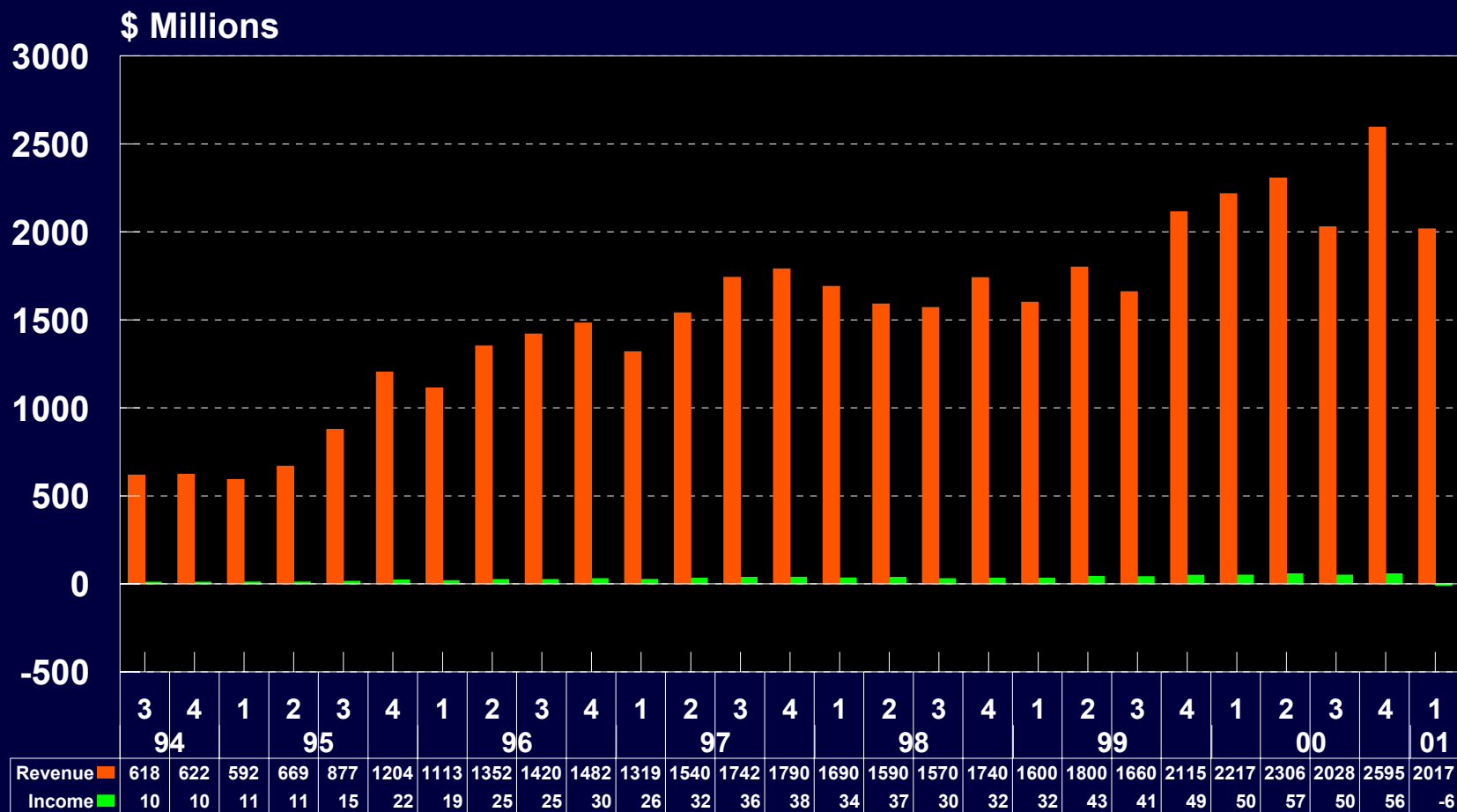


FY ends in August

SLR

SCI Systems

Revenue & Net Income



FY ends 6/30

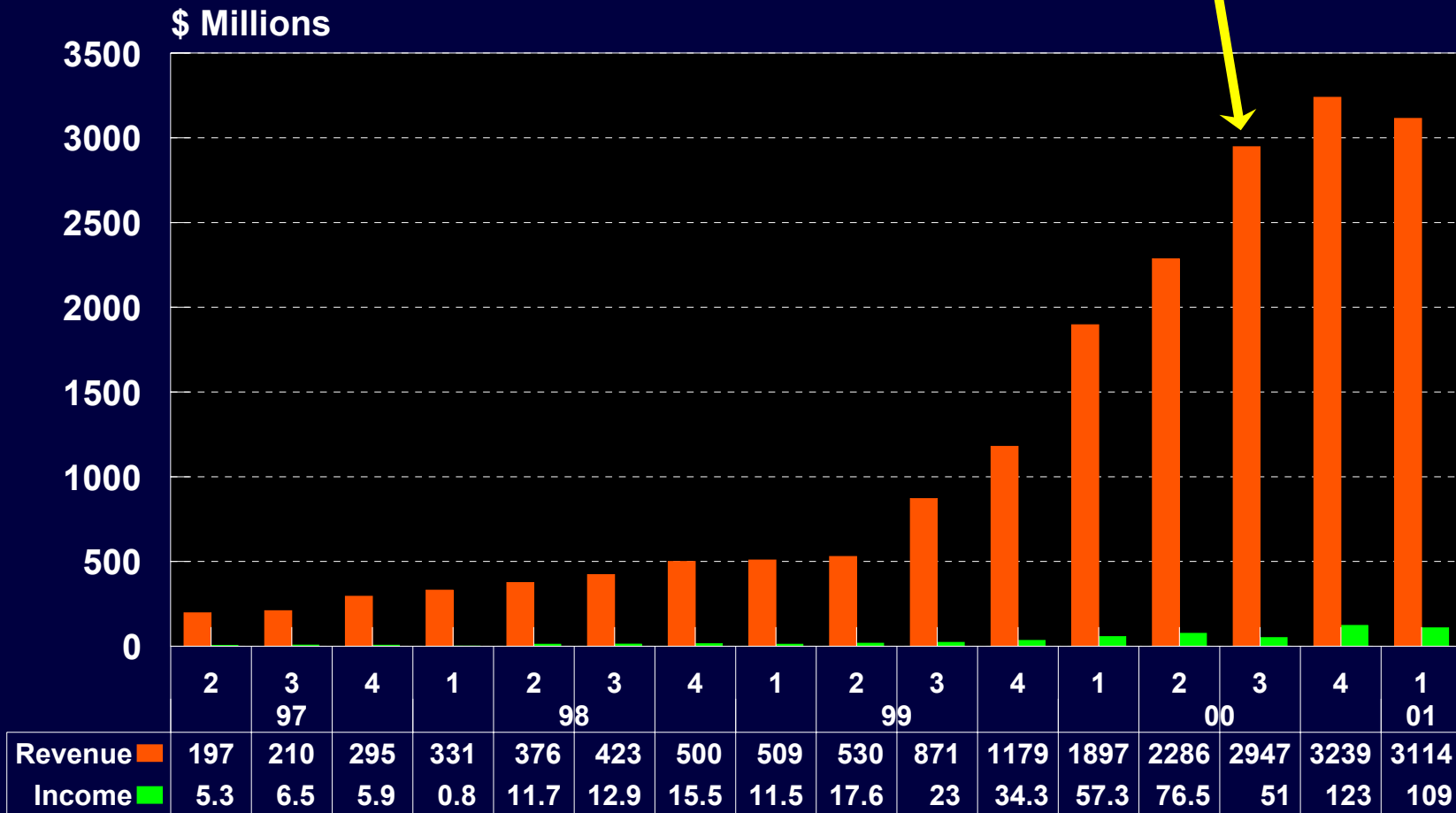
CY

SCI

Flextronics

Revenue & Net Income

PCBs: \$750 million
out of \$12 billion
annualized sales



FY ends 3/31

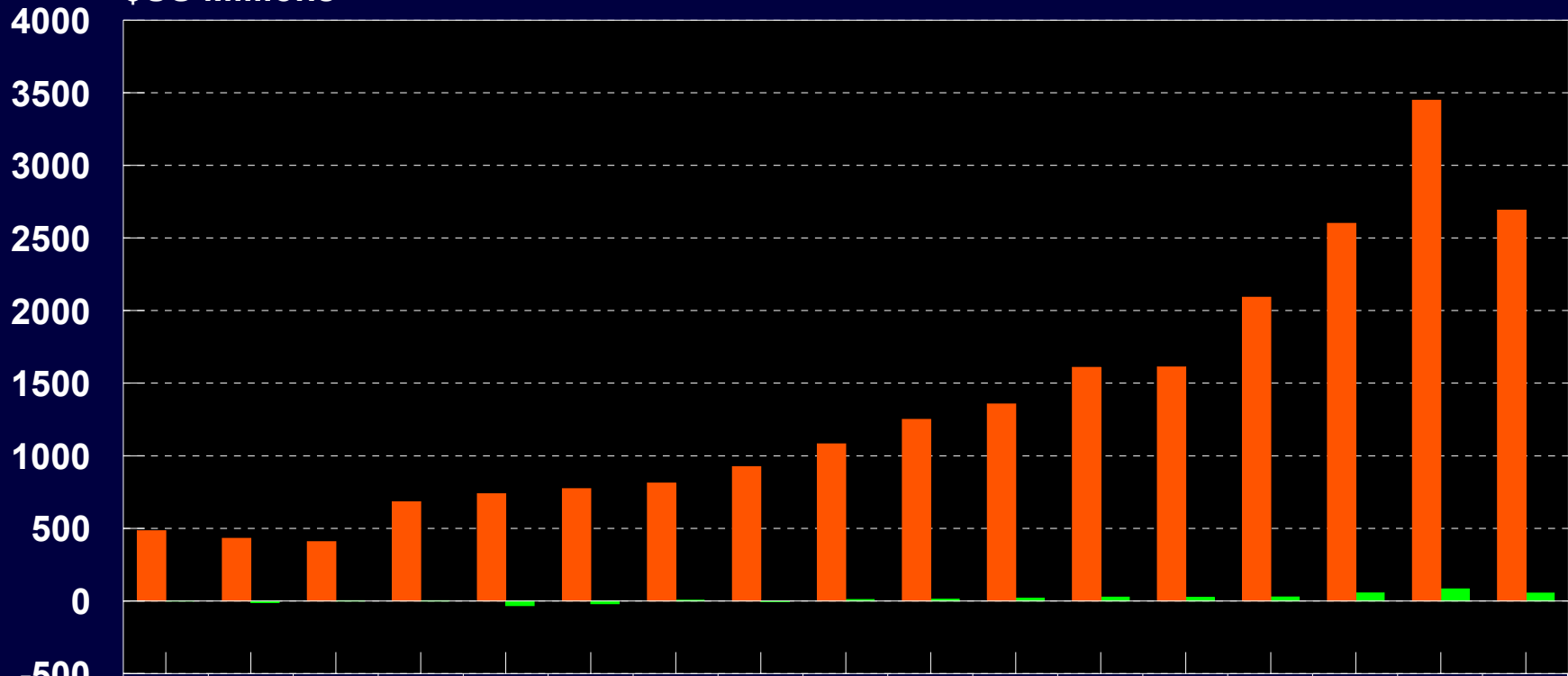
CY

FLEX

Celestica

Revenue & Net Income

\$US Millions



Revenue	484	431	409	683	739	774	812	925	1082	1250	1357	1609	1612	2092	2600	3448	2692
Income	-0	-10	1	2	-32	-19	6	-4	10	13	20	26	26	28	56	84	55

