

# Timing & Magnitude of Much Awaited Recovery

**Walt Custer**  
**Custer Consulting Group**  
*[www.custerconsulting.com](http://www.custerconsulting.com)*  
**November 2002**

# TOPICS

**GLOBAL ECONOMY**

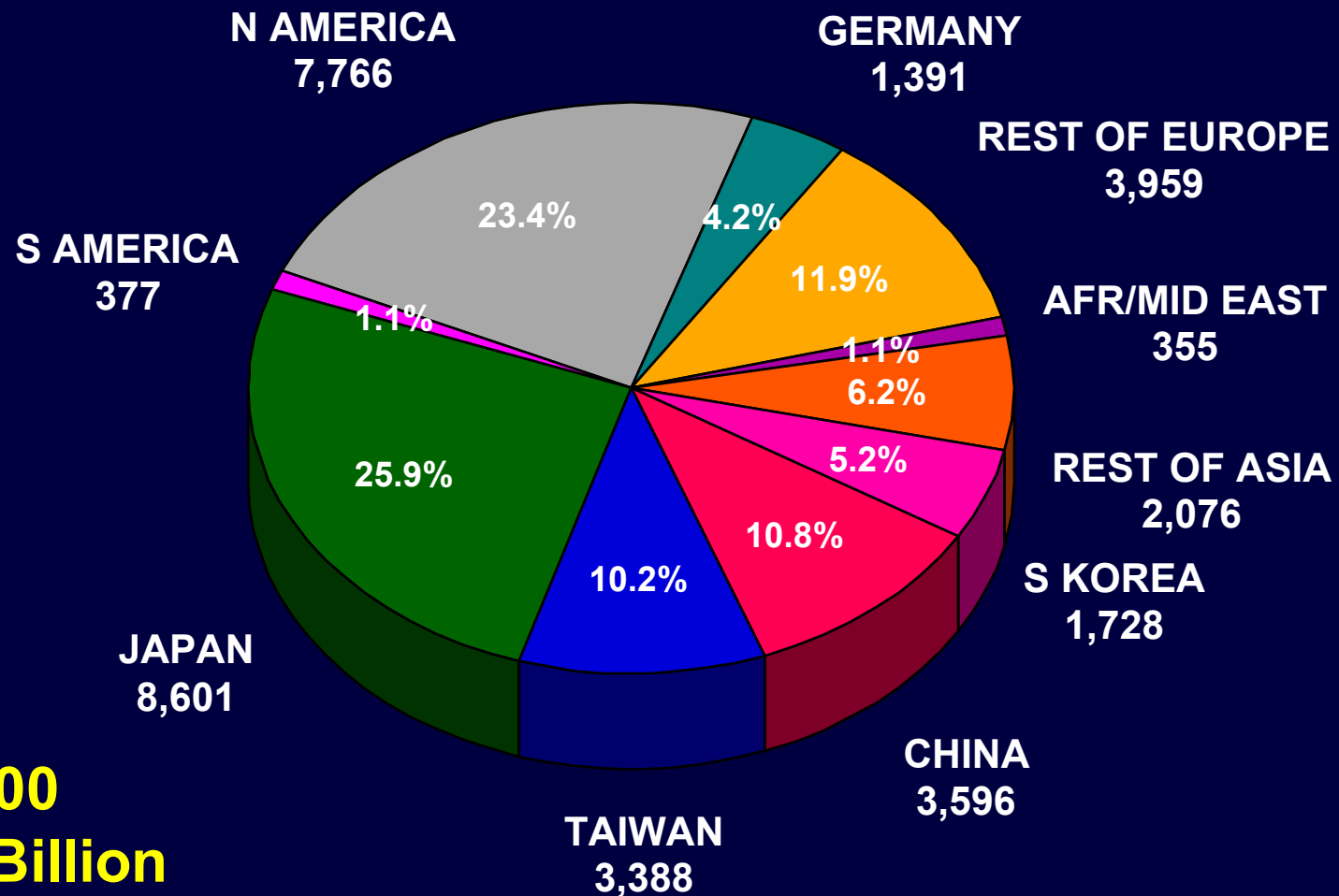
**ELECTRONIC EQUIPMENT**

**SEMICONDUCTORS**

**PRINTED CIRCUIT BOARDS**

**FUTURE OUTLOOK**

# 2001 WORLD RIGID & FLEX PCB PRODUCTION BY GEOGRAPHICAL AREA (\$M)



**2000**  
**\$42.6 Billion**

→ **Total: \$33.2 Billion**

IPC T/MRC 5/2002 (includes microvia PCBs & chip packaging substrates)

# 2000

## **Strong Equipment Demand**

**Telecom**

**Internet Infrastructure/Dot.coms**

**Semiconductor Fab**

**Industrial Electronics**

**Ready capital, overheated stock market**

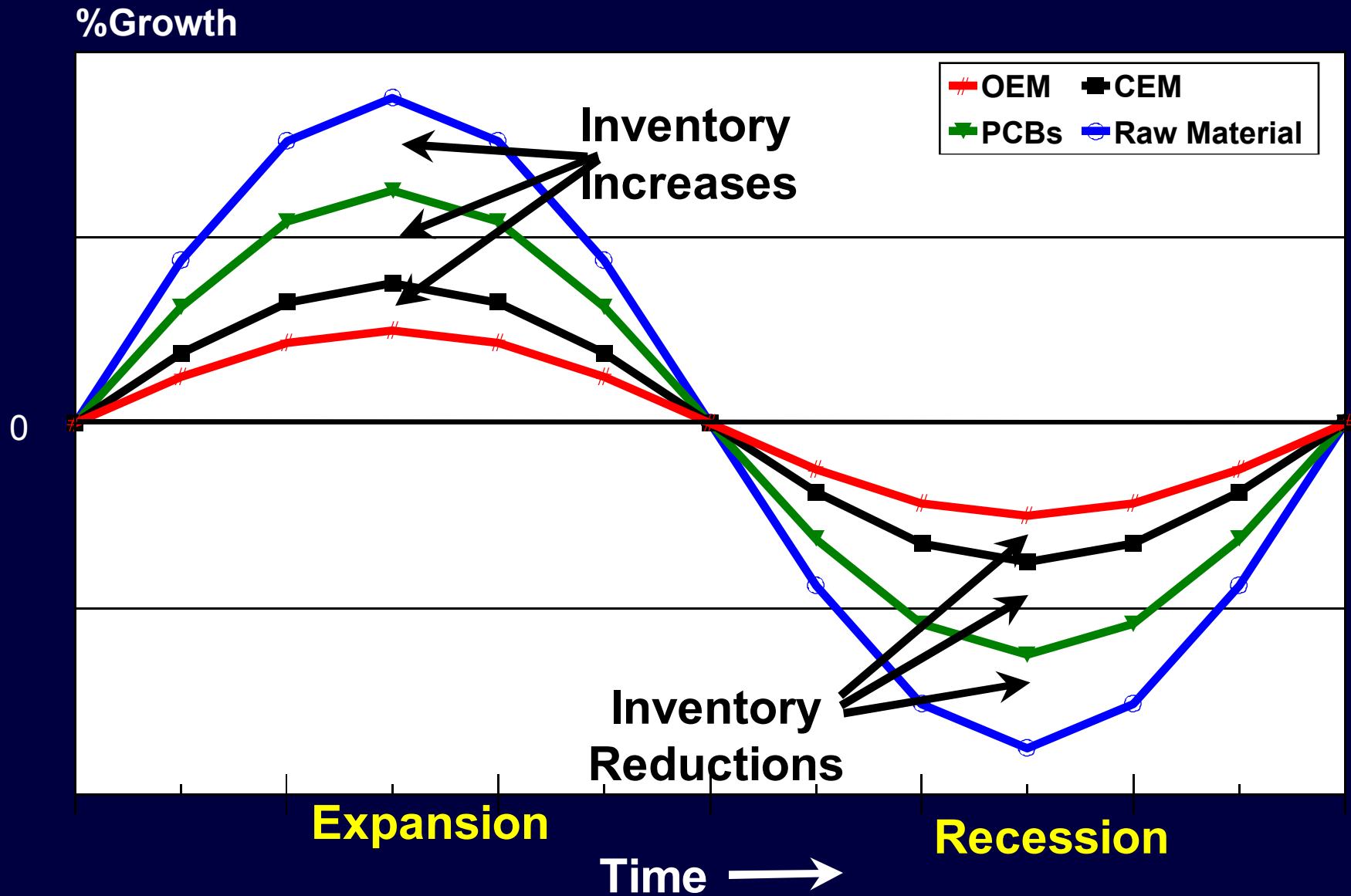
**Shortages & Capacity Fears**

**Double / Over-ordering Components**

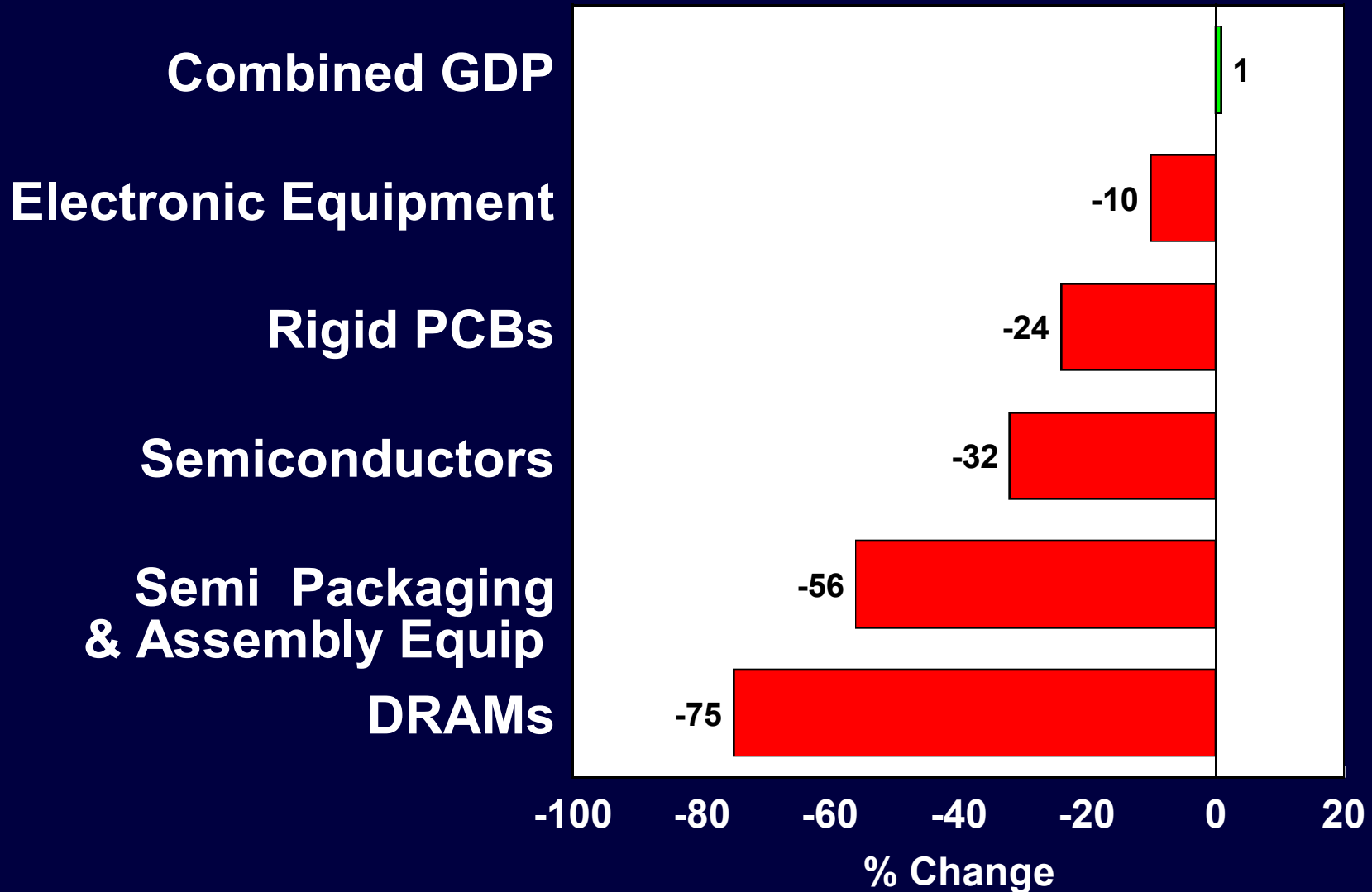
**Inventory Builds - including CEMs**

# BUSINESS CYCLE

## SUPPLY CHAIN EFFECT



# Global Impact 2001 vs 2000



# Causes of Recession

**Inventory corrections**

**Collapse in demand for Fixed Telecom & Internet Infrastructure equipment**

**Overcapacity/Price Degradation**

**Economic downturn**

**Manufacturing shifts to lower cost areas**

**September 11 attacks**

**Accounting scandals**

# The Future?

# Forecasting Tools

## Multiple Approaches Needed

- Global Economic Growth
- Leading indicators
- Electronic equipment orders & inventories
- Company guidance
- Global semiconductor shipments
- PCB shipments & orders
- Future IT spending

# INDUSTRIAL PRODUCTION - WORLD

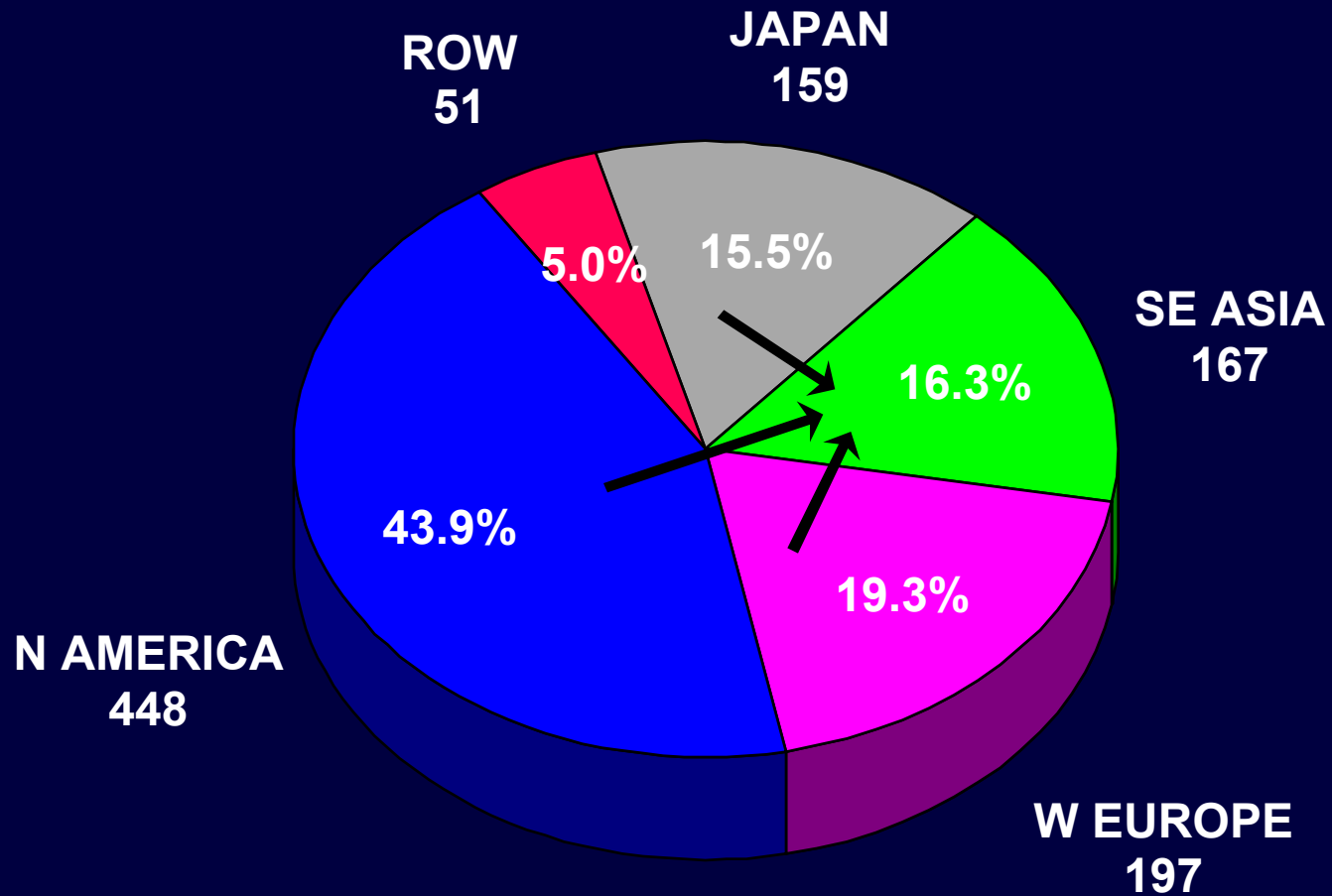
% CHANGE vs ONE YEAR EARLIER

BRITAIN	-2.5 Sep
FRANCE	-1.1 Aug
GERMANY	-1.3 Sep
ITALY	+1.2 Sep
NETHERLANDS	-2.3 Sep
SPAIN	+3.1 Sep
EURO area	-0.8 Aug
RUSSIA	+5.5 Sep
CANADA	+3.1 Aug
USA	+1.2 Oct
CHINA	+14.2 Oct
MALAYSIA	+9.0 Sep
PHILLIPPINES	-12.0 Aug
SINGAPORE	+10.4 Sep
S KOREA	+3.4 Sep
TAIWAN	+12.5 Sep
THAILAND	+9.8 Sep
JAPAN	+5.2 Sep

# **Electronic Equipment Orders & Inventories**

# WORLD ELECTRONIC EQUIPMENT PRODUCTION

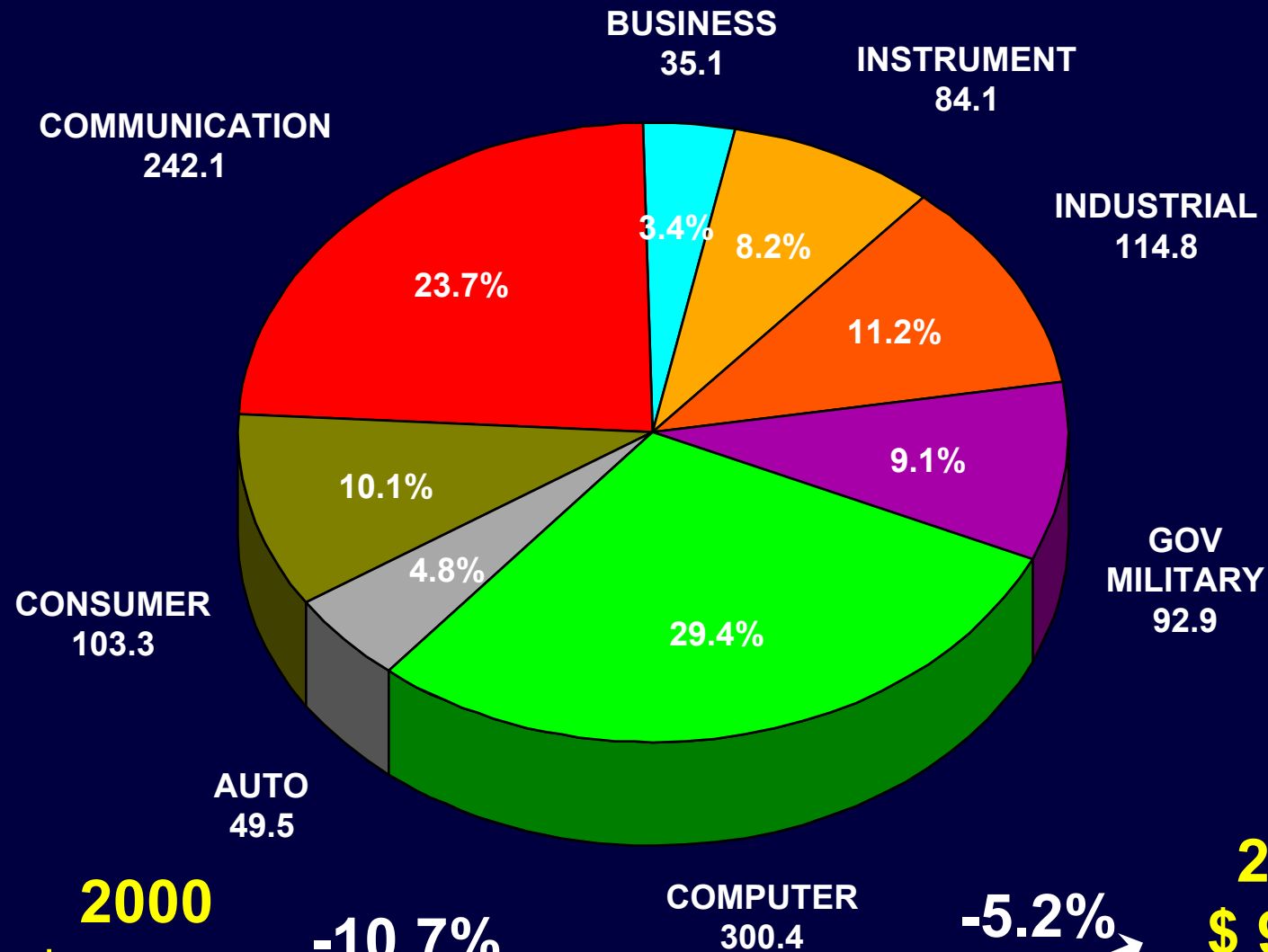
2001



**TOTAL \$1,021 Billion**

# WORLD EQUIPMENT PRODUCTION

2001 ESTIMATE (\$B)



**2000**  
**\$1130 B**

**-10.7%**

**COMPUTER**  
**300.4**

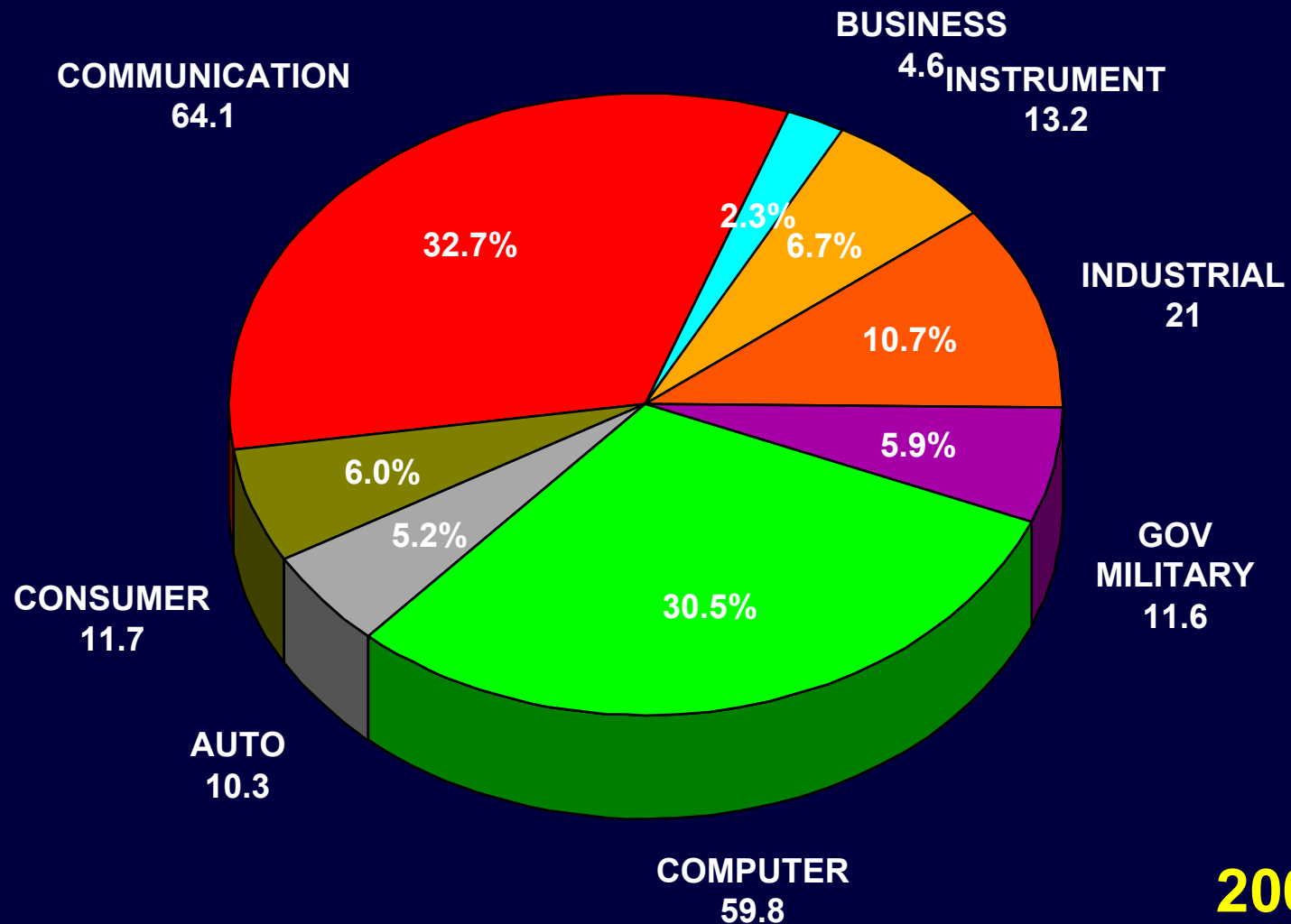
**-5.2%**

**2002**  
**\$ 970B**

**TOTAL \$1020 B**

# ELECTRONIC EQUIPMENT PRODUCTION

W EUROPE - 2001 ESTIMATE (\$B)



