

## IFX Day 2003

Munich – September 22, 2003

### Short-Term Semiconductor Market Outlook and Long-Term Industry Trends

**Dieter May**  
VP Corporate Strategy



Never stop thinking.

## Disclaimer

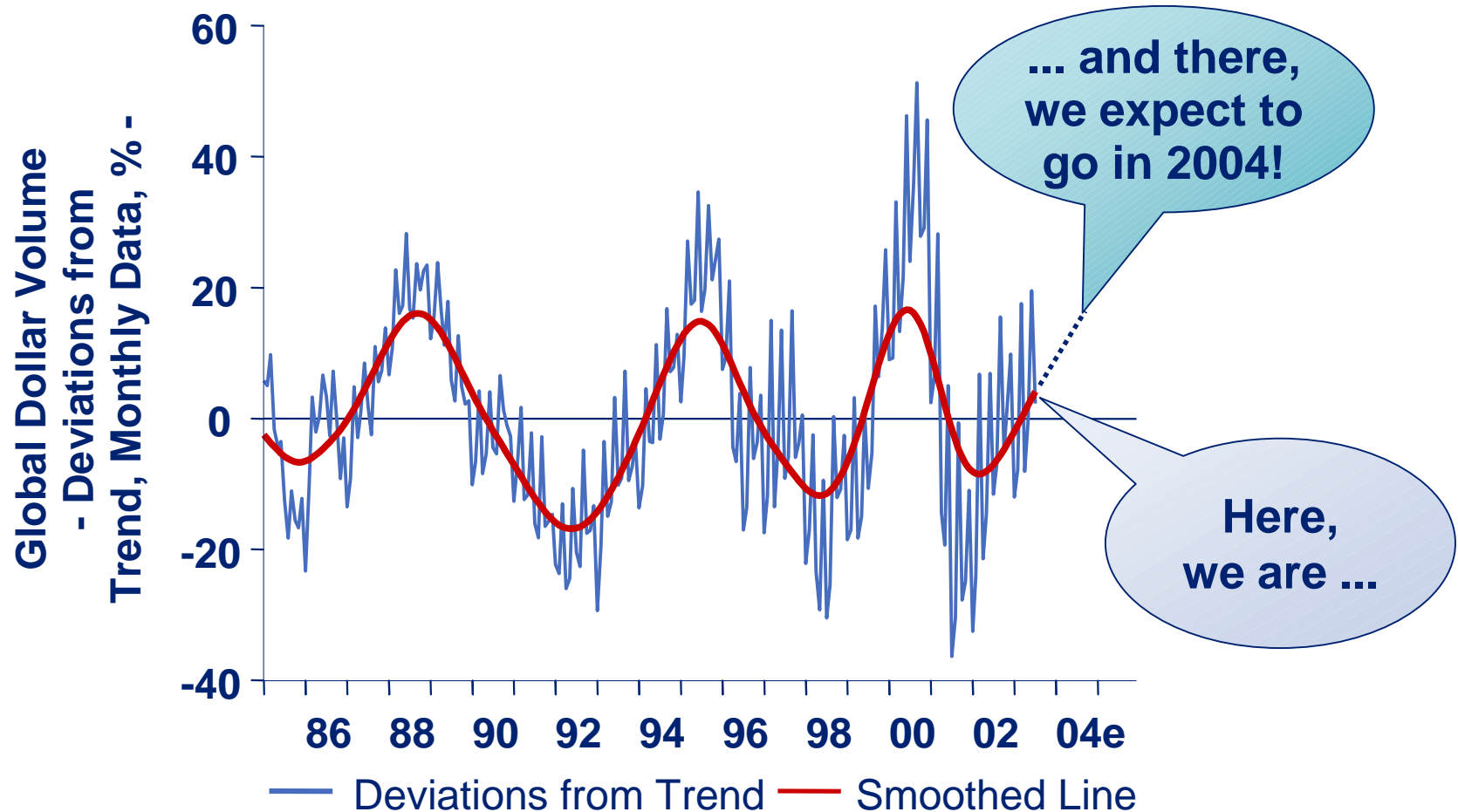
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# Semiconductor Market Cycle – Where are We, Where do We Expect to Go in 2004 and Why?