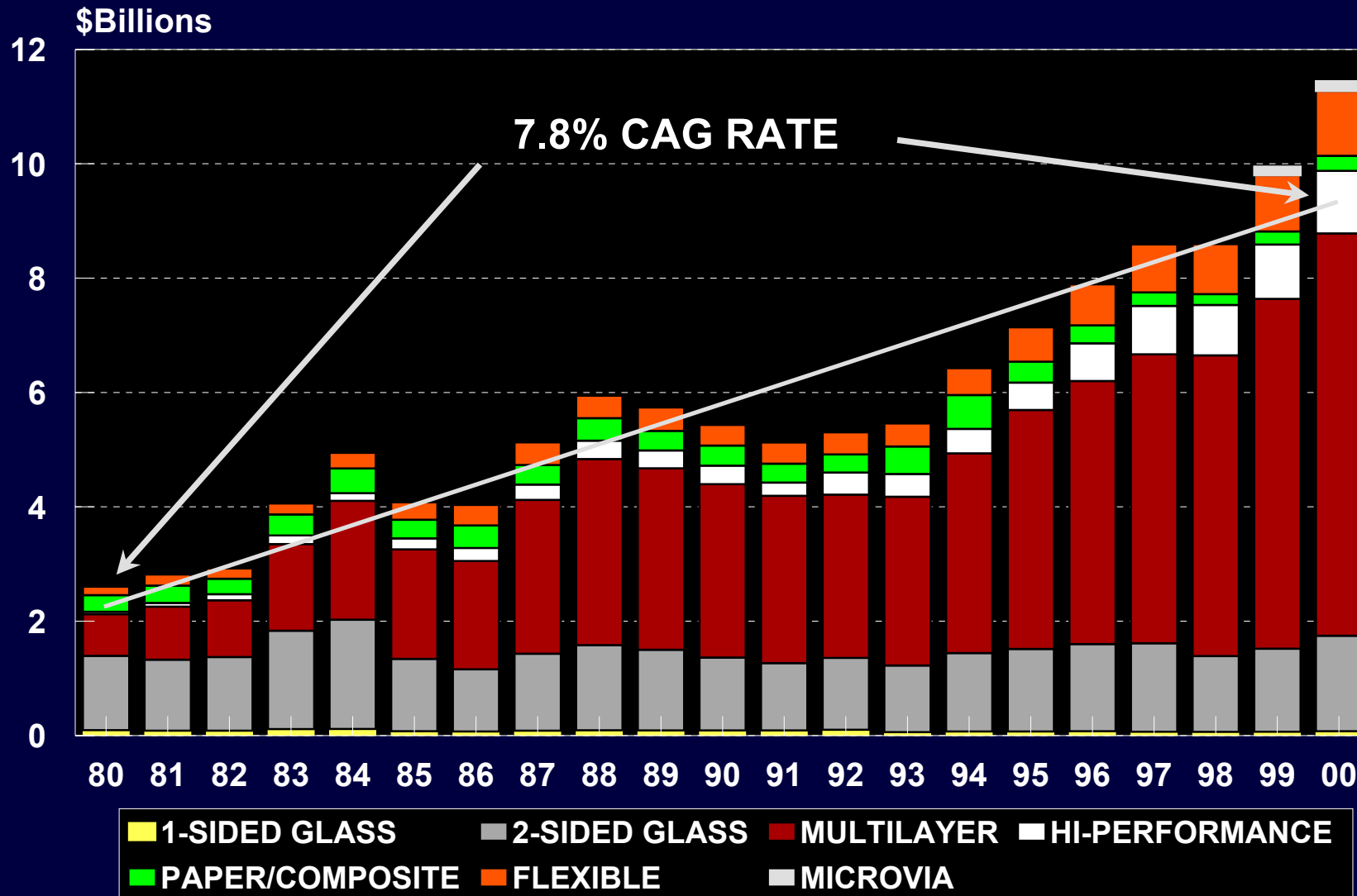
CY

FY=CY

CLS

PCB Fabrication

N. AMERICAN PCB SHIPMENTS



IPC T/MRC 6/2000 + Custer Forecast 10/2000

TOP WORLD PCB MANUFACTURERS

PCB Fab - 2000 ESTIMATE (\$M)

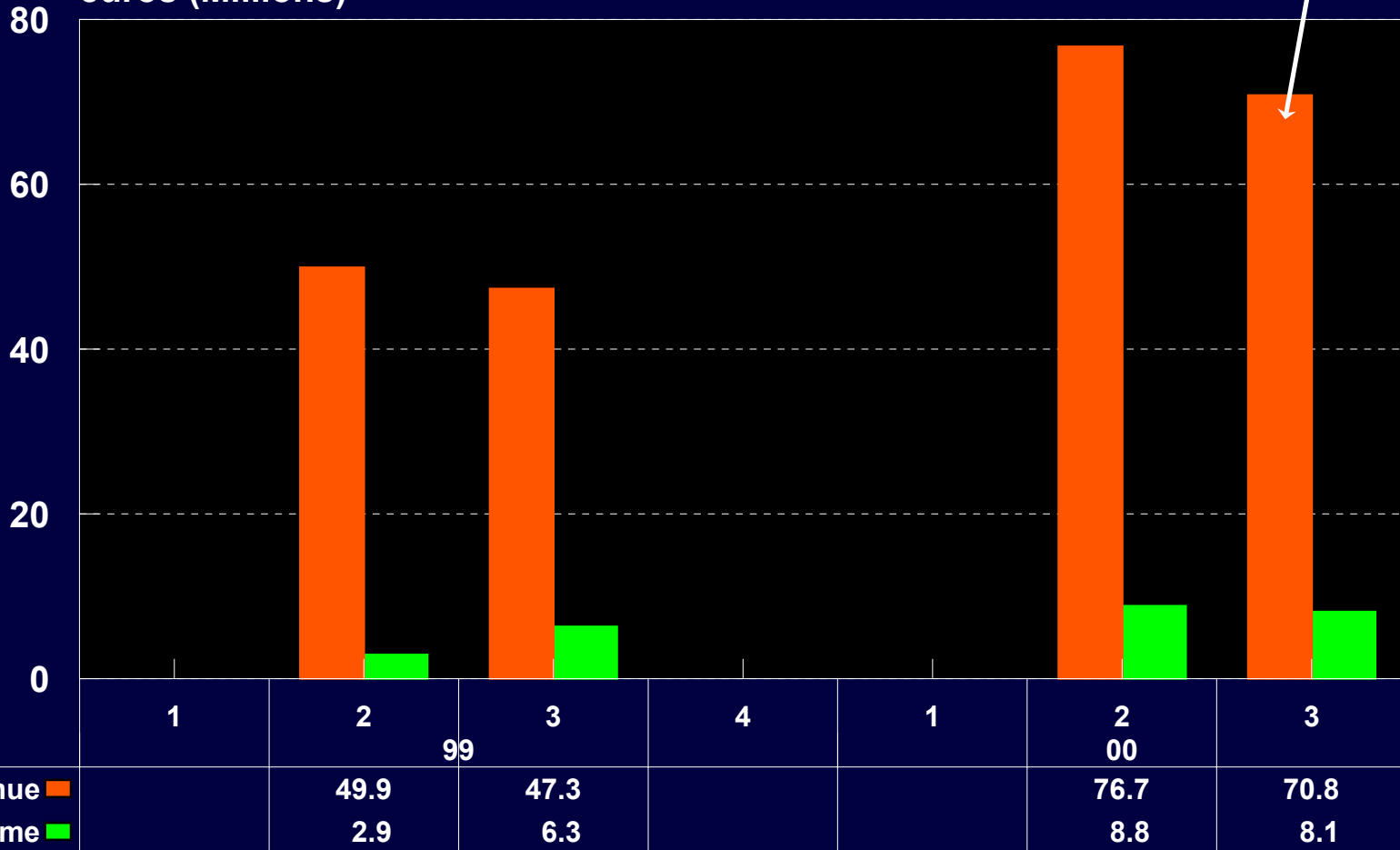
Sanmina	USA	1,500
Viasystems	USA	1,250
CMK	Japan	1,227
Ibiden	Japan	1,093
Hitachi	Japan	964
Nippon Mektron	Japan	835
Compeq	Taiwan	800
Multek	USA	780
Fujitsu	Japan	686
Tyco	USA	600
Matsushita	Japan	490
Daeduck	Korea	480
IBM	USA	450
DDi	USA	450
Nanya PCB	Taiwan	430
Mitsubishi Gas	Japan	410
Photocircuits	USA	405
WWEI	Taiwan	402
Samsung	Korea	400
Wus	Taiwan	375
Shinko Elec	Japan	370
Allied ACI	USA	360
LG Electronics	Korea	340
Toppan Electric	Japan	325
Elec & Eltek	China	320

AT&S, Austria

Revenue & Net Income

\$60 Million

euros (Millions)



CY

FY ends March

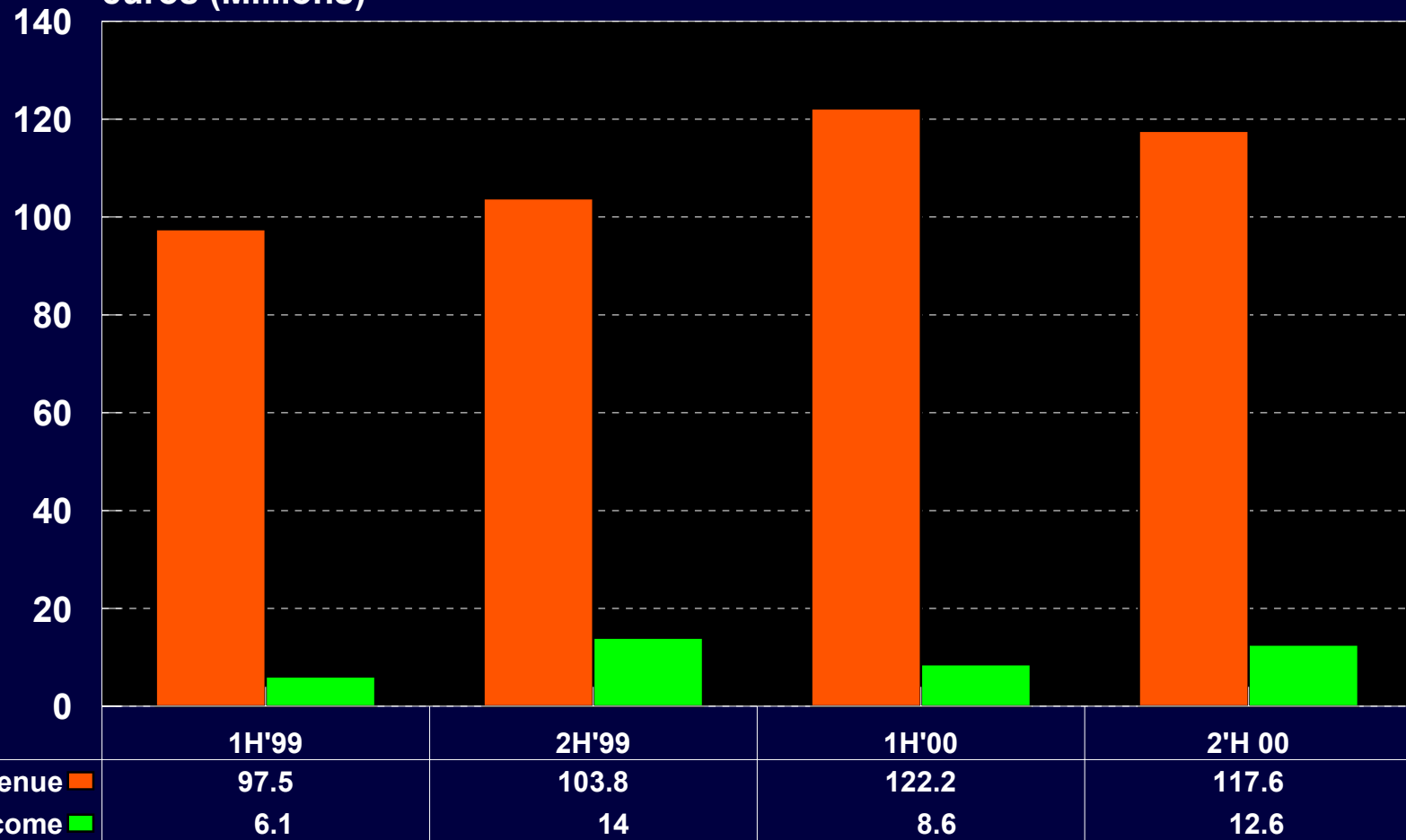
1 euro = .85 US\$

R.AST

Aspocomp, Finland

Revenue & Net Income

euros (Millions)