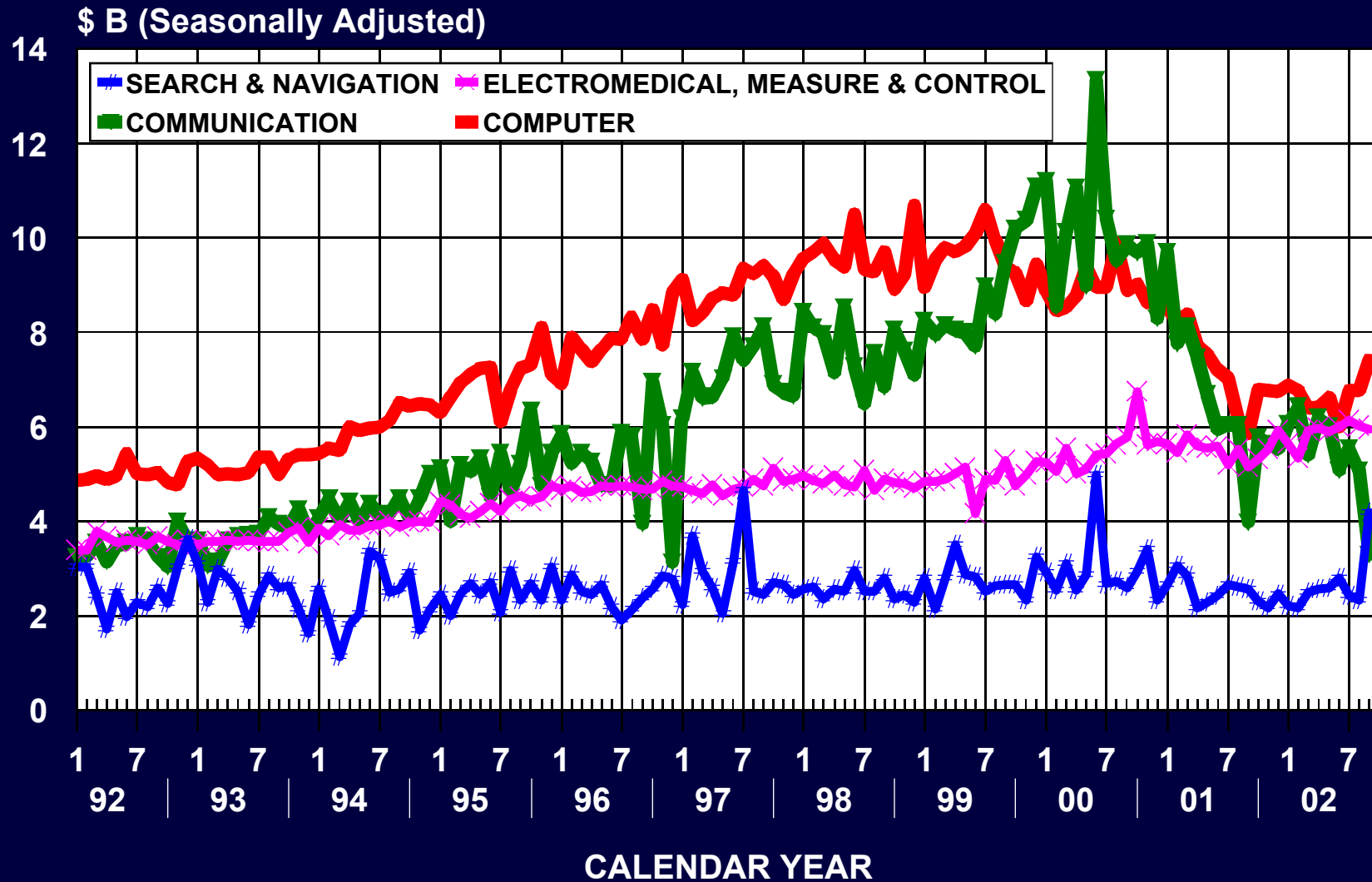
**TOTAL \$196 B**



**2002  
\$191 B**

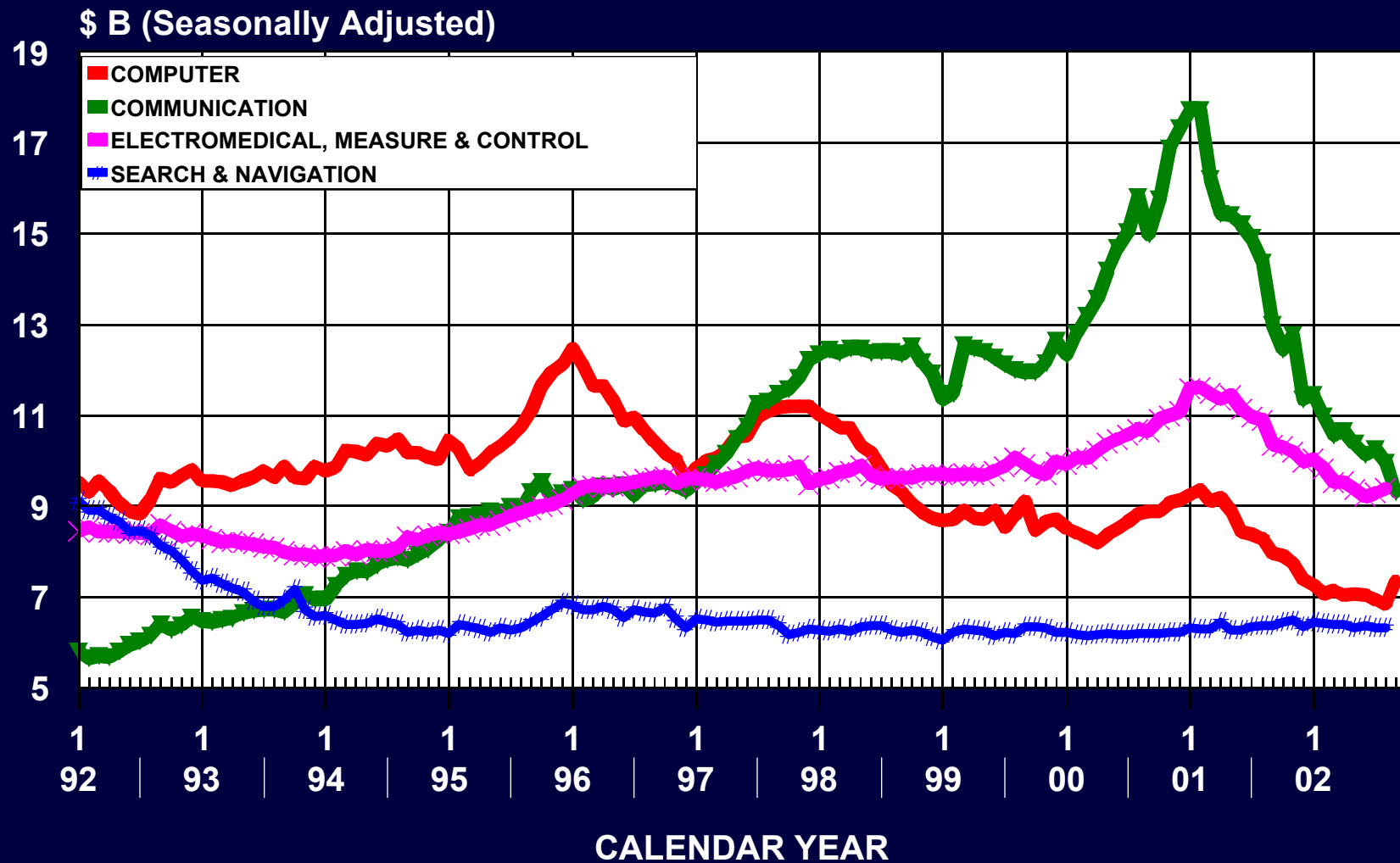
# US ELECTRONIC EQUIPMENT ORDERS

## Monthly Data



# US ELECTRONIC EQUIPMENT INVENTORIES

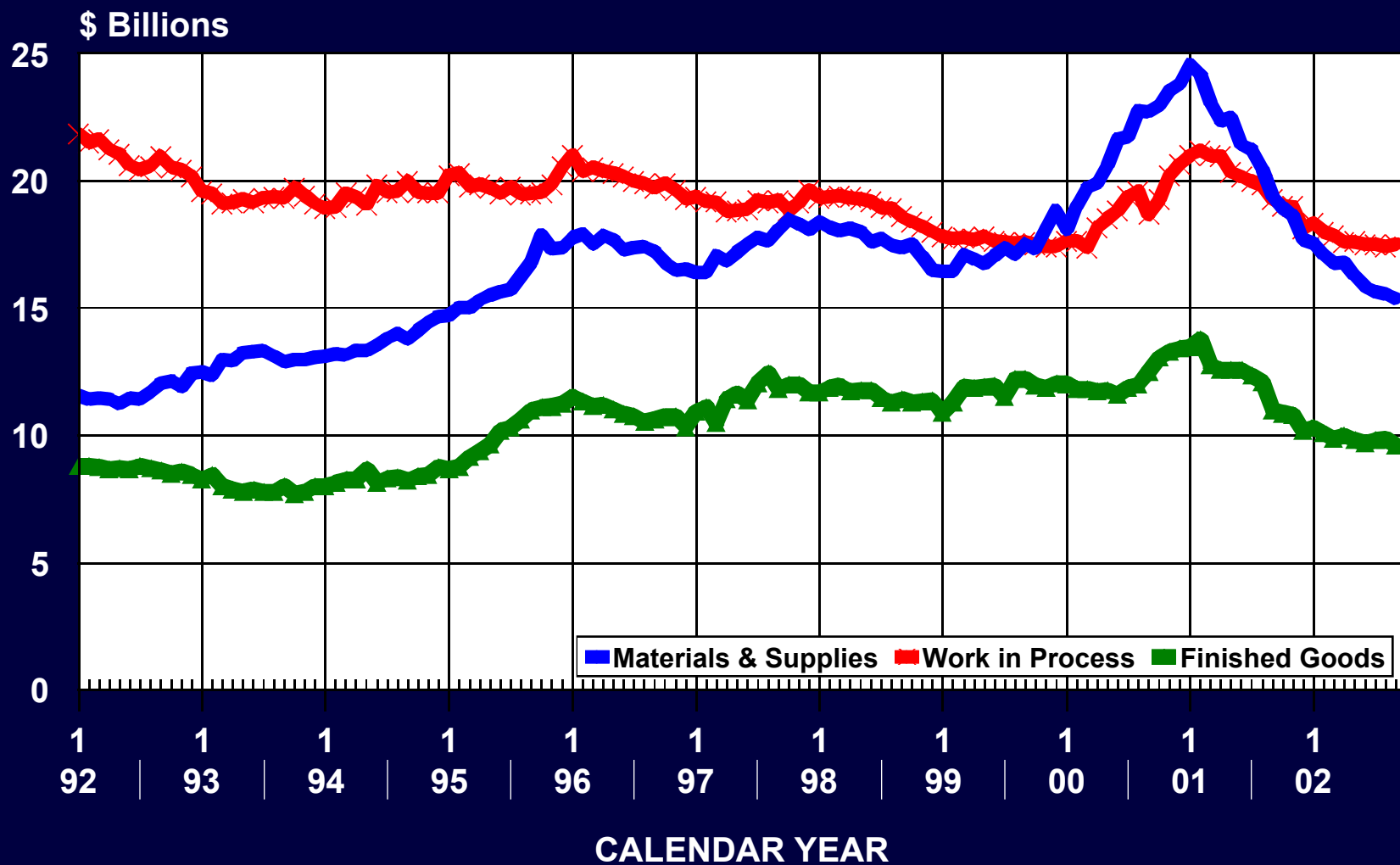
## Monthly Data



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

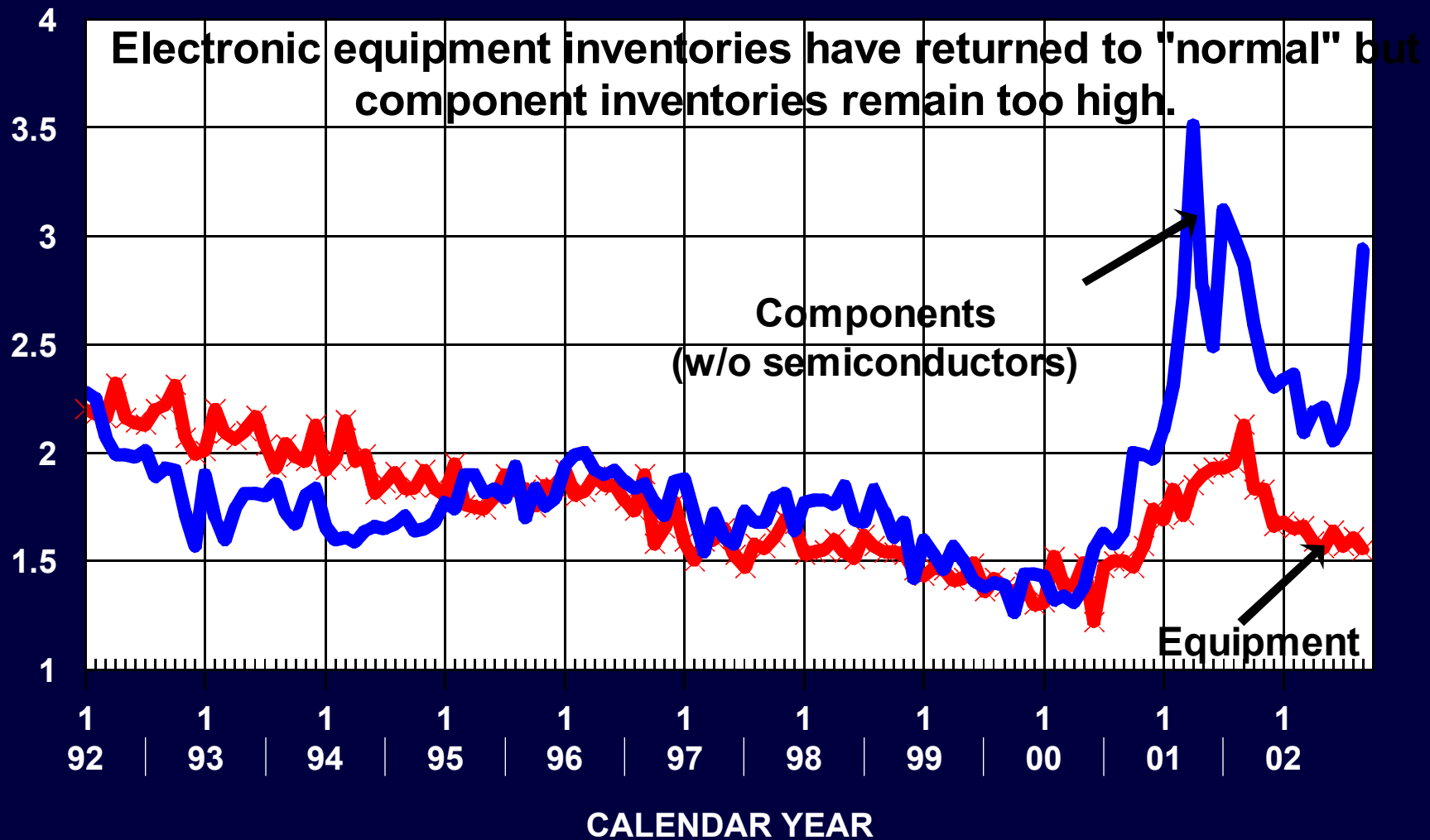
10/02

# Value of U.S. "Computers & Electronic Products" Inventories by Stage of Fabrication



# US Electronic Equipment & Component Inventories

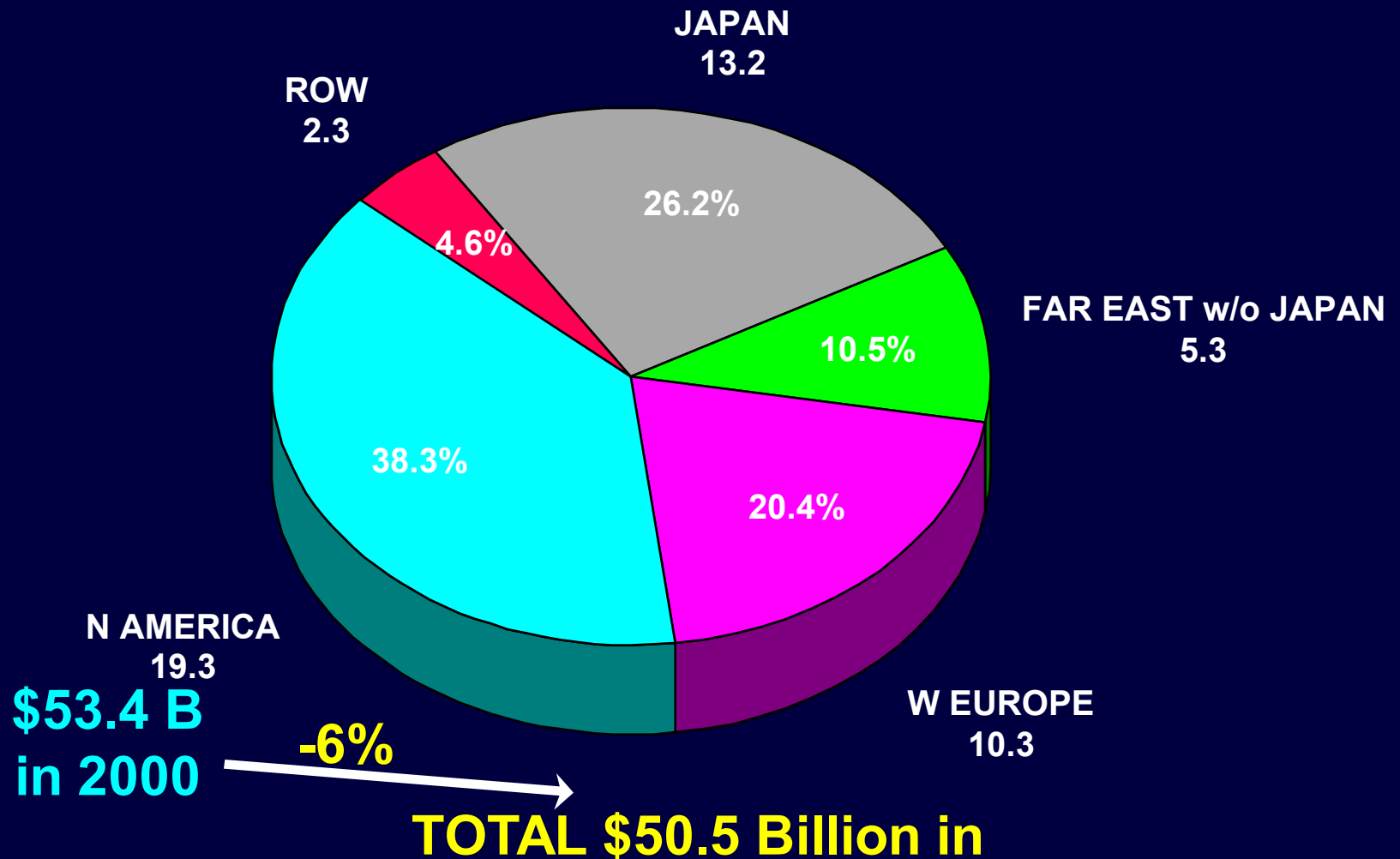
## Inventories vs. Orders



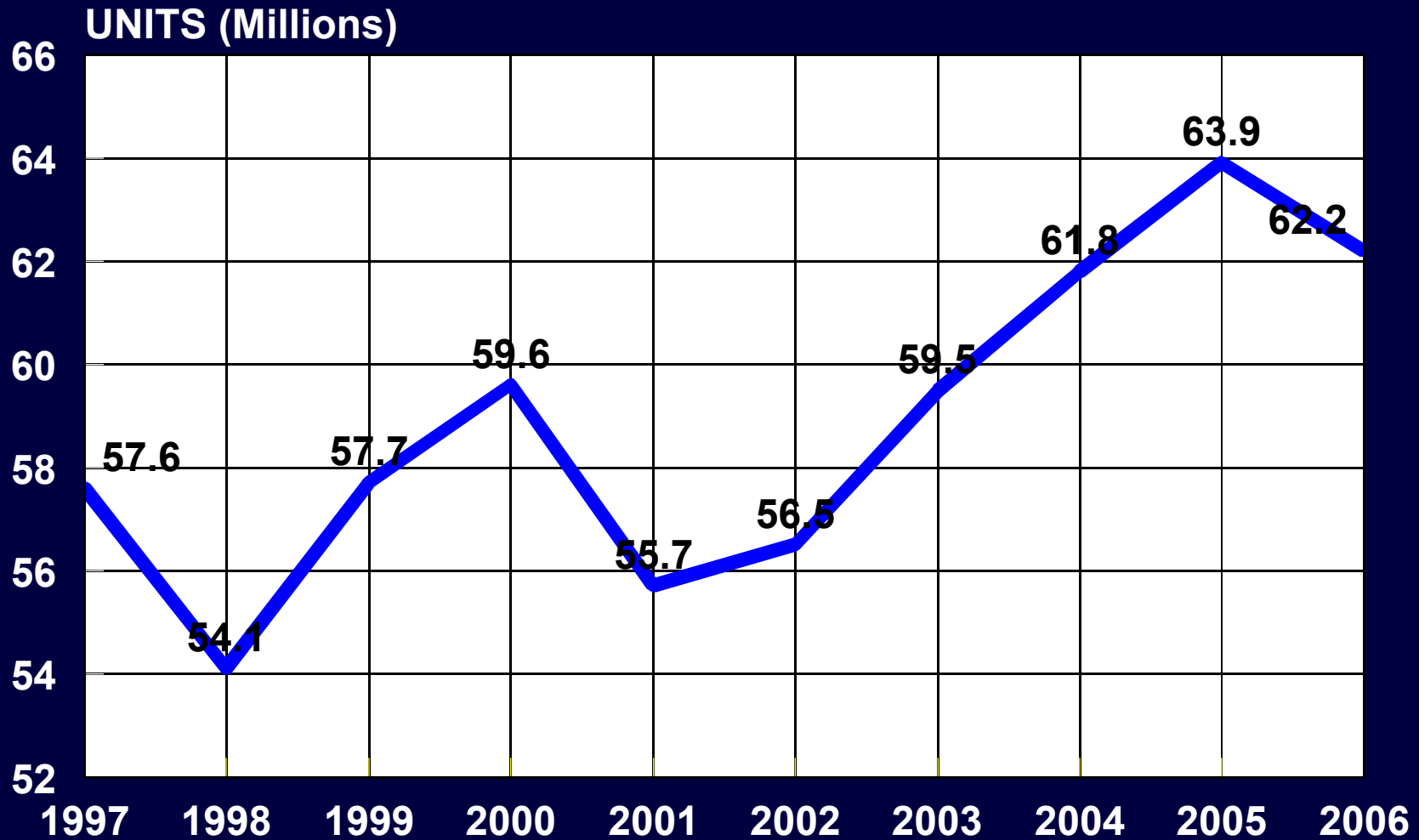
# Automotive Electronics

# WORLD AUTOMOTIVE ELECTRONICS PRODUCTION

## 2001

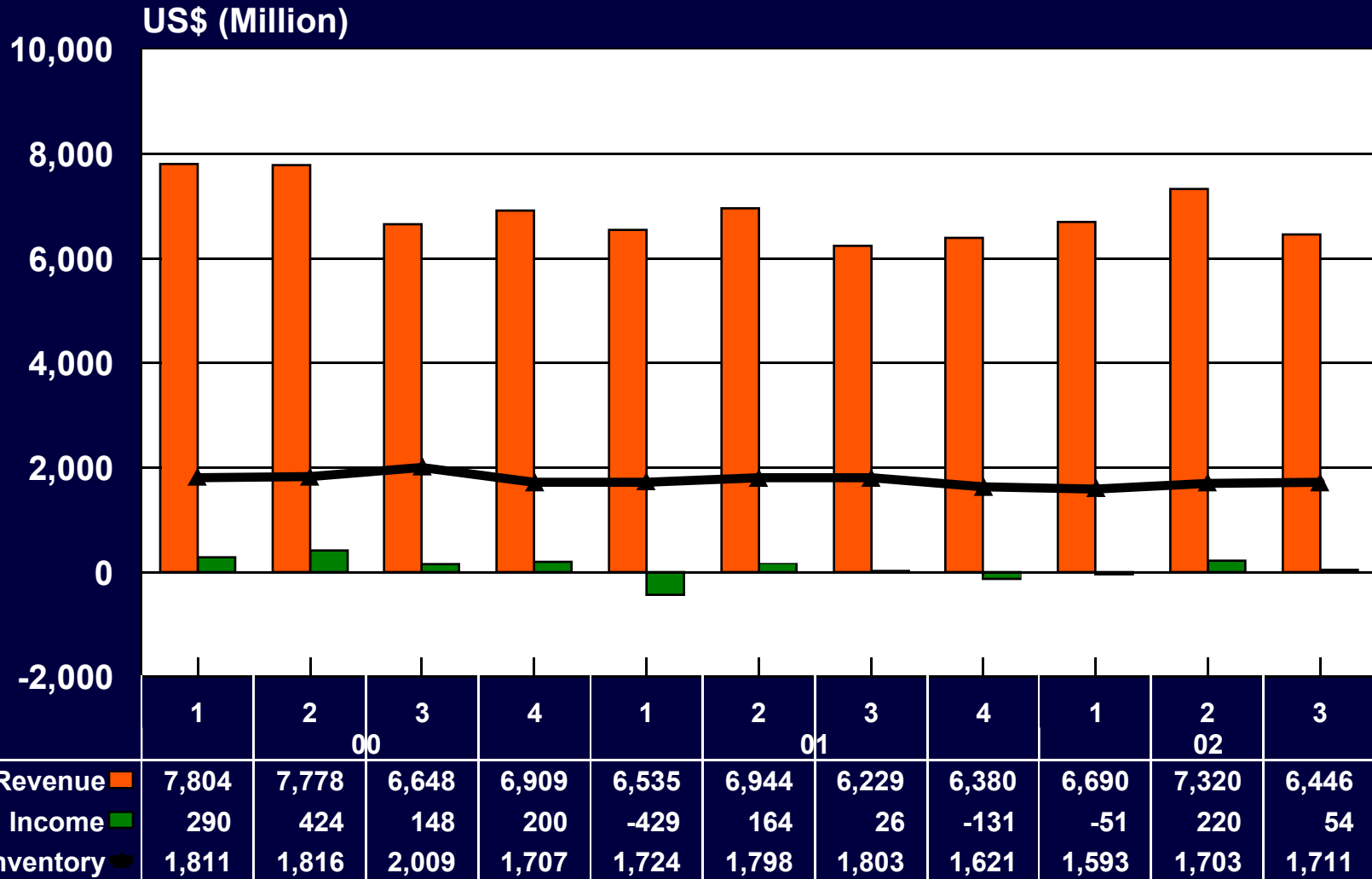


# World Motor Vehicle & Automotive Electronics Production



# Delphi Corp

## Revenue, Net Income & Inventory



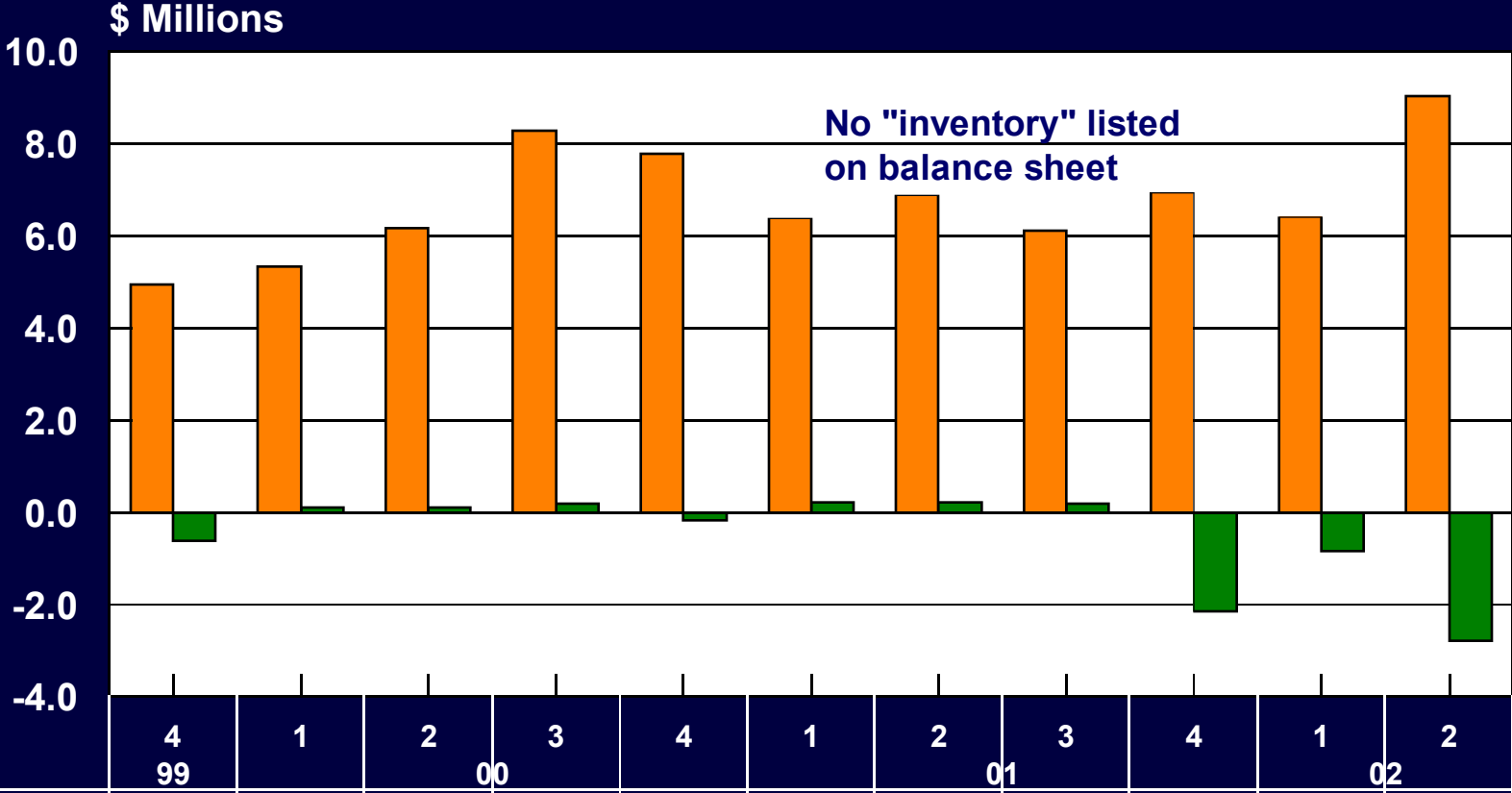
CY

DPH

# **Safety & Security**

# Viisage Technology

## Revenue & Net Income



Revenue	4.9	5.3	6.2	8.3	7.8	6.4	6.9	6.1	6.9	6.4	9.0
Income	-0.6	0.1	0.1	0.2	-0.2	0.2	0.2	0.2	-2.2	-0.9	-2.8

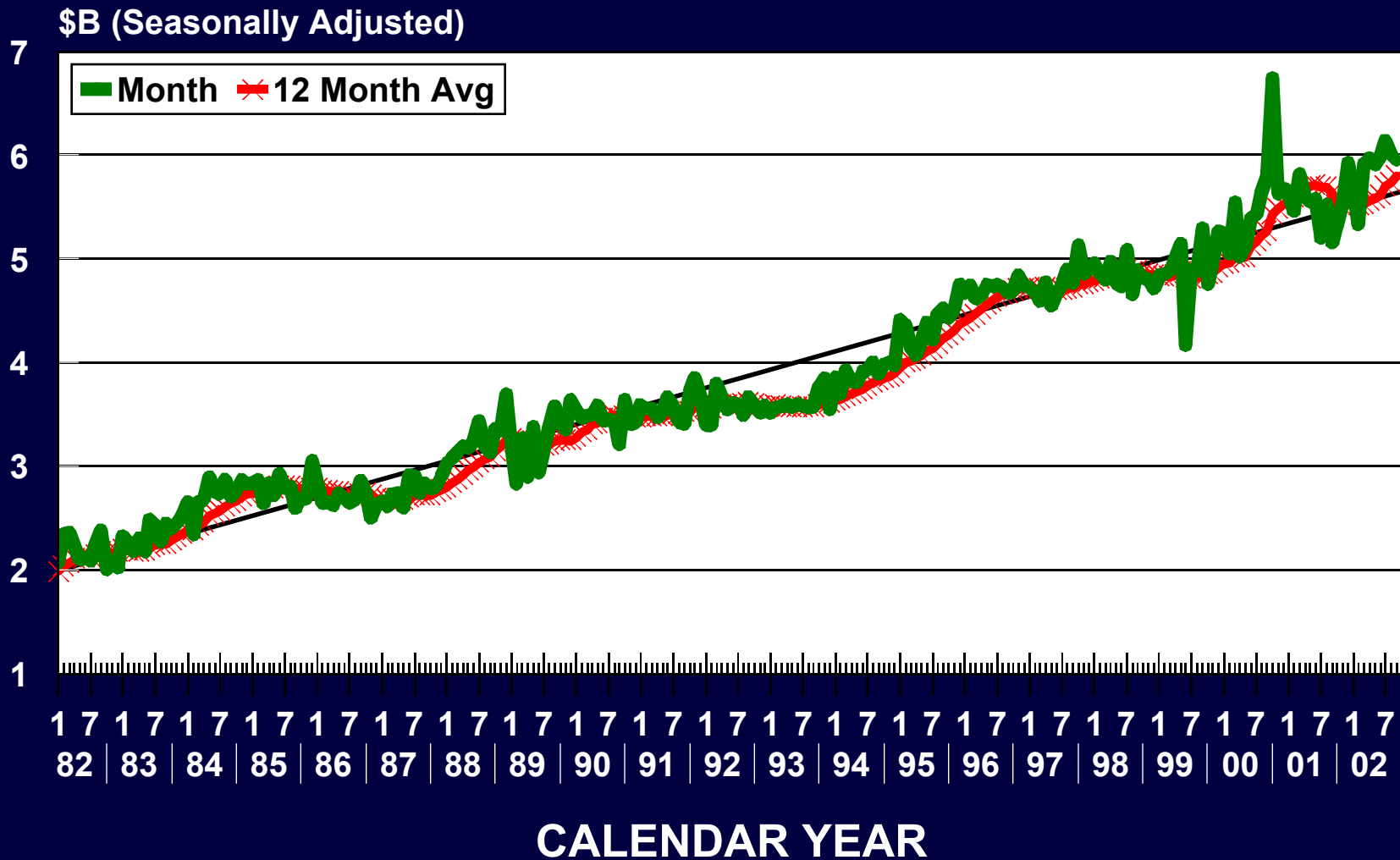
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Visg

# **Instruments & Control Equipment**

# ELECTROMEDICAL, MEASUREMENT & CONTROL EQUIPMENT

## BOOKINGS



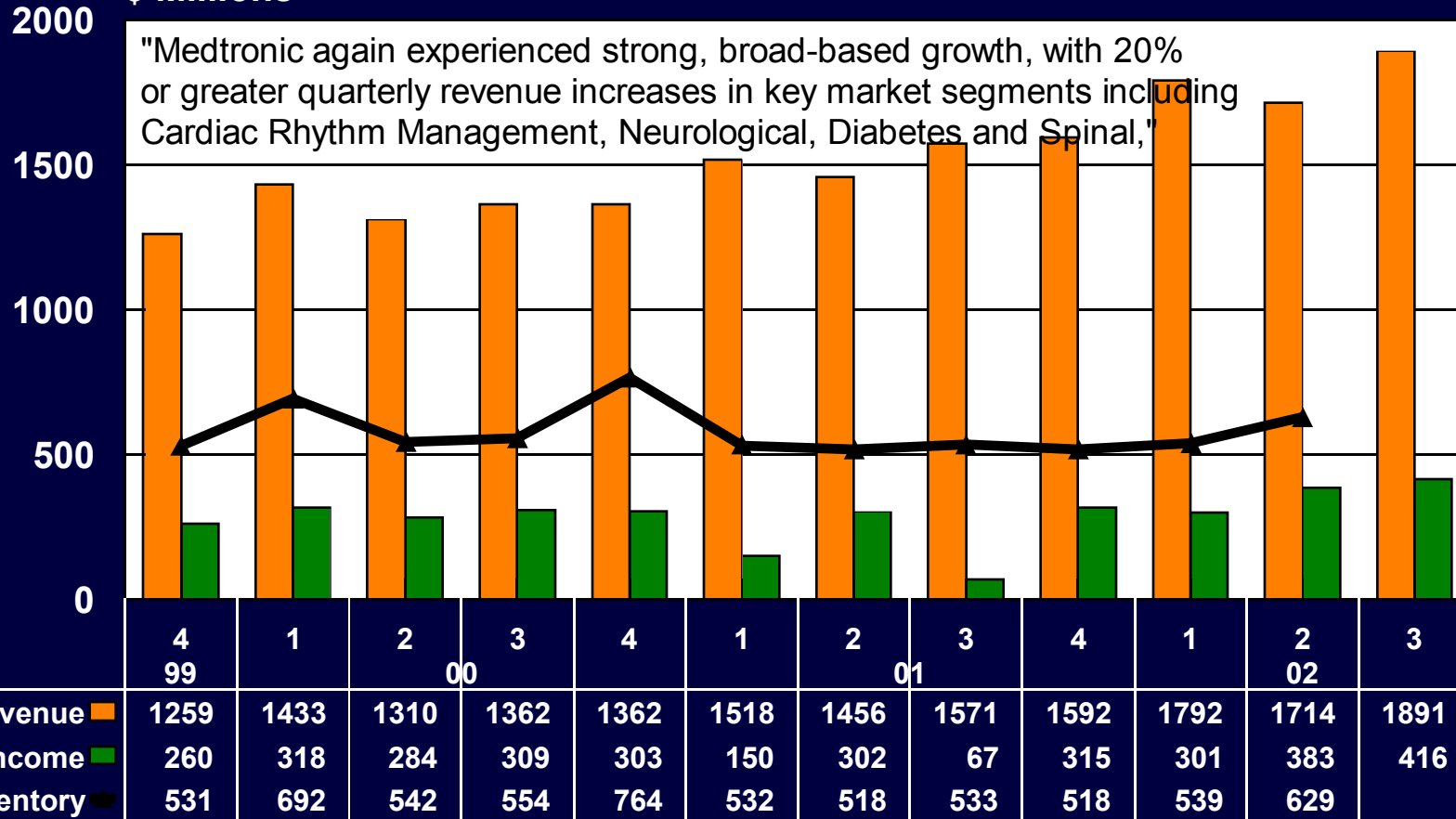
<http://www.census.gov/indicator/www/m3/>

11/02

# Medtronic Inc

## Revenue, Net Income & Inventory

\$ Millions

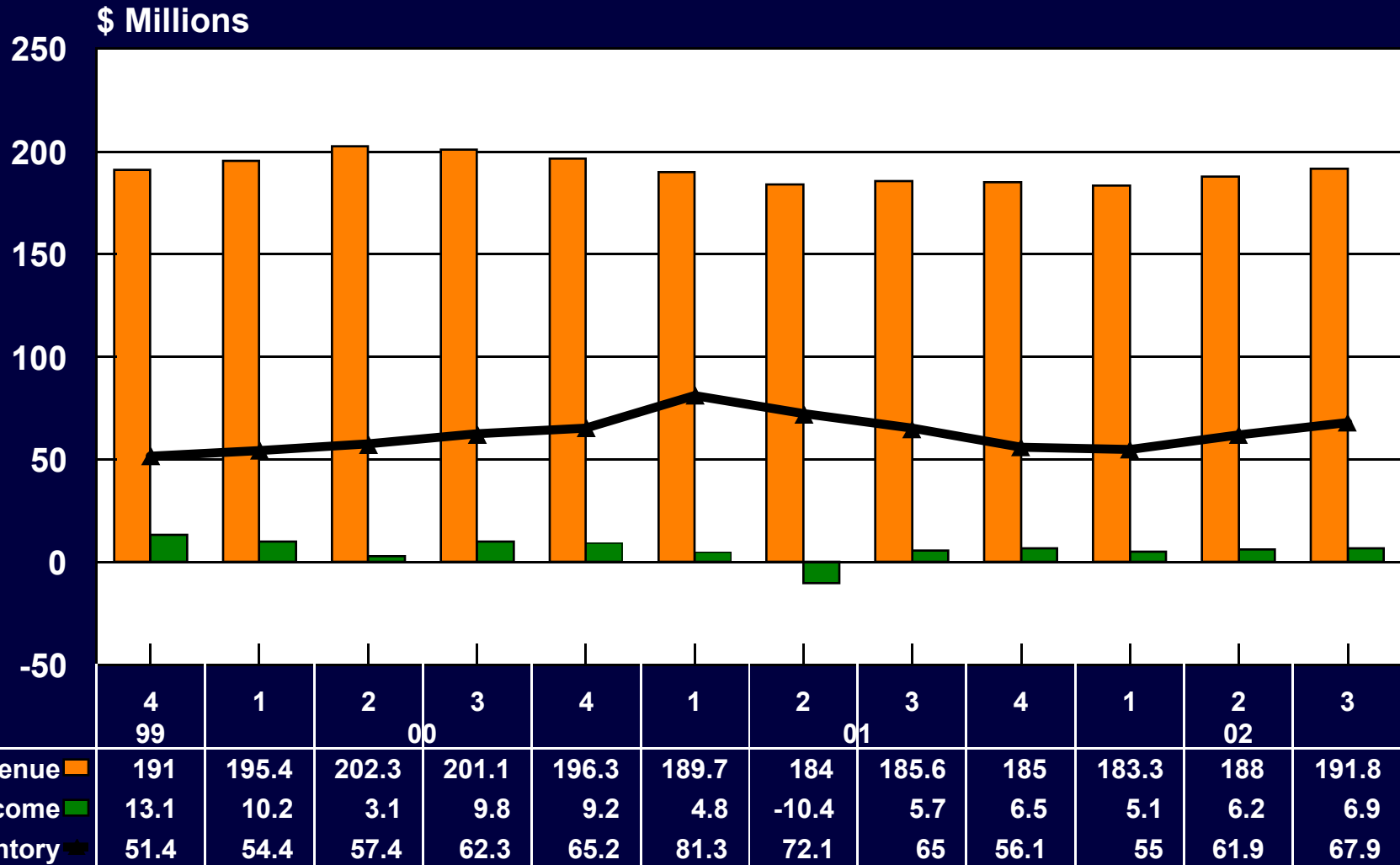


CY

MDT

# Teledyne Technologies

## Revenue & Net Income



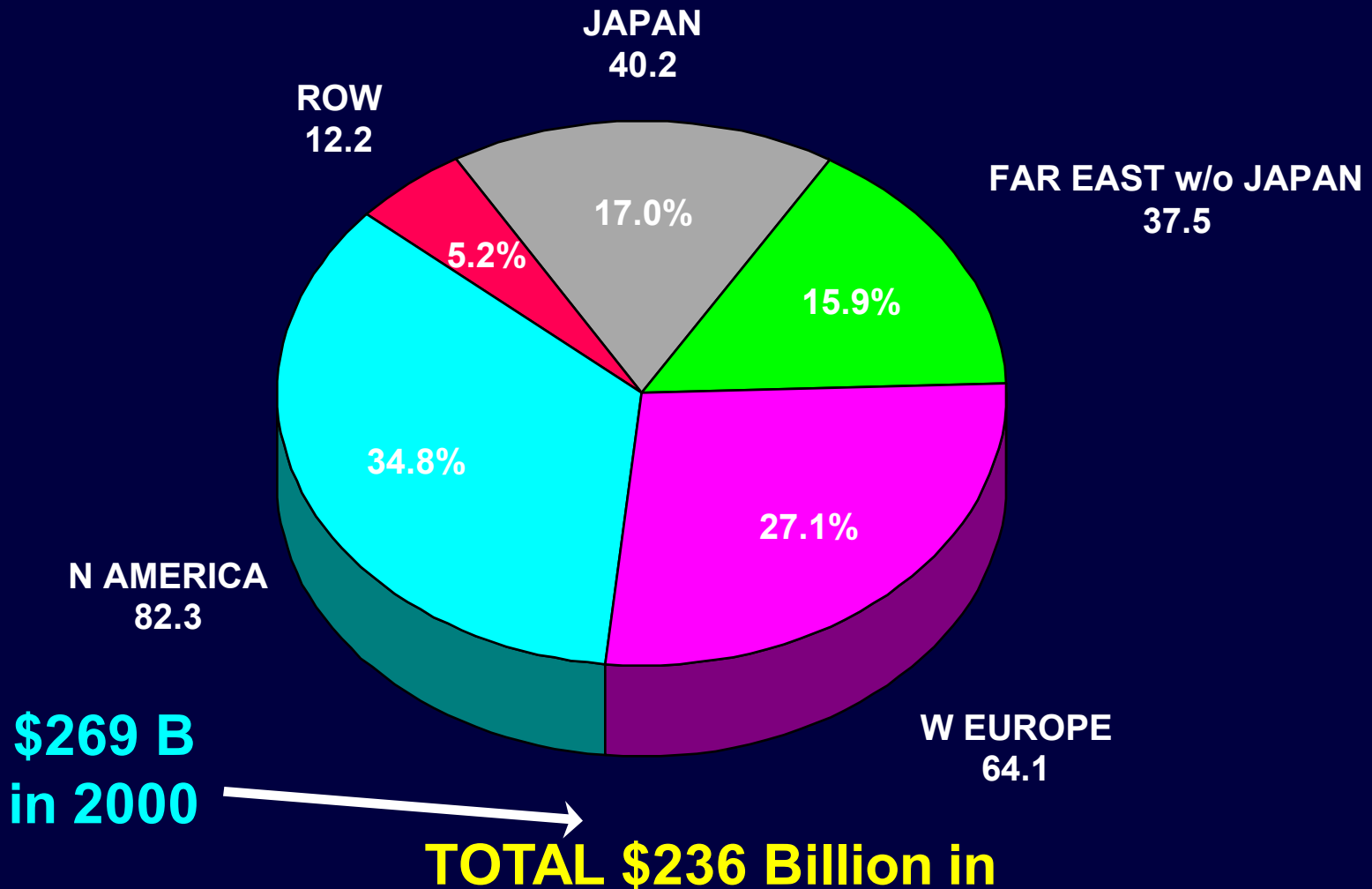
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TDY

# Communications Equipment

# WORLD COMMUNICATIONS EQUIPMENT PRODUCTION

2001

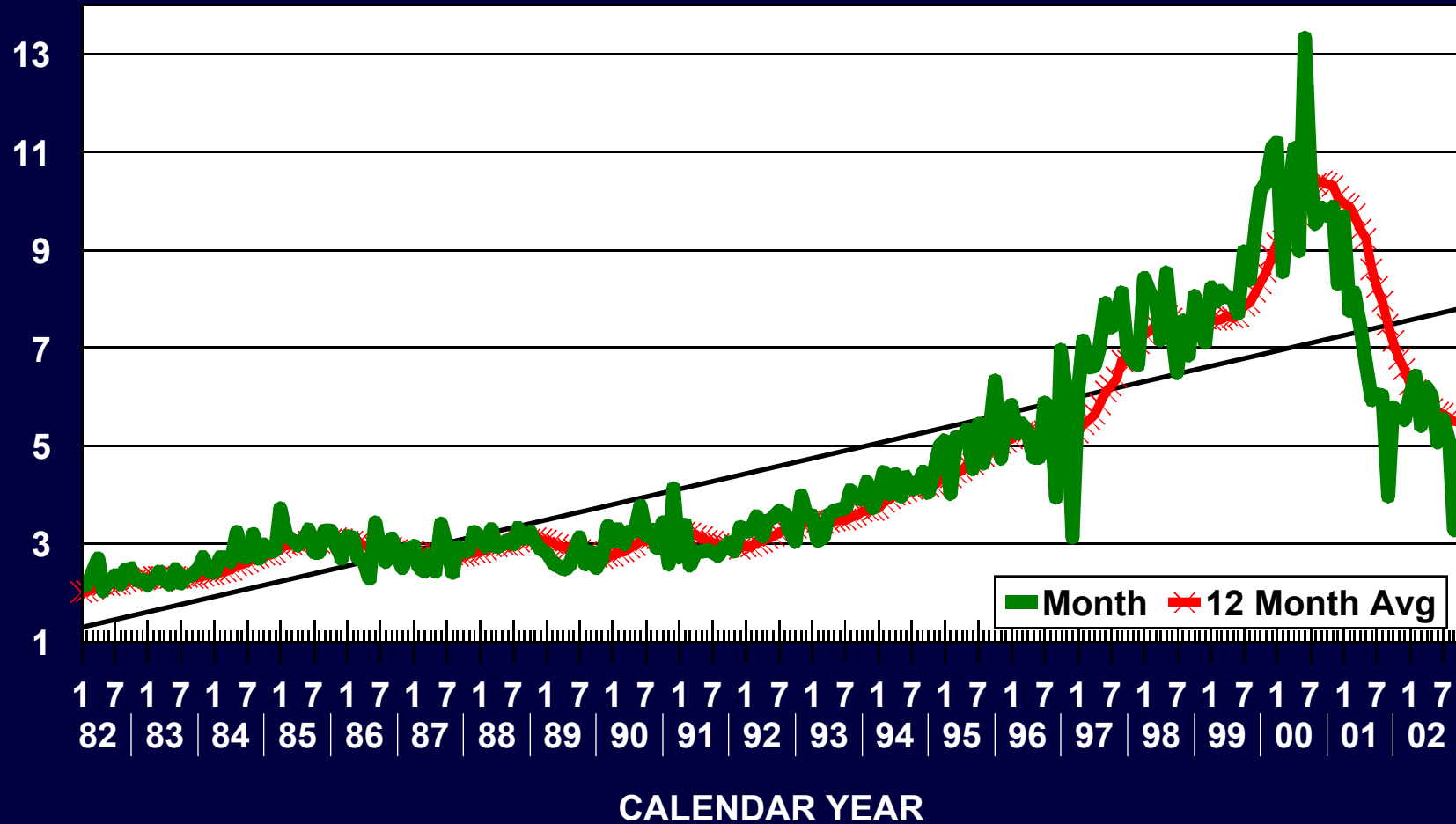


**\$269 B**  
in 2000

**TOTAL \$236 Billion in**  
**2001**

# COMMUNICATIONS EQUIPMENT BOOKINGS

\$ B (Seasonally Adjusted)

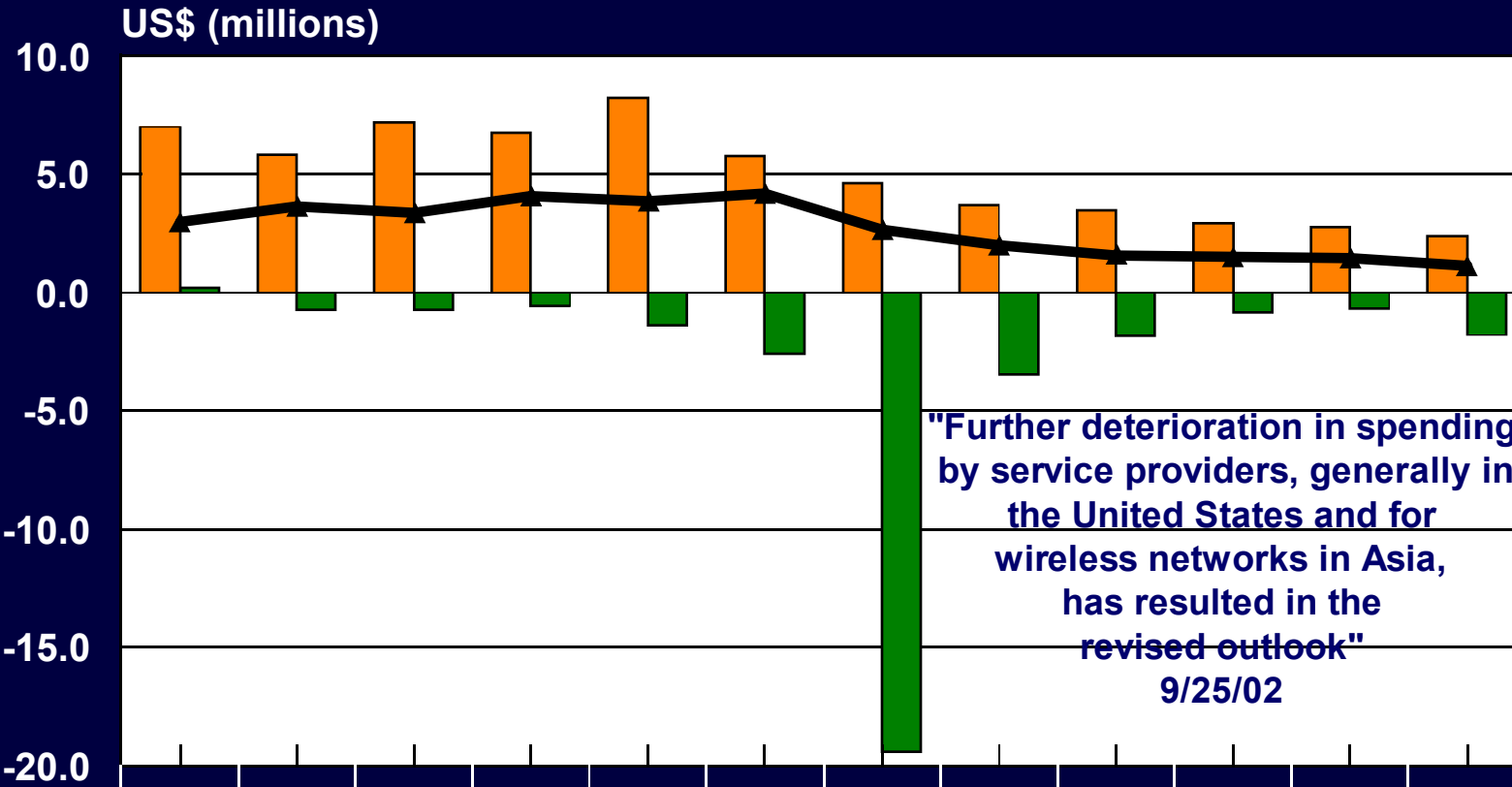


# Worldwide Telecommunications Market Shares

	<u>Q2 2002</u>	<u>YE 2001</u>
<b>Cisco</b>	<b>14.6%</b>	<b>10.1%</b>
<b>Siemens</b>	<b>11.7%</b>	<b>9.9%</b>
<b>Ericsson</b>	<b>11.3%</b>	<b>11.9%</b>
<b>Alcatel</b>	<b>10.2%</b>	<b>11.8%</b>
<b>Nortel</b>	<b>9.8%</b>	<b>11.2%</b>
<b>Lucent</b>	<b>7.8%</b>	<b>9.1%</b>

# Nortel Networks

## Revenue, Net Income & Inventory



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue <span style="color: orange;">■</span>	7.0	5.8	7.2	6.7	8.2	5.8	4.6	3.7	3.5	2.9	2.8	2.4
Income <span style="color: green;">■</span>	0.2	-0.7	-0.7	-0.6	-1.4	-2.6	-19.4	-3.5	-1.8	-0.8	-0.7	-1.8
Inventory <span style="color: black;">▲</span>	3.0	3.6	3.4	4.1	3.8	4.2	2.6	2.0	1.6	1.5	1.5	1.1

CY

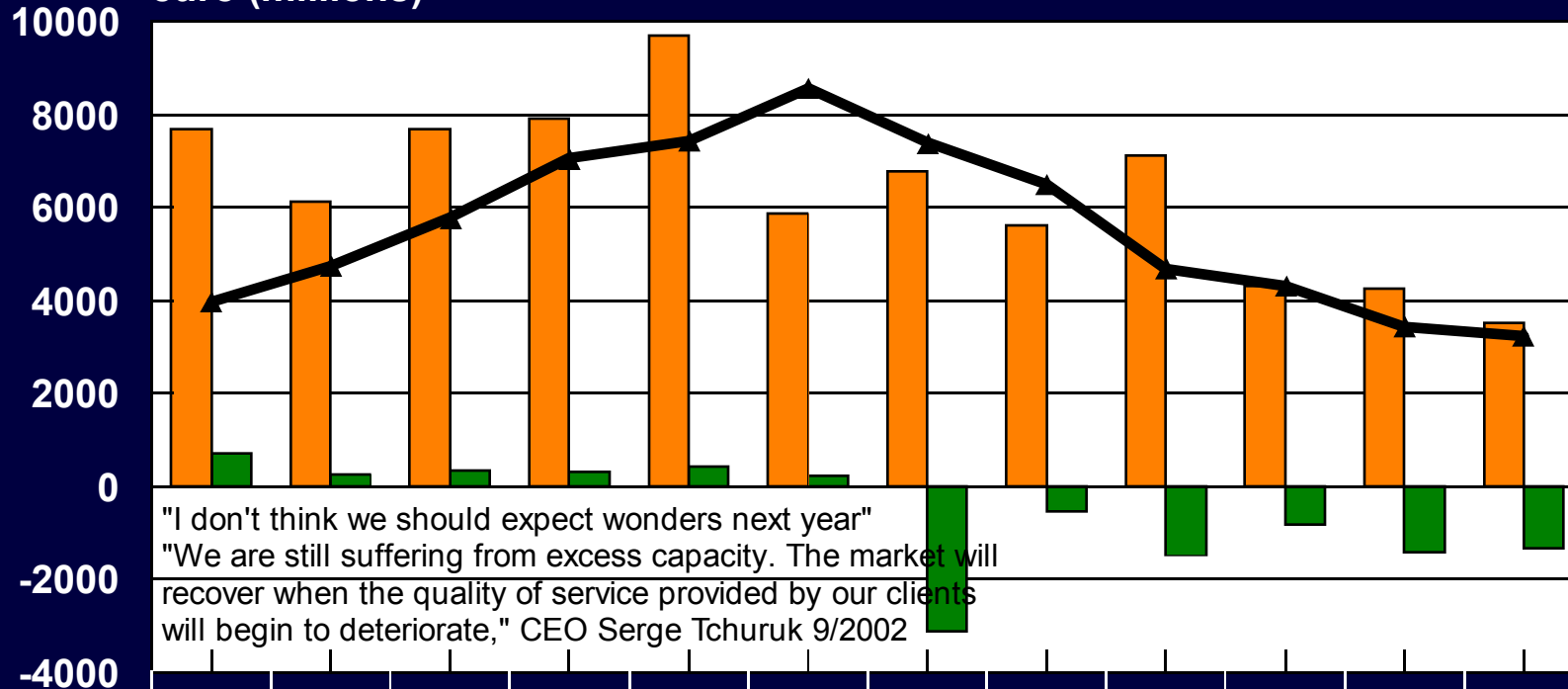
NT

FY=CY

# Alcatel

## Revenue & Net Income

euro (millions)