## Semiconductor Market Cycle



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## Short-Term Market Outlook

### Macroeconomic Environment

### Demand

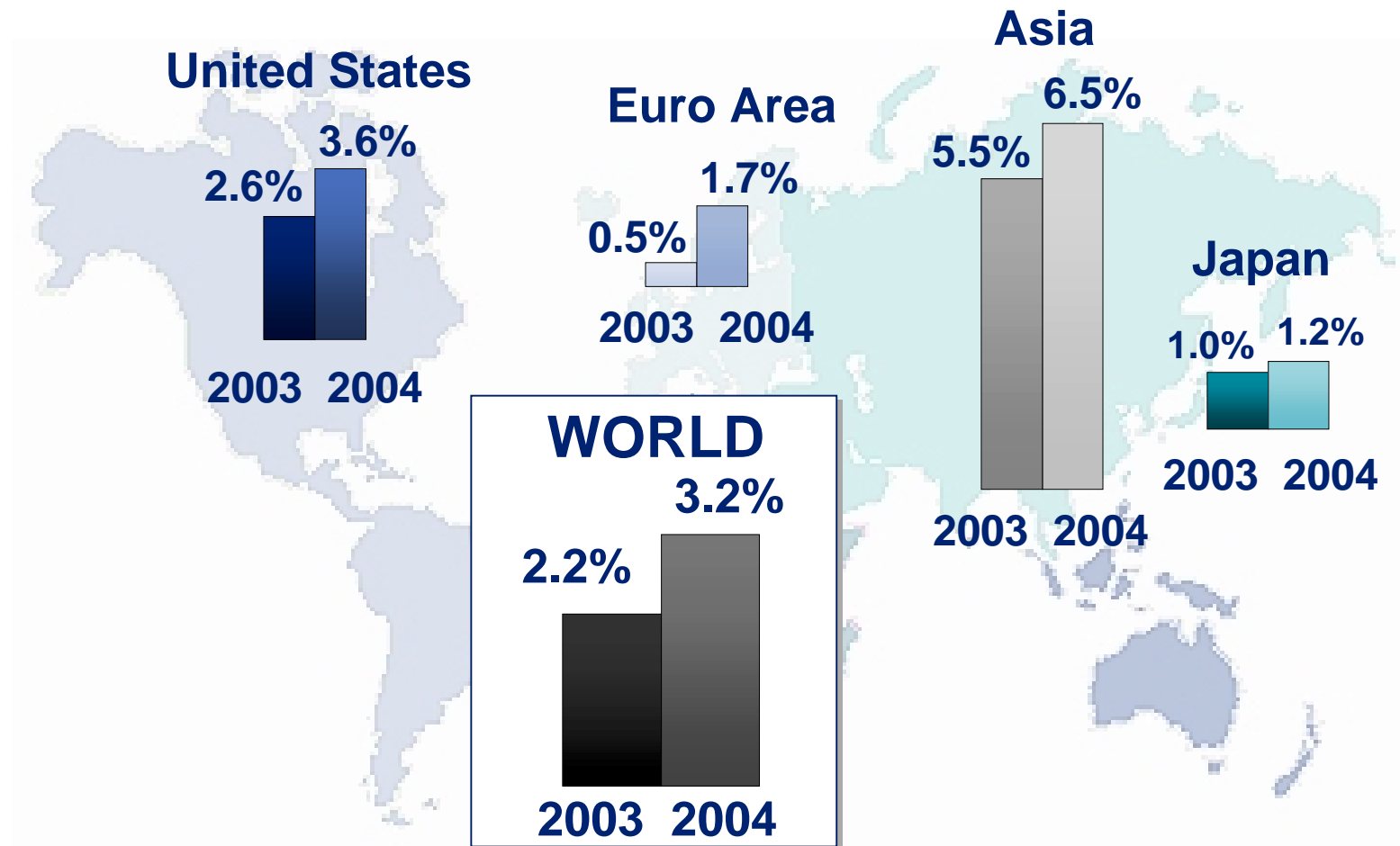