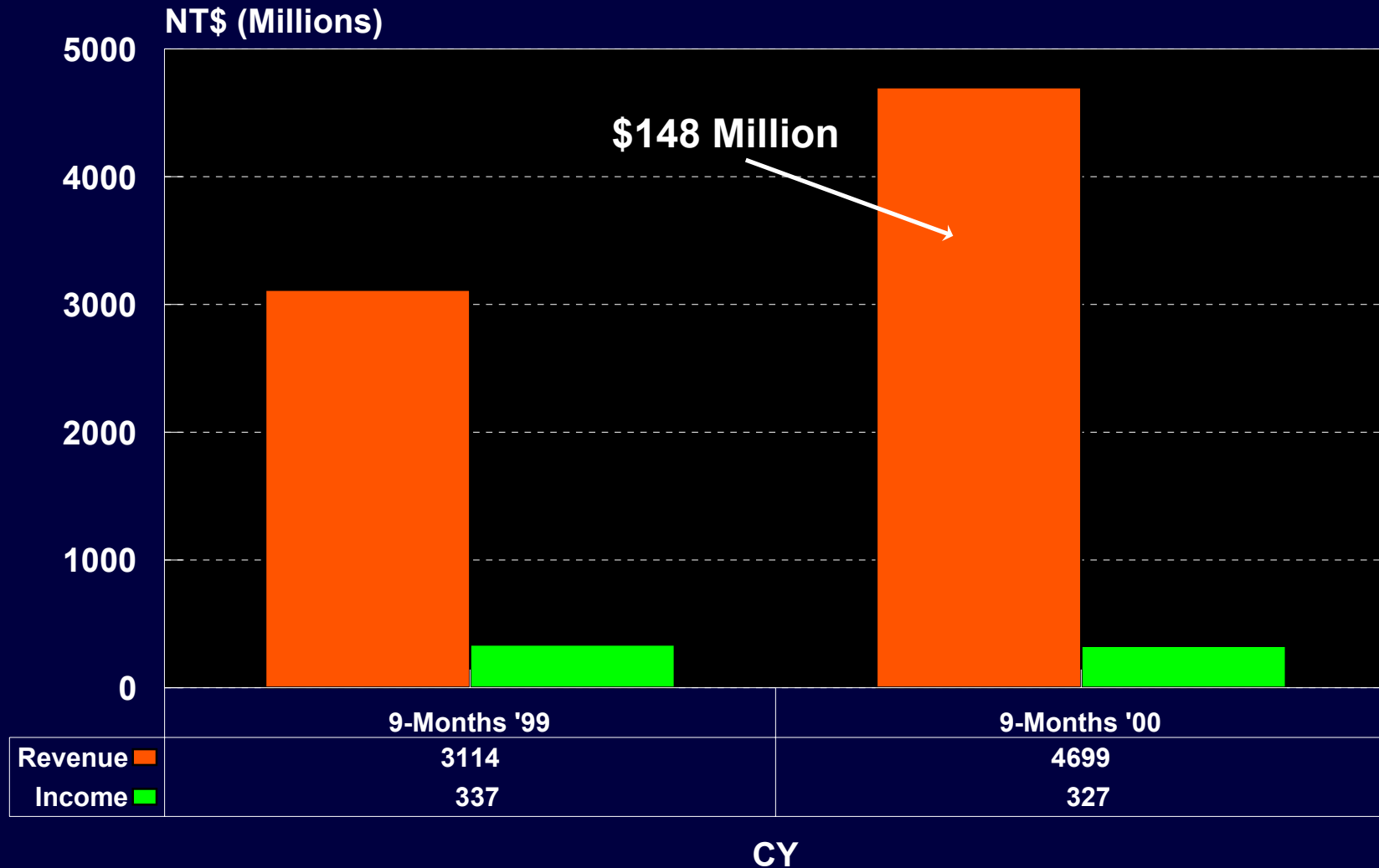


CY

Y.APC

Chin-poon Industrial, Taiwan

Revenue & Net Income



31.8 NT\$ = 1 US\$

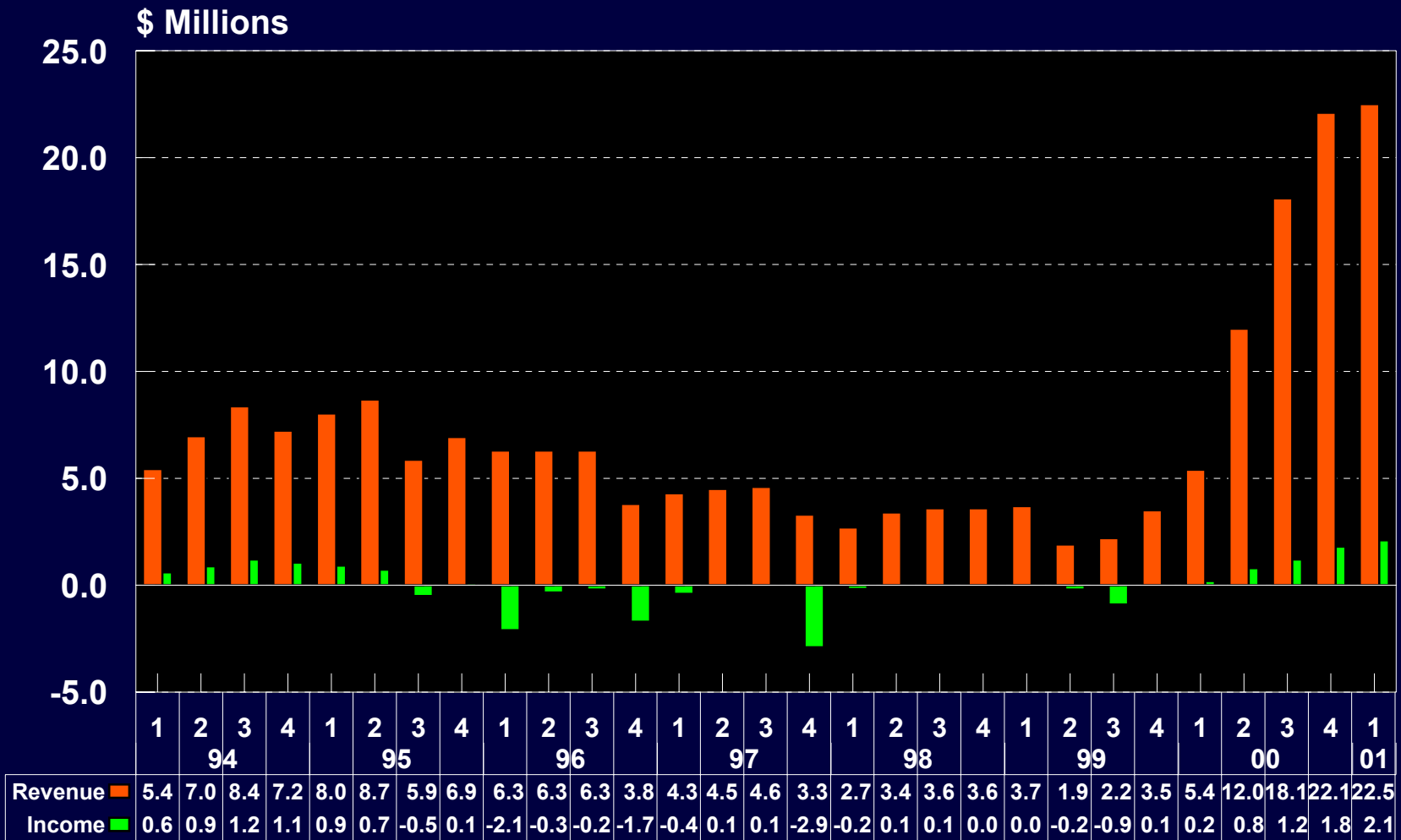
TOP N AMERICAN PCB MANUFACTURERS

PCB FAB - 2000 ESTIMATE (\$M)

	PCB \$M
SANMINA	1,500
VIASYSTEMS	1,250
MULTEK	780
TYCO	600
DDi	450
IBM	450
PHOTOCIRCUITS	405
ALLIED (ACI)	360
3M	200
MERIX	197
TTM TECHNOLOGIES	195
TERADYNE (w/HERCO)	180
INNOVEX	138
PARLEX	132
SHELDAHL	131
LITTON	102
TOPPAN WEST	85
BUREAU ELECTRONICS	75
CIRCUIT-WISE	70

M-WAV

Revenue & Net Income



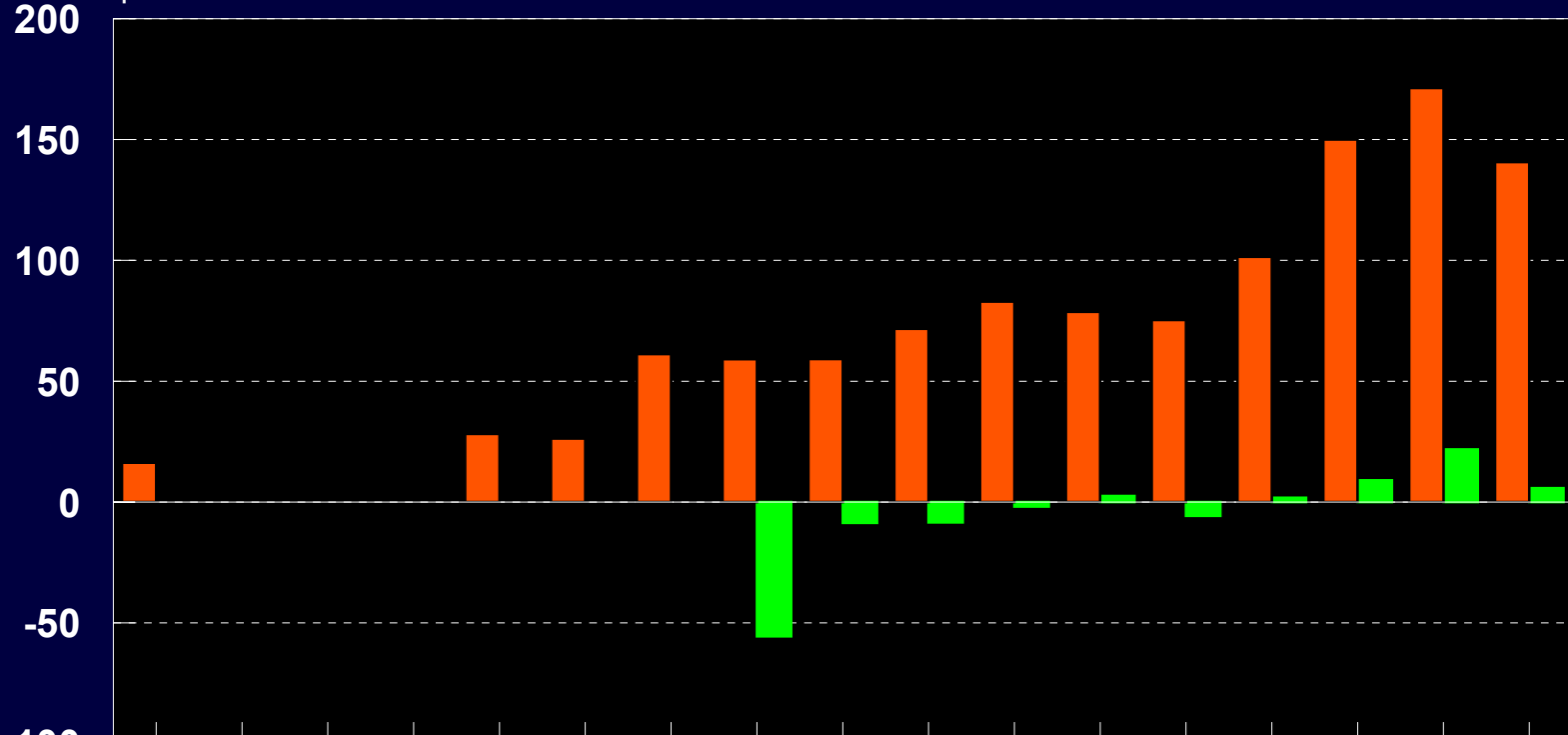
FY = CY

MWAV

DDi Corp

Revenue & Net Income

\$ Millions



	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1
	97				98				99				00				01
Revenue	16.3				28.2	26.3	61.2	59.1	59.2	71.7	82.9	78.7	75.3	101.5	150	171.3	140.7
Income							-55.6	-8.6	-8.4	-1.9	2.5	-5.7	1.8	9	21.8	5.7	