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue	7671	6124	7687	7908	9689	5864	6767	5613	7109	4296	4235	3508
Income	691	258	343	297	426	210	-3117	-558	-1498	-836	-1438	-1352
Inventory	3960	4731	5764	7039	7415	8564	7379	6482	4681	4293	3416	3219

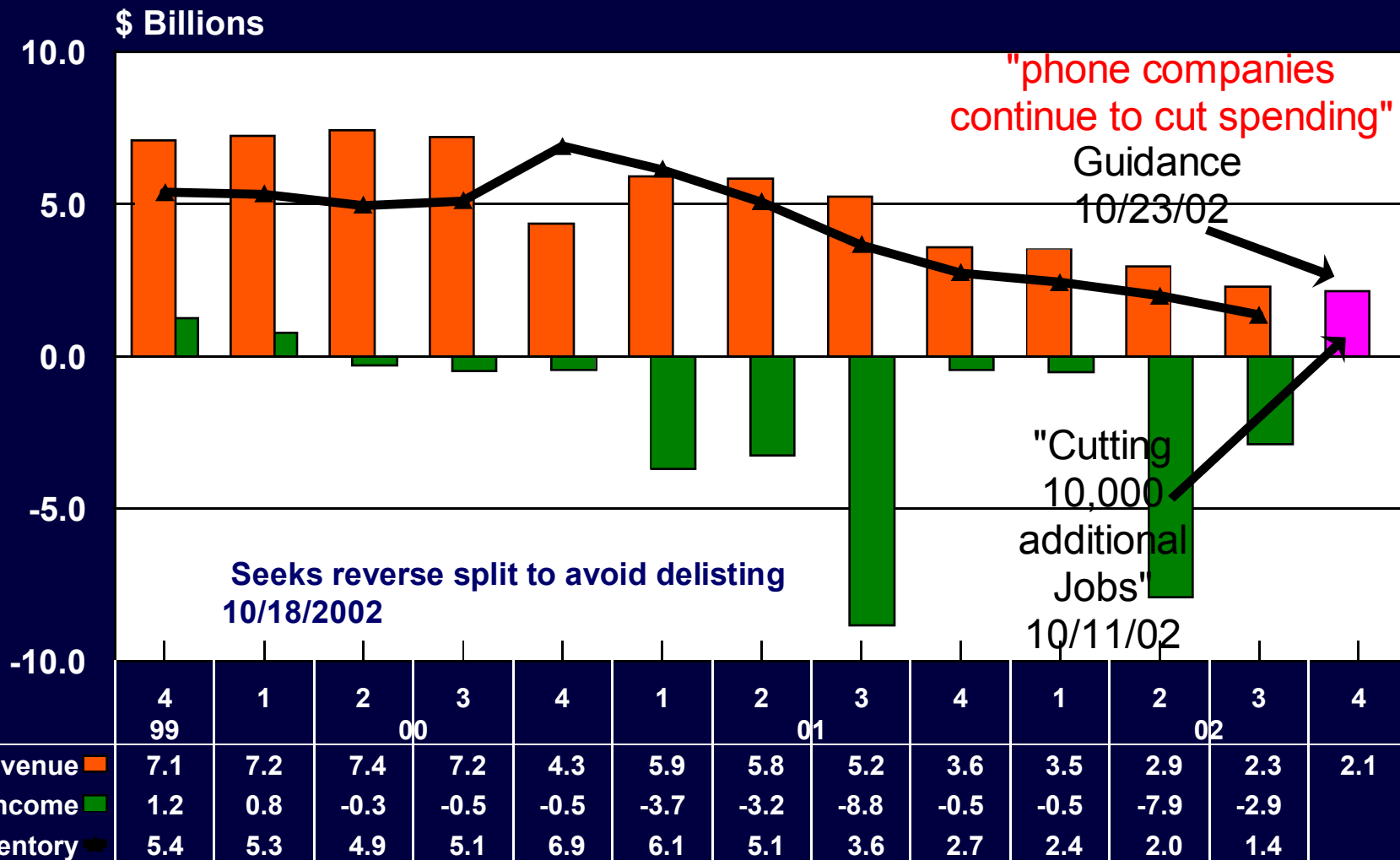
CY

ALA

FY=CY

# Lucent Technologies

## Revenue, Net Income & Inventory



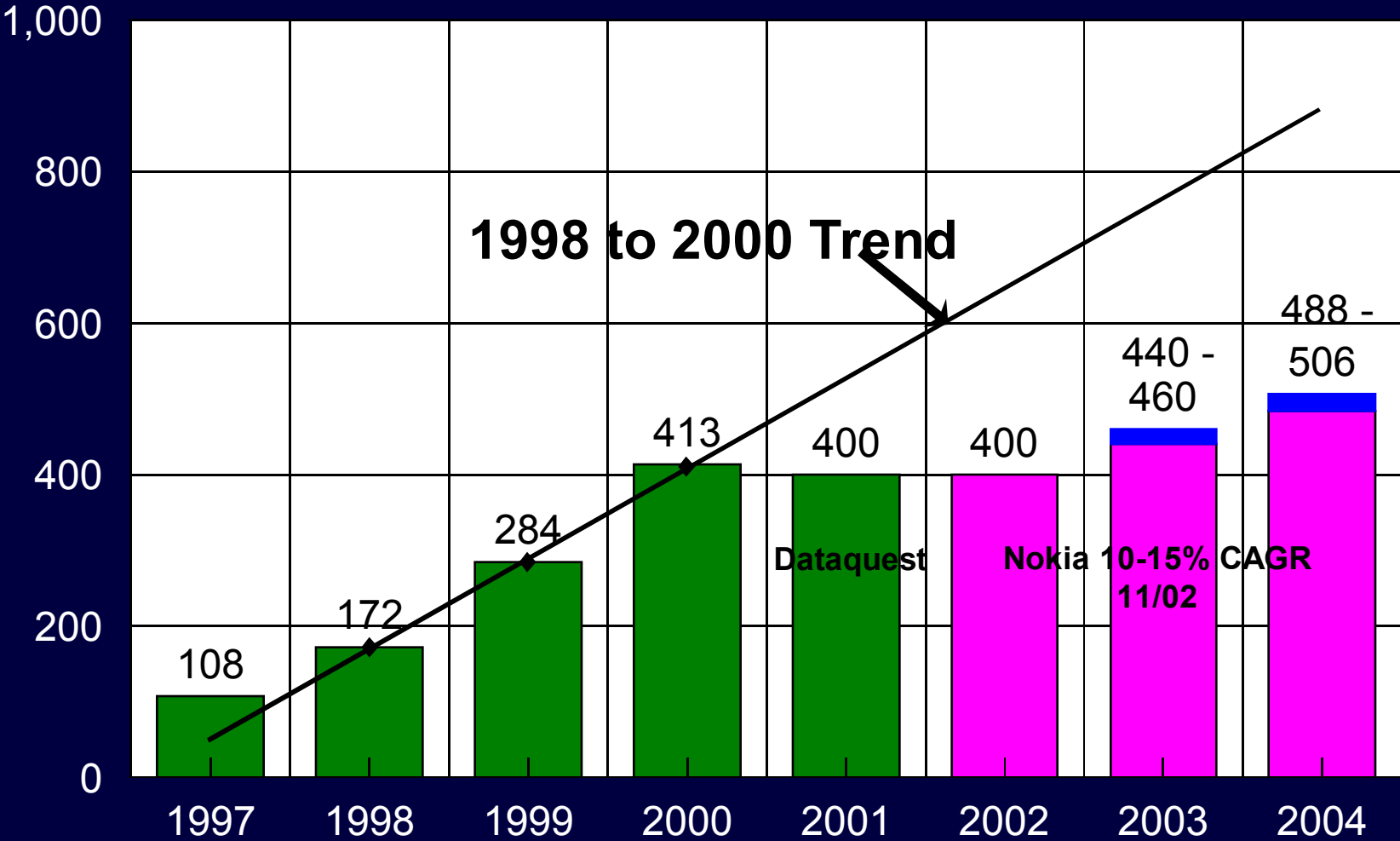
FY ends September

CY

LU

# WORLD CELLULAR PHONE GROWTH

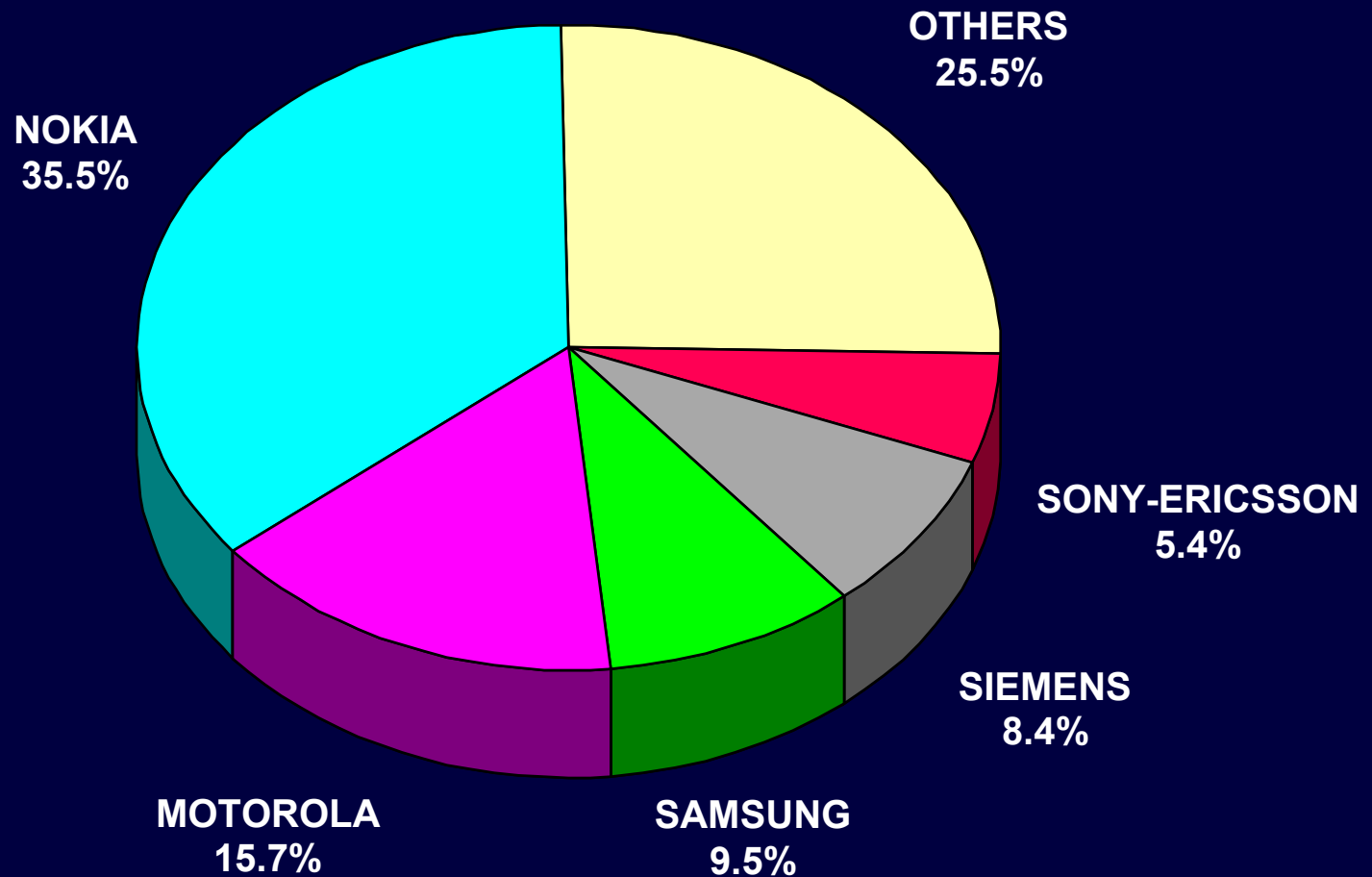
## TOTAL SALES - ANALOG & DIGITAL



IDC 8/2001, Dataquest 8/2002, Nokia 11/02

# WORLD CELLULAR PHONE SALES

2Q 2002



Gartner Dataquest 8/2002

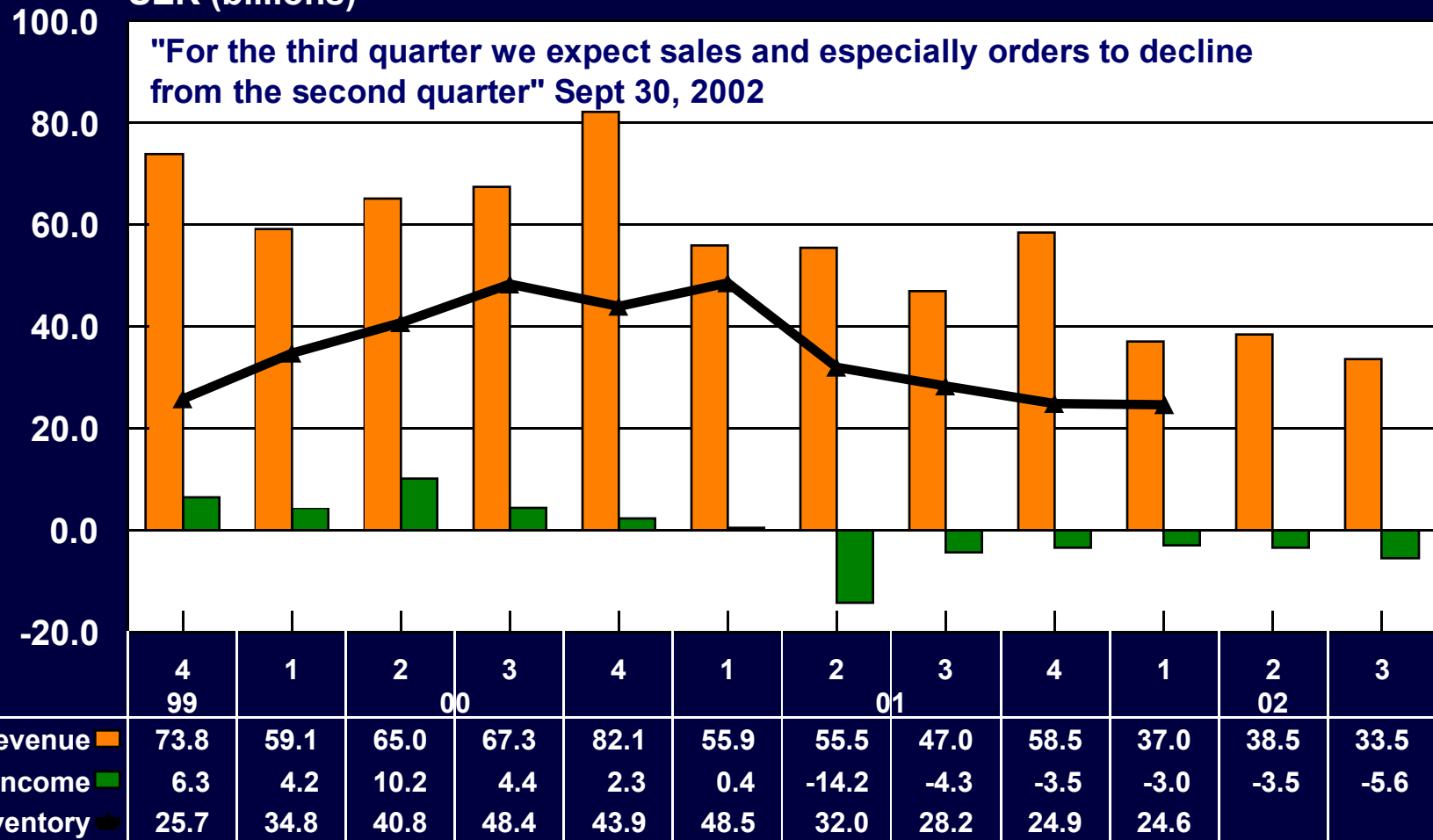
**TOTAL: 98.7 MILLION UNITS**

# L.M. Ericsson

## Revenue, Net Income & Inventory

SEK (billions)

"For the third quarter we expect sales and especially orders to decline from the second quarter" Sept 30, 2002



CY

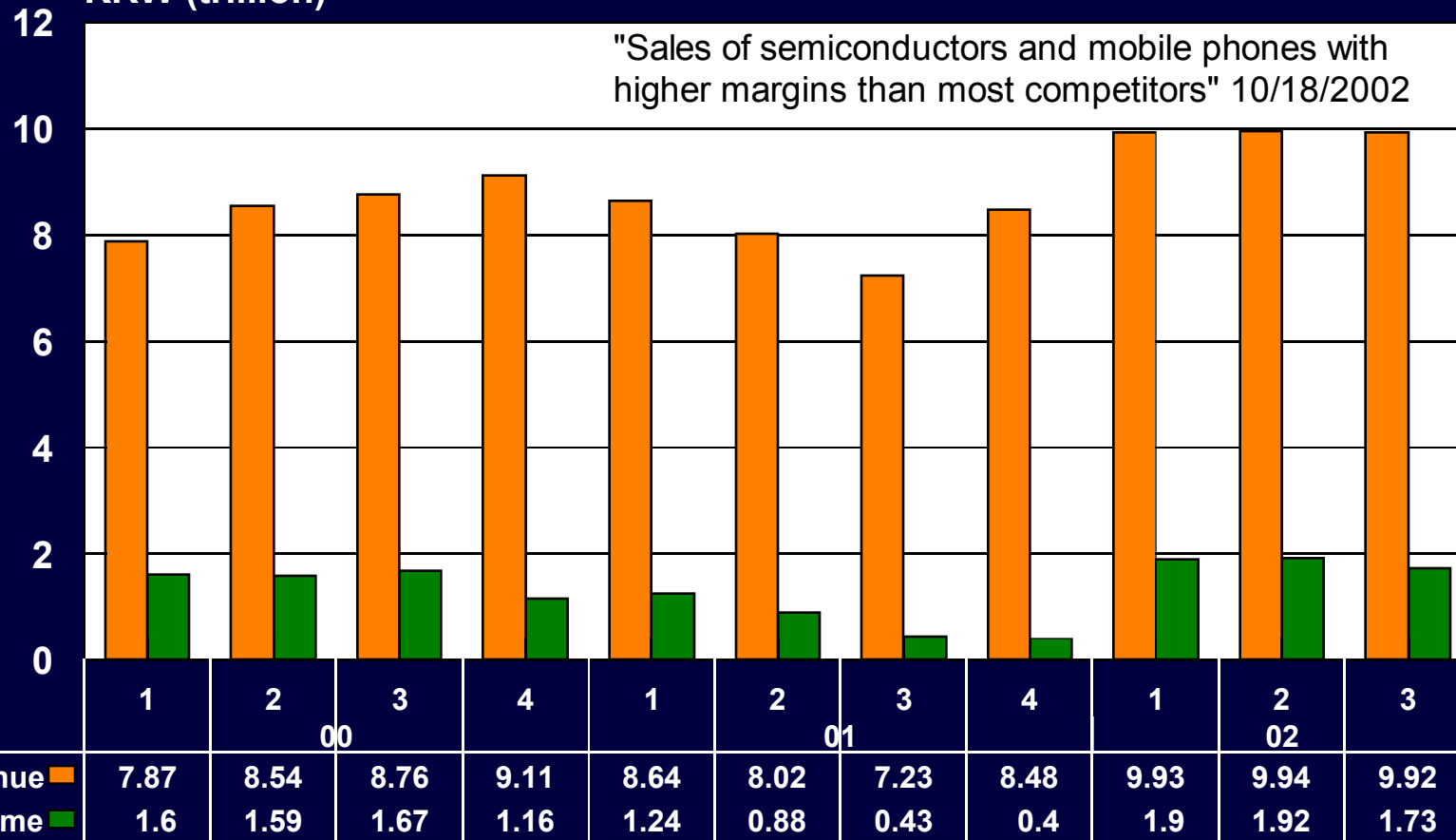
FY=CY

ERICSSON

# Samsung Electronics Co.

## Revenue & Net Income

KRW (trillion)

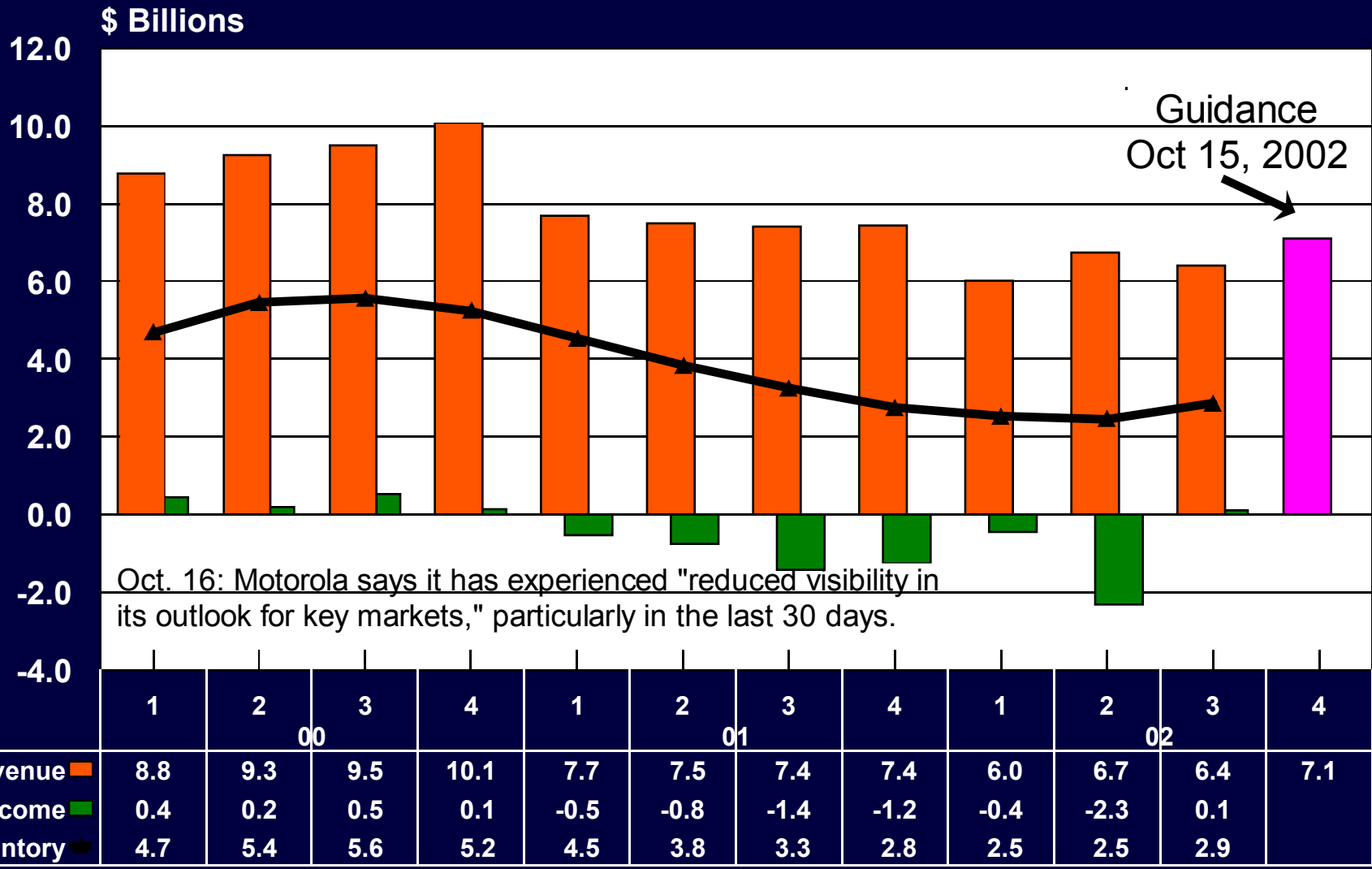


CY

Q.SSE

# Motorola

## Revenue, Net Income & Inventory



FY=CY

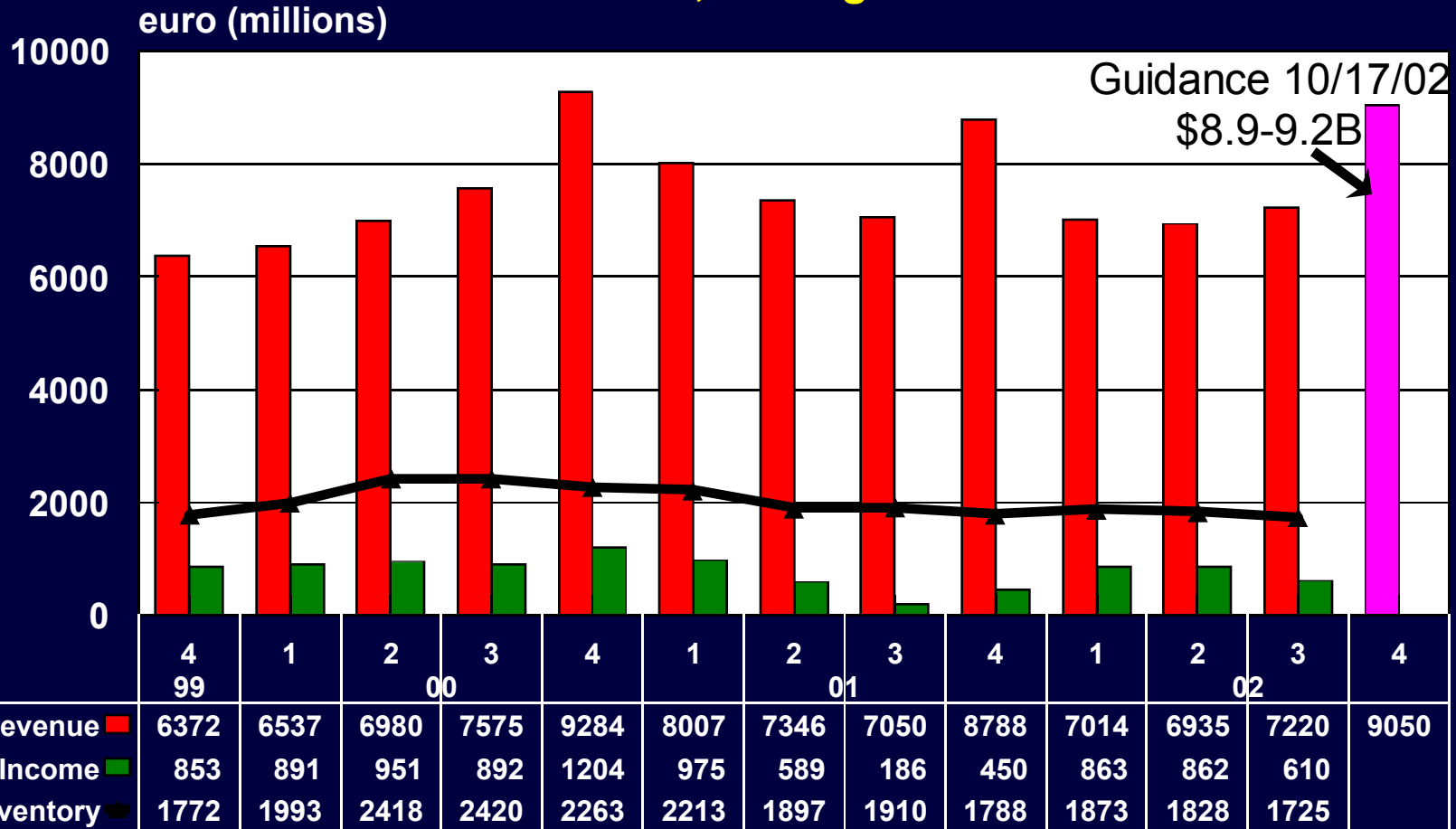
CY

MOT

# Nokia

## Revenue, Net Income & Inventory

"In the fourth quarter, we expect a substantial increase in our market share, leading to a new record level" 10/17/02



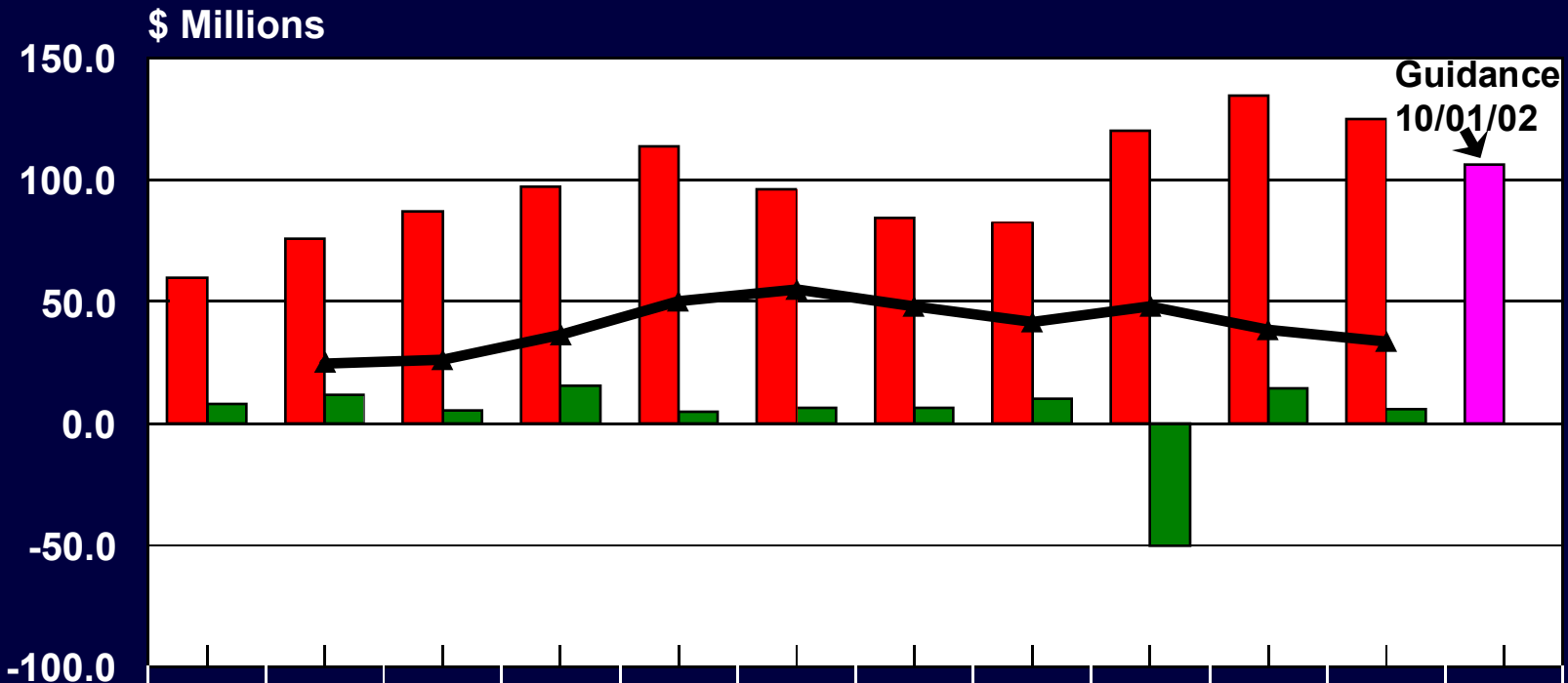
CY

NOK

FY=CY

# Polycom

## Revenue, Net Income & Inventory



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue <span style="color: red;">■</span>	60.0	75.6	87.1	97.4	113.6	96.2	84.5	82.5	120.0	134.5	125.0	106.0
Income <span style="color: green;">■</span>	7.9	11.8	5.5	15.2	4.9	6.4	6.3	9.9	-50.4	14.5	5.6	
Inventory <span style="color: black;">▲</span>		24.7	26.2	36.1	50.0	54.9	48.2	41.9	48.2	38.2	33.5	

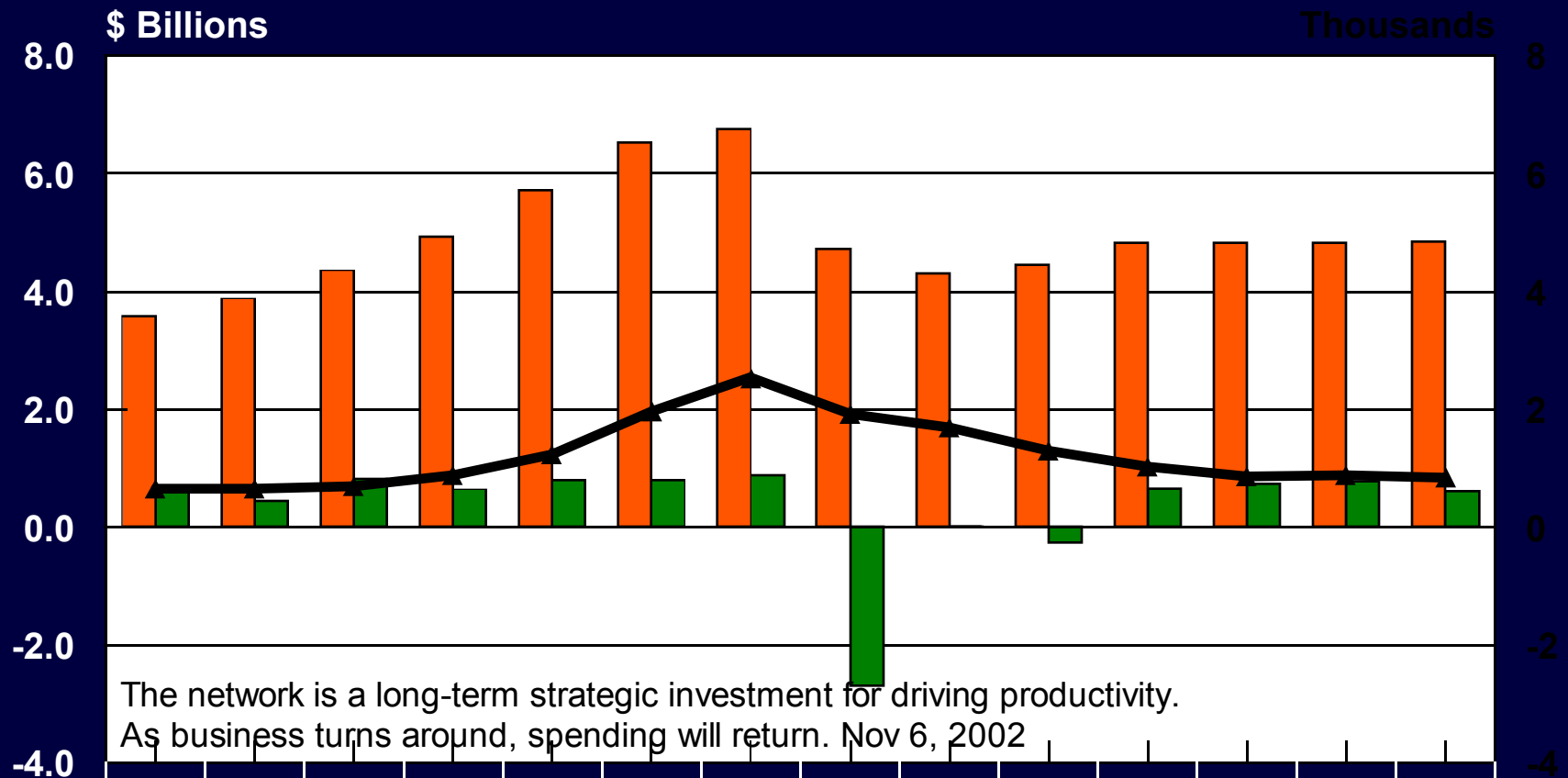
CY

PLCM

# Internet Infrastrucure

# CISCO SYSTEMS

## Revenue, Net Income & Inventory



	2	3	4	1	2	3	4	1	2	3	4	1	2	3
	99			00			01			02				
Revenue	3.6	3.9	4.4	4.9	5.7	6.5	6.7	4.7	4.3	4.4	4.8	4.8	4.8	4.8
Income	0.7	0.4	0.8	0.6	0.8	0.8	0.9	-2.7	0.0	-0.3	0.7	0.7	0.8	0.6
Inventory	0.7	0.7	0.7	0.9	1.2	2.0	2.5	1.9	1.7	1.3	1.0	0.9	0.9	0.8

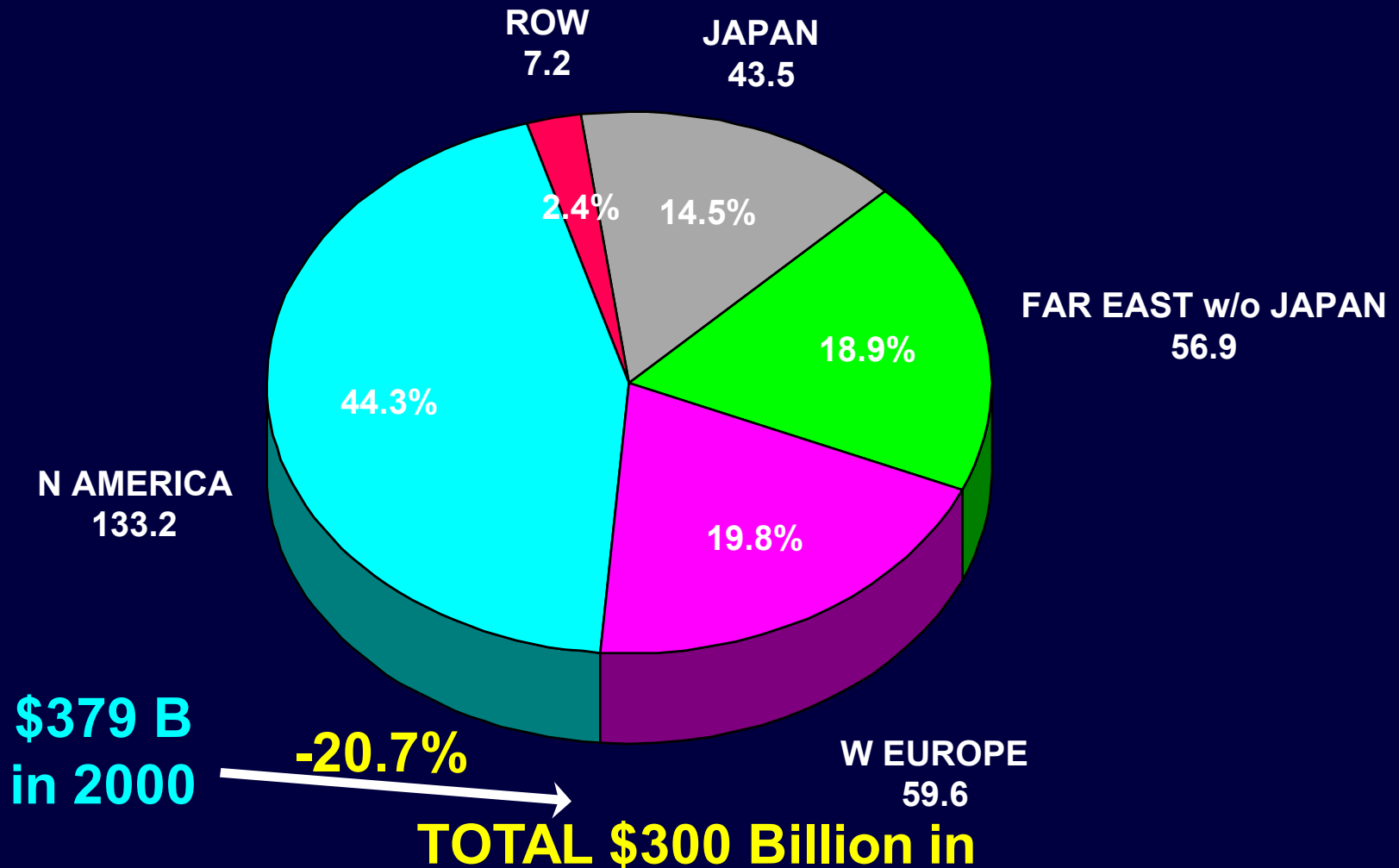
CY

CSCO

**Computers  
&  
Related  
Products**

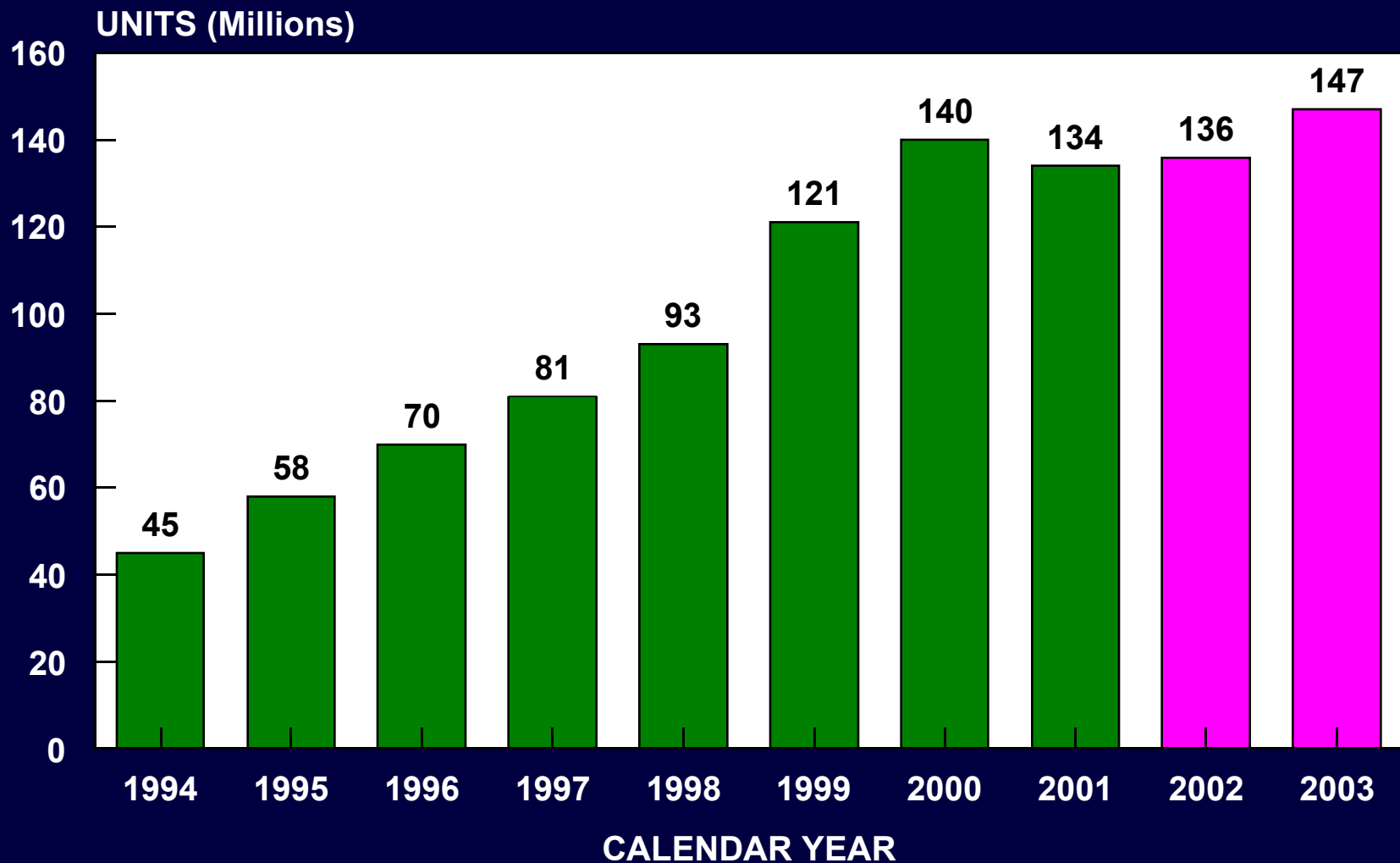
# WORLD COMPUTER EQUIPMENT PRODUCTION

## 2001



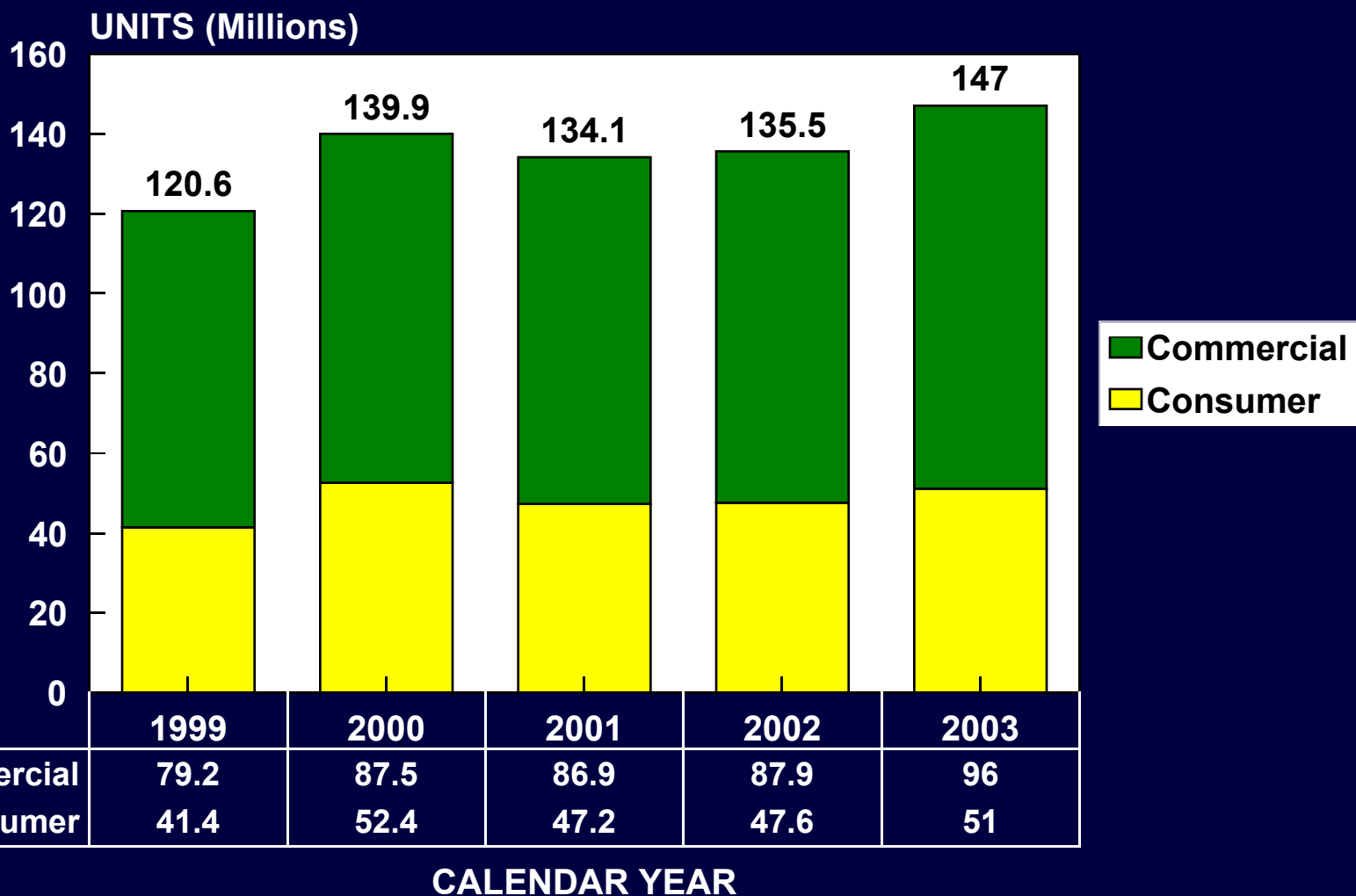
# PERSONAL COMPUTER GROWTH

## GLOBAL SALES



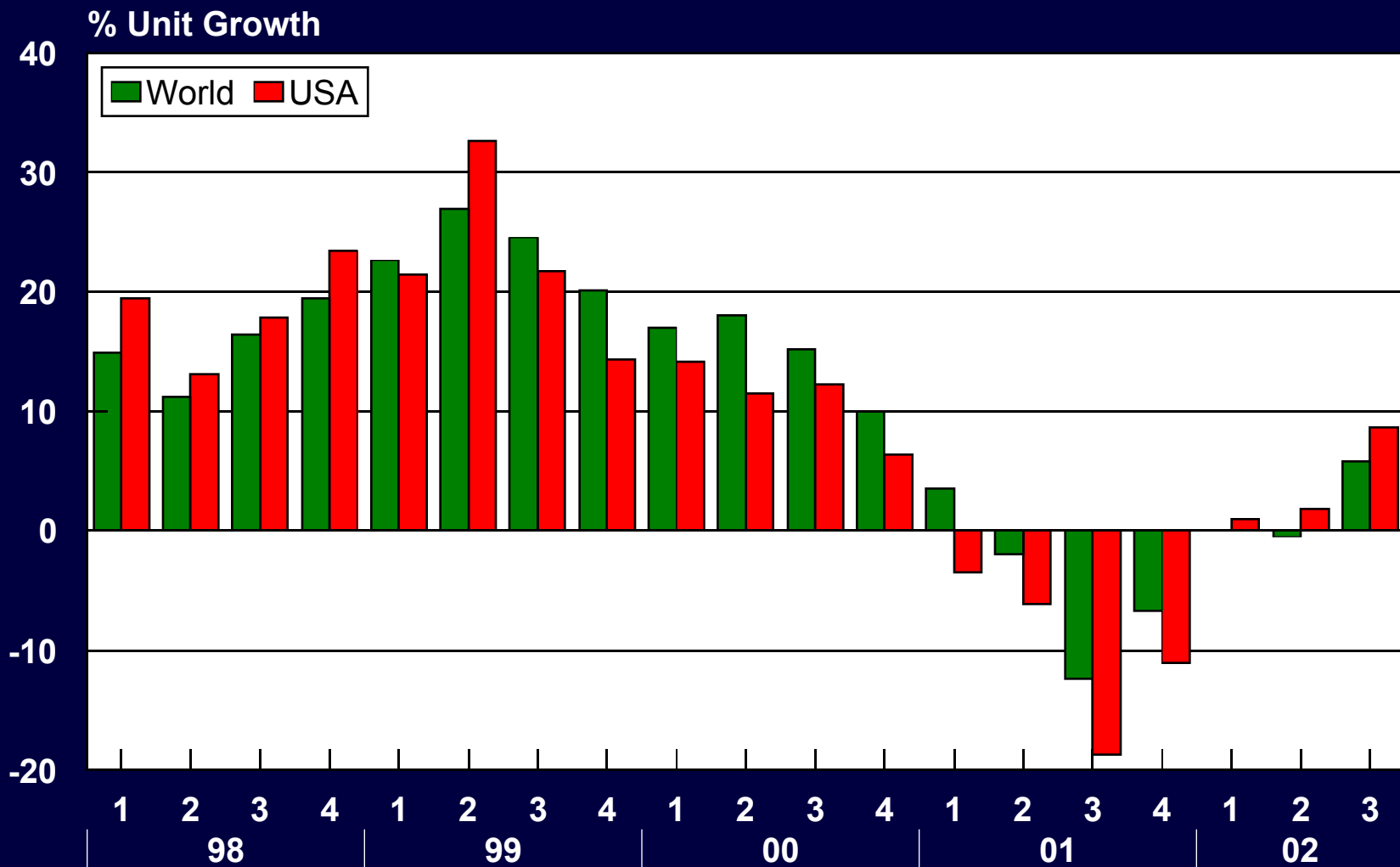
Gartner Dataquest 1/2002, IDC 9/2002  
Desktops, Notebooks, Ultraportables - does not include Servers

# World PC Shipments



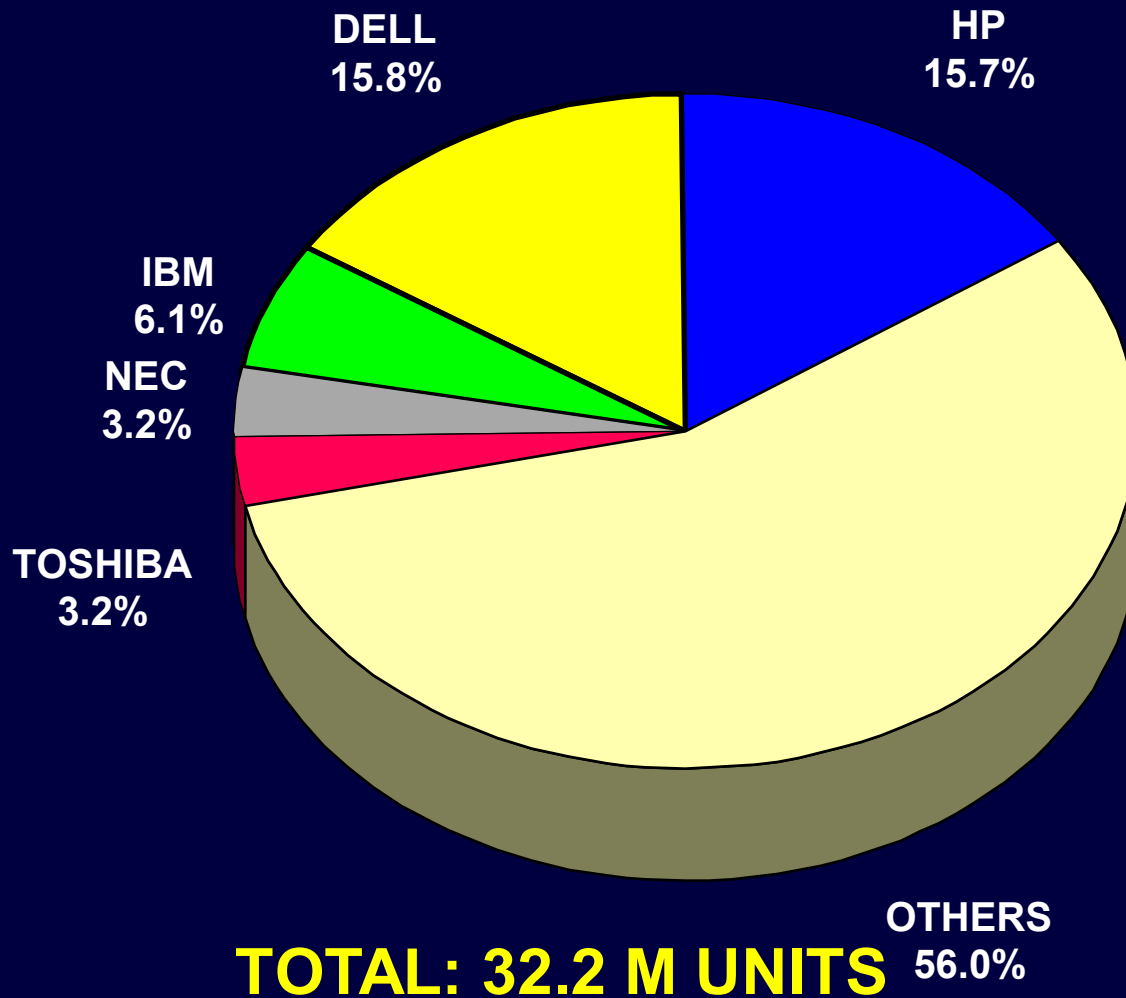
IDC 9/2002

# Personal Computer Market Growth World & USA



# WORLD PC VENDOR UNIT SHIPMENTS

3Q 2002



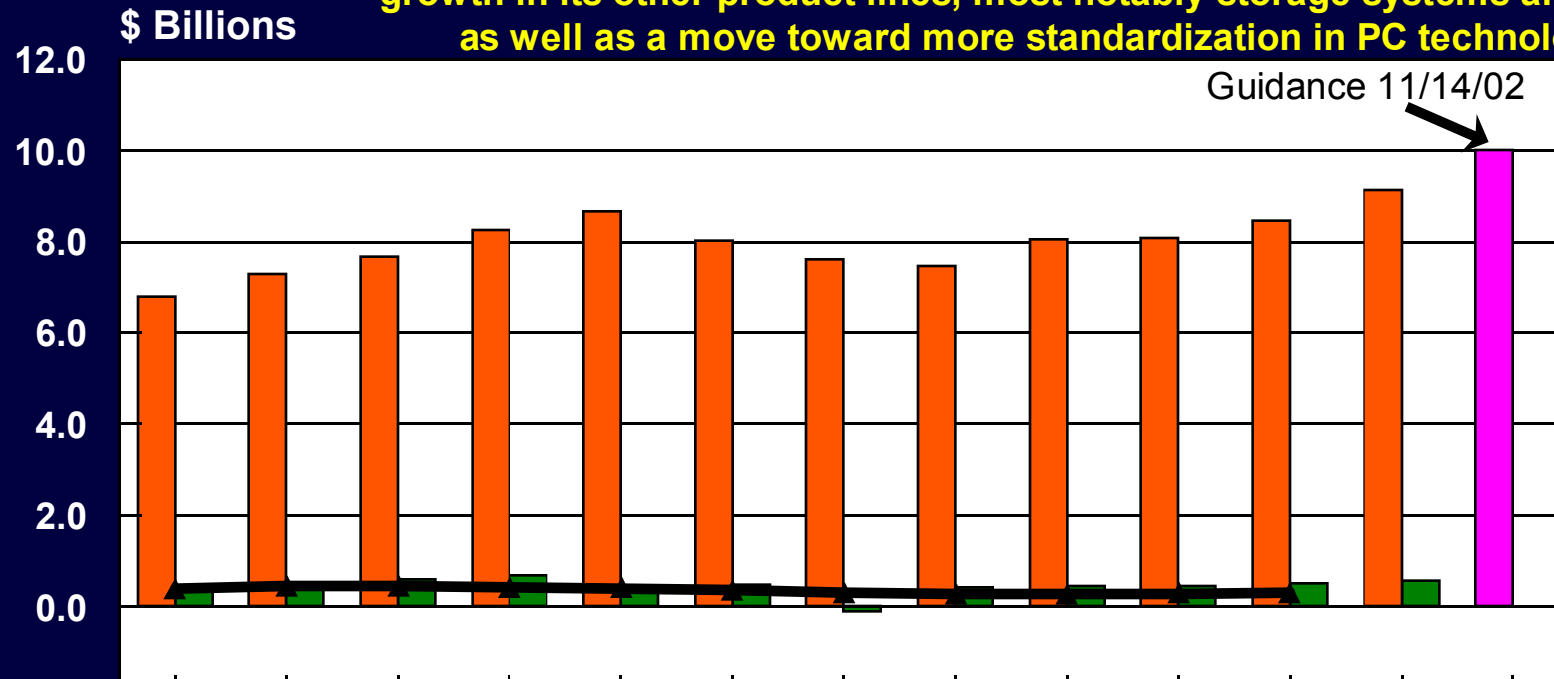
DATAQUEST 10/2002

Preliminary: Data includes desk-based PCs, mobile PCs & IA32 servers

# DELL COMPUTER

## Revenue, Net Income & Inventory

growth in its other product lines, most notably storage systems and servers, as well as a move toward more standardization in PC technologies.



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3	4
SALES	6.8	7.3	7.7	8.3	8.7	8.0	7.6	7.5	8.1	8.1	8.5	9.1	10.0
PROFITS	0.4	0.5	0.6	0.7	0.4	0.5	-0.1	0.4	0.5	0.5	0.5	0.6	
Inventory	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3		

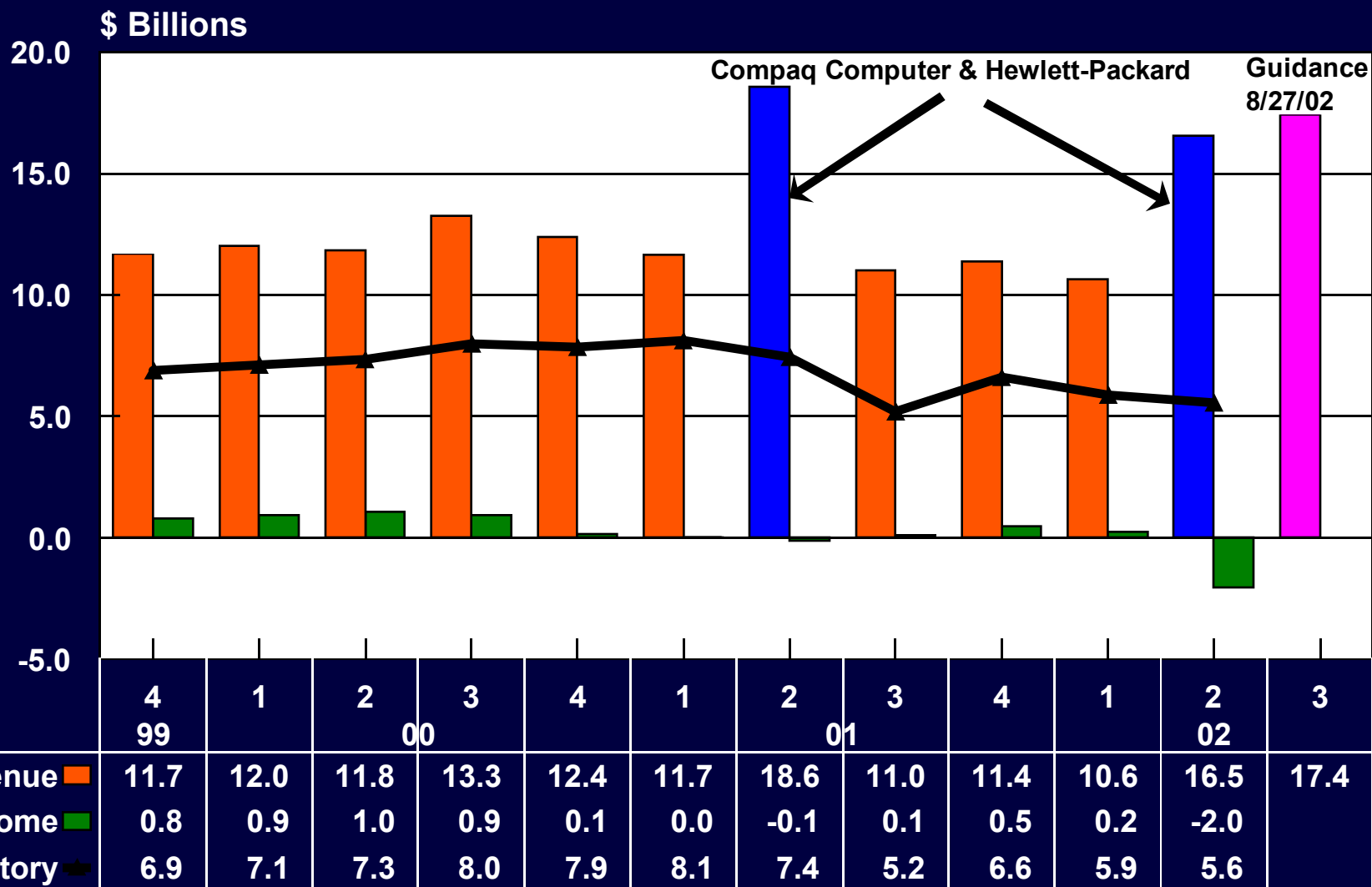
CY

FY ends October

DELL

# Hewlett-Packard

## Revenue, Net Income & Inventory

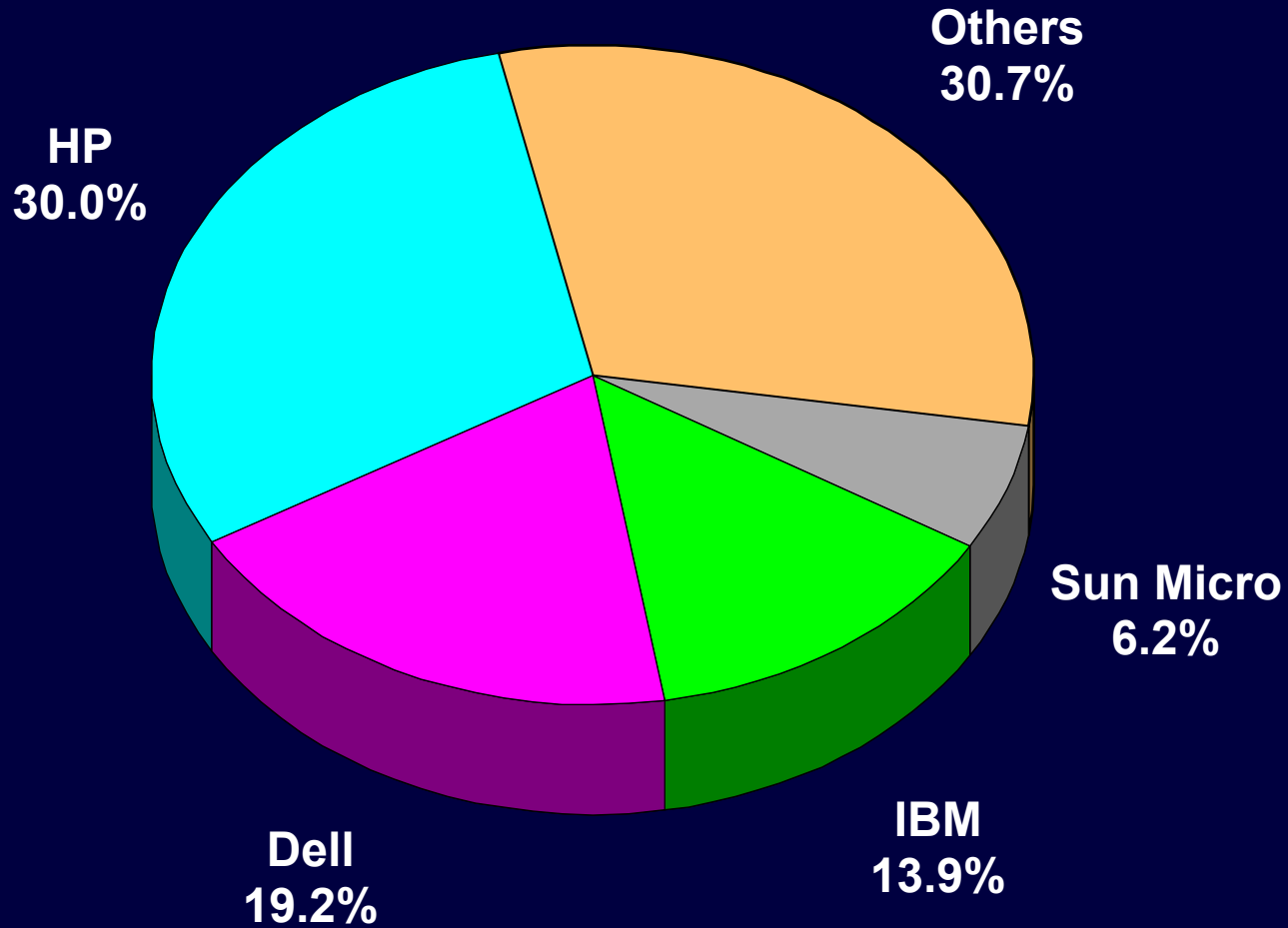


FY ends October

CY

HPQ

# SERVER WORLD MARKET 3Q'02



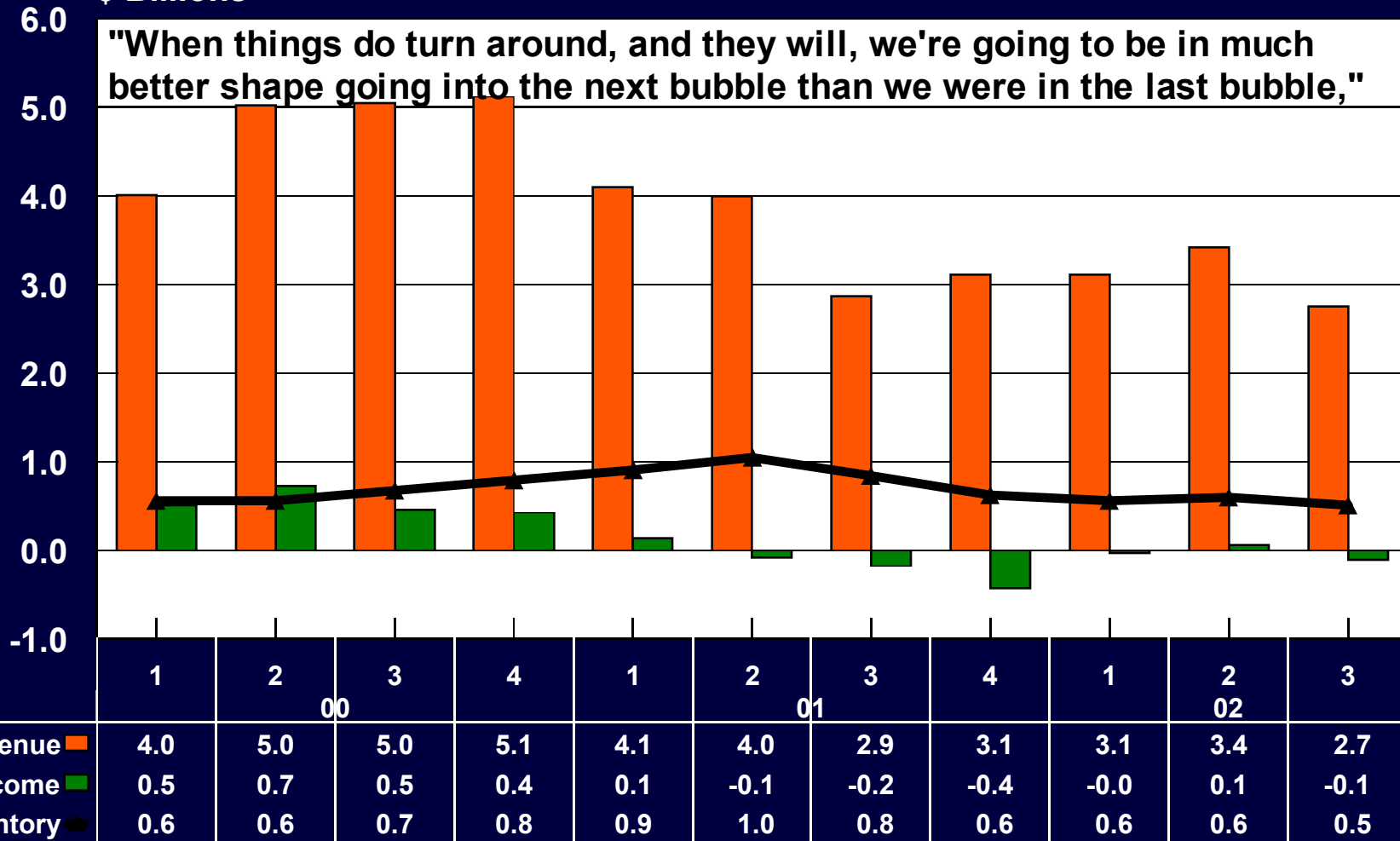
**3Q'02 Total: 1.1 M Units**

# Sun Microsystems

## Revenue, Net Income & Inventory

\$ Billions

"When things do turn around, and they will, we're going to be in much better shape going into the next bubble than we were in the last bubble,"



CY

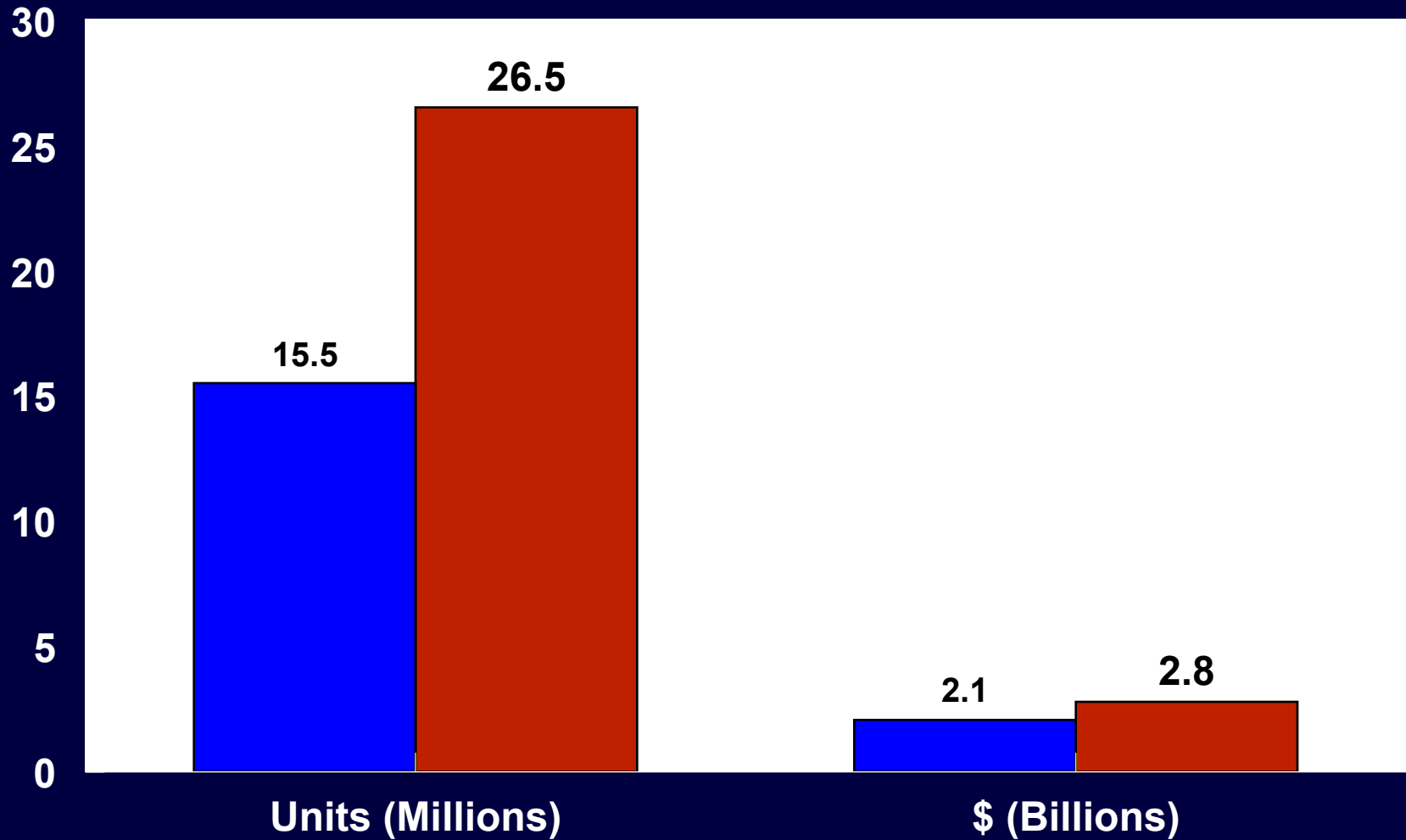
SUNW

FY ENDS 6/30

# Computer Peripherals

# Wireless LAN Shipments & Revenue

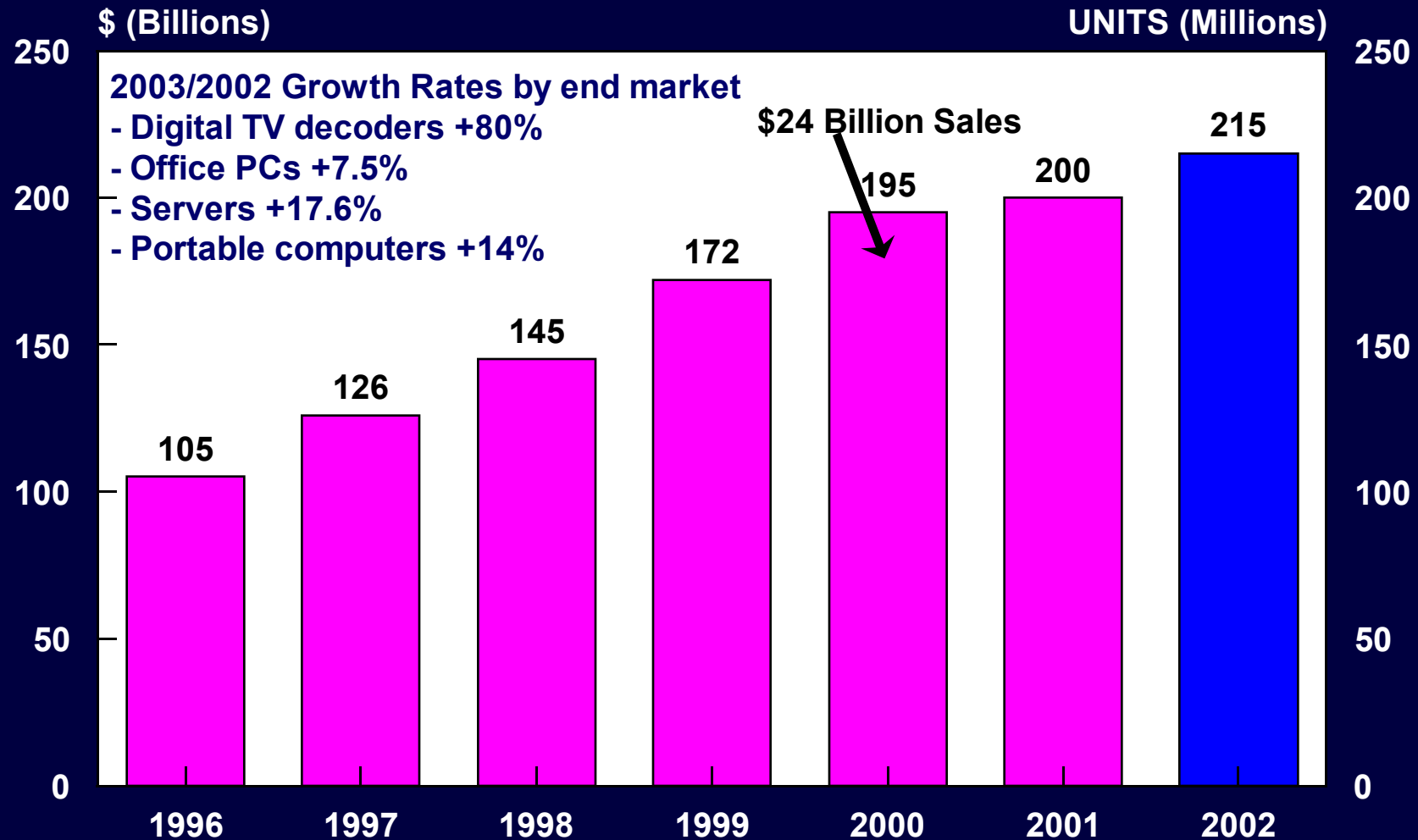
## World



Dataquest 11/2002

# RIGID DISK DRIVES

## WORLDWIDE UNIT SHIPMENTS



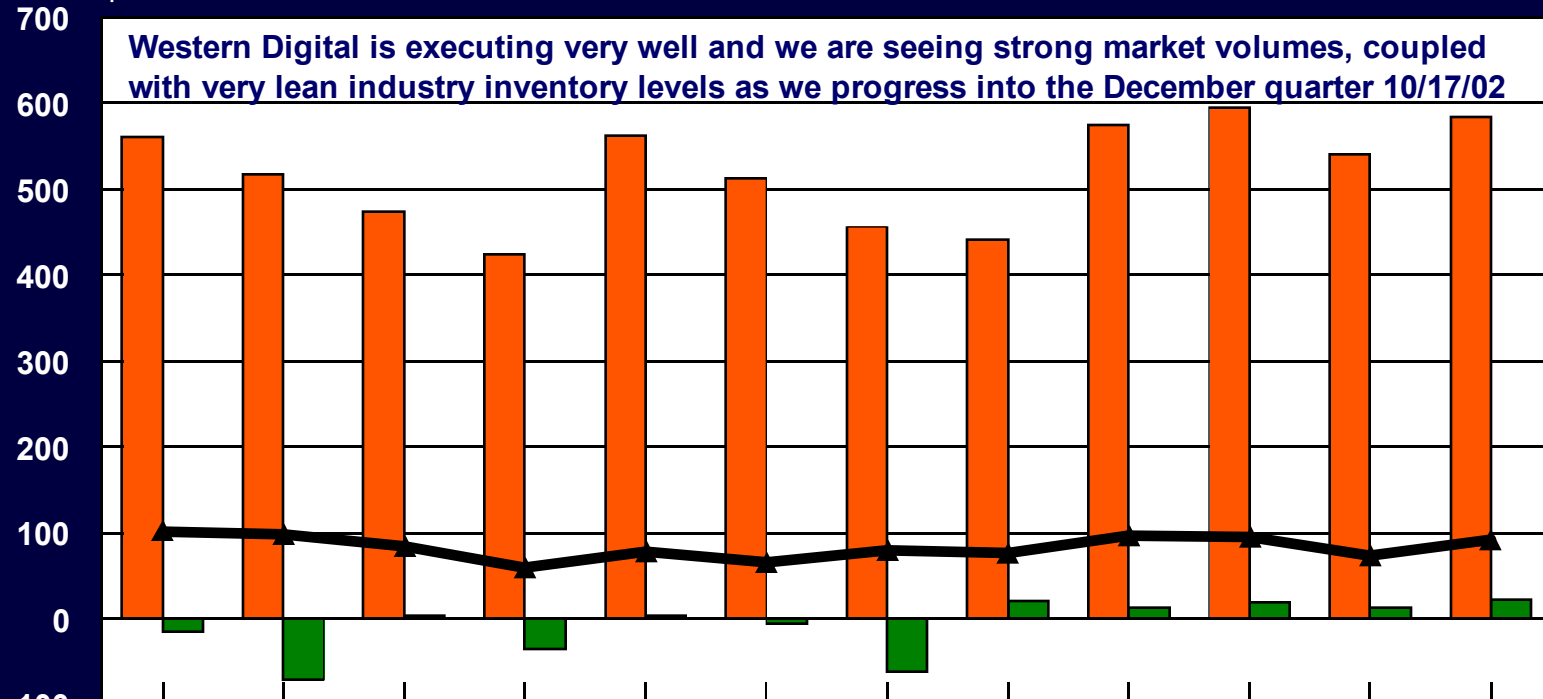
IDC 11/2000, JEI 9/2001, Maxtor 1/2002, Custer forecast 6/2002

# Western Digital

## Revenue, Net Income & Inventory

\$ Millions

Western Digital is executing very well and we are seeing strong market volumes, coupled with very lean industry inventory levels as we progress into the December quarter 10/17/02



	4 99	1 00	2 00	3 00	4 00	1 01	2 01	3 01	4 01	1 02	2 02	3 02
Revenue	560	517	474	424	562	512	456	441	575	595	541	583
Income	-15	-71	4	-36	4	-6	-61	21	13	19	13	22
Inventory	102	98	84	60	78	65	79	76	96	95	73	92