CY

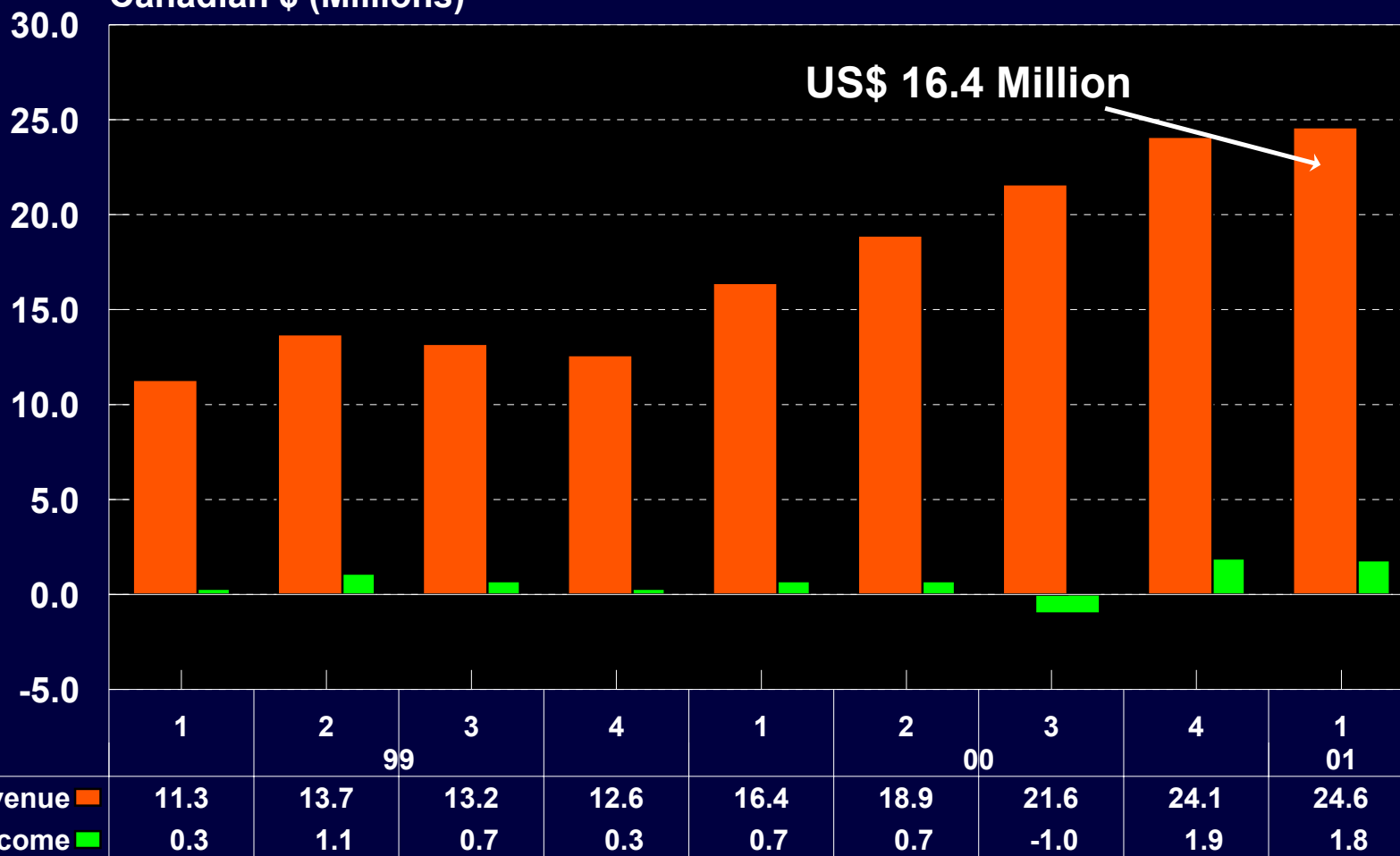
DDIC

FY=CY

Coretec Inc

Revenue & Net Income

Canadian \$ (Millions)

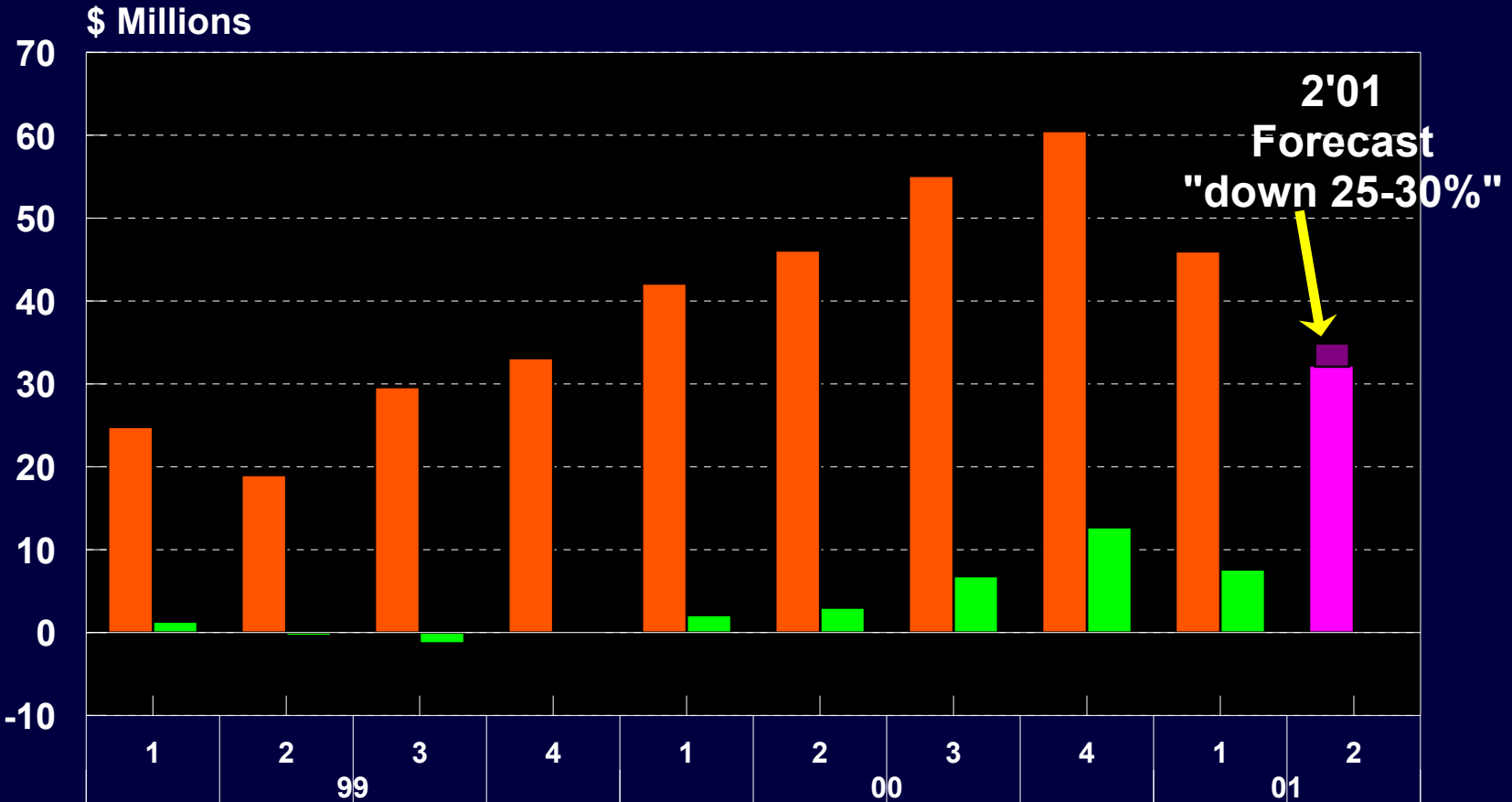


FY=CY

T:CY

TTM Technologies

Revenue & Net Income



Revenue	24.8	19	29.6	33.1	42.1	46.1	55.1	60.5	46	32.2
Income	1.3	-0.4	-1.3	0.1	2.1	3	6.8	12.7	7.6	