CY

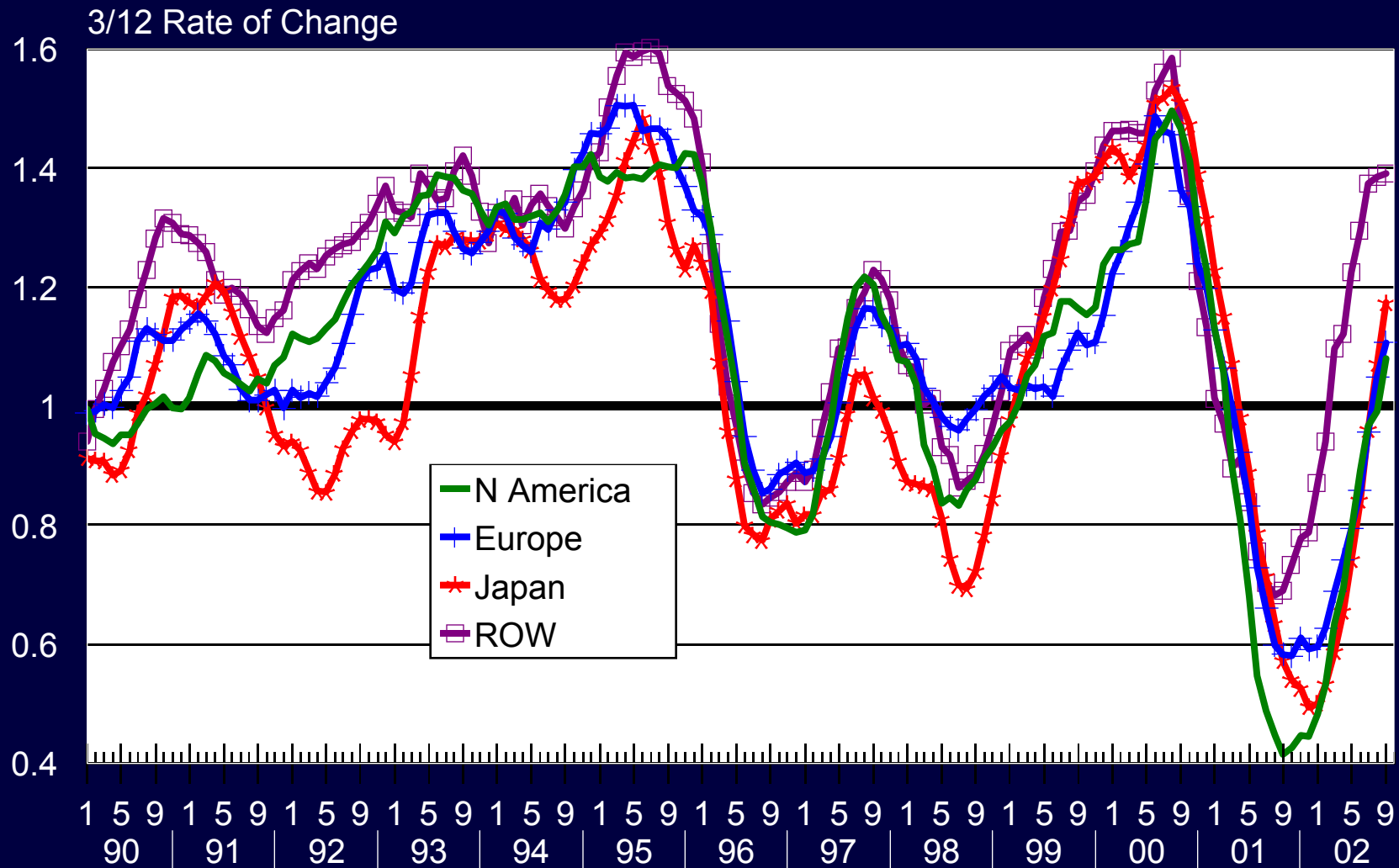
FY ends June

WDC

# Semiconductors

# SEMICONDUCTOR GROWTH RATES

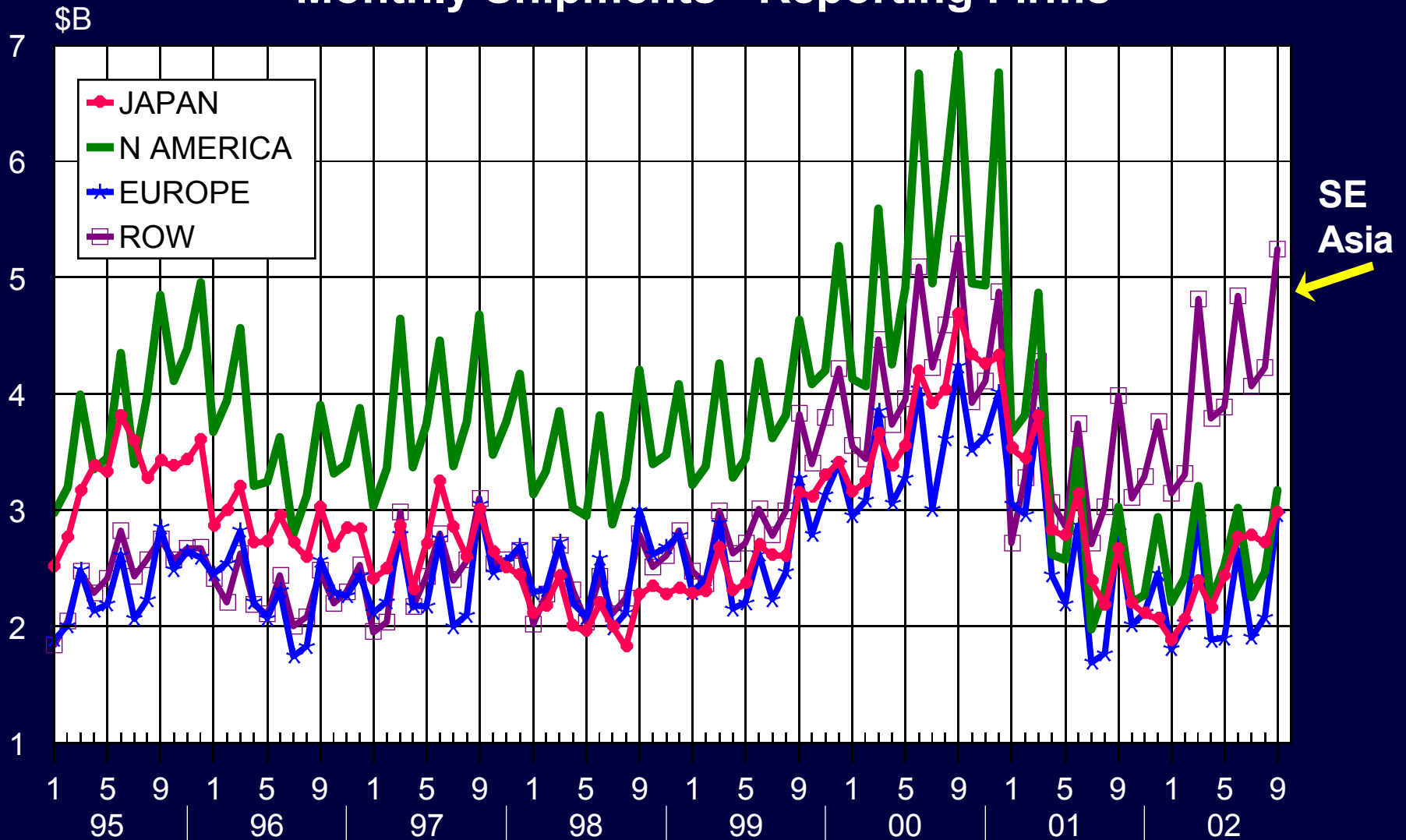
## TOTAL \$ SHIPMENTS TO AN AREA



Total \$ Shipments from All Countries to an Area  
SIA website: [www.semichips.org/](http://www.semichips.org/)

# TOTAL SEMICONDUCTOR \$ SHIPMENTS TO AREA

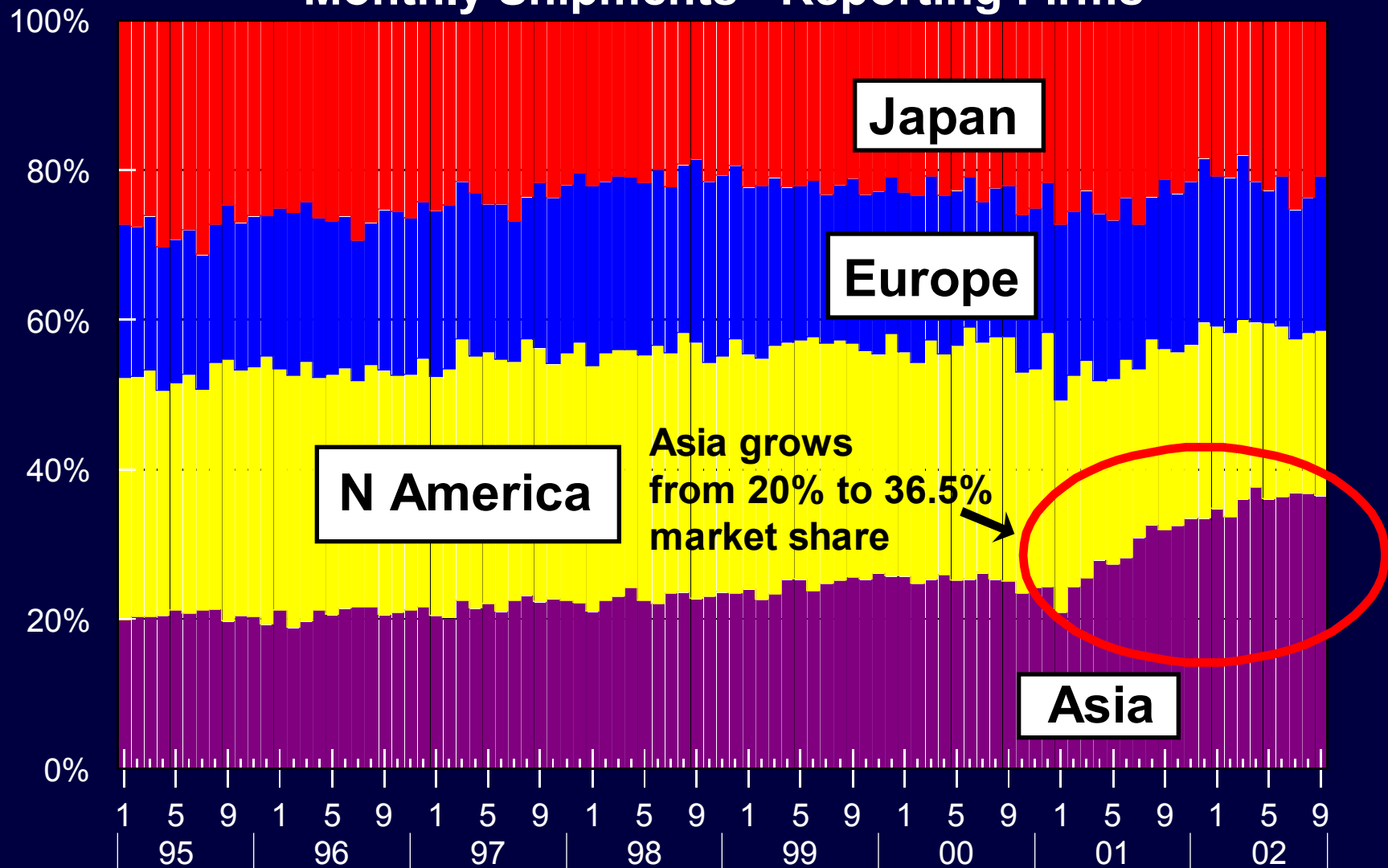
## Monthly Shipments - Reporting Firms



SIA website: [www.semichips.org/](http://www.semichips.org/)

# TOTAL SEMICONDUCTOR \$ SHIPMENTS TO AREA

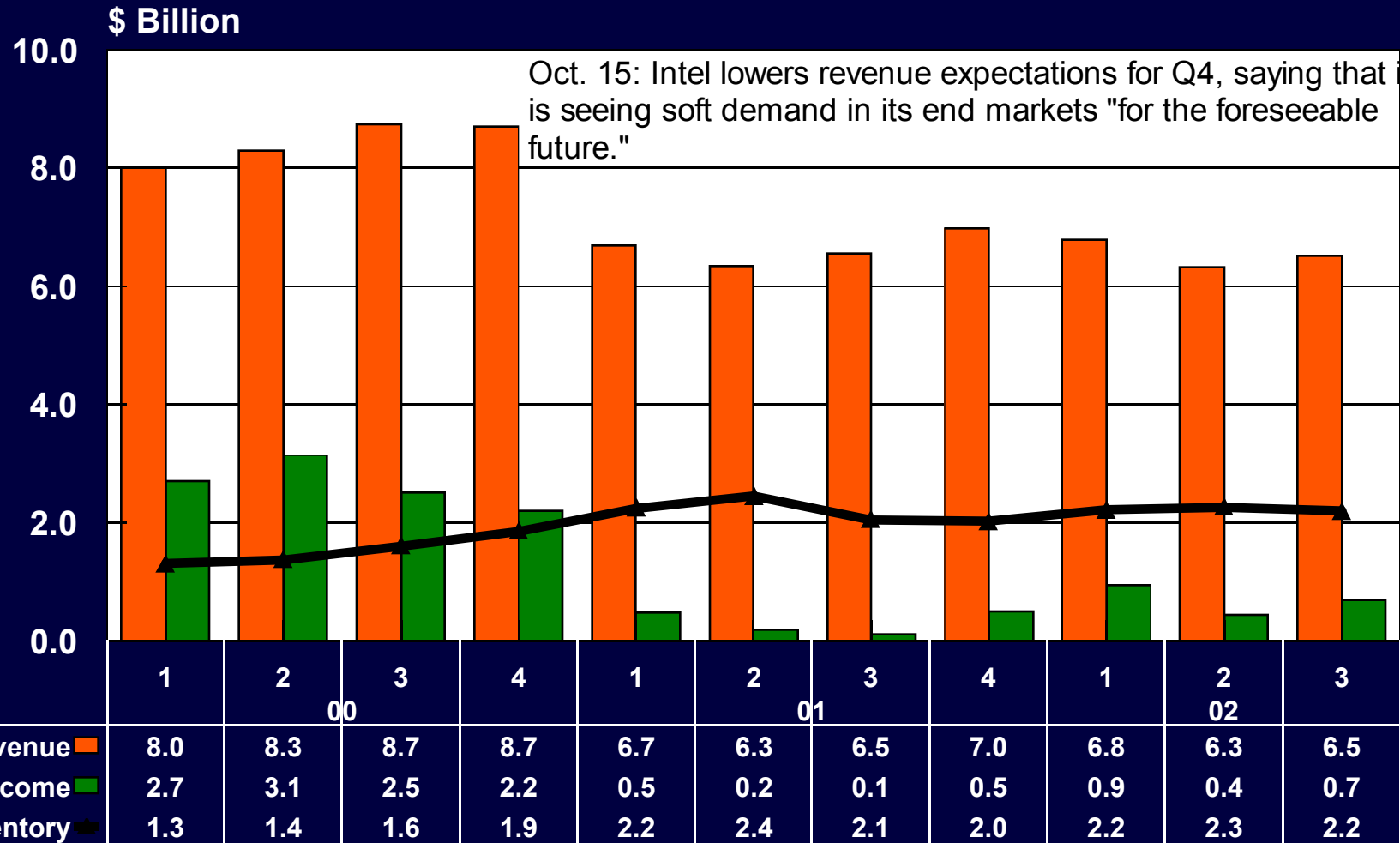
## Monthly Shipments - Reporting Firms



# Intel

## Revenue, Net Income & Inventory

"a turnaround will happen when there is corporate purchases of IT infrastructure and that cannot happen until there is corporate profitability in the United States, Japan and Western Europe... It is very difficult to predict when that will happen." Craig Barrett Sept 30, 2002



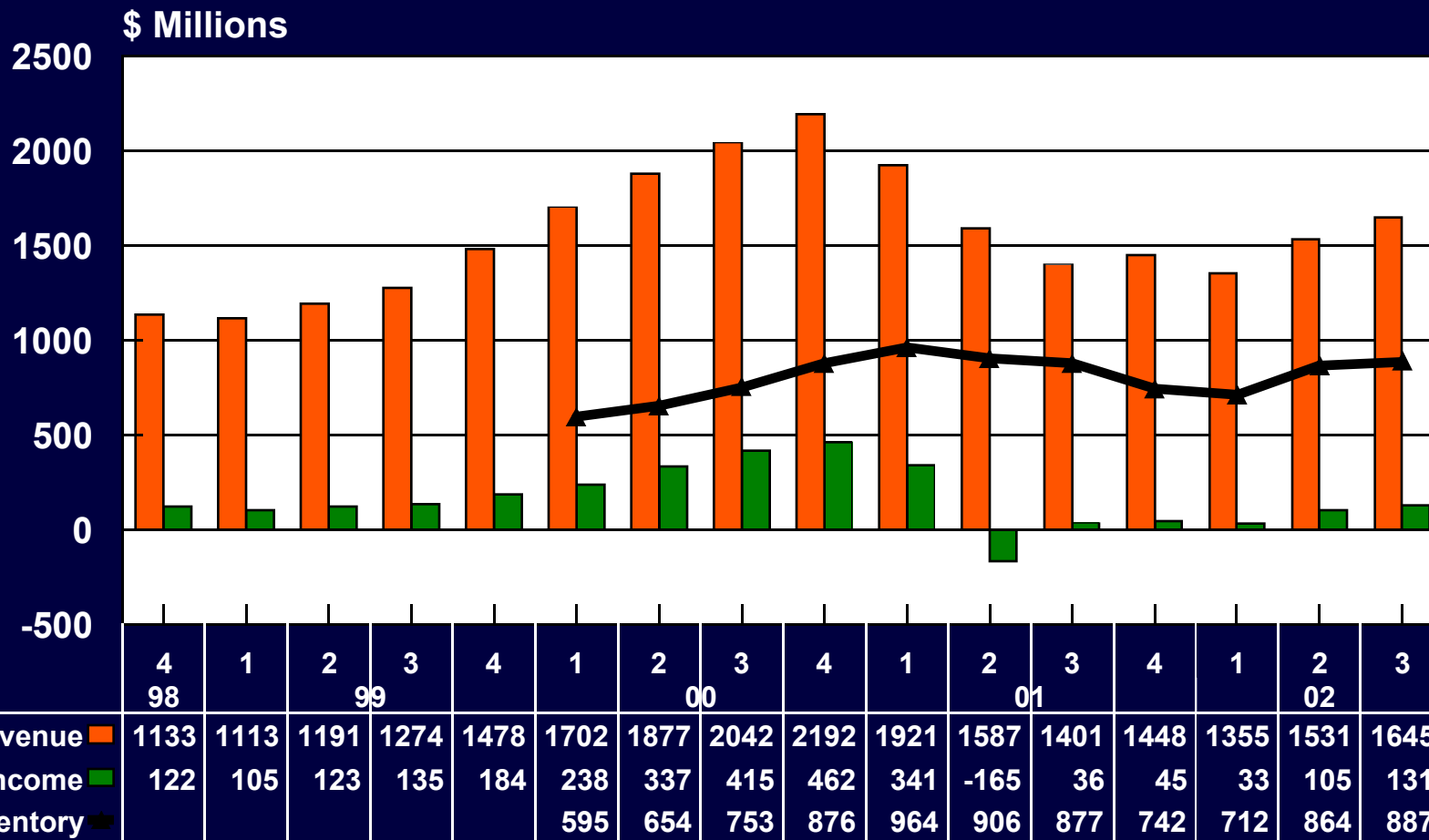
FY=CY

CY

INTC

# STMicroelectronics N. V.

## Revenue & Net Income



CY

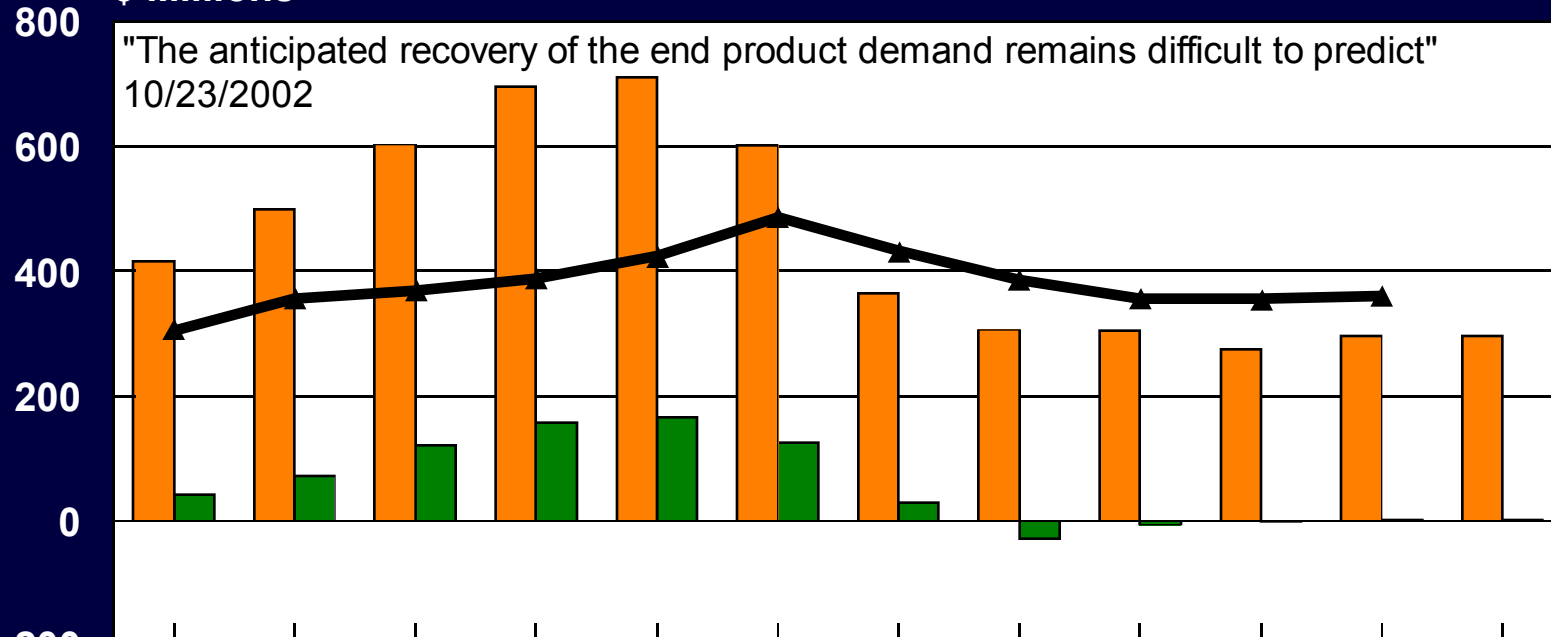
STM

# AVX Corp

## Revenue, Net Income & Inventory

\$ Millions

"The anticipated recovery of the end product demand remains difficult to predict"  
10/23/2002



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue	416	499	602	695	710	601	365	306	304	275	295	295
Income	43	71	120	156	166	125	29	-28	-6	-2	1	1
Inventory	305	356	369	388	423	487	432	386	356	355	359	

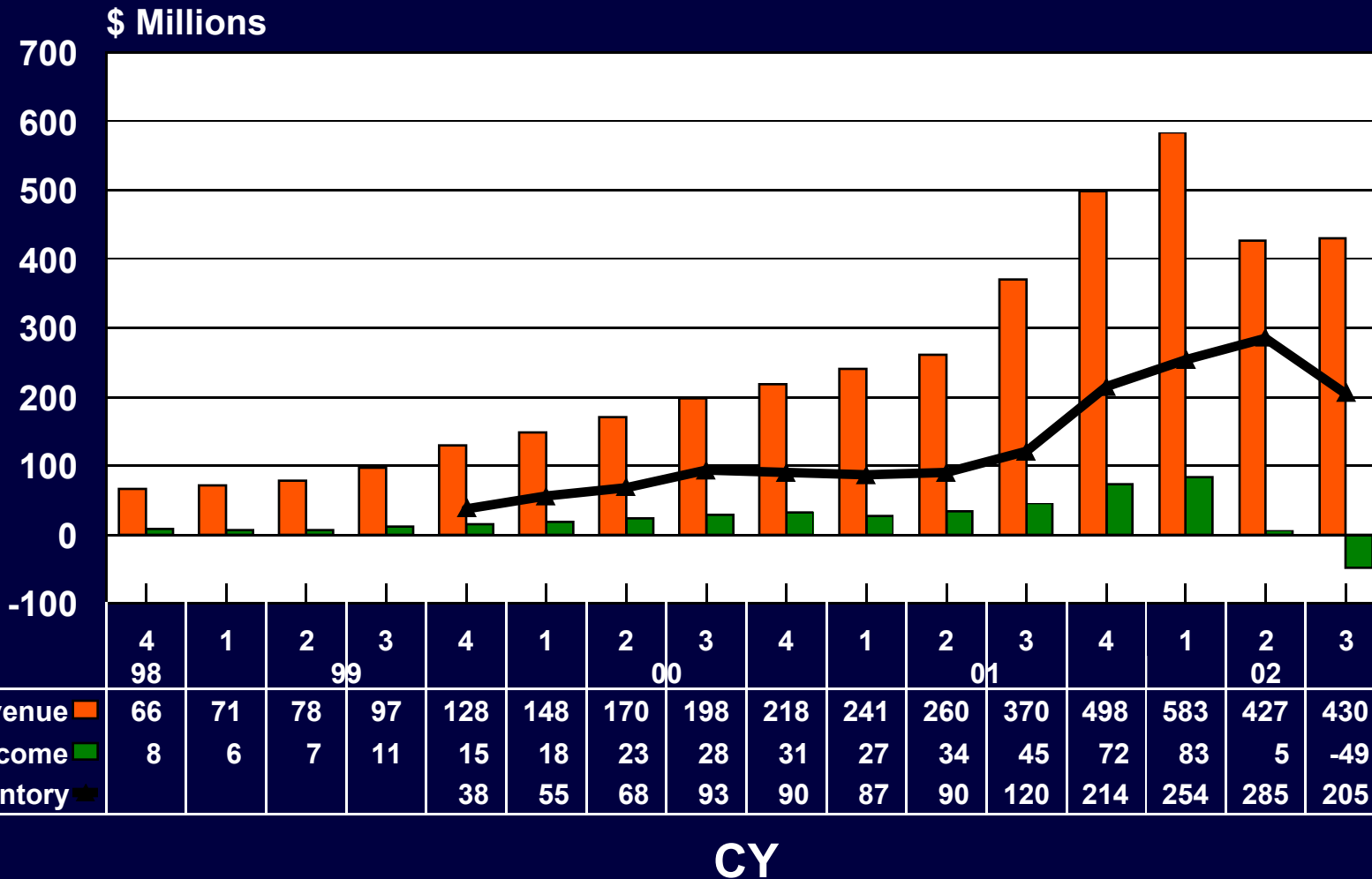
CY

AVX

FY = CY

# NVIDIA Corp

## Revenue, Net Income & Inventory

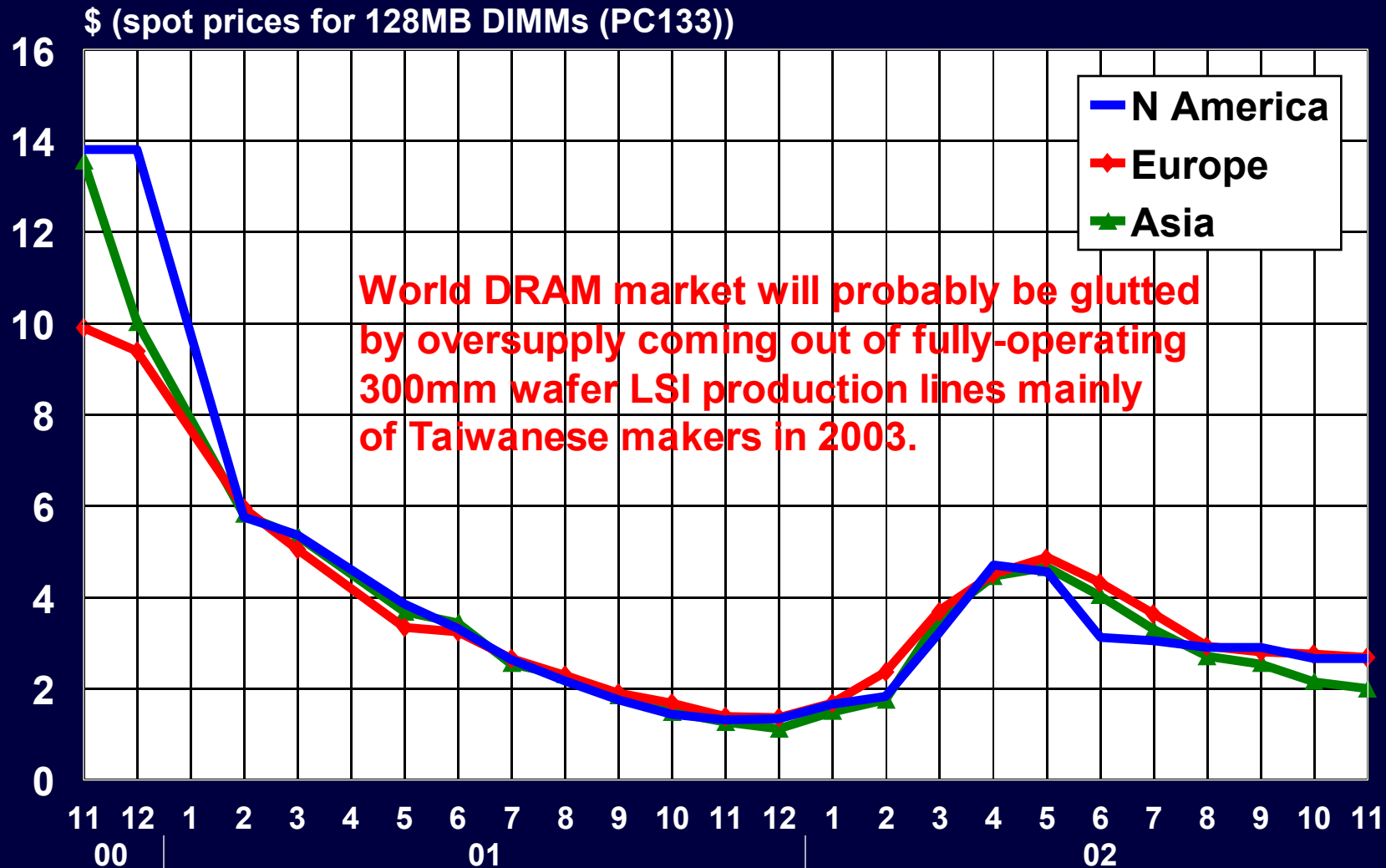


FY ends January

NVDA

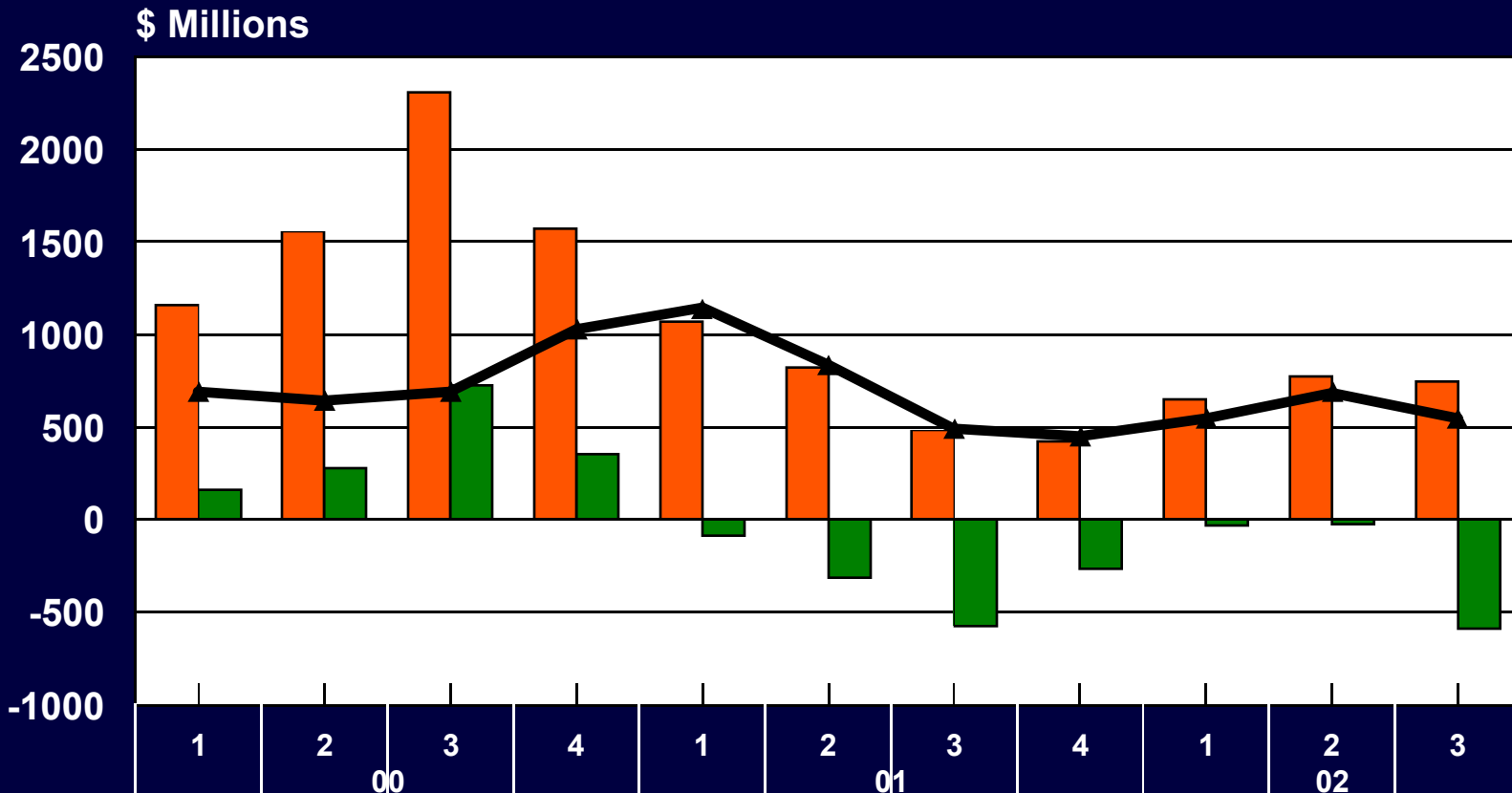
# DRAM Prices (large volume users)

30-Day Rolling Averages of 128Mb DRAMs (PC133, 16M x 8)



# MICRON TECHNOLOGY

## Revenue & Net Income



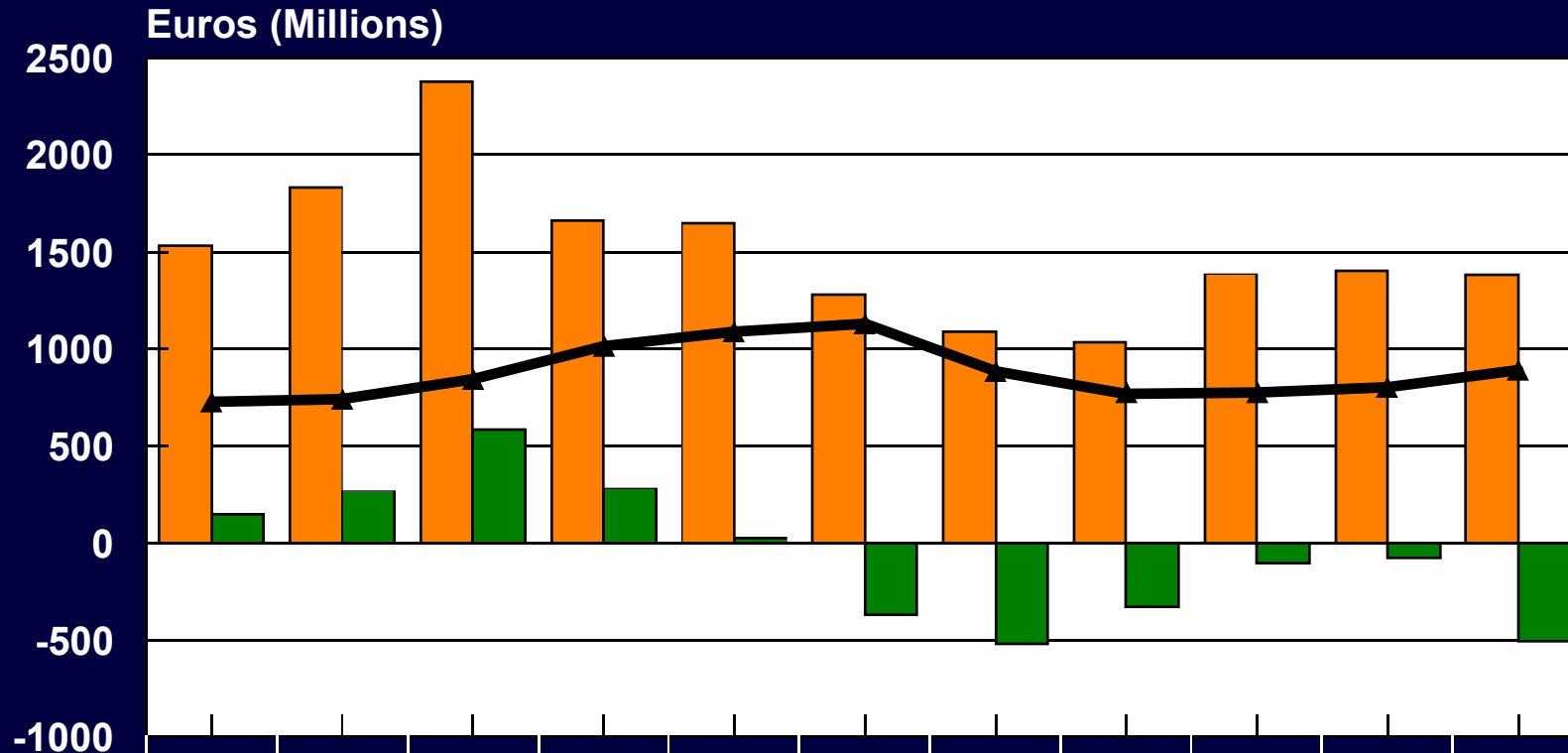
	00				01				02		
	1	2	3	4	1	2	3	4	1	2	3
Revenue	1159	1554	2306	1572	1066	818	480	424	646	771	748
Income	161	275	727	352	-88	-313	-576	-266	-30	-24	-587
Inventory	690	642	689	1026	1141	837	491	451	548	687	545

CY

MU

# Infineon Technologies AG

## Revenue, Net Income & Inventory



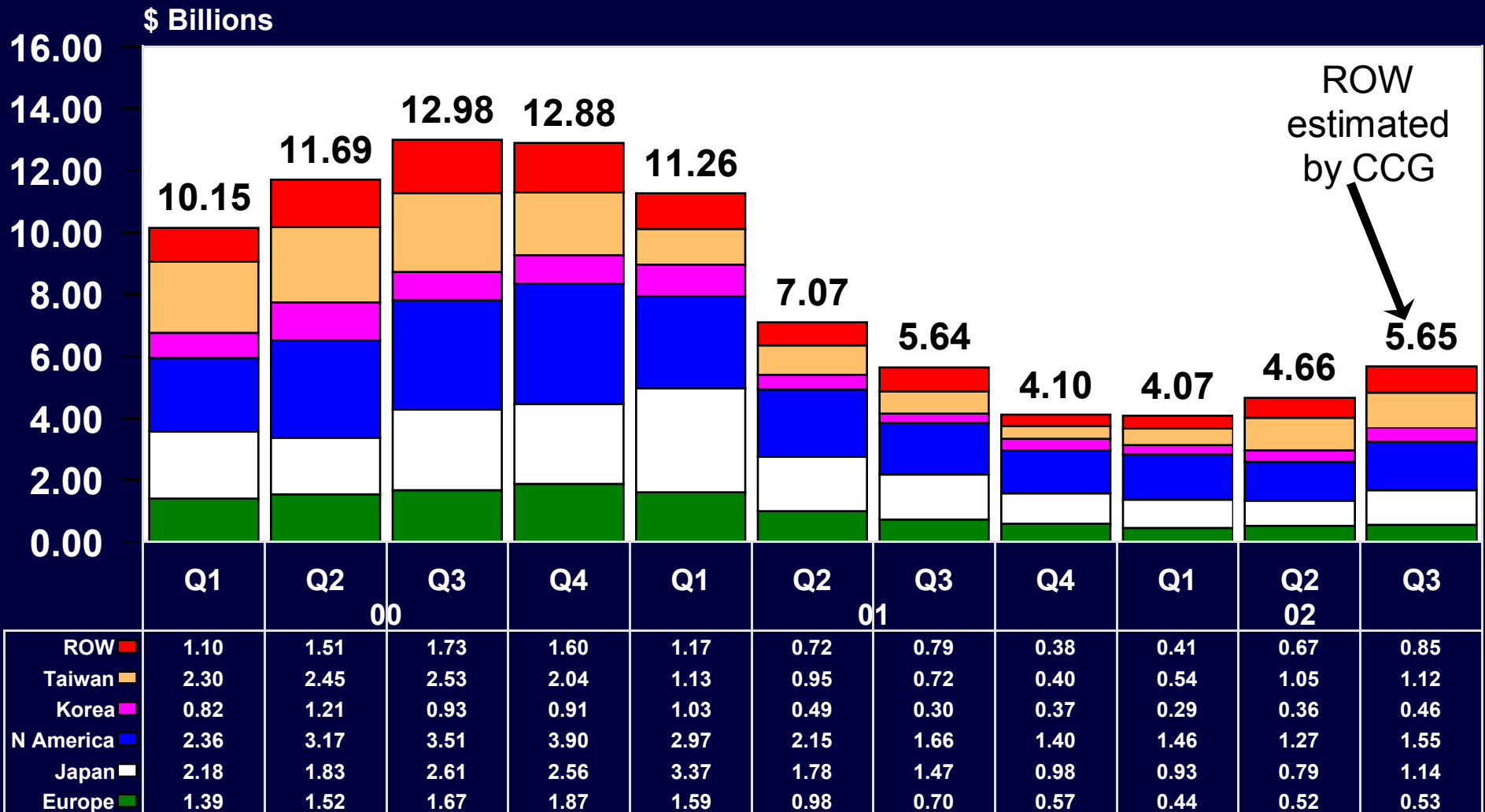
	2000				2001				2002		
	1	2	3	4	1	2	3	4	1	2	3
Revenue	1533	1830	2380	1658	1650	1277	1086	1034	1385	1404	1384
Income	146	266	581	280	23	-371	-523	-331	-108	-76	-506
Inventory	724	738	841	1011	1086	1130	882	769	772	802	891

CY

IFX

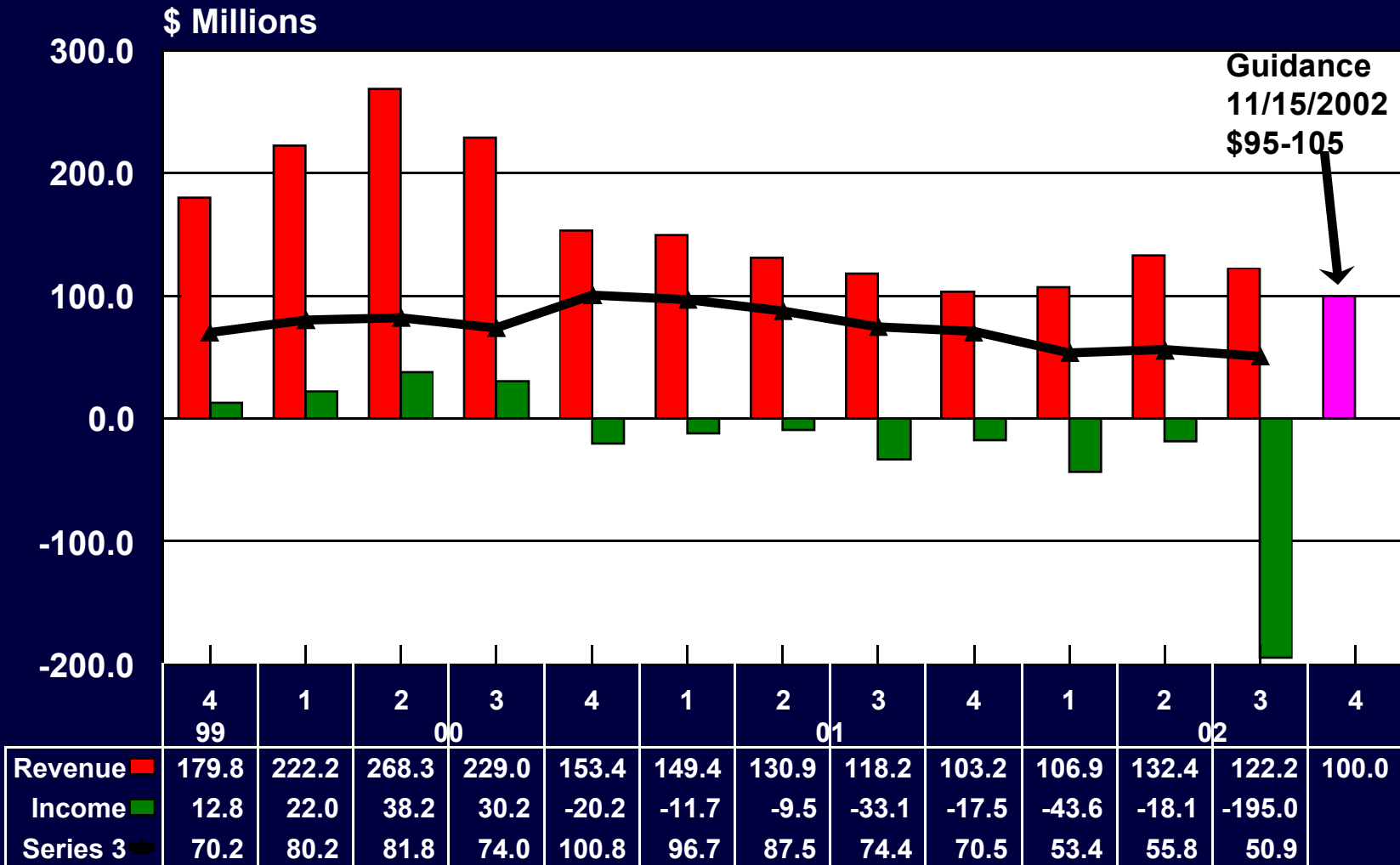
# **Semiconductor Fab, Assembly & Test**

# Semiconductor Capital Equipment Shipments by Area



# Kulicke & Sofa

## Revenue, Net Income & Inventory



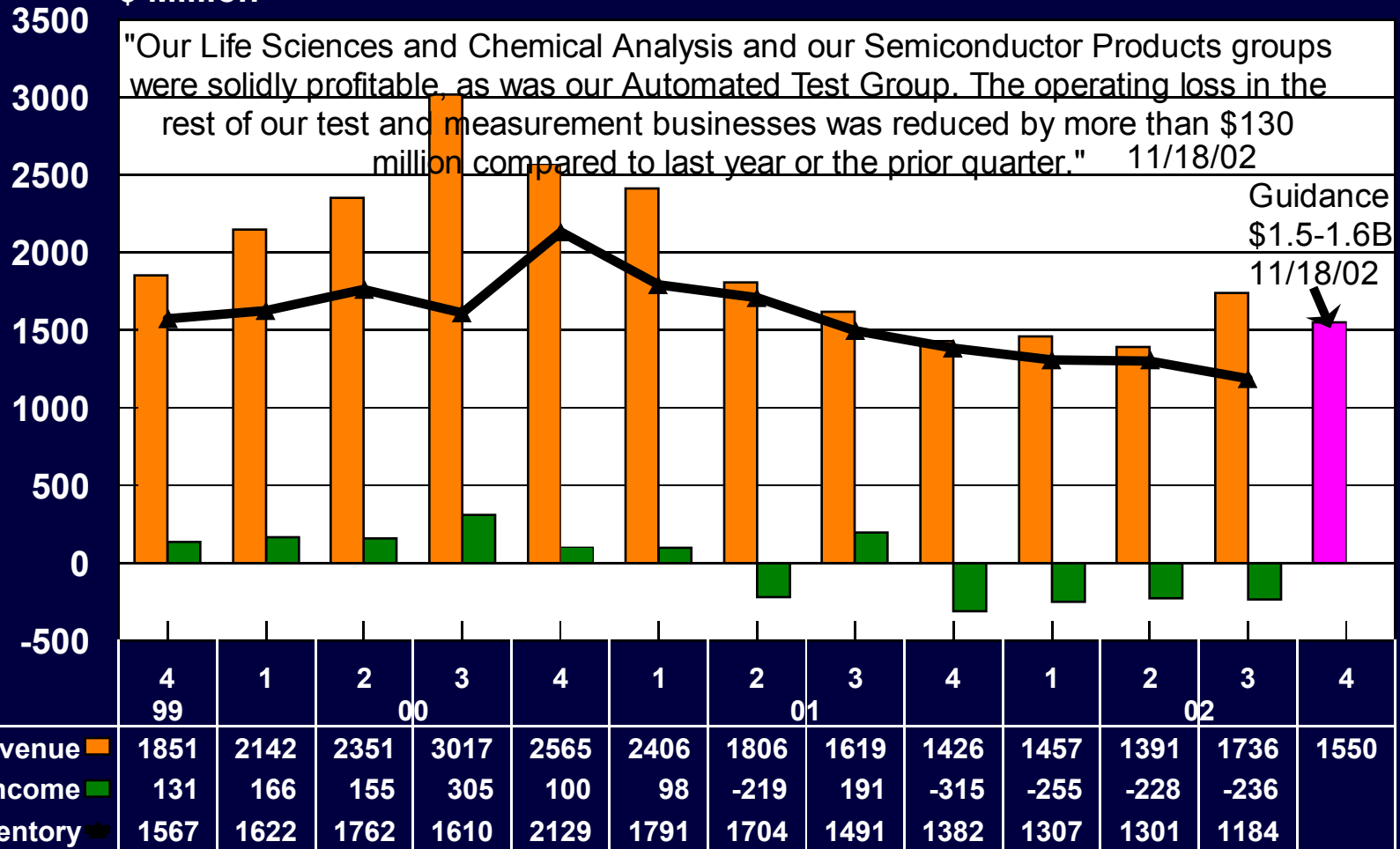
CY

KLIC

# Agilent Technologies

## Revenue, Net Income & Inventory

\$ Million



CY

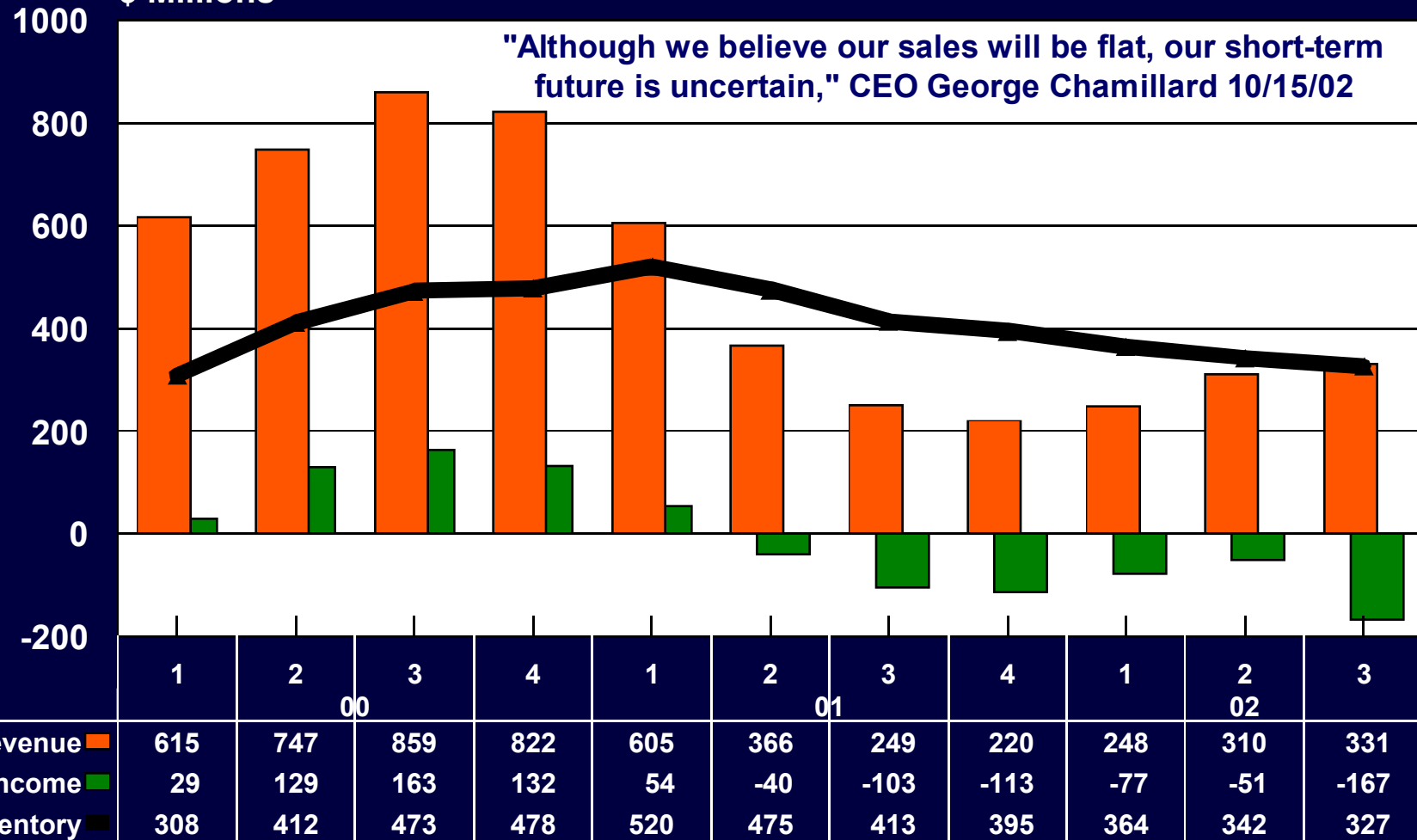
A

FY ends Oct31

# Teradyne

## Revenue, Net Income & Inventory

\$ Millions

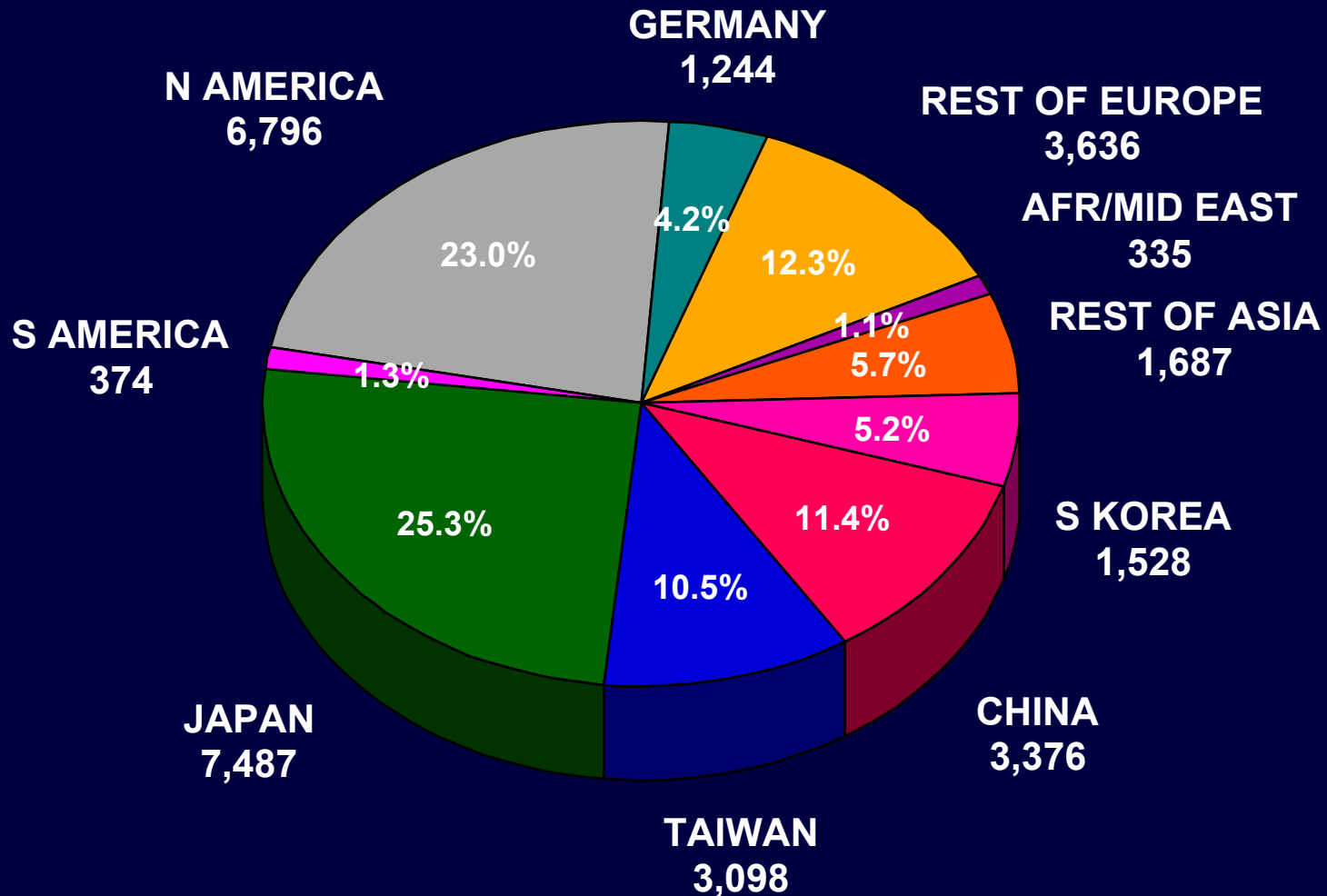


CY

TER

# PCB Fabrication

# 2001 WORLD RIGID PCB PRODUCTION BY GEOGRAPHICAL AREA (\$M)

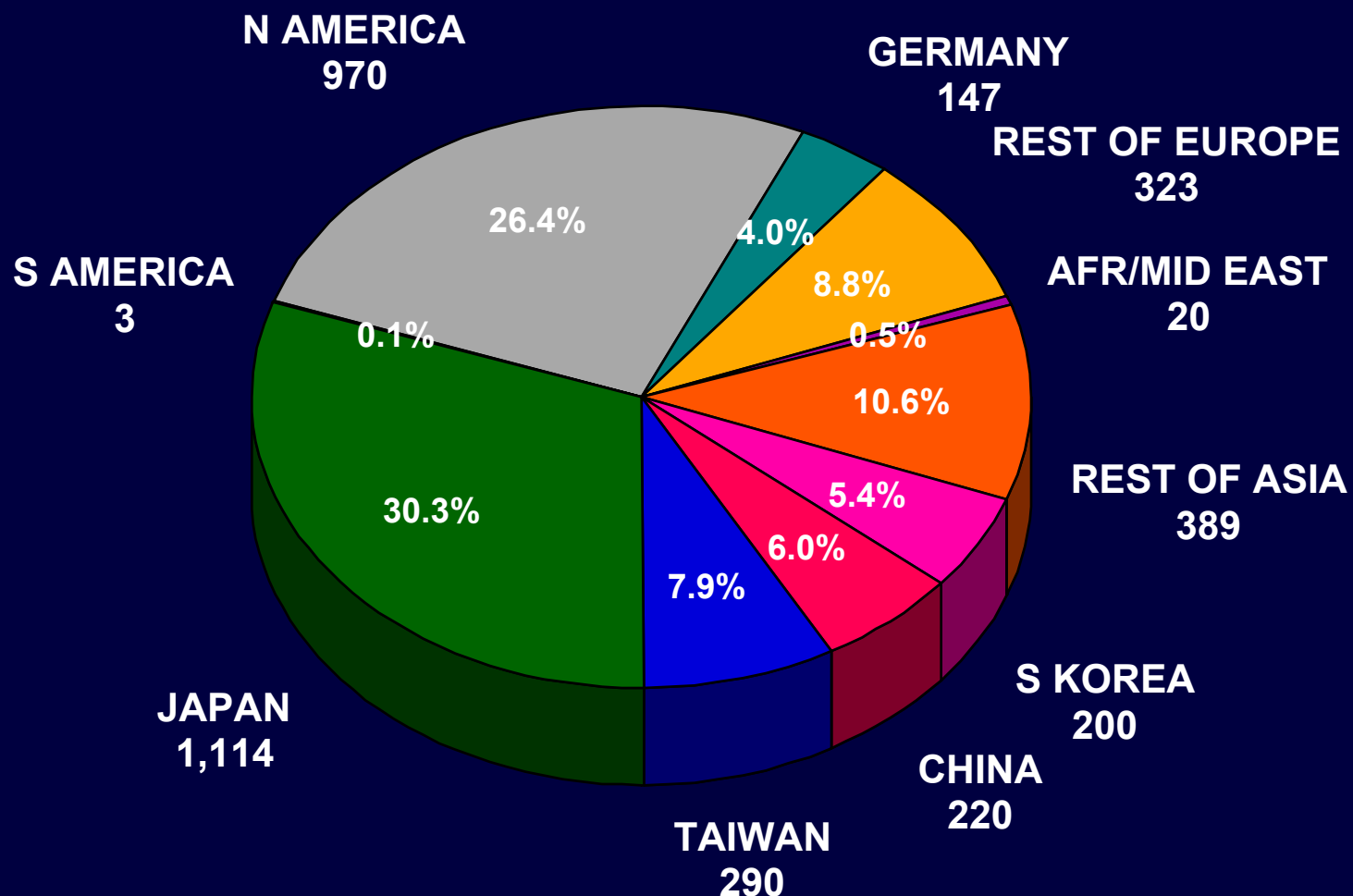


**Total: \$29.6 Billion**

IPC TMRC 5/2002 (includes Microvia PCBs & chip packaging substrates)

# 2001 WORLD FLEXIBLE CIRCUIT PRODUCTION

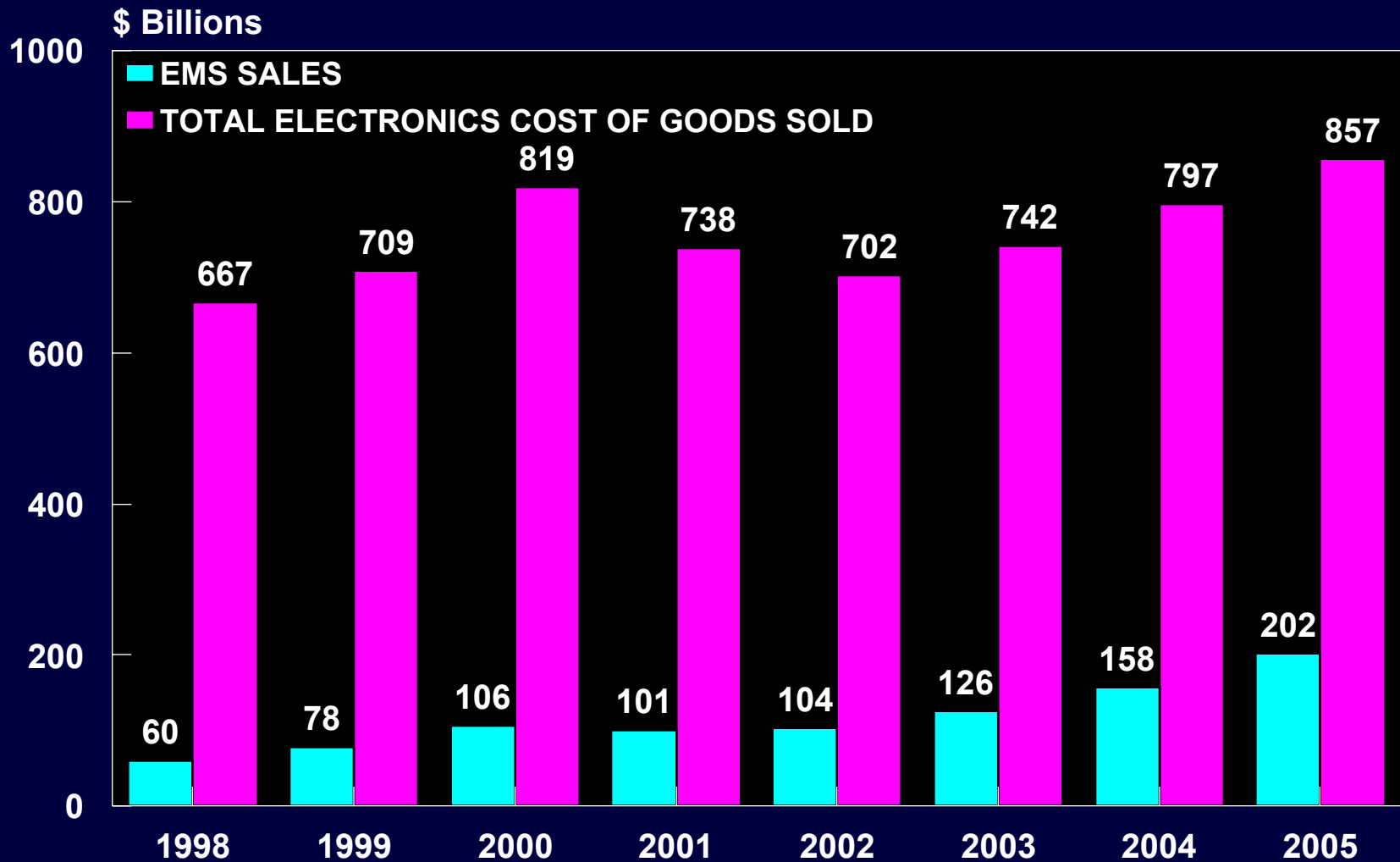
## BY GEOGRAPHICAL AREA (\$M)



**Total: \$3.7 Billion**

# **Electronic Manufacturing Services**

# EMS Estimated Revenue & OEM Penetration Rate



# Top World Contract Electronic Manufacturers

## 2001 vs 2000

			<u>2001</u>	<u>2000</u>	<u>Grow %</u>
Solectron (w/CMAC)	SLR	USA	17,393	18,589	- 6
Flextronics	FLEX	Singapore	12,923	10,369	+25
Sanmina-SCI	SANM	USA	10,831	13,447	-20
Celestica	CLS	Canada	10,004	9,752	+3
Jabil Circuit	JBL	USA	4,086	3,998	+2
Elcoteq Network	Y.ELC	Finland	1,725	2,050	-16
Manufacturers' Services Ltd	MSV	USA	1,522	1,757	-12
ACT Manufacturing	ACTM	USA	1,286	1,371	- 6
Benchmark Electronics	BHE	USA	1,277	1,706	-25
Viasystems	VG	USA	1,206	1,510	-20
<b>Total Top 10</b>			<b>62,253</b>	<b>64,549</b>	<b>- 4%</b>

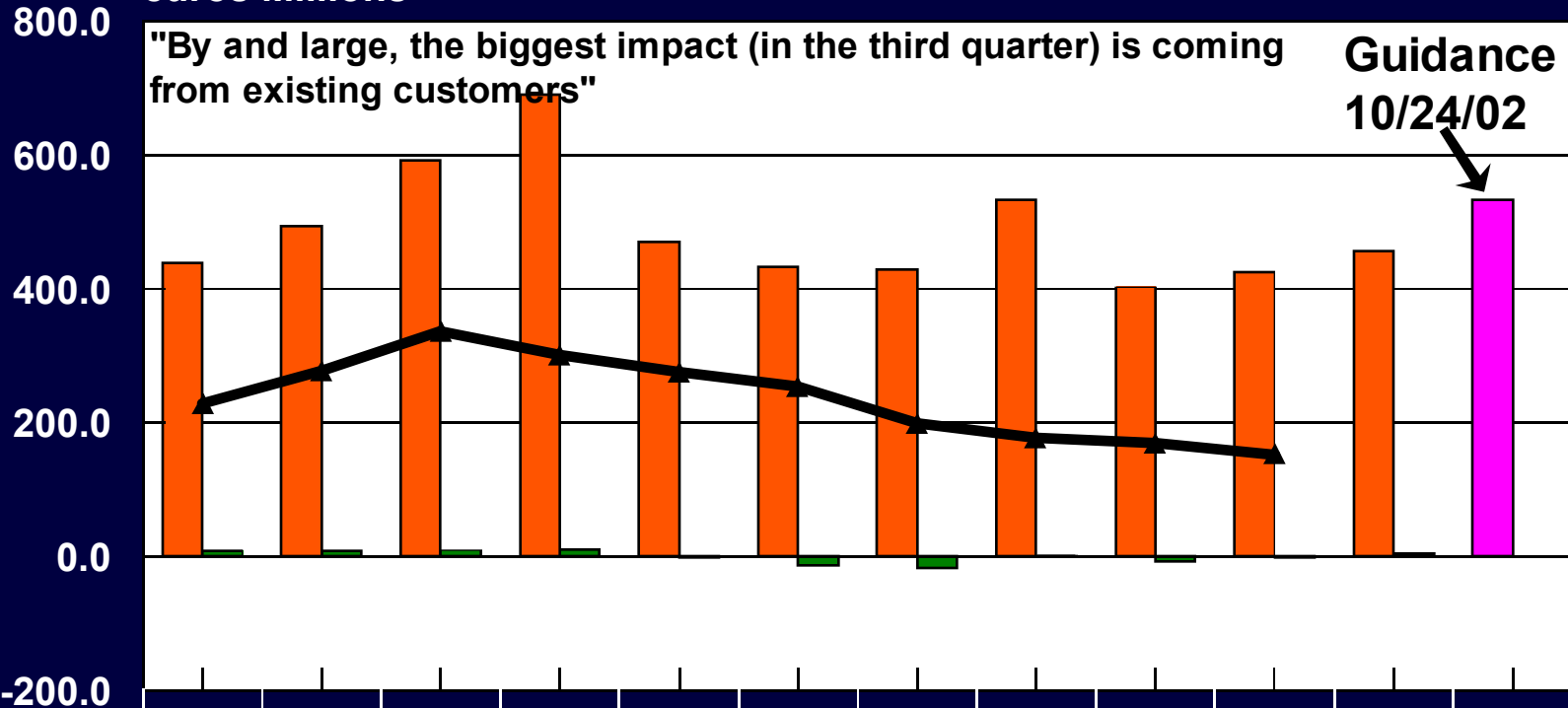
**Sources: Company Data**

**\$US Millions converted at constant CY2000 exchange**

# Elcoteq, Finland

## Revenue, Net Income & Inventory

euros Millions



	00				01				02			
	1	2	3	4	1	2	3	4	1	2	3	4
Revenue	438.2	494.1	591.4	690.0	470.0	433.0	428.0	532.0	402.0	425.0	456.1	532.0
Income	8.8	8.9	9.1	10.4	-2.0	-13.1	-17.0	0.1	-7.6	-2.4	4.6	
Inventory	227.6	277.6	335.9	300.5	275.1	253.4	198.6	177.8	169.2	152.2		

CY

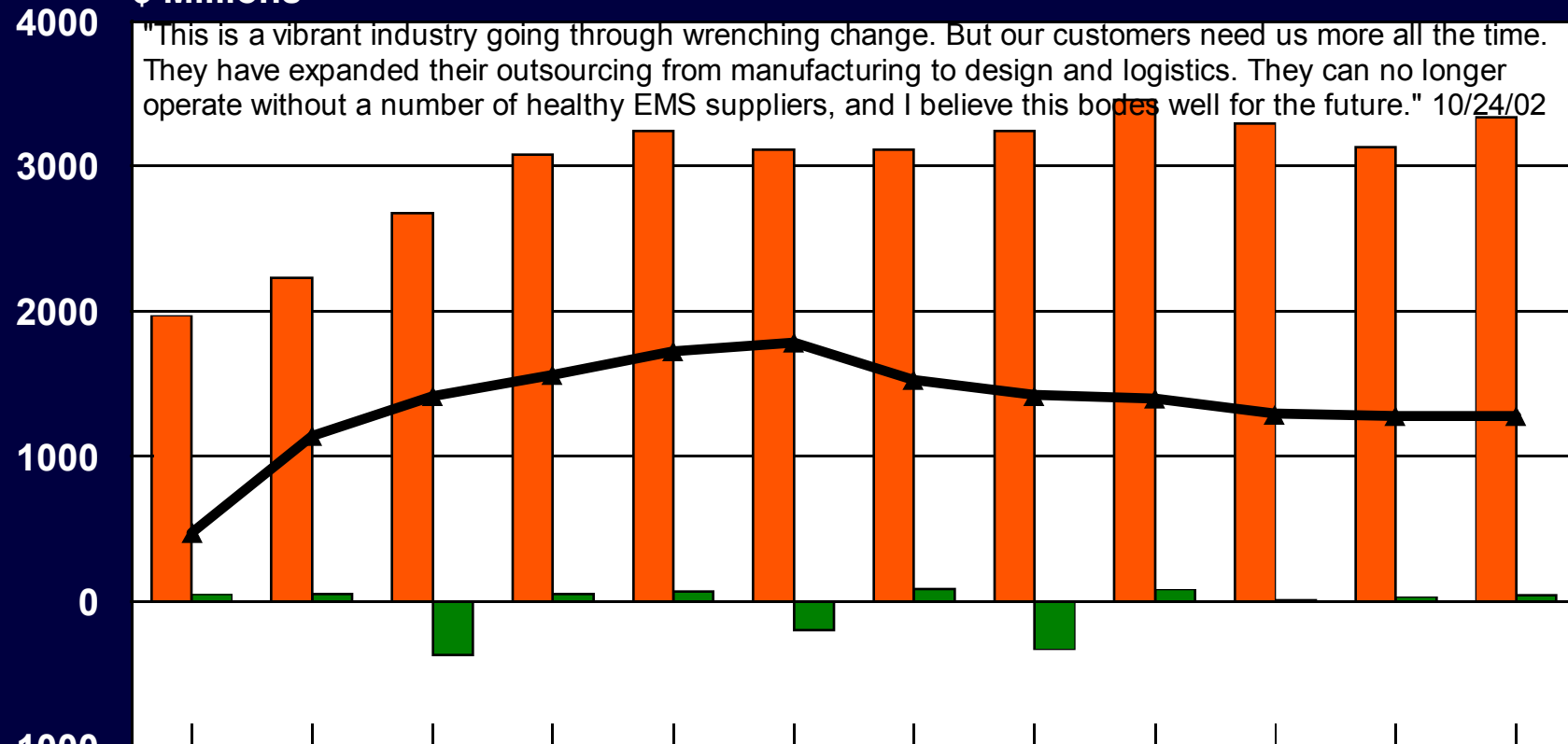
Y.ELQ

# Flextronics

## Revenue, Net Income & Inventory

\$ Millions

"This is a vibrant industry going through wrenching change. But our customers need us more all the time. They have expanded their outsourcing from manufacturing to design and logistics. They can no longer operate without a number of healthy EMS suppliers, and I believe this bodes well for the future." 10/24/02



	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue	1968	2229	2677	3079	3239	3114	3111	3245	3453	3296	3127	3341
Income	48	53	-371	50	68	-193	88	-330	82	6	30	40
Inventory	470	1143	1415	1564	1728	1787	1526	1420	1401	1292	1282	1280

FY ends 3/31

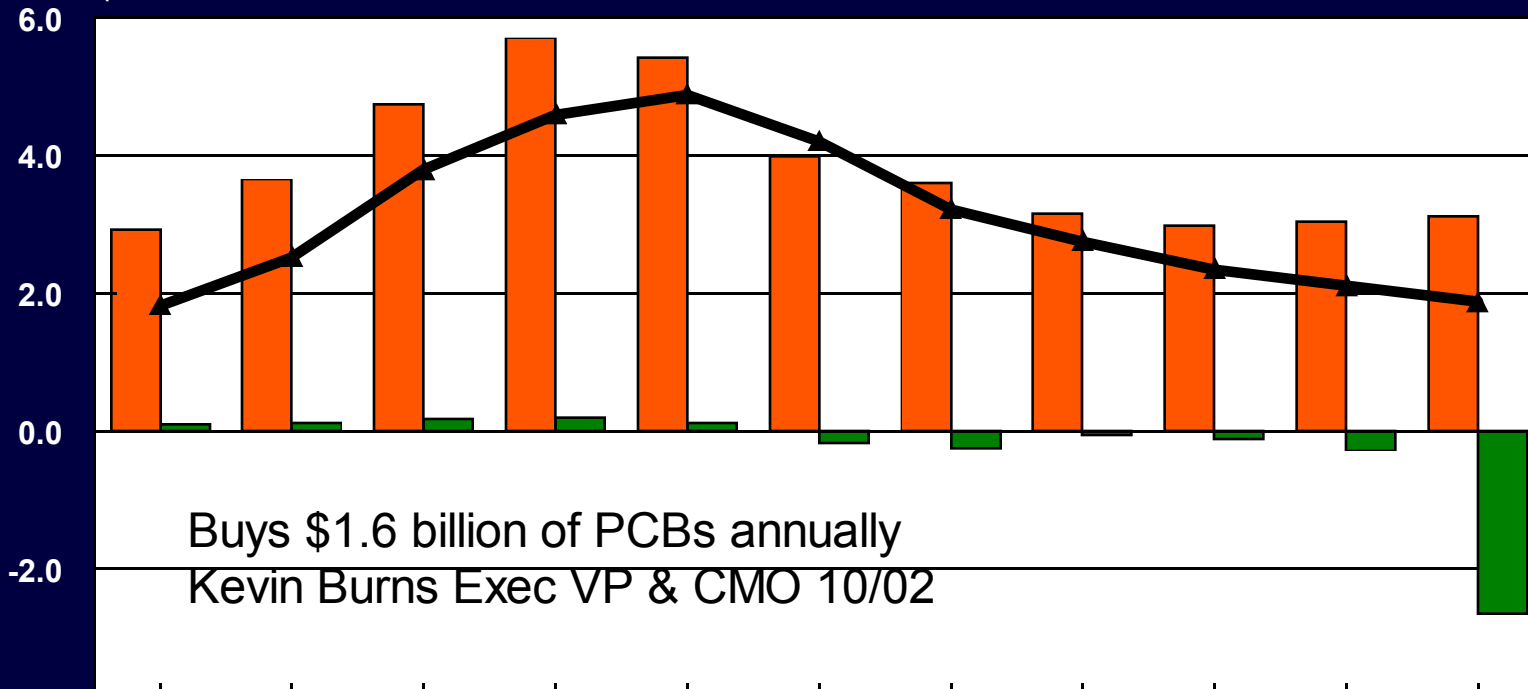
CY

FLEX

# SOLECTRON

## Revenue, Net Income & Inventory

\$ Billions



Buys \$1.6 billion of PCBs annually  
Kevin Burns Exec VP & CMO 10/02

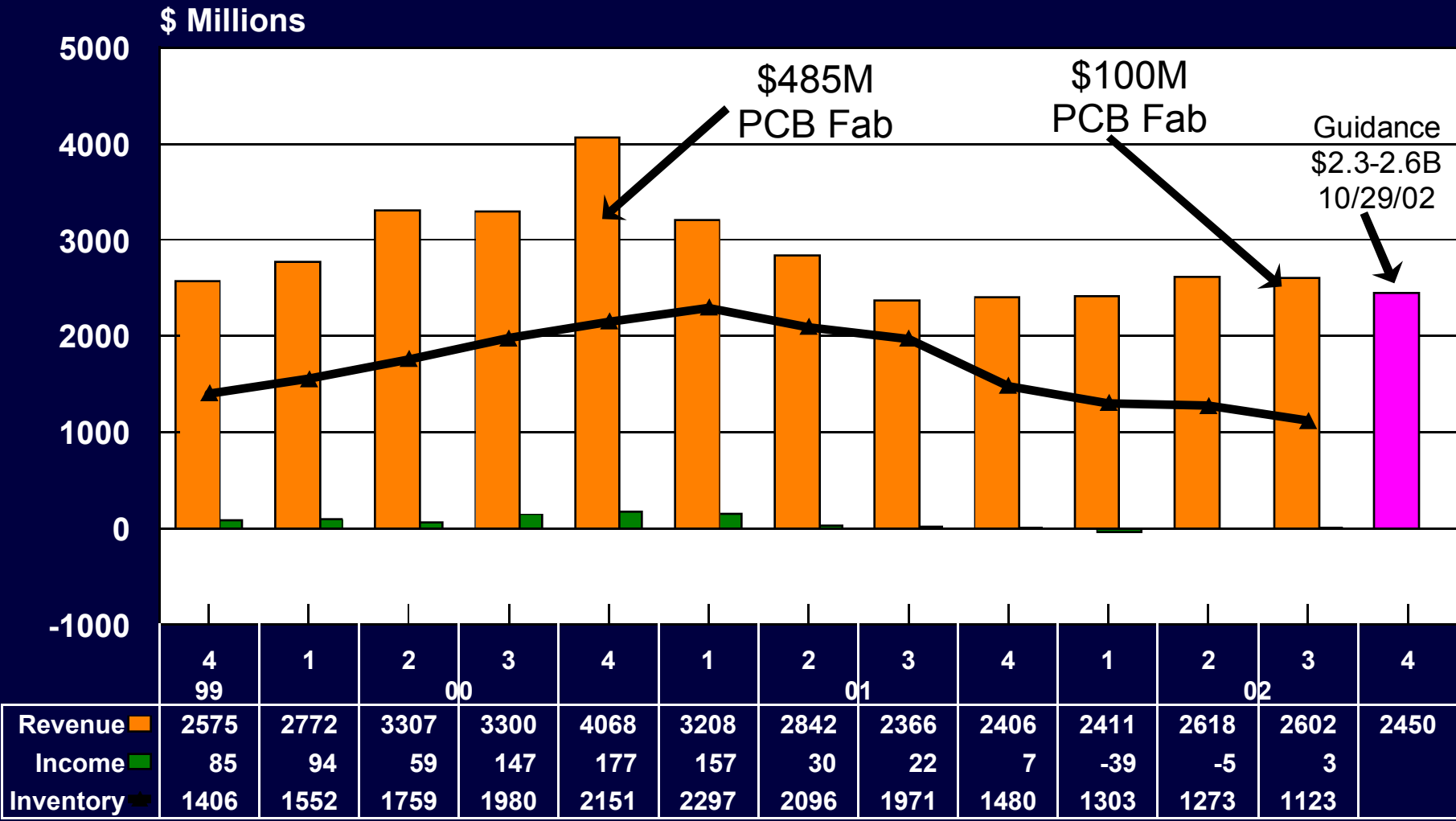
	1	2	3	4	1	2	3	4	1	2	3	
	00				01				02			
Revenue	2.9	3.6	4.7	5.7	5.4	4.0	3.6	3.2	3.0	3.0	3.1	
Income	0.1	0.1	0.2	0.2	0.1	-0.2	-0.3	-0.1	-0.1	-0.3	-2.6	
Inventory	1.8	2.5	3.8	4.6	4.9	4.2	3.2	2.8	2.3	2.1	1.9	

SLR

FY ends in August

# SANMINA-SCI CORP

## Revenue, Net Income & Inventory



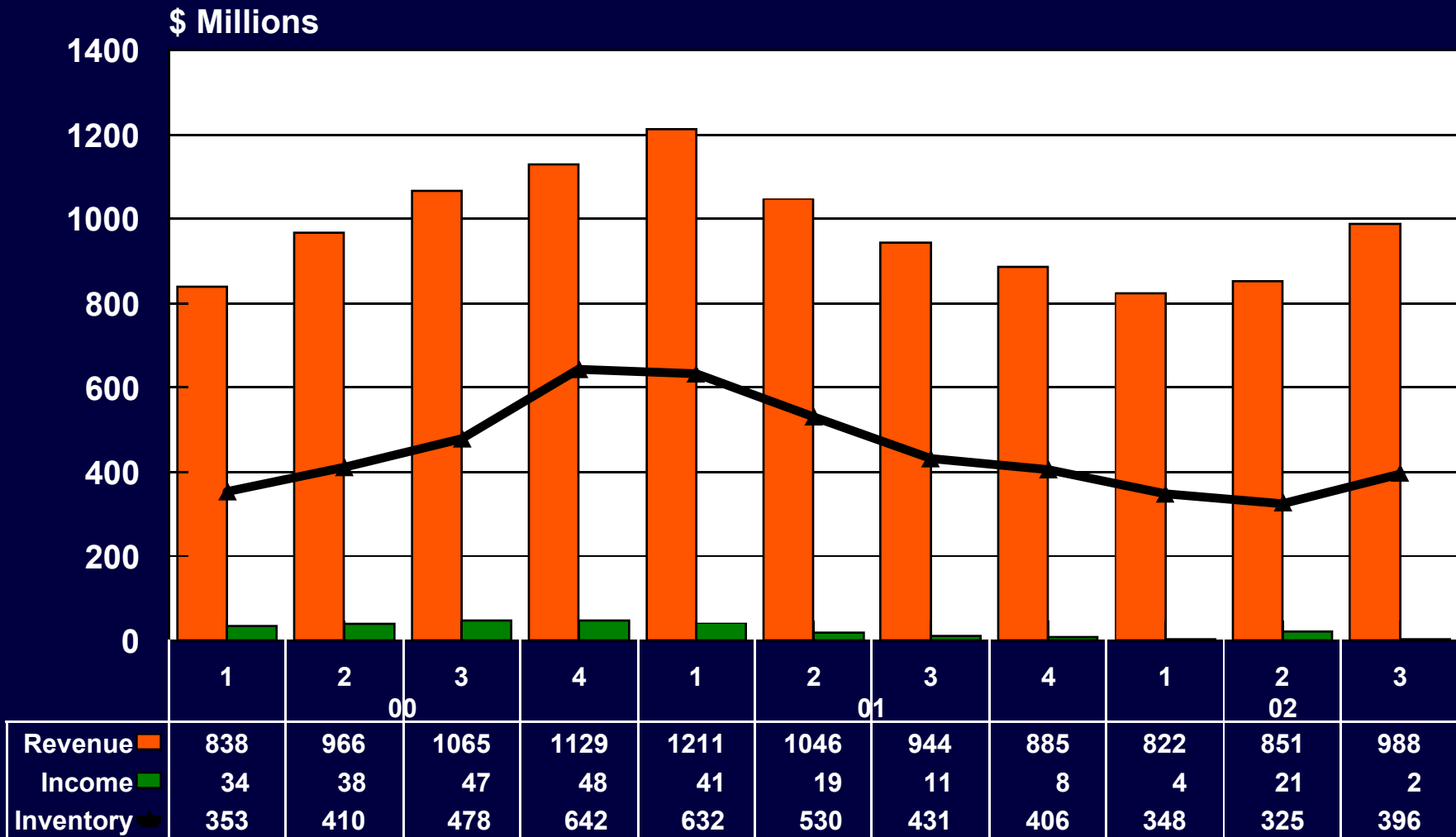
FY ends September 30  
(historical data = combined Sanmina & SCI)