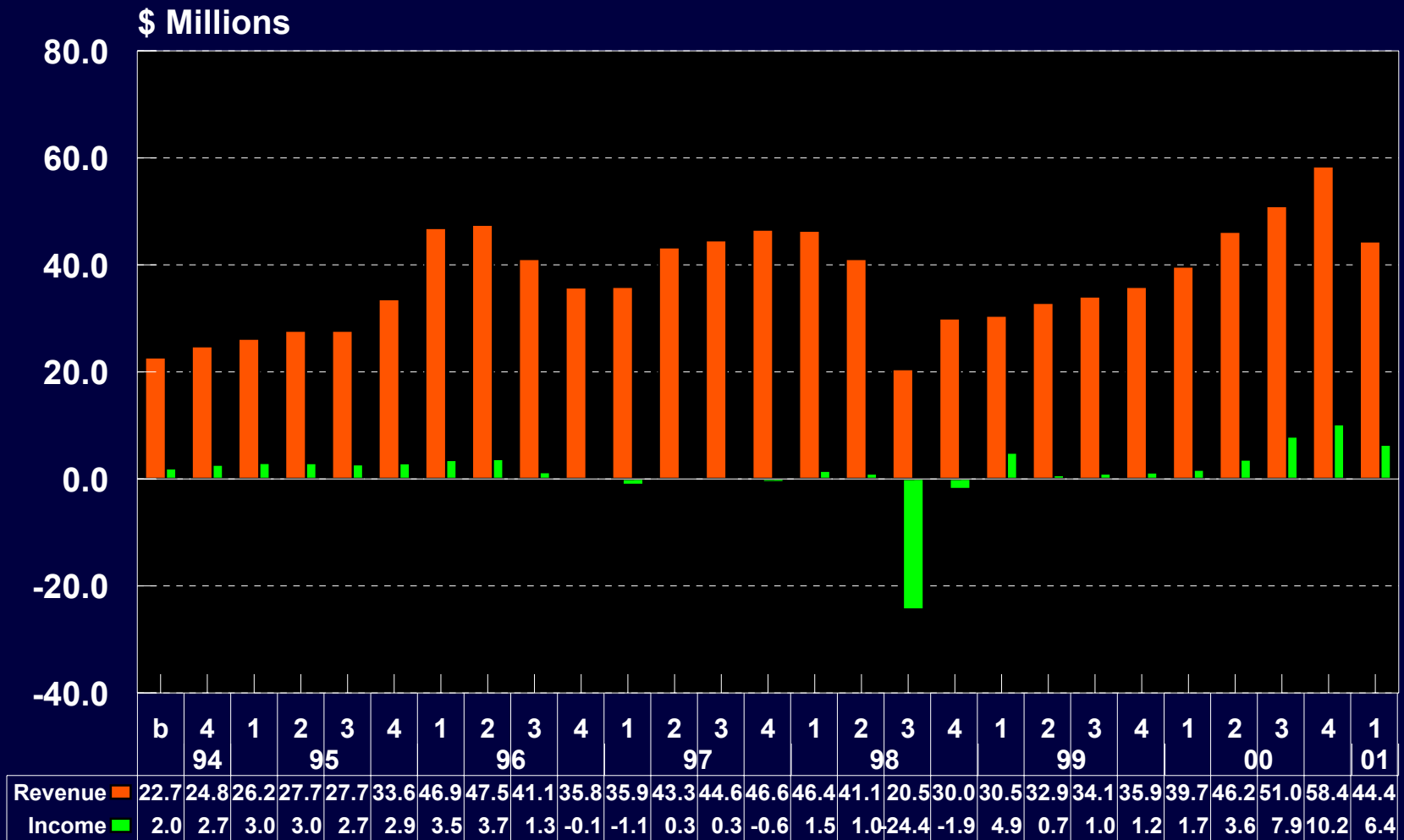
FY=CY

CY

TTMI

MERIX

Revenue & Net Income

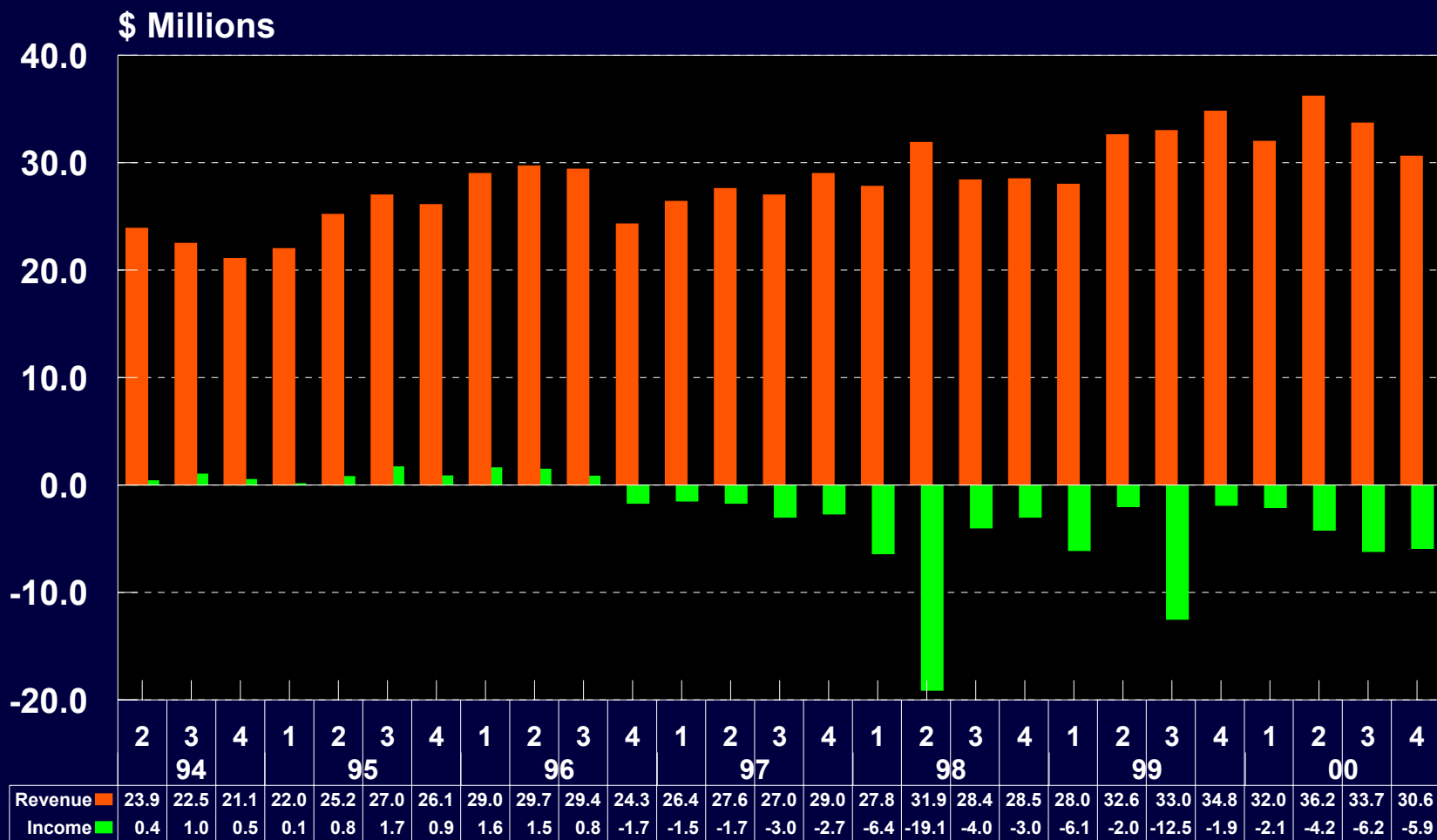


MERIX

FY ends May

SHELD AHL

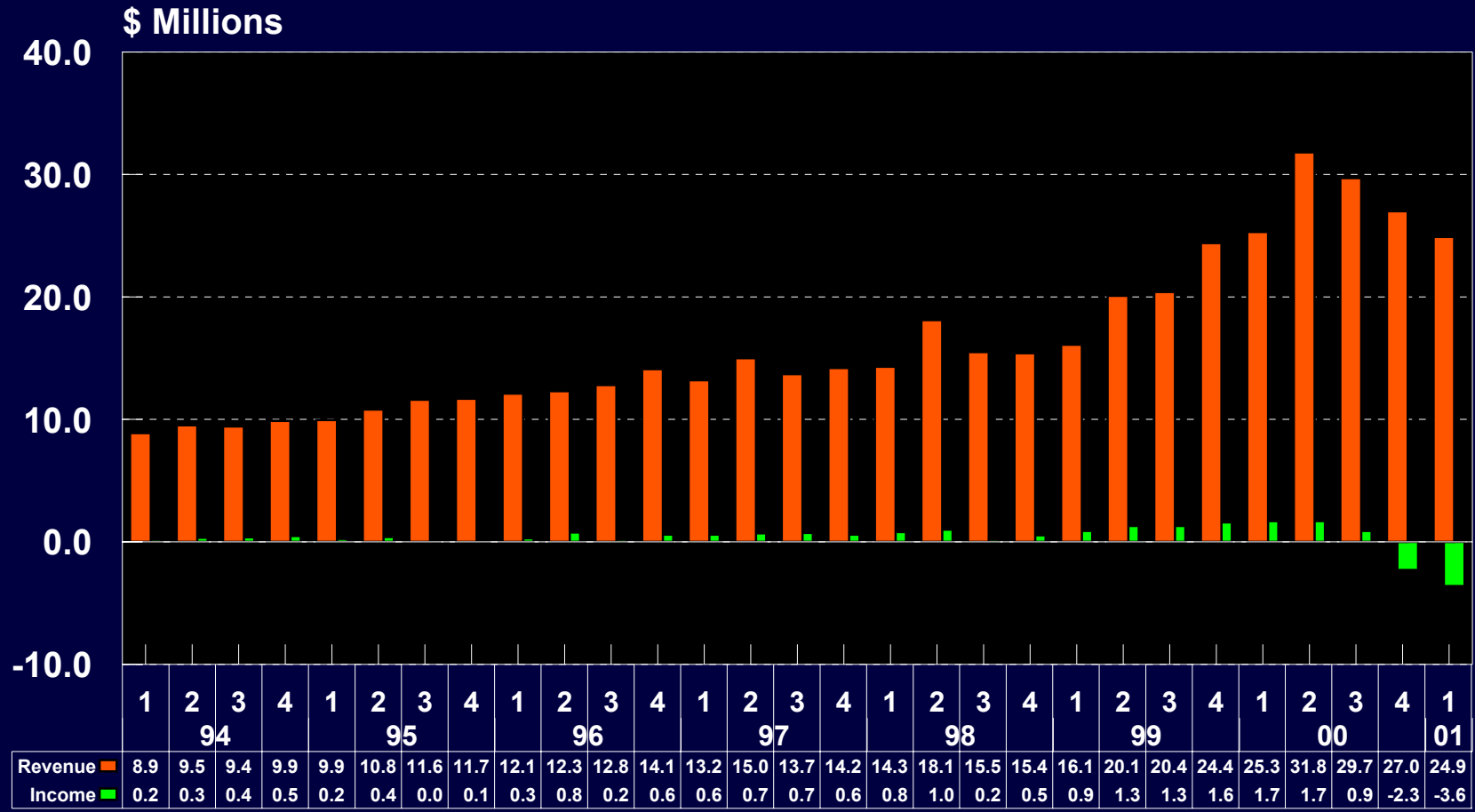
Revenue & Net Income



CY

PARLEX

Revenue & Net Income



CY

FY ends June 30

PRLX

N. AMERICAN PCB MANUFACTURERS - PUBLIC DATA

QUARTERLY SALES & NET INCOME (\$M)

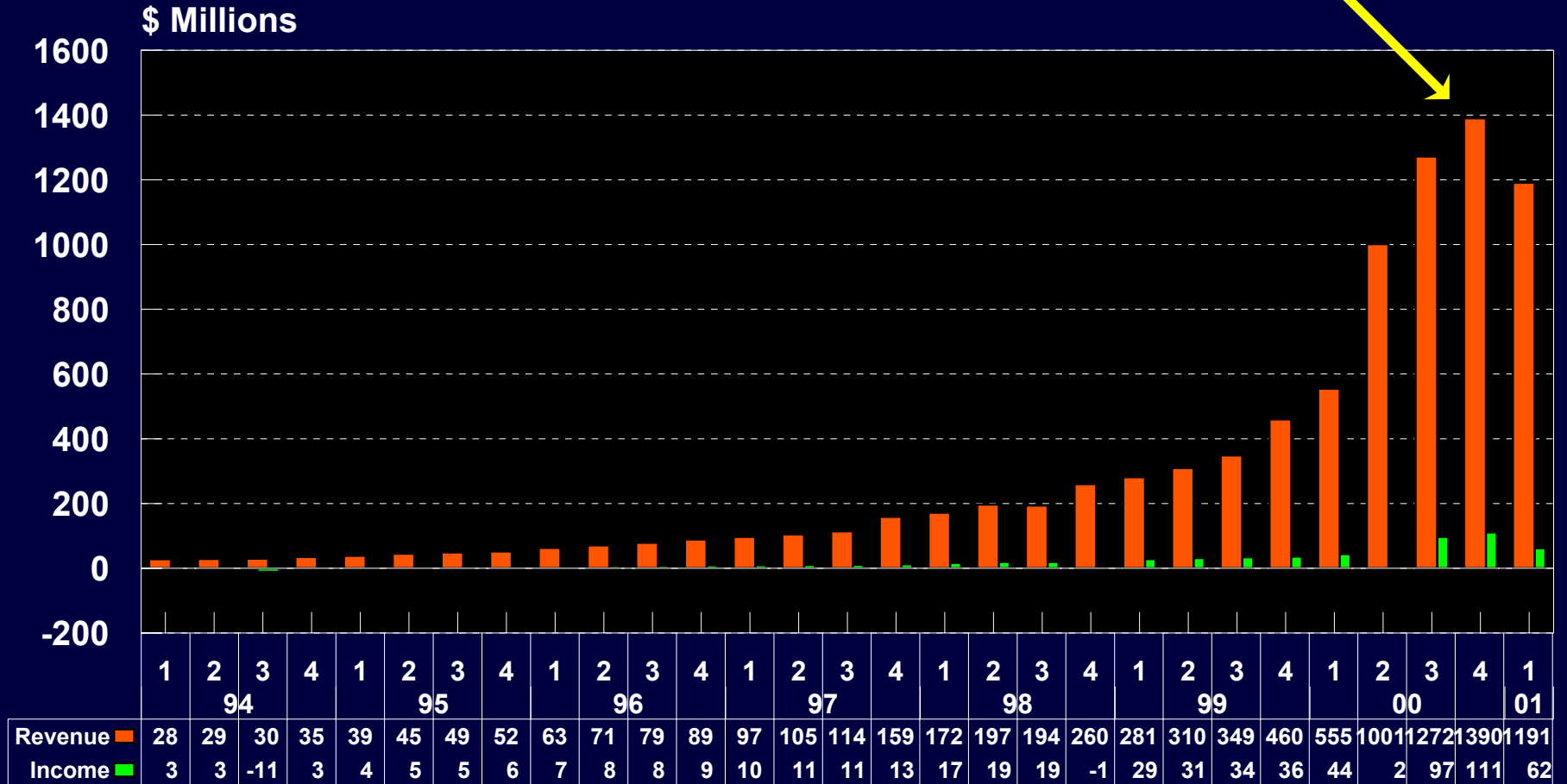
		LAST YEAR		THIS YEAR		QUARTER
		SALES	INC	SALES	INC	ENDING
CIRCUIT WORLD	TSE:CCW	4.6	0.3	6.5	0.6	3/01
CORETEC	TSE:CYY	10.9	0.4	16.4	1.2	3/01
DDi	DDIC	75.3	-2.0	140.7	5.7	3/01
INNOVEX	INVX	41.4	1.2	34.9	-23.3	3/01
MERIX	MERX	39.7	1.7	44.4	6.4	2/01
M-WAV	MWAV	5.4	0.2	22.5	2.1	3/01
PARLEX	PRLX	25.3	1.7	24.9	-3.6	3/01
SHELDAHL	SHEL	34.8	-1.9	30.6	-5.9	12/00
TTM	TTMI	42.1	2.1	46.0	7.6	3/01
TOTAL		279.5	3.7	369.9	-9.2	
INCOME %			1.3%		-2.5%	

Includes foreign sales

SANMINA

Revenue & Net Income

**PCBs: \$1.5 billion
out of \$ 5.6 billion
annualized sales**



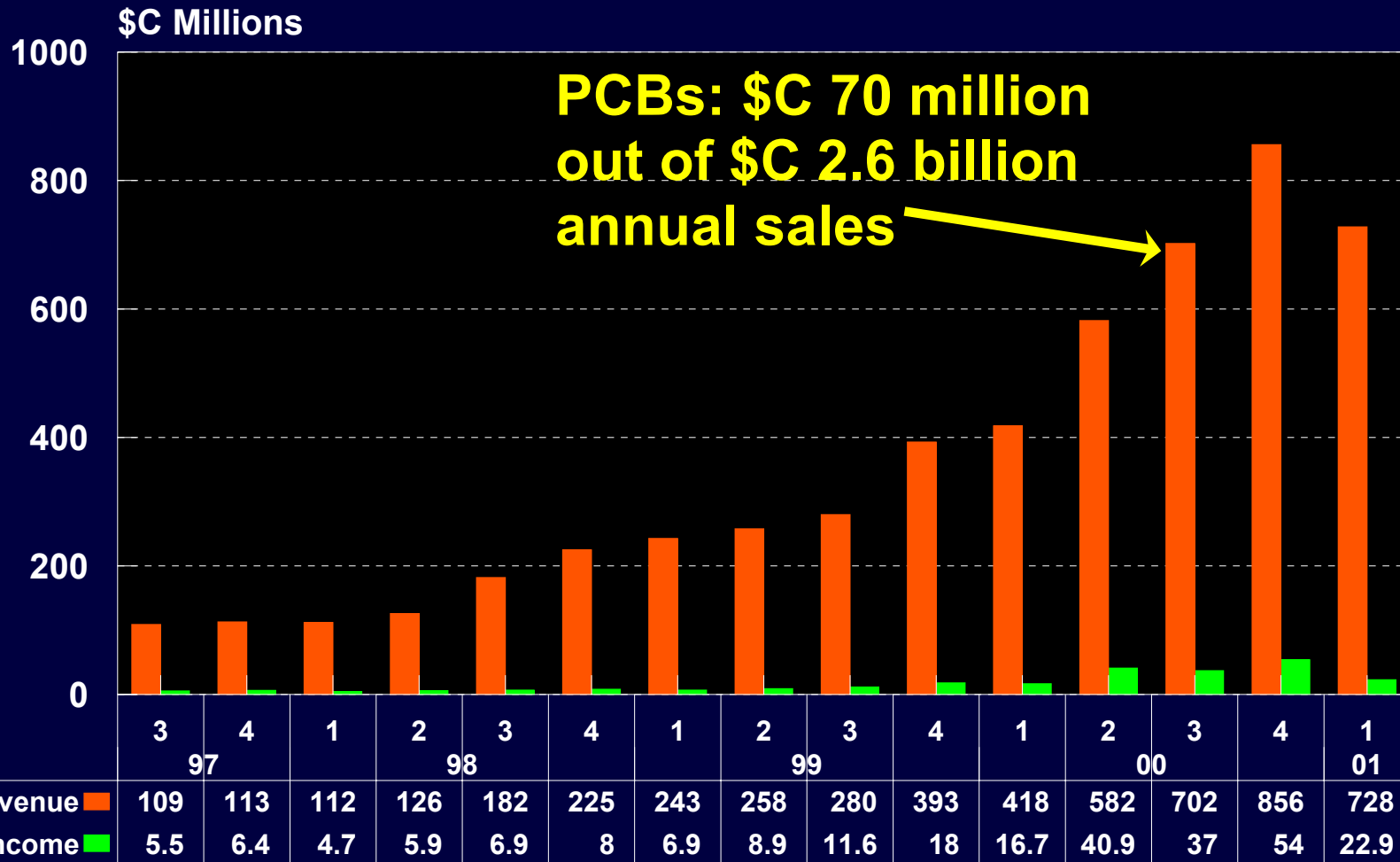
CY

FY ends September 30

SANM

C-MAC INDUSTRIES

Revenue & Net Income



FY=CY

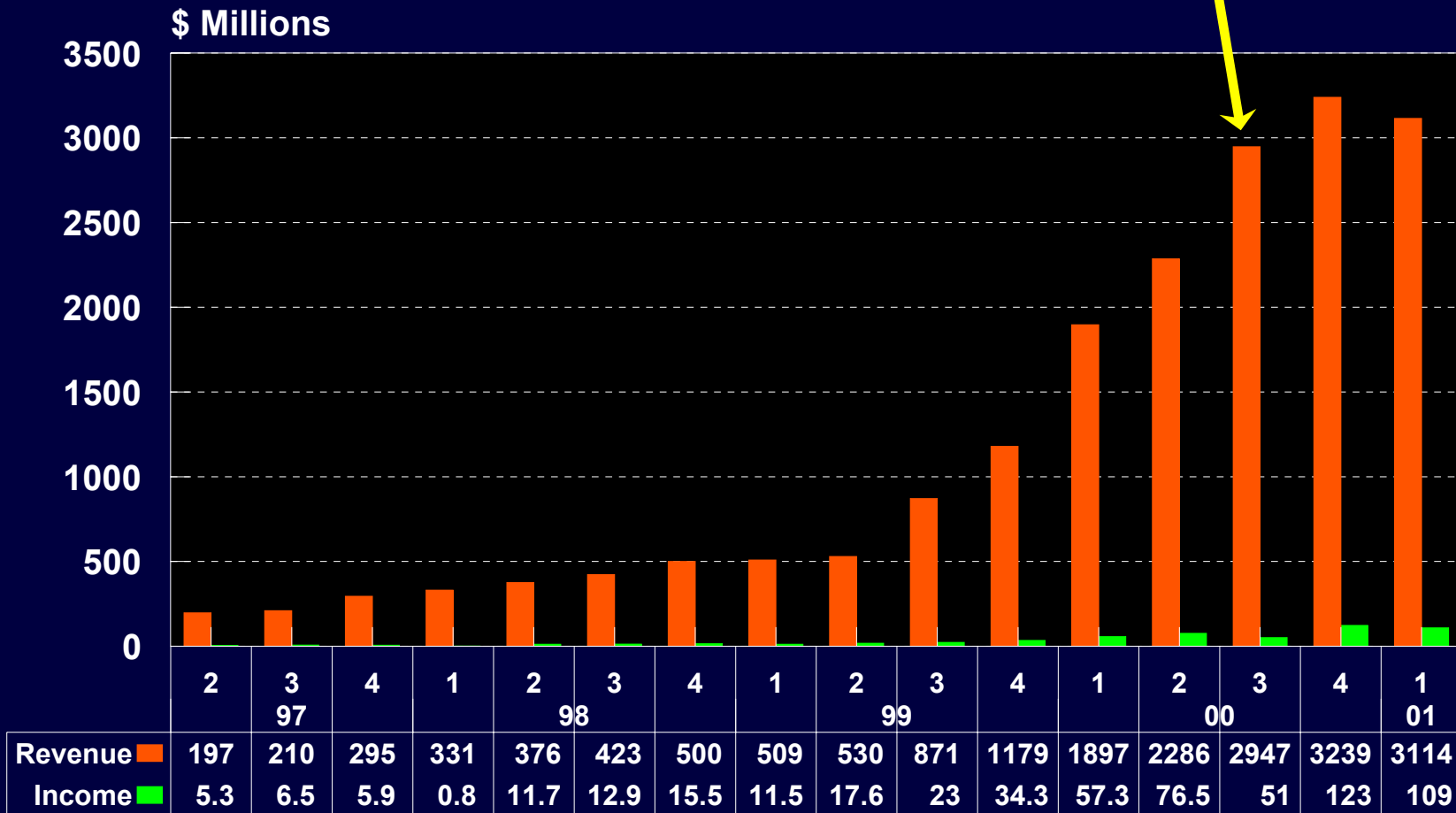
CY

T.CMS

Flextronics

Revenue & Net Income

PCBs: \$750 million
out of \$12 billion
annualized sales



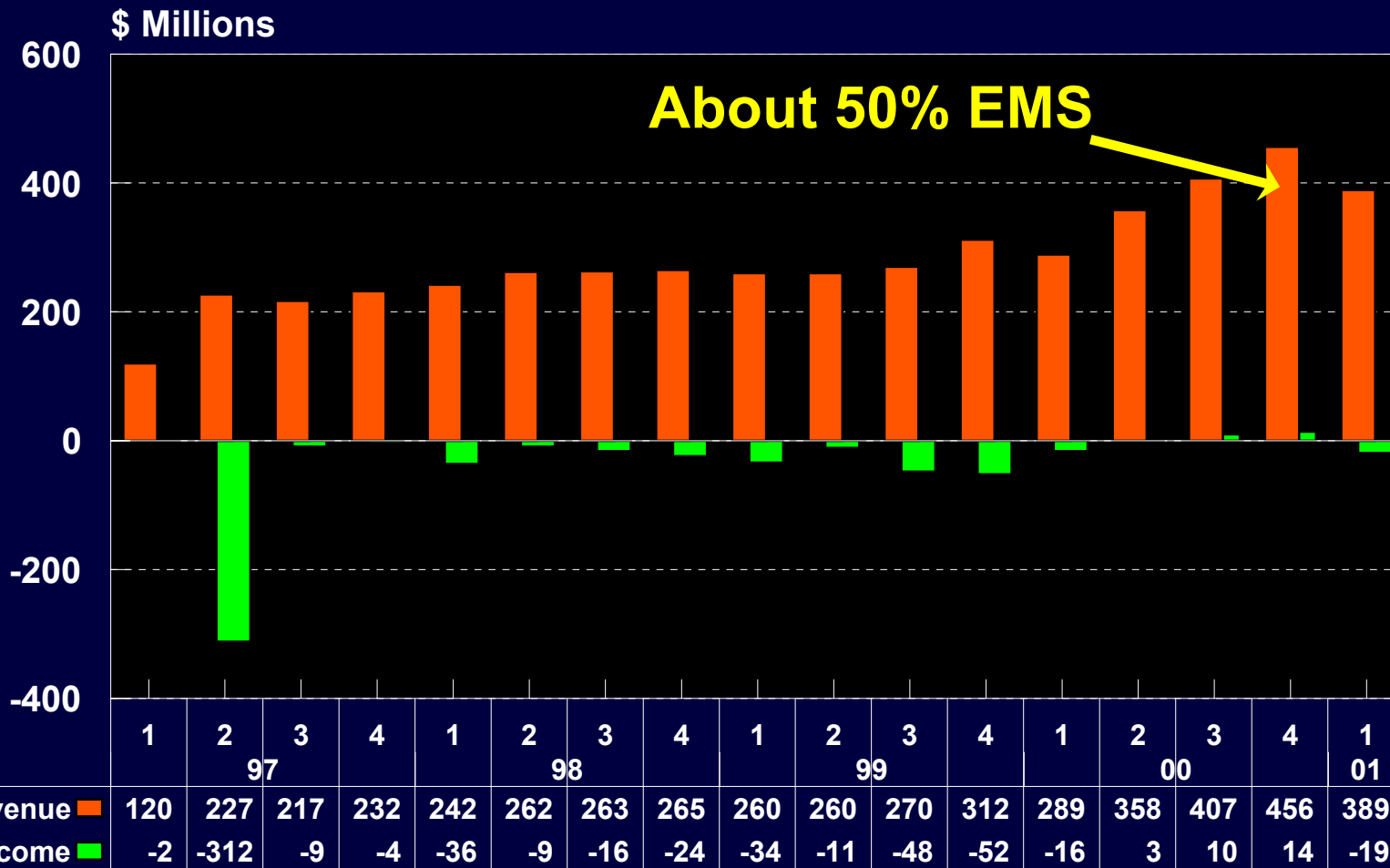
FY ends 3/31

CY

FLEX

VIASYSTEMS

Revenue & Income



CY

VG

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