CY

SANM

# JABIL CIRCUIT INC

## Revenue & Net Income



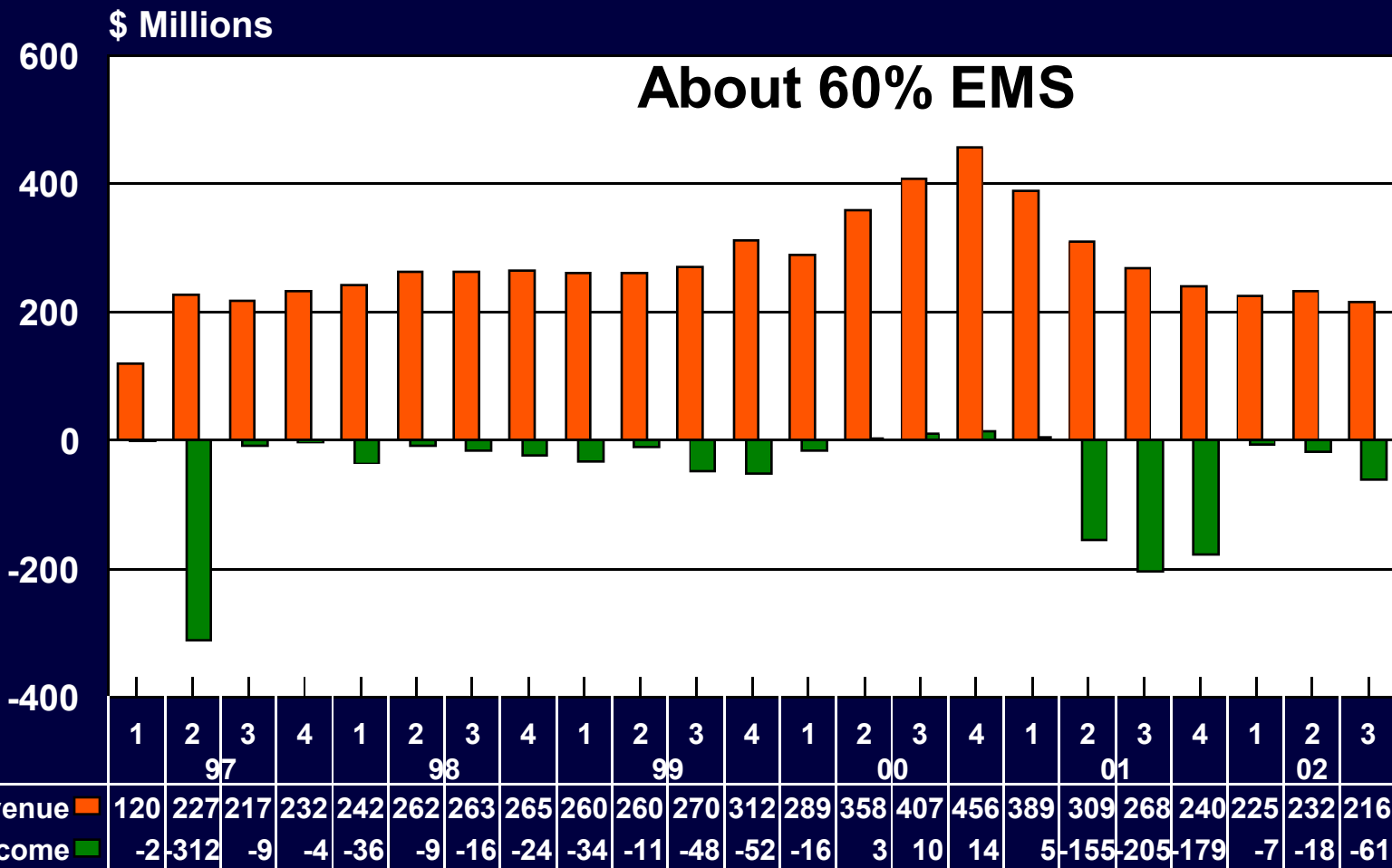
CY

FY ends August

JBL

# VIASYSTEMS

## Revenue & Income



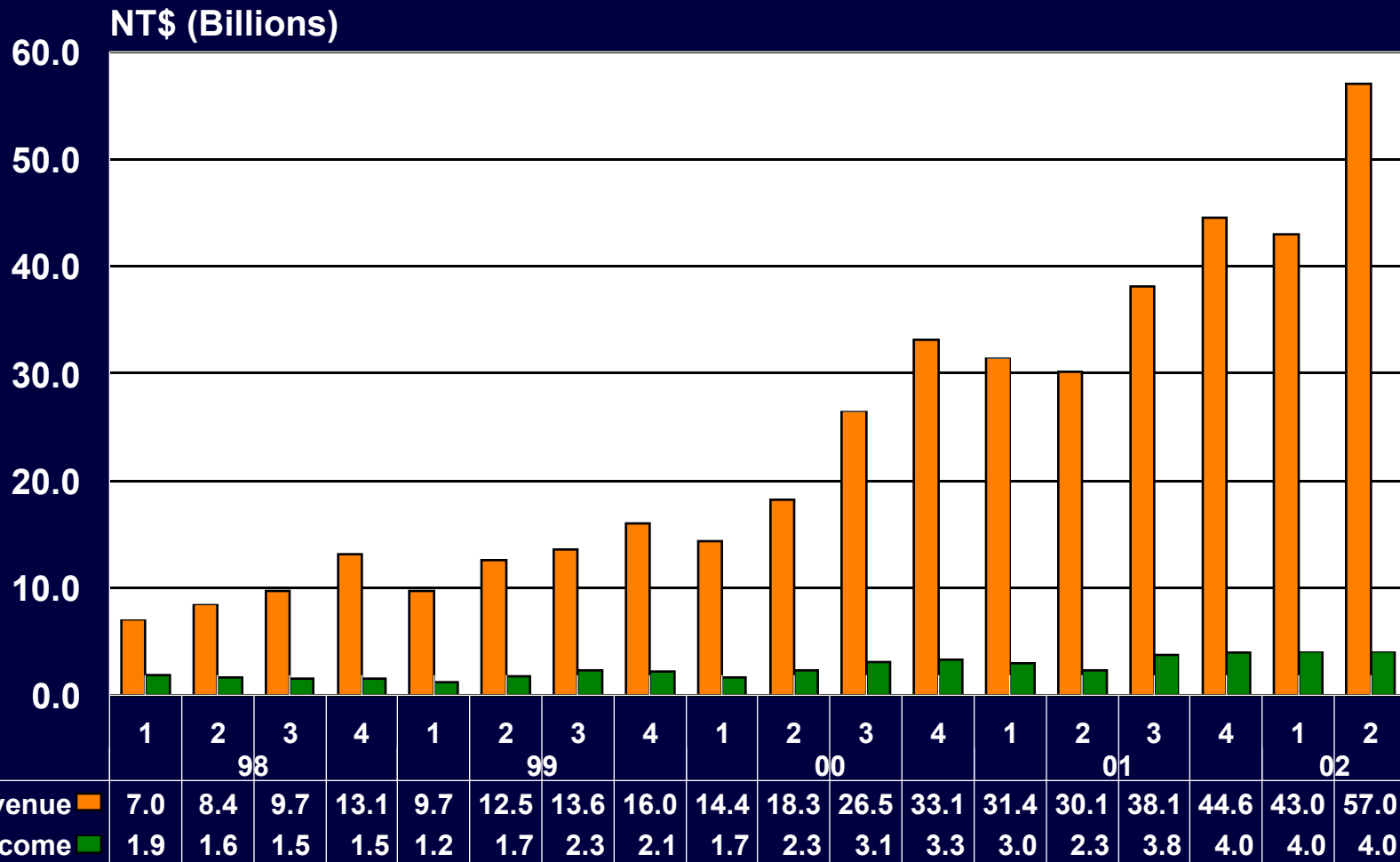
CY

VSGI

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

# Foxconn Electronics (Hon Hai), Taiwan

## Revenue & Net Income



CY

# PCB Fabrication

(more info)

# TOP WORLD PCB MANUFACTURERS

## PCB Fab - 2001 ESTIMATE (\$M)

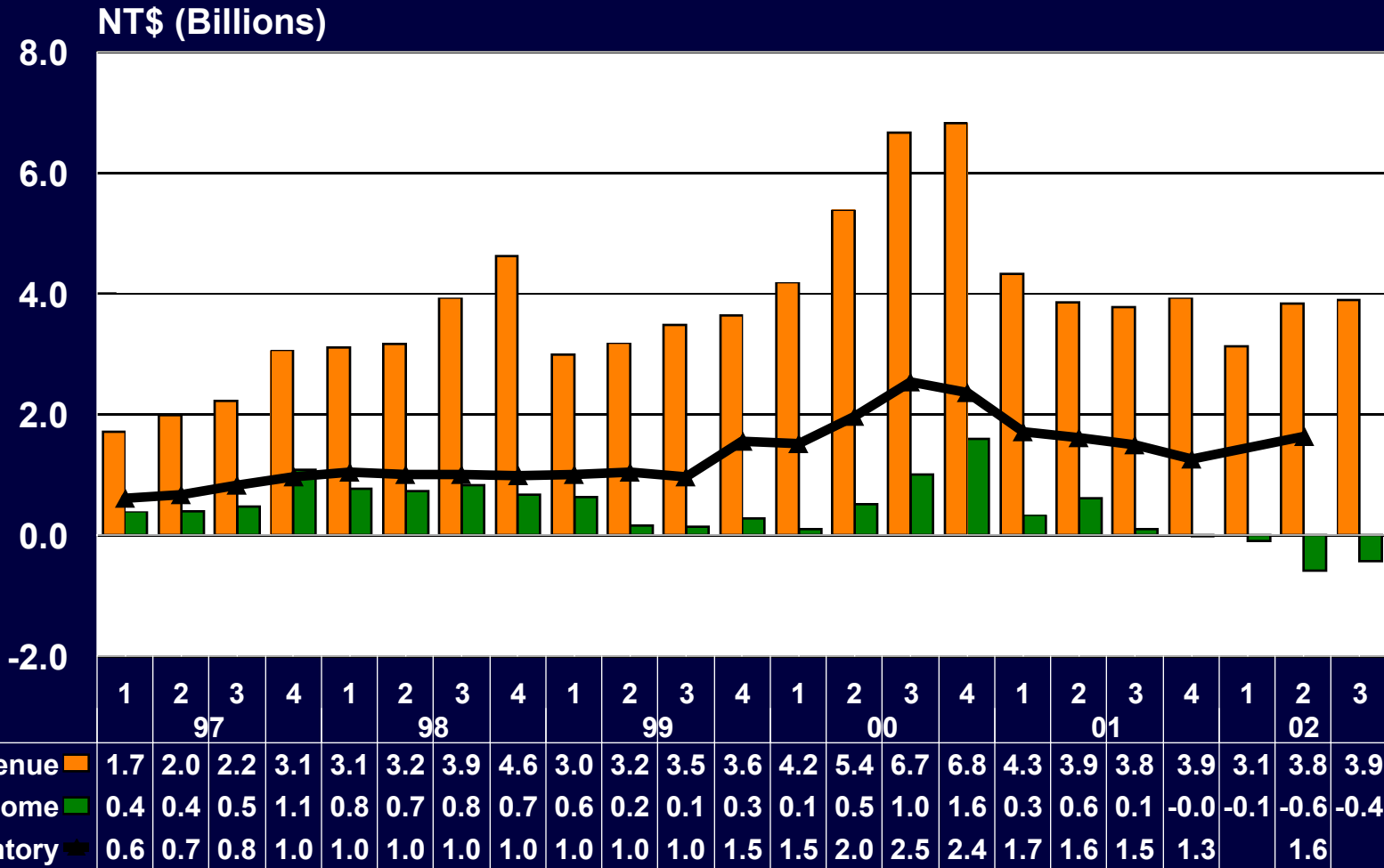
Ibiden	Japan	909
CMK	Japan	836
Sanmina-SCI	USA	750
Mektron	Japan	680
Hitachi Group	Japan	642
Compeq	Taiwan	597
Viasystems Group	USA	560
Tyco	USA	550
Unimicron	Taiwan	410
Daeduck Group	Korea	410
Shinko Denki	Japan	400
Multek	USA	400
Samsung E-M	Korea	368
Fujitsu	Japan	336
IBM	USA	315
Matsushita EC	Japan	296
Sony Group	Japan	296
Nan Ya PCB	Taiwan	296
Photocircuits	USA	294
Elec & Eltek	Hong Kong	280
AT&S	Austria	279
DDi	USA	270
Korea Circuit	Korea	270

# TOP ASIAN PCB MANUFACTURERS 2001

	<u>\$ (Millions)</u>
COMPEQ	597
DAEDUCK GROUP	410
UNIMICRON	410
SAMSUNG E-M	368
NAN YA PCB	296
ELEC & ELTEK	280
KOREA CIRCUIT	270
WUS GROUP	268
MEADVILLE GROUP (OPC)	180
GOLD CIRCUIT	174
TOPSEARCH	157
CHIN-POON	155
WONGS CIRCUITS	138
LG ELECTRONICS	138

# Compeq, Taiwan

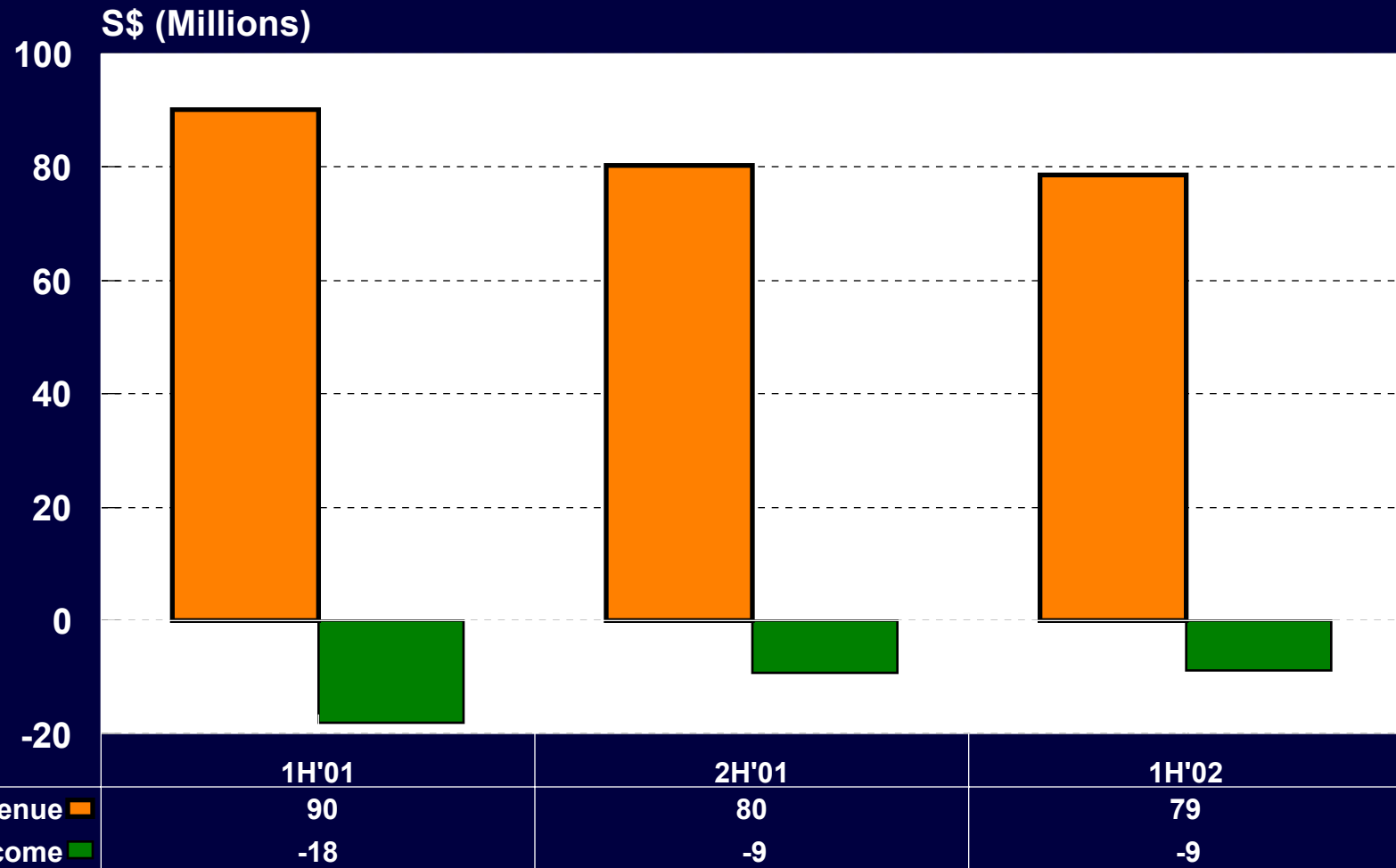
## Revenue & Net Income



CY

# GUL Technologies, Singapore

## Revenue & Net Income

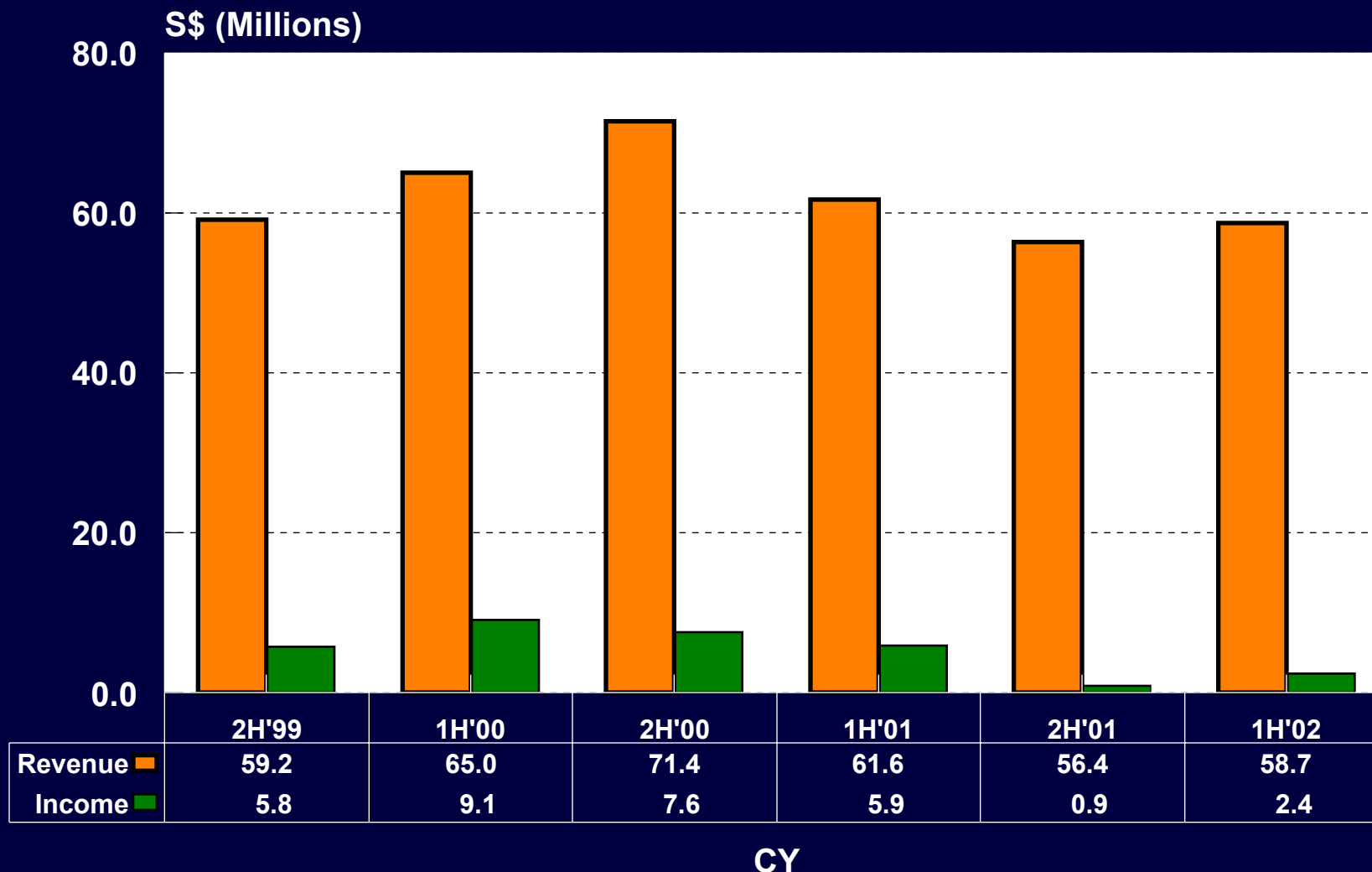


CY

1.8 S\$ = 1 US\$

# Pentex-Schweizer Circuits Ltd

## Revenue & Net Income



1.8 S\$ = 1 US\$

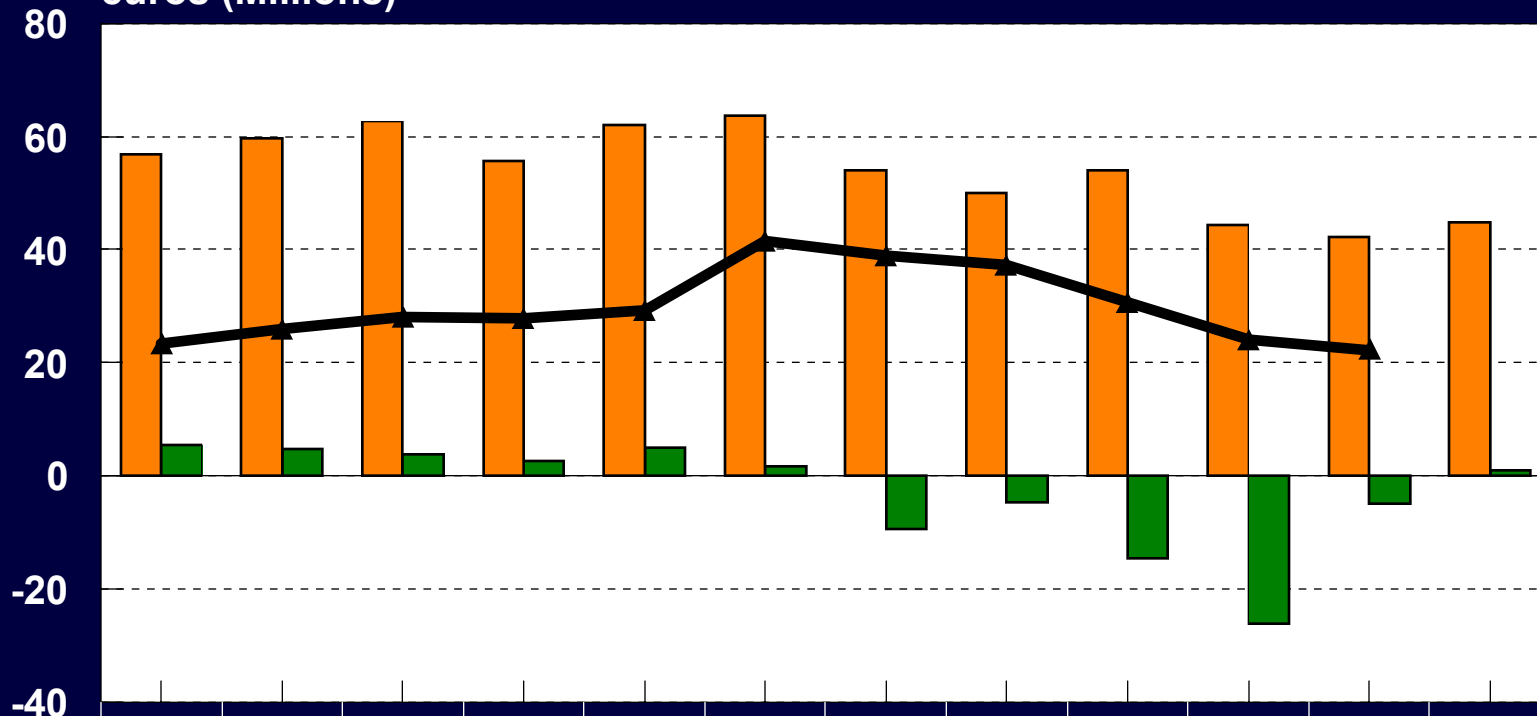
# TOP EUROPEAN PCB MANUFACTURERS 2001

	<u>\$ (Millions)</u>
AT&S-GROUP	279
RUWEL-GROUP	208
ASPOCOMP	170
VOGT-FUBA	133
ALCATEL-GROUP	127
EUROCIR	100
SEAG (Schweizer)	89
CIRCATEX	83
CIRE GROUP	70
STP	64
WURTH	63
LARES-COZZI	60
PPC	54

# Aspocomp, Finland

## Revenue, Net Income & Inventory

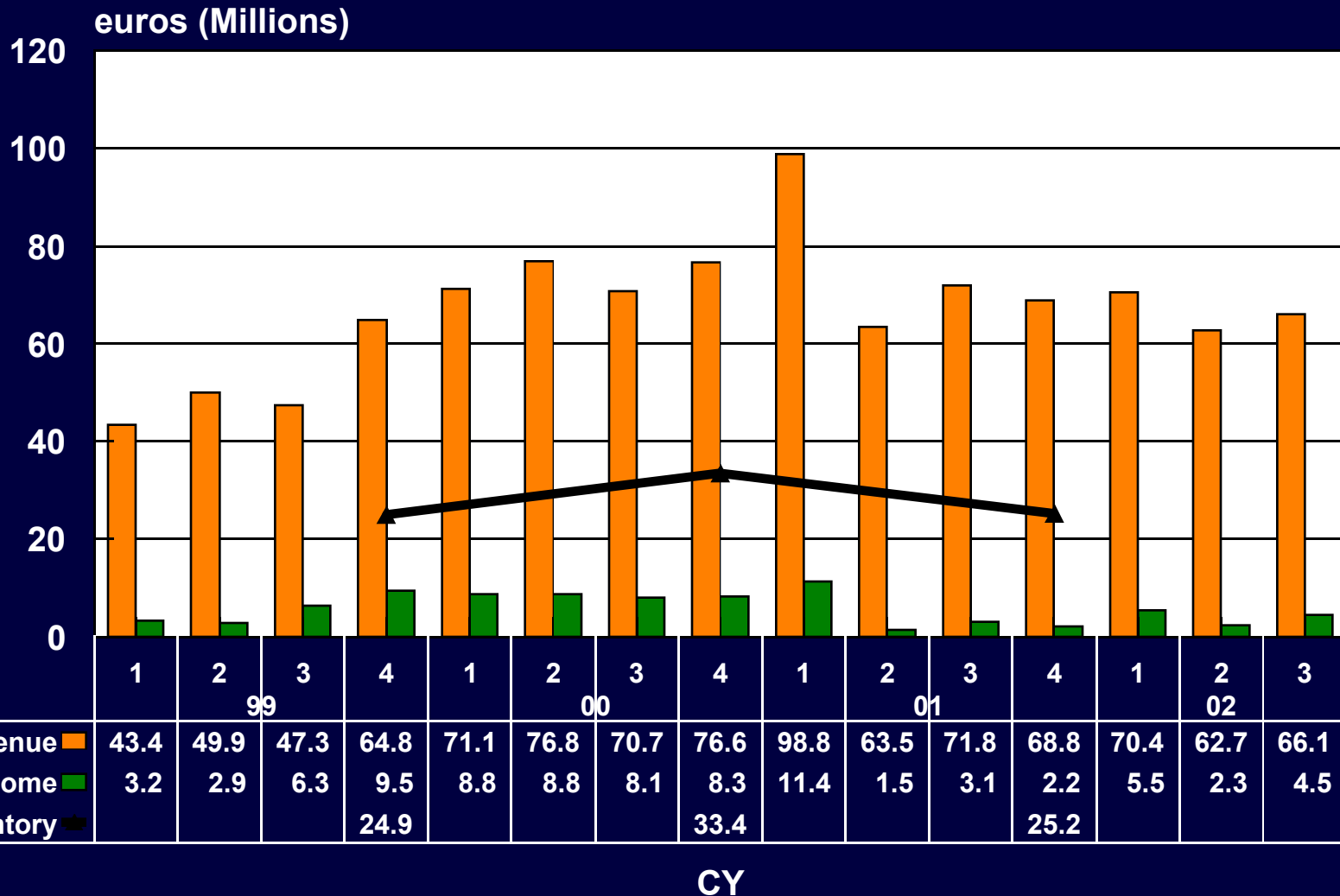
euros (Millions)



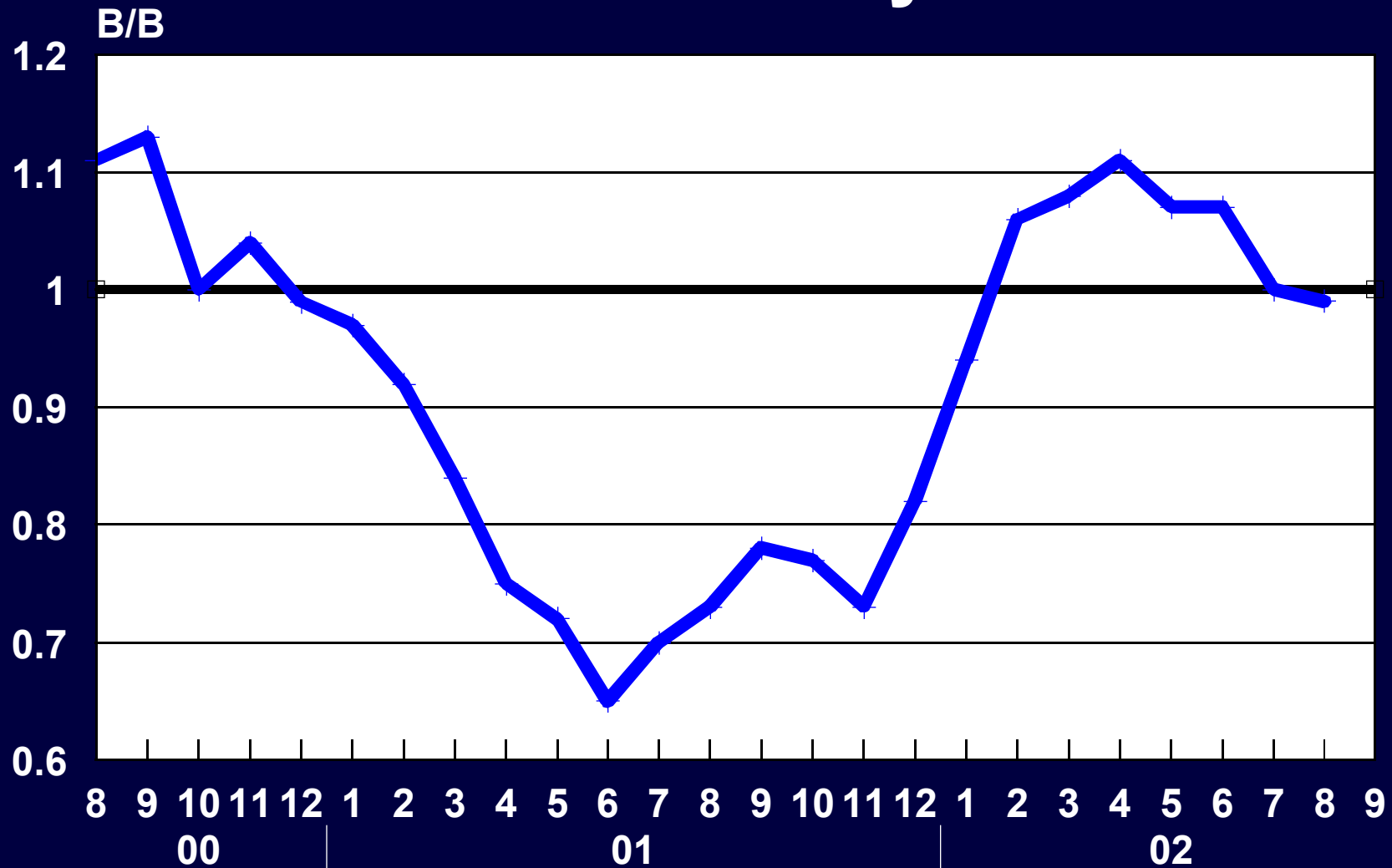
	4 99	1	2 00	3	4	1	2 01	3	4	1	2 02	3
Revenue	56.9	59.6	62.6	55.6	62	63.7	54	50.1	54	44.3	42.2	44.8
Income	5.4	4.7	3.9	2.7	4.9	1.8	-9.5	-4.6	-14.6	-26.2	-5	0.9
Inventory	23.4	26	28.2	27.9	29.3	41.5	39	37.2	30.7	24.1	22.3	

# AT&S, Austria

## Revenue, Net Income & Inventory

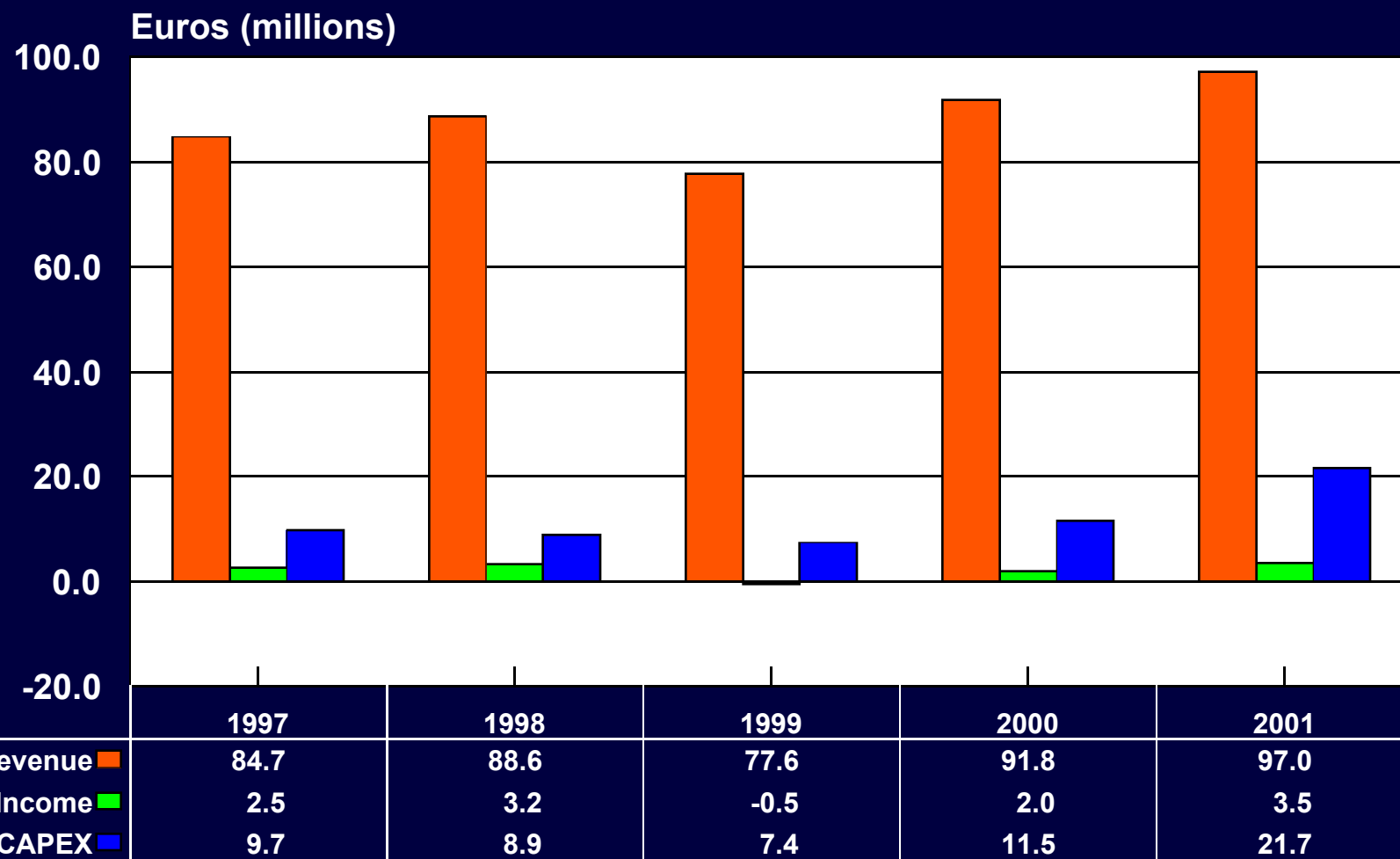


# PCB Book/Bill Germany



# Schweizer Electronic AG

## Revenue, Net Income & Capital Expenditure



CY

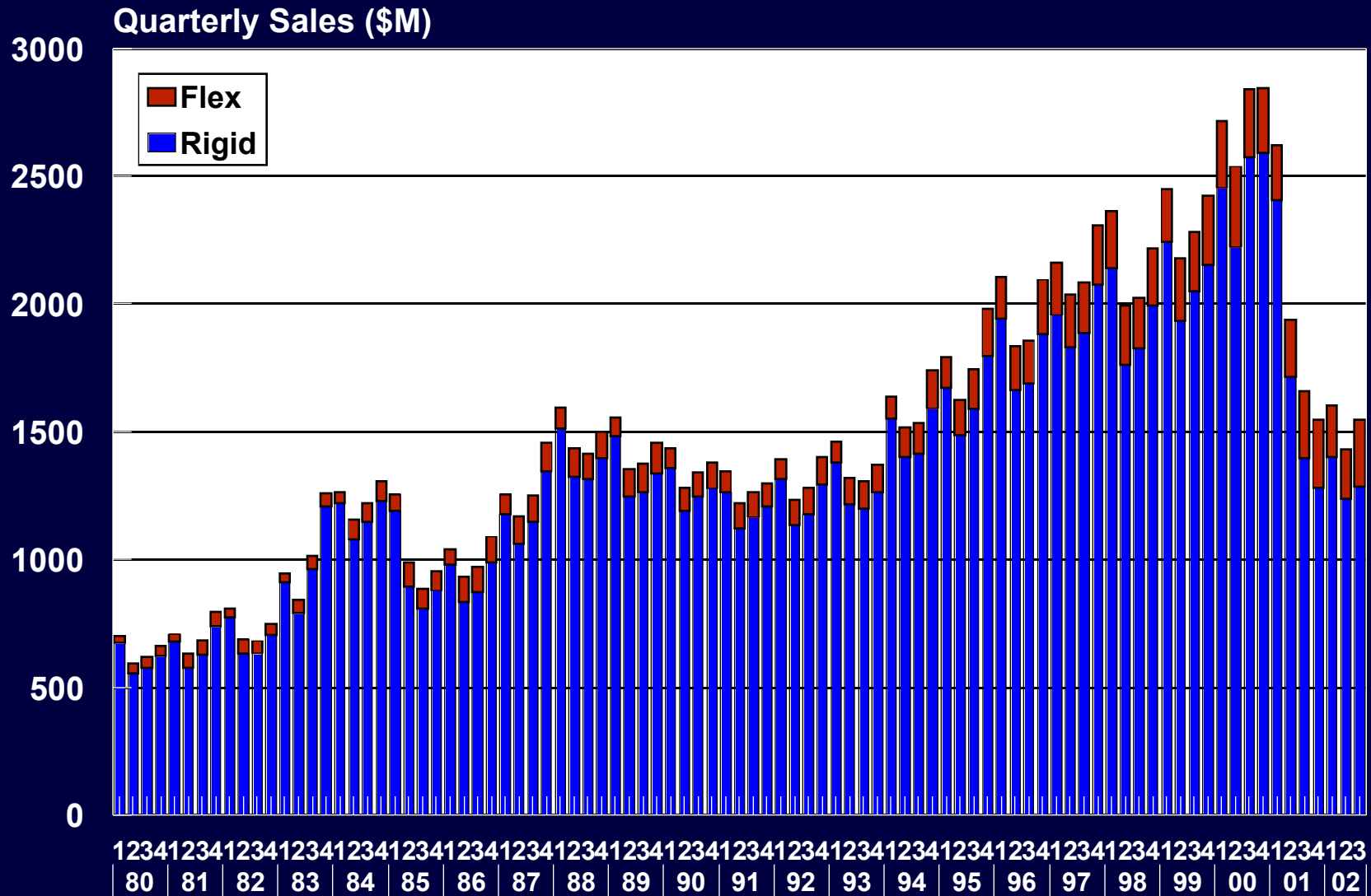
SEAG

# TOP N AMERICAN PCB MANUFACTURERS

PCB FAB - 2001 ESTIMATE (\$M)

	PCB \$M
SANMINA-SCI	750
VIASYSTEMS GROUP	560
TYCO	550
MULTEK	400
IBM	315
DDi	300
PHOTOCIRCUITS	294
HONEYWELL (ACI)	250
3M	200
TTM TECHNOLOGIES	133
MERIX	121
INNOVEX	120
SHELDAHL	106
TERADYNE	90
PARLEX	86
BUREAU ELECTRONICS	70
AMBITECH	61
M-FLEX	55
NORTHROP (Litton)	50