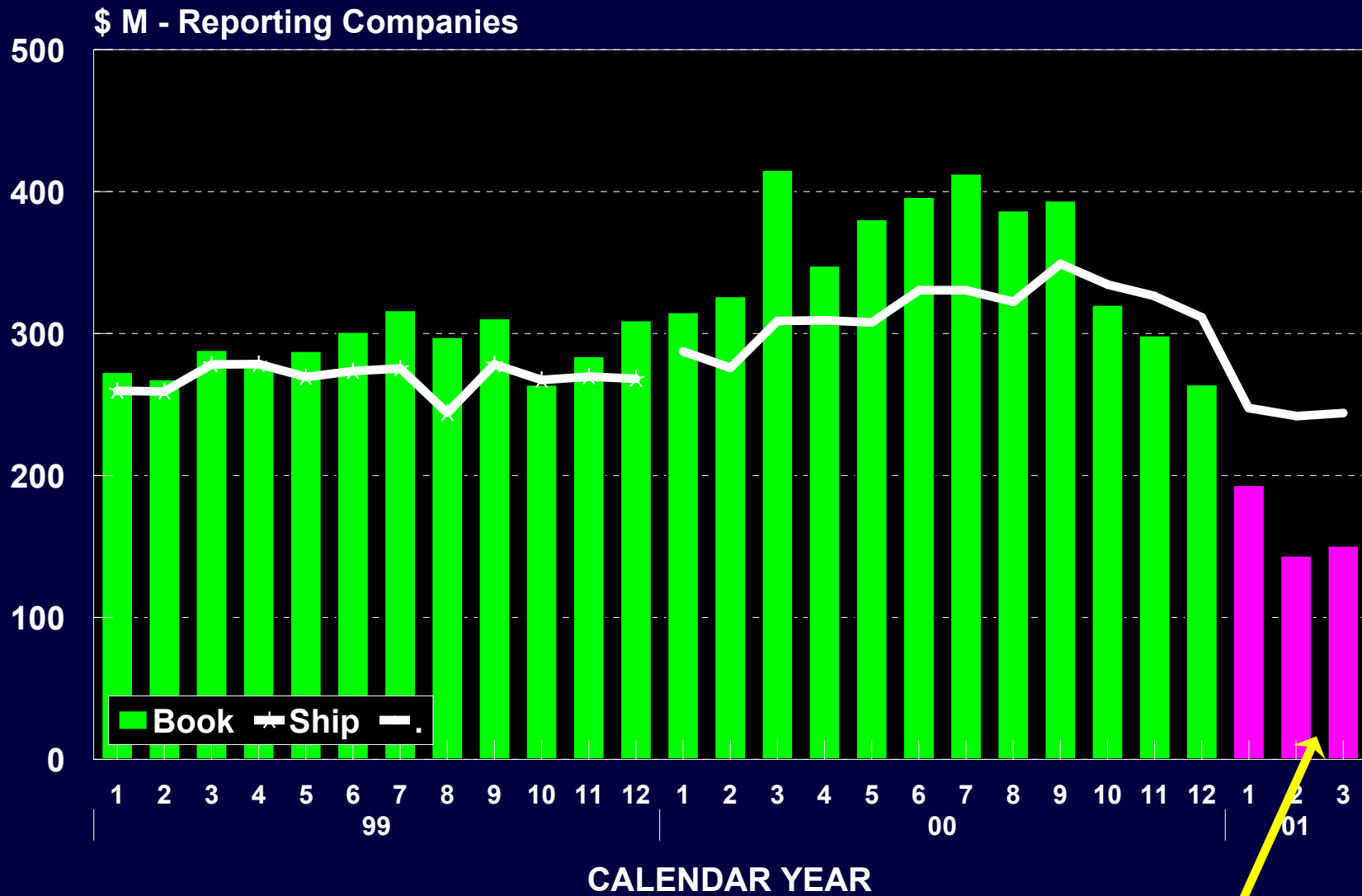
N. AMERICAN CEMs WITH PCB FABs - PUBLIC DATA

QUARTERLY SALES & NET INCOME (\$M)

		LAST YEAR		THIS YEAR		QUARTER
		SALES	INC	SALES	INC	ENDING
C-MAC	TSE:CMS	277	11	485	15	3/01
FLEXTRONICS	FLEX	2229	73	3114	109	3/01
SANMINA	SANM	948	59	1191	115	3/01
VIASYSTEMS	VG	289	-19	389	-19	3/01
TOTAL		3743	124	5179	221	
INCOME %			3.3%		4.3%	

Includes foreign sales

U.S. RIGID PCB BOOKINGS & SHIPMENTS

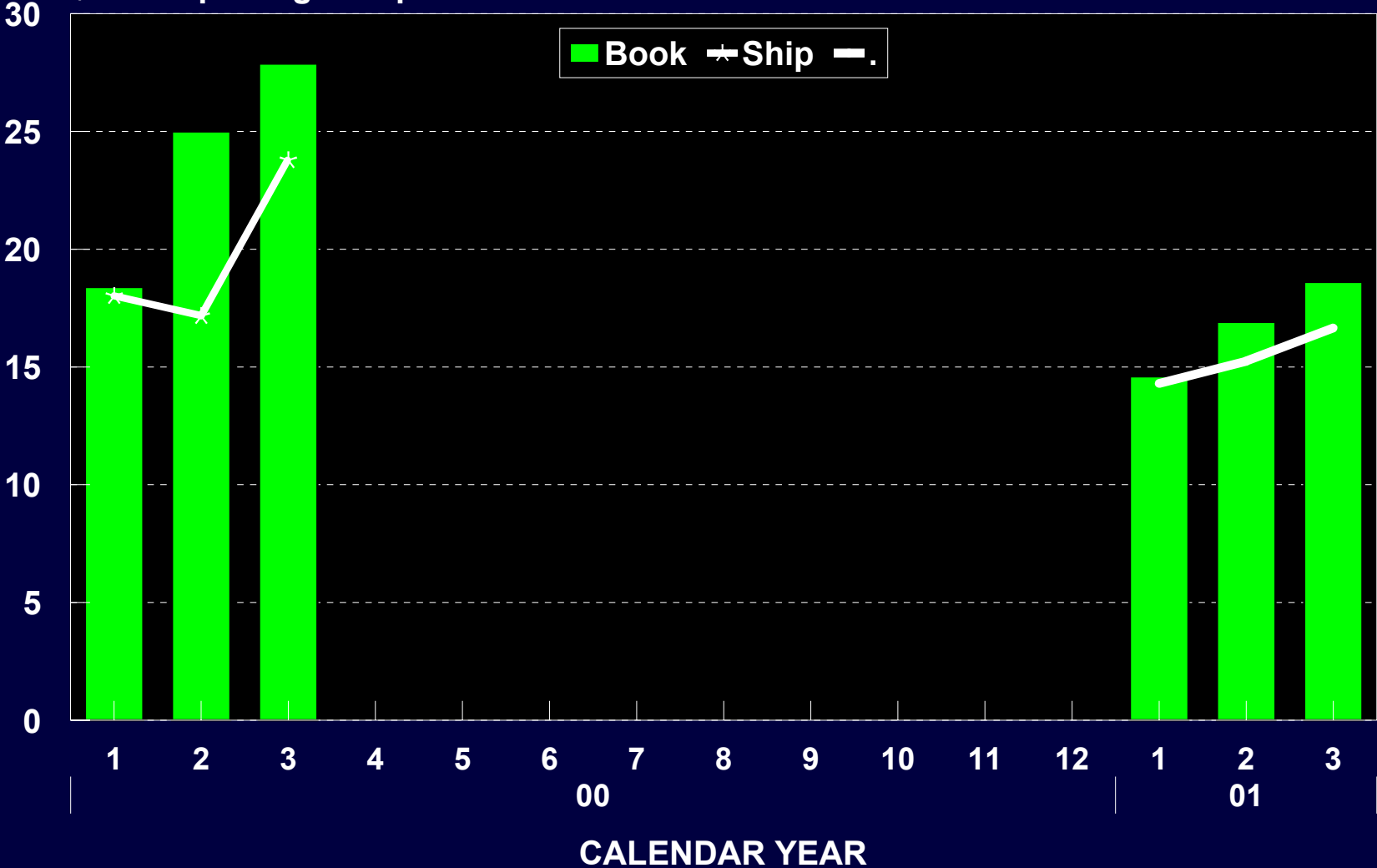


IPC T/MRC 4/2001

Custer Estimate (new company mix)

U.S. FLEX CIRCUITS BOOKINGS & SHIPMENTS

\$ M - Reporting Companies



MARCH N AMERICAN PCB GROWTH INDICATORS

% GROWTH - Mar 2001 vs Mar 2000

RIGID PCB \$ SHIPMENTS

DOWN 13.0%

RIGID PCB \$ BOOKINGS

DOWN 53.3%

RIGID PCB BOOK/BILL RATIO

3-MONTH AVG 0.67

1-MONTH 0.63

LAMINATE+PREPREG SQ FT SHIPMENTS

DOWN 39.9%

LAMINATE+PREPREG SQ FT BOOKINGS

DOWN 48.7%

FLEX CIRCUIT \$ SHIPMENTS

DOWN 30.0%

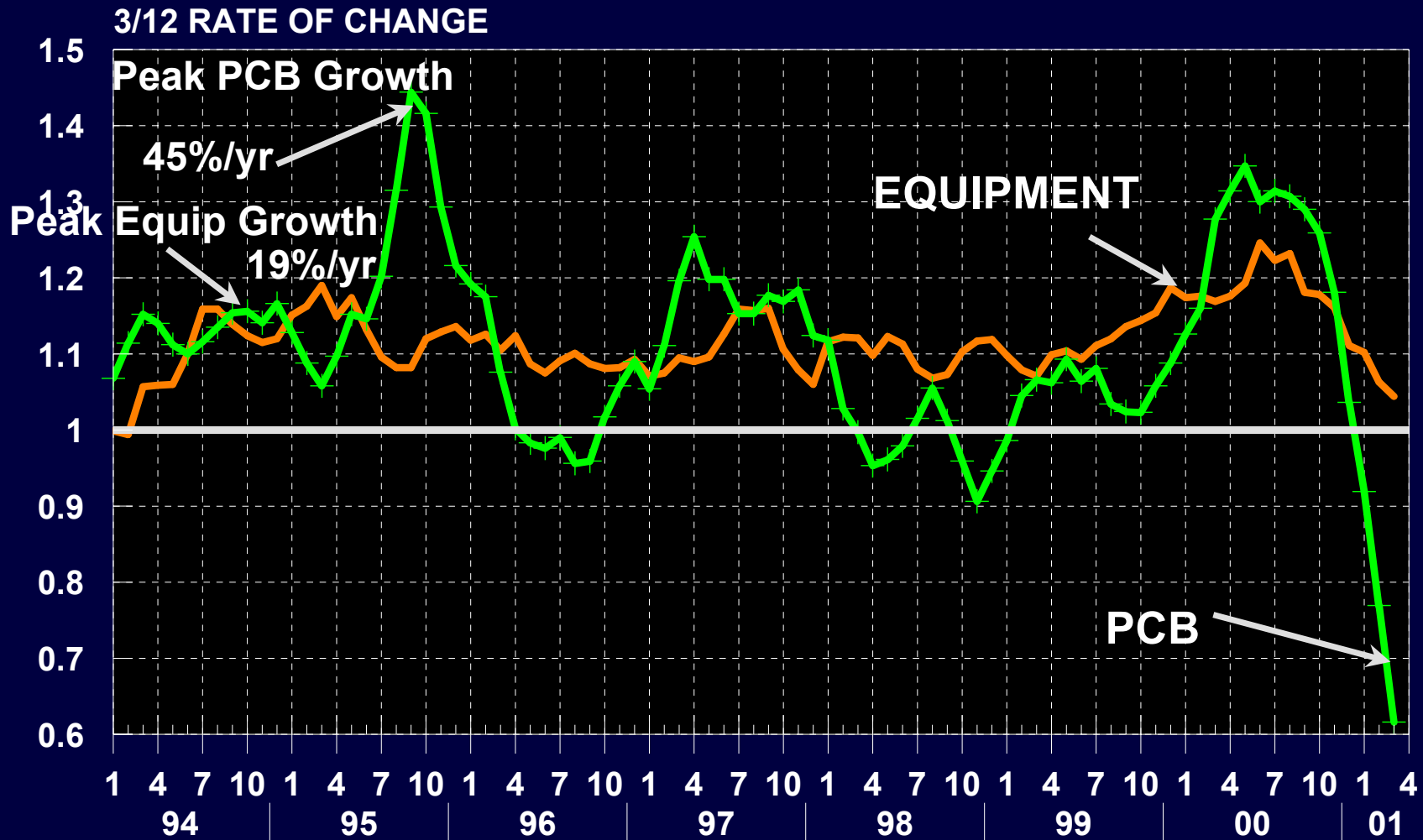
FLEX CIRCUIT \$ BOOKINGS

Down 33.3%

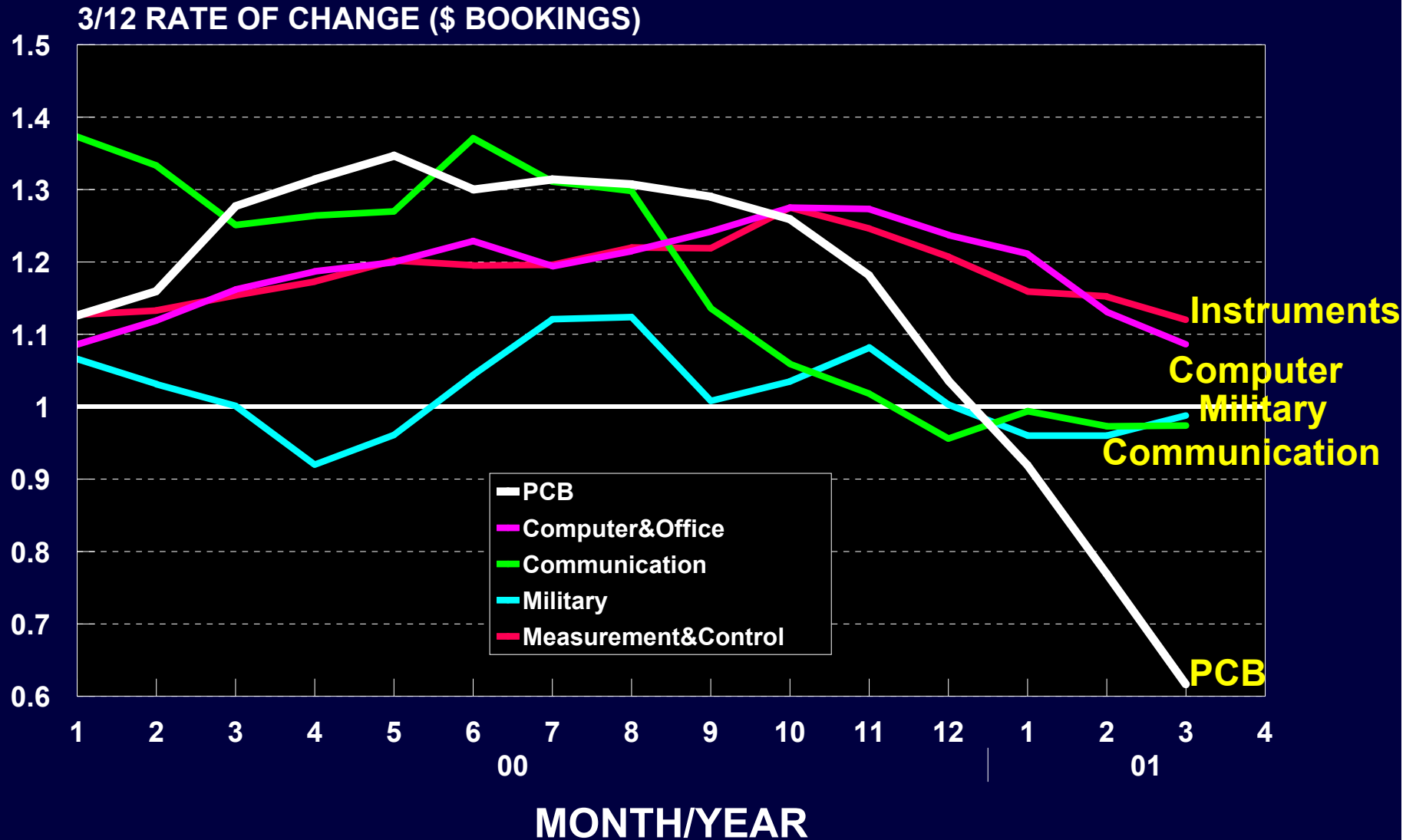
Growth Rates & Future Outlook

U.S. ELECTRONIC EQUIPMENT vs PCBs

\$ BOOKINGS GROWTH

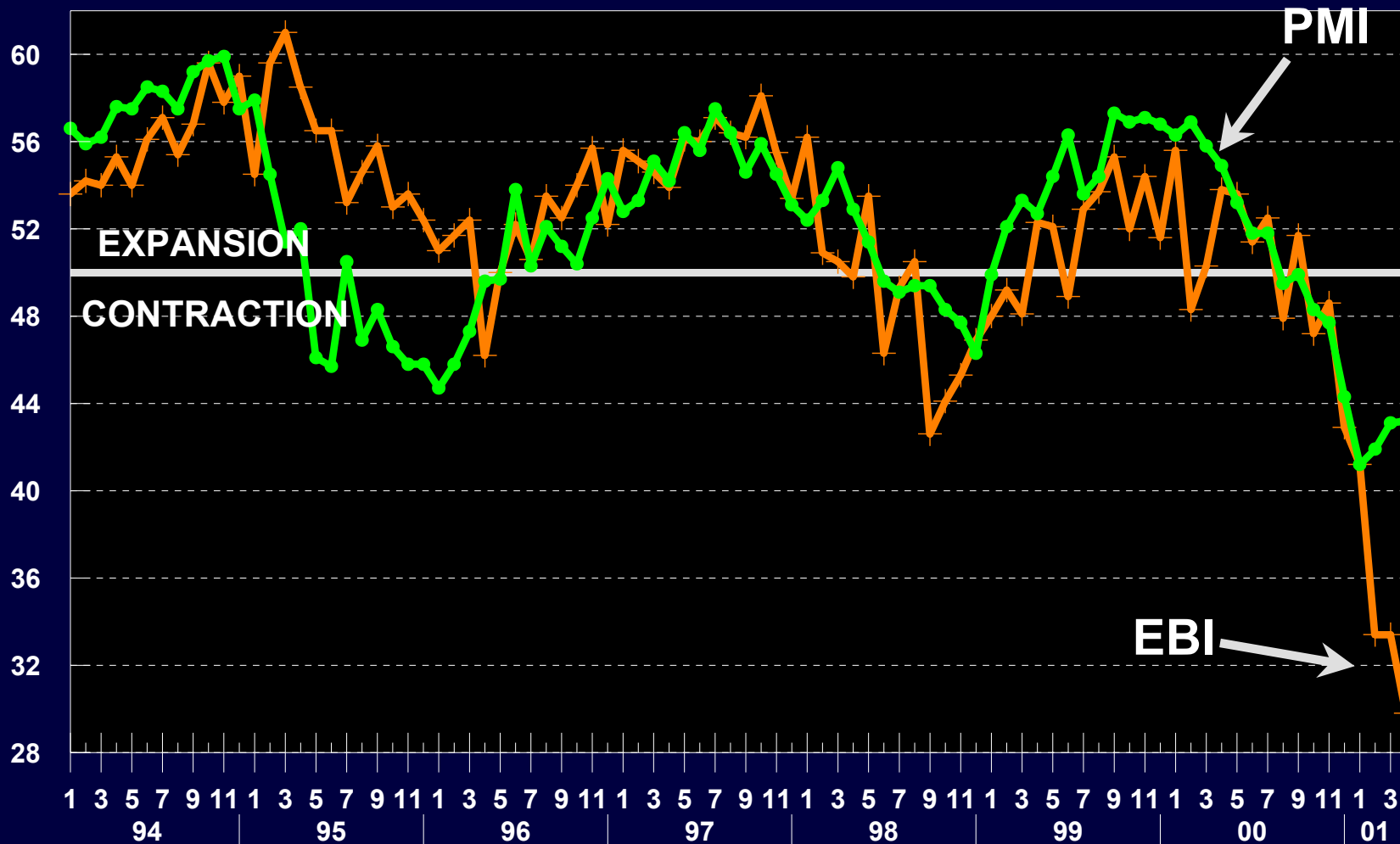


US RIGID PCB vs ELECTRONIC EQUIPMENT BOOKINGS



PMI vs EBI "QUEST" ELECTRONIC BUYERS' INDEX

DIFFUSION INDEX



NATIONAL ASSOC of PURCHASING MANAGERS
ELECTRONIC BUYERS NEWS

PRESENT GROWTH RATES (%)

U.S. ECONOMY & ELECTRONICS INDUSTRY

	LATEST MONTH	ANNUAL GROWTH RATE	3-MONTH GROWTH RATE
RIGID PCB BOOKING \$	3/01	102.7	61.6
RIGID PCB SHIPMENT \$	3/01	114.4	97.6
LAMINATE+PREPREG SHIPMENTS SF	3/01	108.2	83.0
ELECTRONIC COMPONENTS BOOK \$	3/01	108.0	90.0
ELECTRONIC EQUIPMENT BOOKINGS \$			
COMPUTER & OFFICE	3/01	119.6	108.6
COMMUNICATIONS	3/01	109.4	97.4
MEASURE/CONTROL INSTRUMENTS	3/01	118.3	112.0
MILITARY (SEARCH & NAVIG)	3/01	101.1	98.8
TOTAL ELECTRONIC EQUIPMENT	3/01	114.1	104.4
INDUSTRIAL PRODUCTION	4/01	103.7	100.0

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

Summary & Conclusions

Summary

- **Component & electronic equipment orders were "too" strong in 2000. Lead times extended and overbooking & inventory buildups occurred.**
- **2001 component orders are now dropping sharply. Shortages are generally now over. Substantial inventories still exist throughout the "food chain." Downward price pressures exist.**
- **U.S. Interest rates are being lowered to stimulate the economy. "Low rates" won't stimulate PCBs until 2002.**

Summary

- **Personal computer seasonality continues but growth has slowed significantly. The 2000 Christmas was very disappointing leaving behind large excess retail inventories. Signs of recovery are now evident.**
- **Cell phone growth has slowed. Outsourcing to CEMs is common as cell phone makers seek low cost production.**
- **Semiconductor fab investment has plunged. Fab test & measurement and production equipment which grew 80% in 2001 is in a downturn.**
- **Military & Medical electronics are a bright spots. Automotive is down but "stable."**

Summary

- Domestic rigid PCB shipments grew 18% in CY2000.
- 2001 PCB orders are now plummeting.
- This downturn may be the worst in history with substantially lower new orders, massive inventory reductions and cancellations of existing orders. PCBs are now well "overcorrected" vs. equipment.
- Factory closings, staff reductions, reduced capital spending and bankruptcies are now occurring.
- Multinational PCB makers are shifting production to low cost of manufacturing areas - primarily China.

Summary

- **The first signs of a global recovery suggest possible growth in some sectors in 2H'01. This assumes no global recession.**
- **Recovery in telecom and Internet Infrastructure will take longer. Inventory levels are in the 6-9 month range. Firms such as Nortel, Lucent and Cisco are key.**

Electronic Equipment Production Growth

Constant \$ Growth Rates Converted @ Constant Exchange Rates

	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>98-03</u>
World	7.3	11.5	4.3	7.7	10.6	8.2
USA	8.5	13.1	4.5	7.6	10.1	8.7
W Europe	8.5	11.1	3.7	6.0	9.8	7.8
Japan	-3.0	7.5	3.5	5.6	7.8	4.2
Four Tigers	6.9	16.5	6.4	9.8	14.5	10.7

Conclusions

2000 should not be the benchmark

"Limited Visibility"

but 2001 will be a difficult year.

**Selective recovery beginning in
2H'01**

**Probable "below-zero" total growth
in 2001. 4-8% growth in 2002**