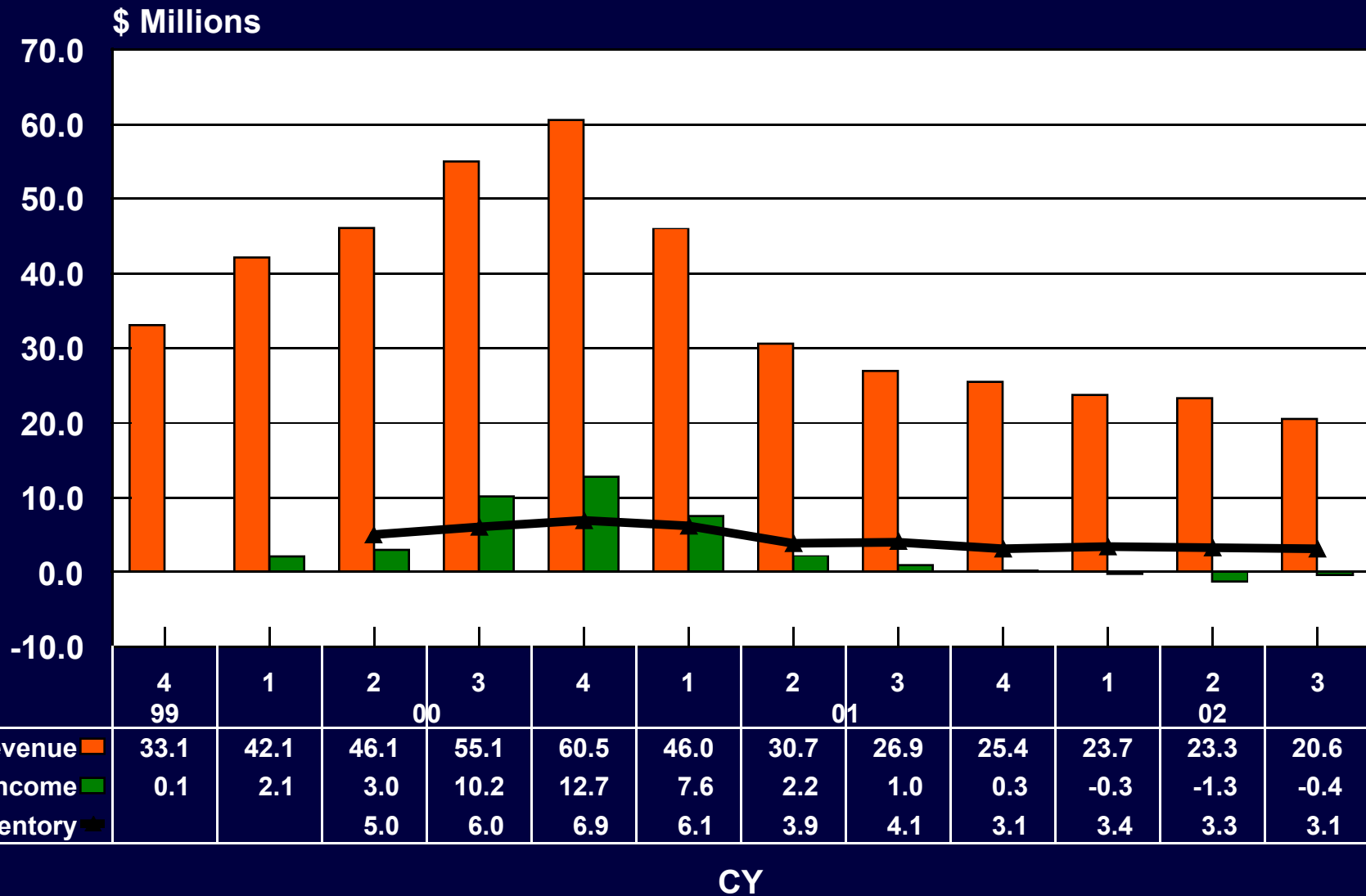
# N. AMERICAN TOTAL PCB SHIPMENTS



IPC T/MRC data with Custer interpretation

# TTM Technologies

## Revenue & Net Income

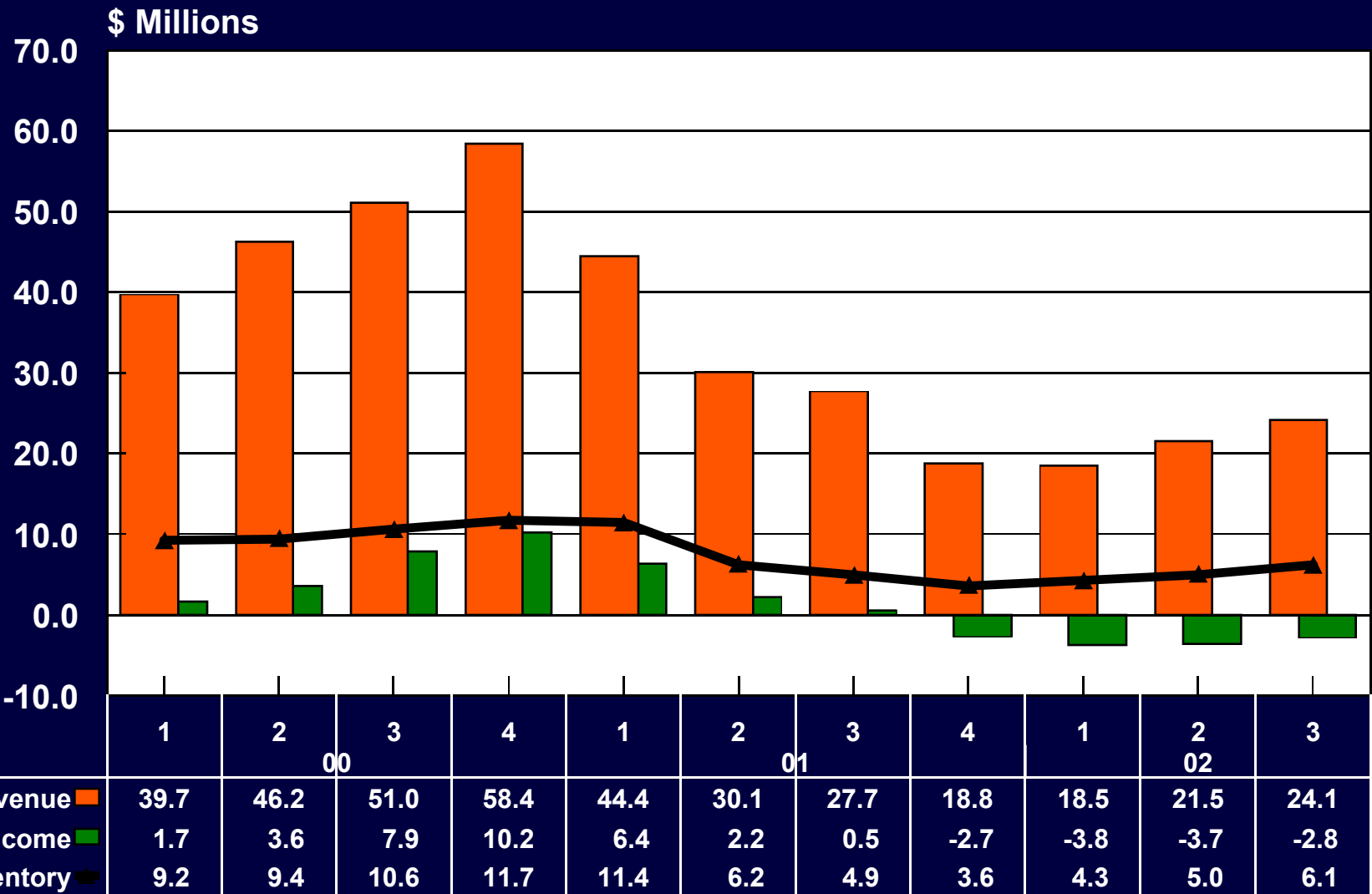


FY=CY

TTMI

# MERIX

## Revenue, Net Income & Inventory

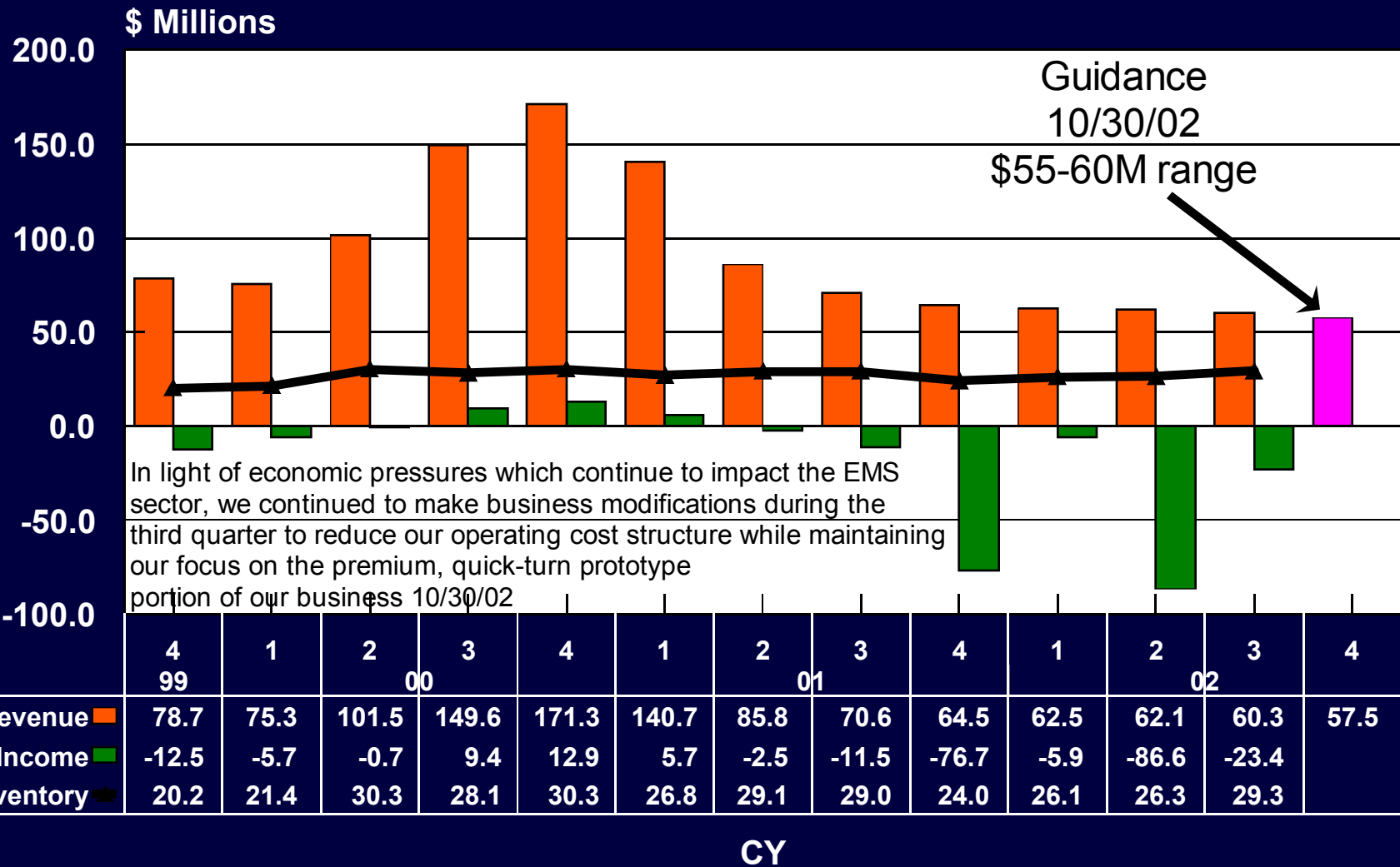


MERIX

FY ends May

# DDi Corp

## Revenue, Net Income & Inventory

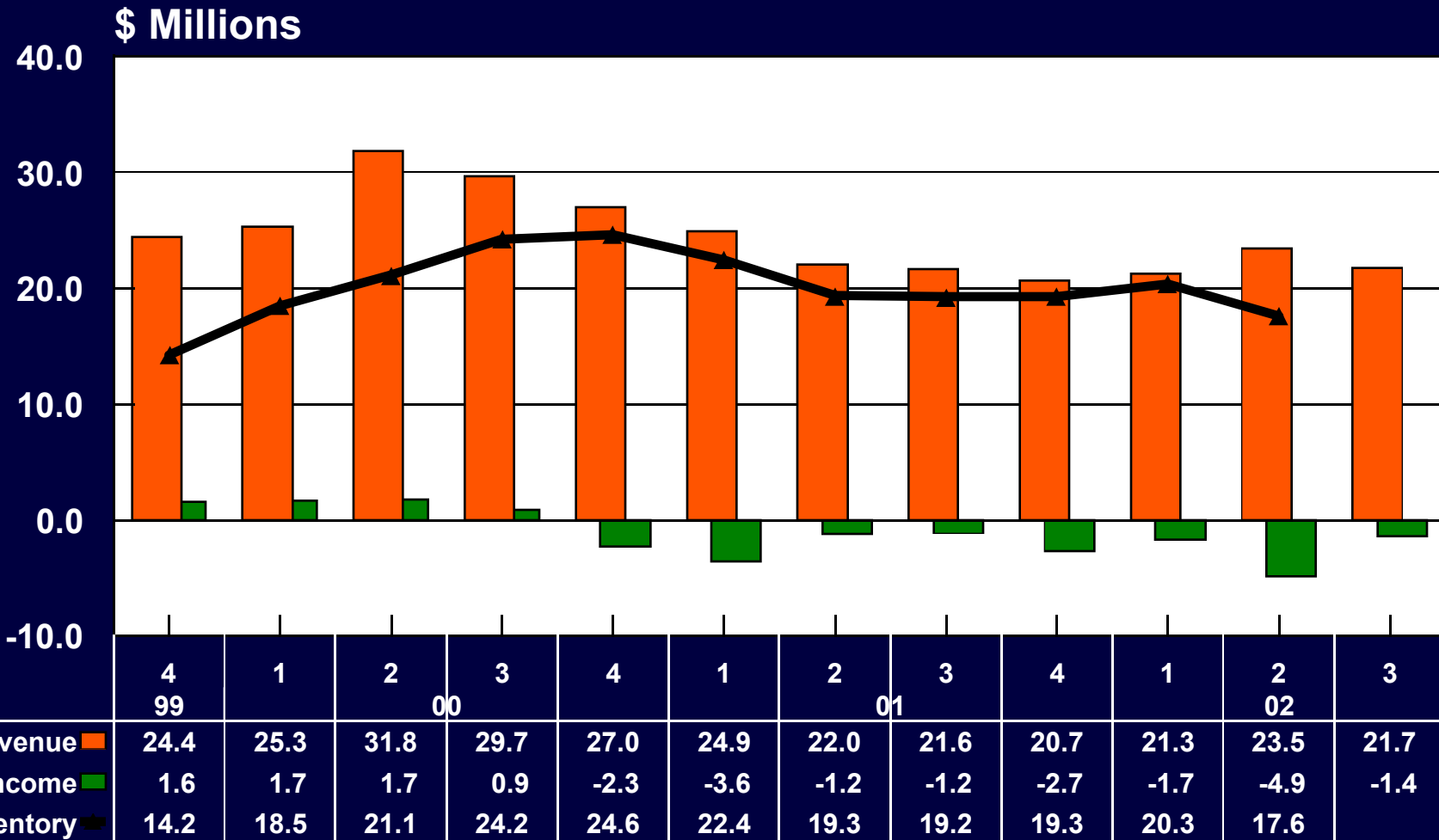


FY=CY

DDIC

# PARLEX

## Revenue, Net Income & Inventory

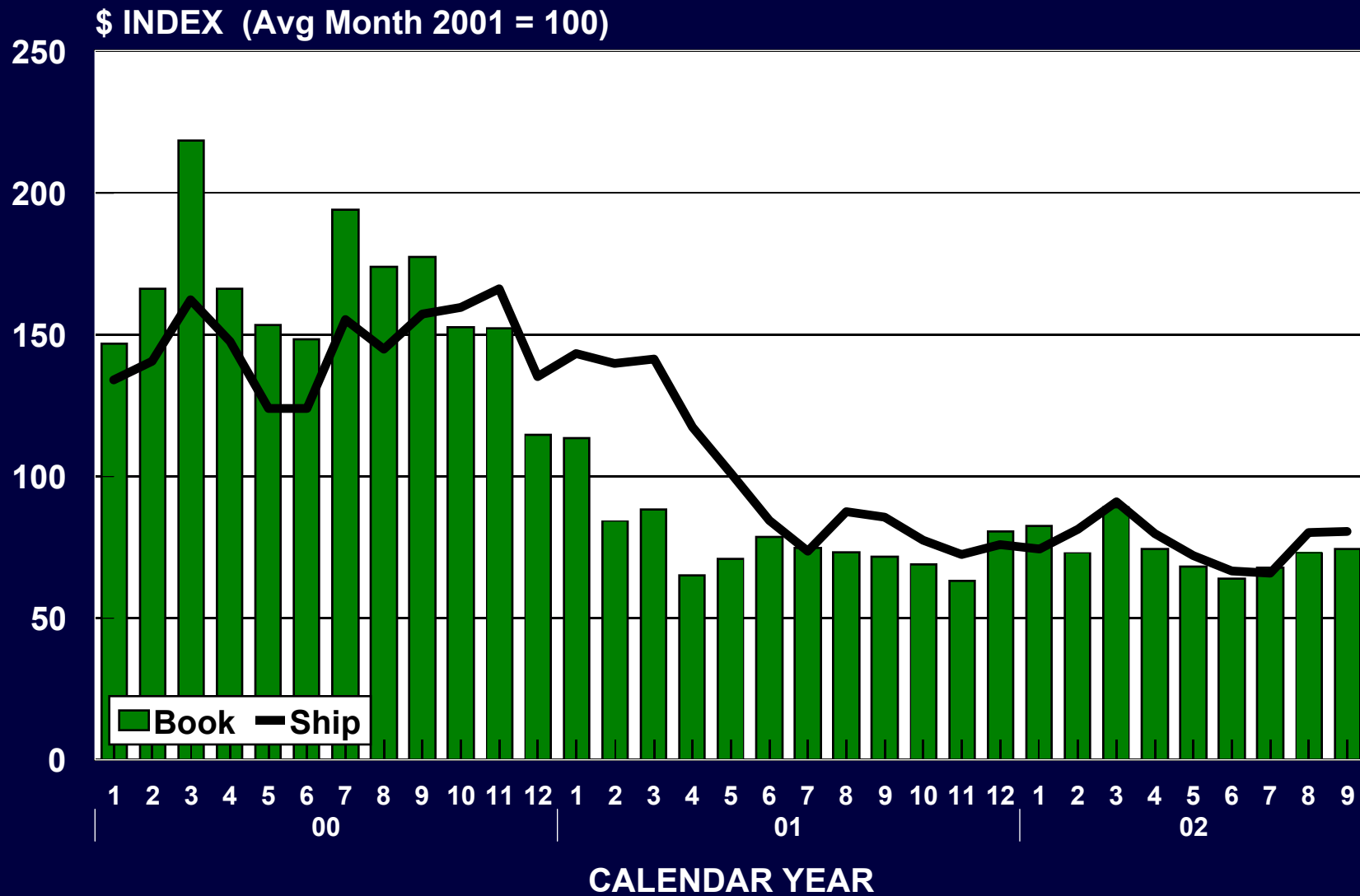


CY

FY ends June 30

PRLX

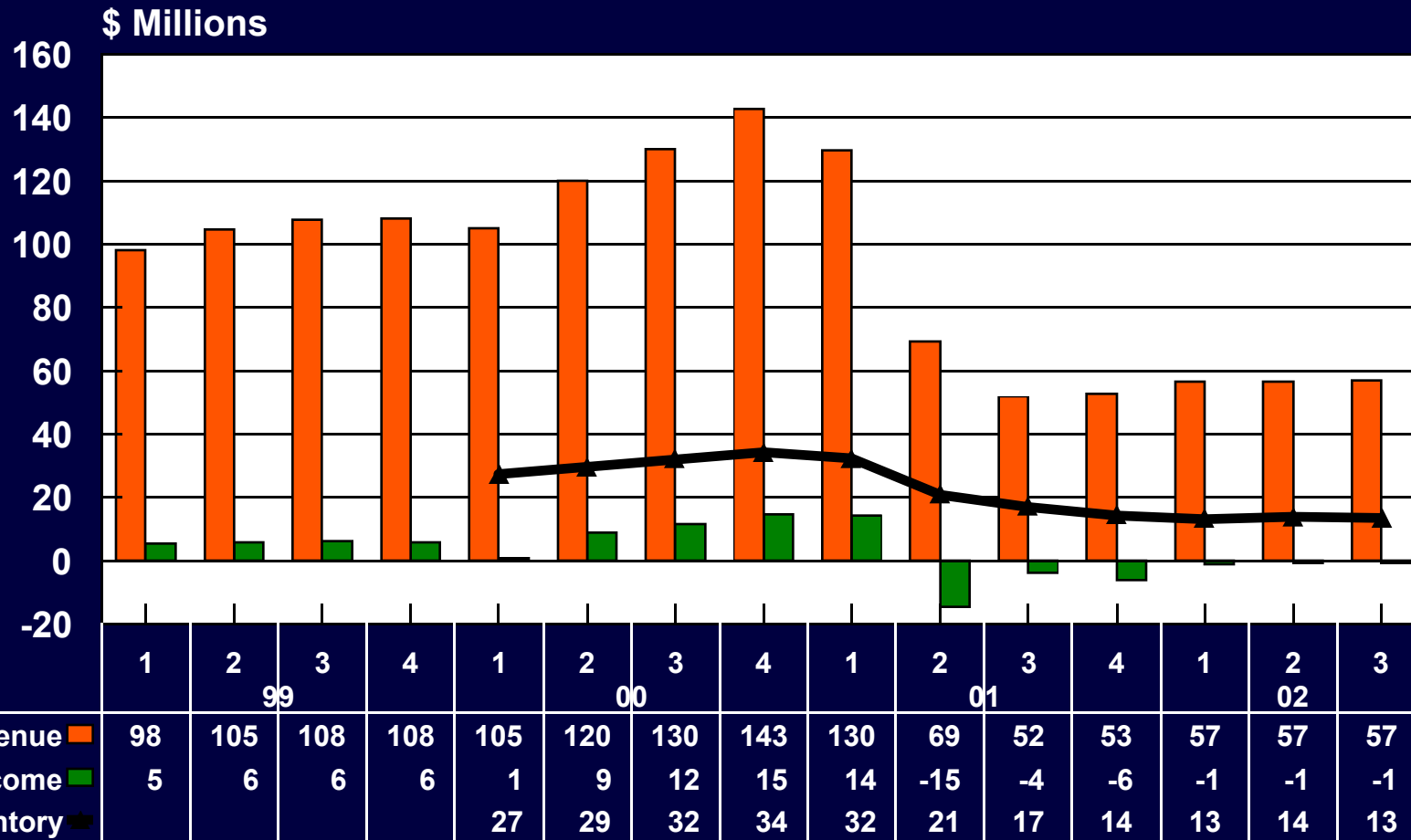
# U.S. RIGID PCB BOOKINGS & SHIPMENTS



**PCB Materials  
&  
Process  
Equipment  
Suppliers**

# Park Electrochemical Corp

## Revenue, Net Income & Inventory



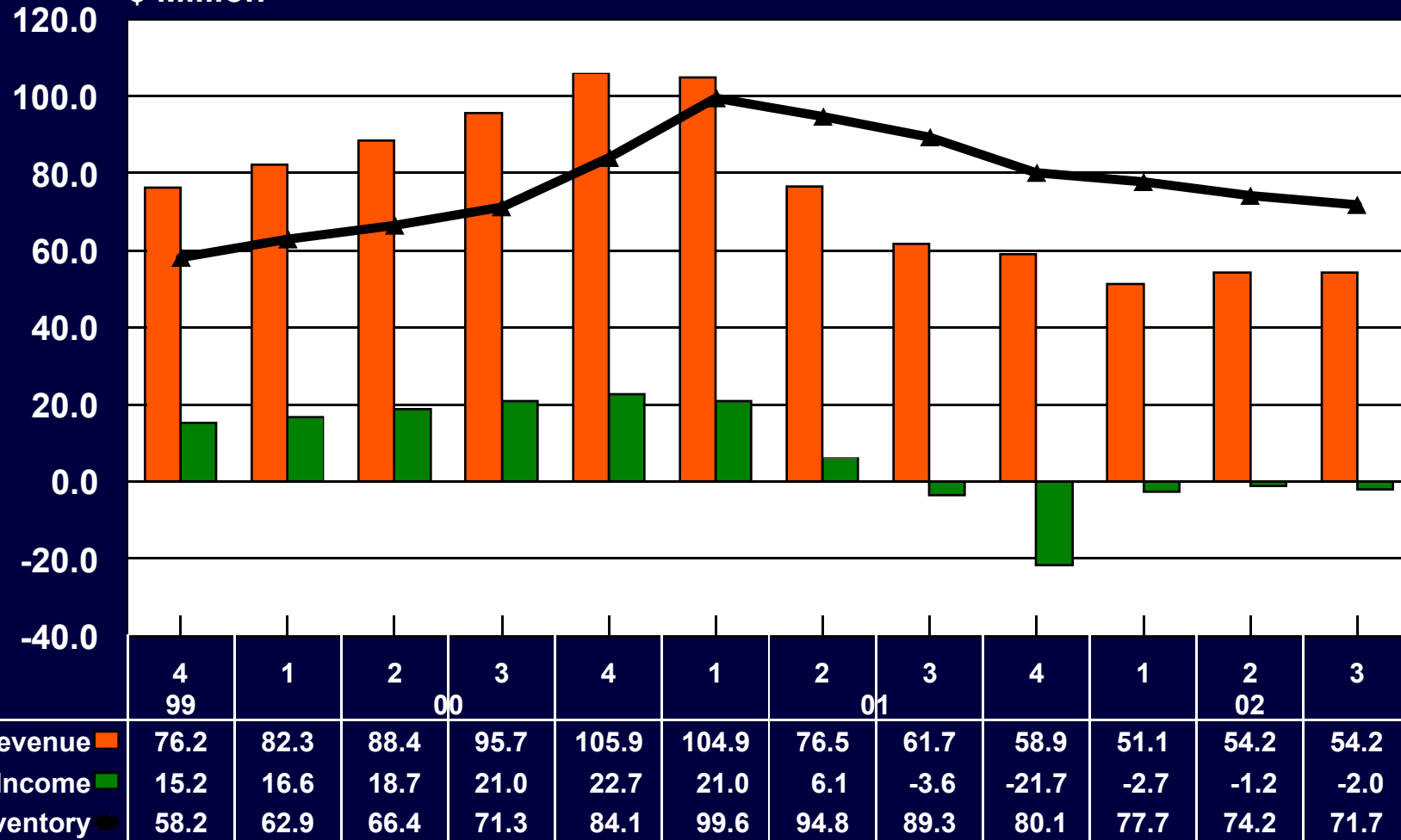
CY

PKE

# Orbotech

## Revenue, Net Income & Inventory

\$ Million



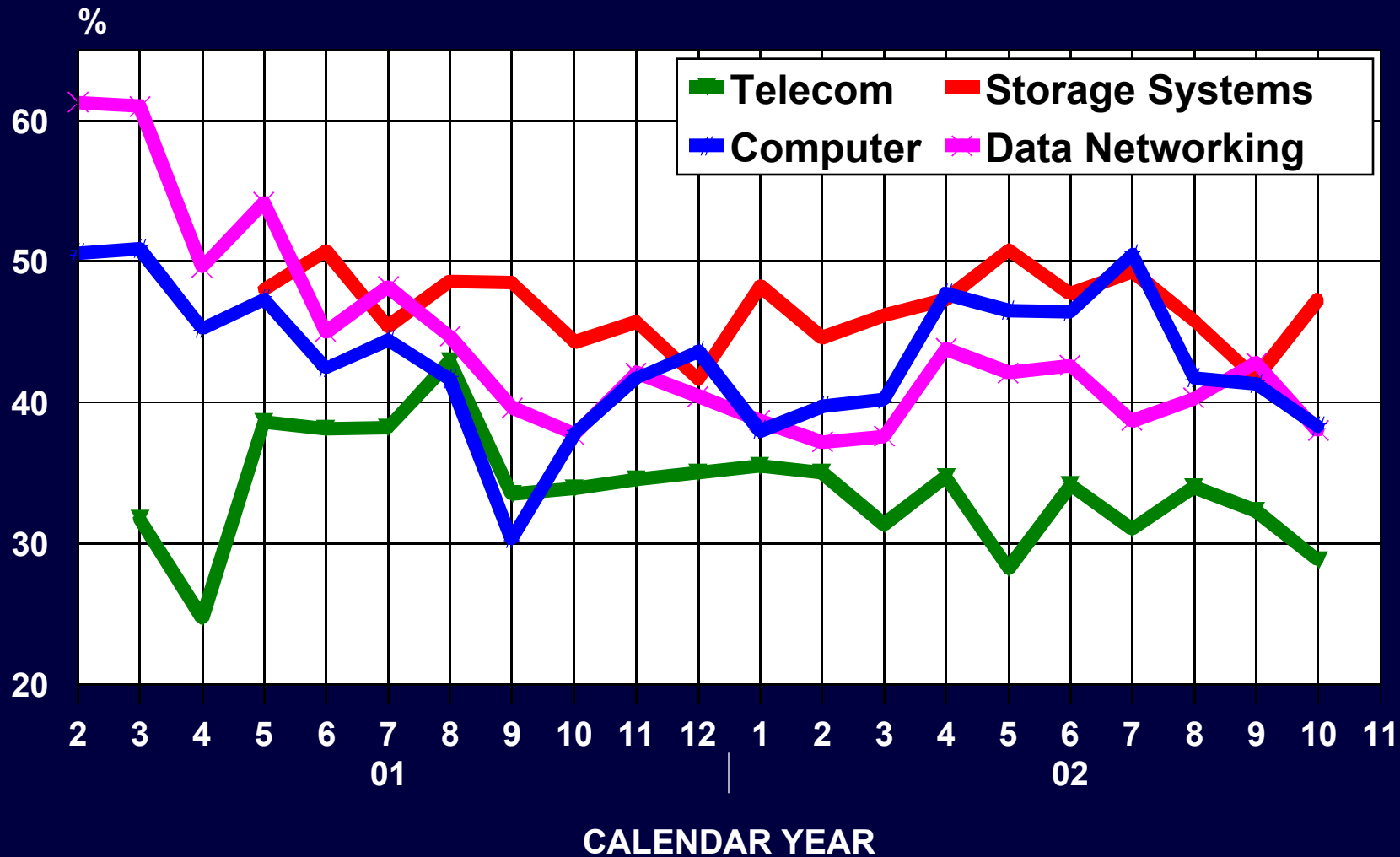
CY

ORBK

**Summary,  
Conclusions  
&  
Forecasts**

# IT Future Hardware Spending

% of Companies That Plan to Increase Spending



CIO Magazine Tech Poll  
[www.cio.com/info/releases](http://www.cio.com/info/releases)

# Summary

- **The Boom of 2000 was followed by a massive slowdown in 2001. Electronic component orders plummeted due to inventory reduction efforts, a sharp drop in electronic equipment demand & Sept 11 effects.**
- **The "Food Chain" has shifted significant production to China, Eastern Europe and other "low cost" areas.**
- **OEM & CEM inventory levels continue to decline however component inventories remain high.**

# Summary

- **Wired Telecom recovery will be delayed to 2004.**
- **Military electronics and security devices are niche growth markets. Automotive has remained relatively stable.**
- **The massive PCB capacity buildup in China continues**
- **PCB & material prices are severely depressed**
- **N American & Europe companies have shut down substantial excess PCB capacity. Used PCB process equipment is plentiful.**

# Summary

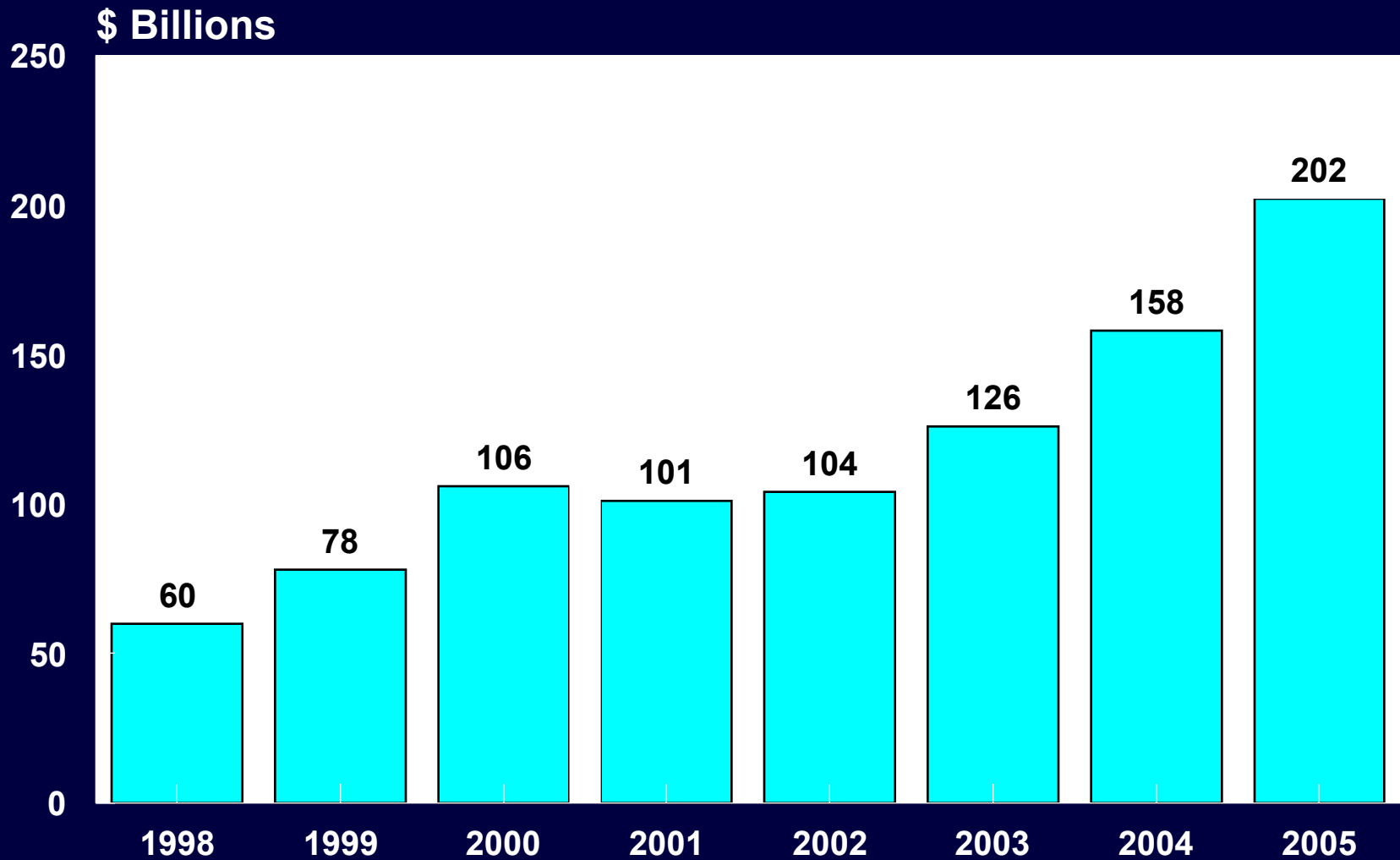
- **The future is clouded. Although PCB & electronic equipment orders are now growing vs. the trough of 2001, substantial "negative guidance" exists**
- **The N American & European equipment end markets have shifted significantly**
- **Lower consumer & business confidence & uncertainties including the mid-east situation & accounting scandals are all limiting economic growth.**
- **An abrupt recovery looks unlikely & a "double-dip" recession could even occur.**
- **The financially stronger N American & European PCB makers will survive, capturing a larger share of a smaller available market**

# Electronic Equipment Production Growth

Current \$ Growth Rates Converted @ Constant 2001 Exchange Rates

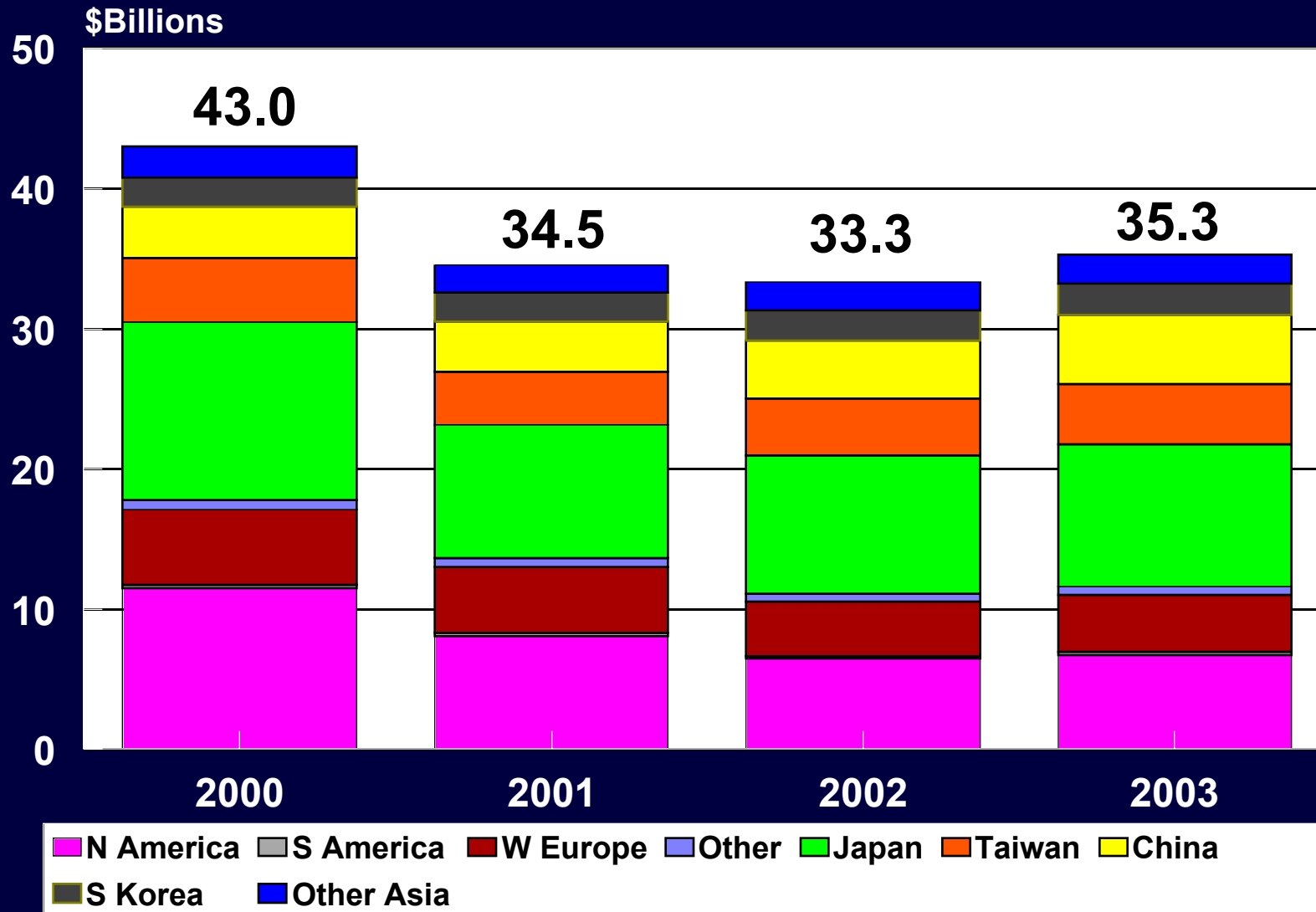
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
World	12.0	-10.7	-5.1	6.9	10.7
USA	10.2	-14.2	-6.4	5.7	9.7
W Europe	11.9	-8.1	-8.8	3.7	8.1
Japan	7.6	-10.9	-14.5	2.7	9.1
Four Tigers	18.2	-9.6	4.7	7.8	9.7
China	15.1	5.7	7.8	15.6	17.5

# EMS Estimated Global Revenue



Technology Forecasters 8/02

# World PCB Output



NT Information 9/02 (constant 2000 exchange rates)

# World PWB Output (US\$ Billion)

<u>Region</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>
N.America	11.5	8.1	6.5	6.7
S.America	0.2	0.2	0.2	0.2
W.Europe	5.4	4.8	3.9	4.1
<u>Others</u>	<u>0.7</u>	<u>0.6</u>	<u>0.6</u>	<u>0.6</u>
<b>Subtotal</b>	<b>17.8</b>	<b>13.6</b>	<b>11.1</b>	<b>11.6</b>
Japan	12.7	9.5	9.8	10.1
Taiwan	4.6	3.8	4.0	4.3
China	3.6	3.6	4.1	5.0
S.Korea	2.1	2.0	2.2	2.2
<u>Other Asia</u>	<u>2.3</u>	<u>2.0</u>	<u>2.0</u>	<u>2.1</u>
<b>Asia Total</b>	<b>25.2</b>	<b>20.9</b>	<b>22.2</b>	<b>23.7</b>
<b>World Total</b>	<b>43.0</b>	<b>34.5</b>	<b>33.3</b>	<b>35.3</b>
Asia's Share	58.6%	60.6%	66.6%	67.1%
China's Share	8.5%	10.4%	12.4%	14.1%

**NT Information 9/02**

# **But . . .**

**Don't confuse the temporary downturn in some key electronic end markets with the "Asian Shift." These events may overlap but are different.**

**Our current long term views are negatively colored by the present recession**

**Major innovations are difficult to forecast. Bill Gates played "catch up" with first Internet browser!**

**New growth often comes from unexpected sources**

**We live in an electronic age. The landscape has changed but the fundamental markets will rebound and new sets of opportunities will exist.**