### Supply

### Market Forecast

## Long-Term Industry Trends

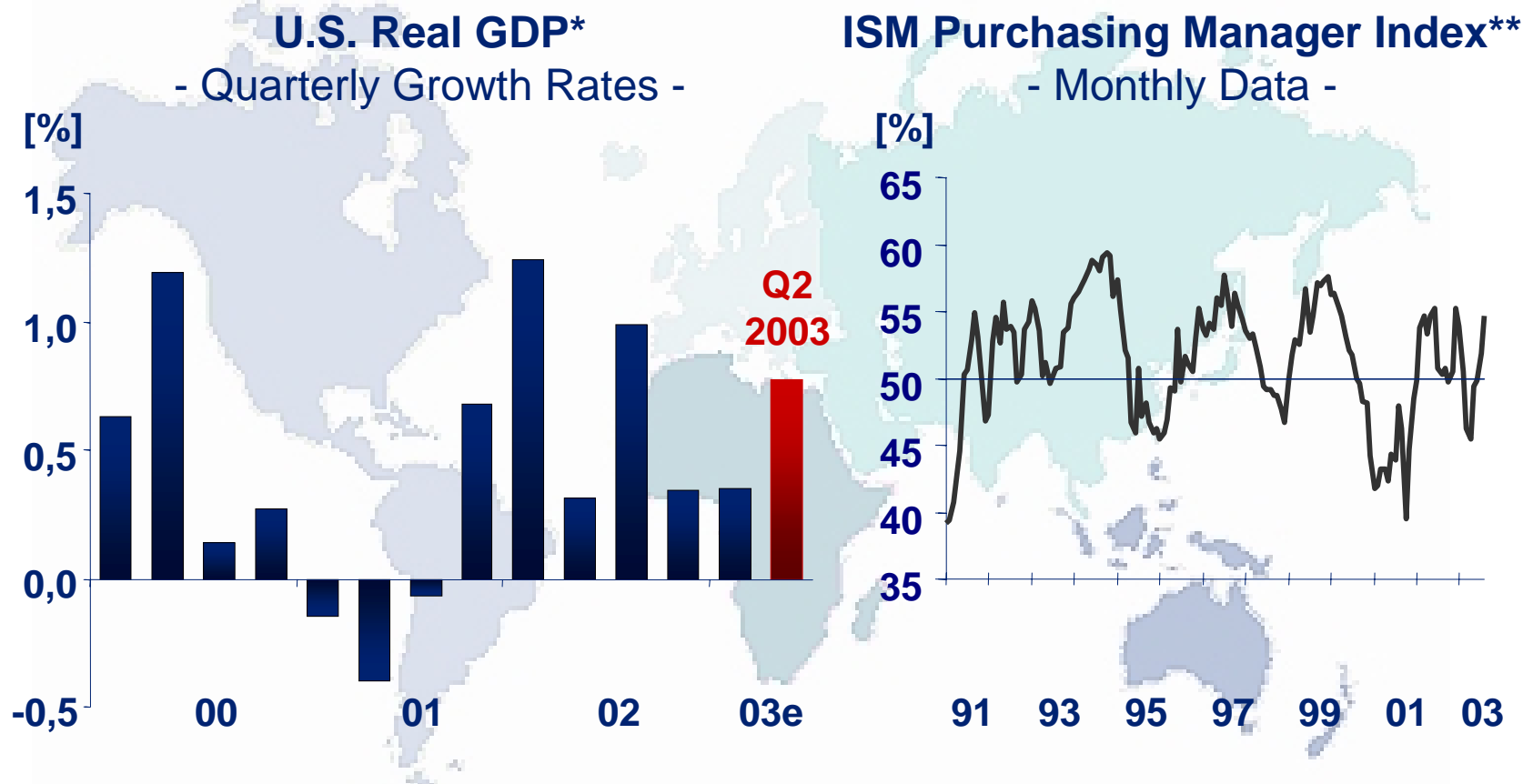
# The World Economic Outlook Appears to Brighten ...

## Real GDP Growth Forecast 2003e – 2004e



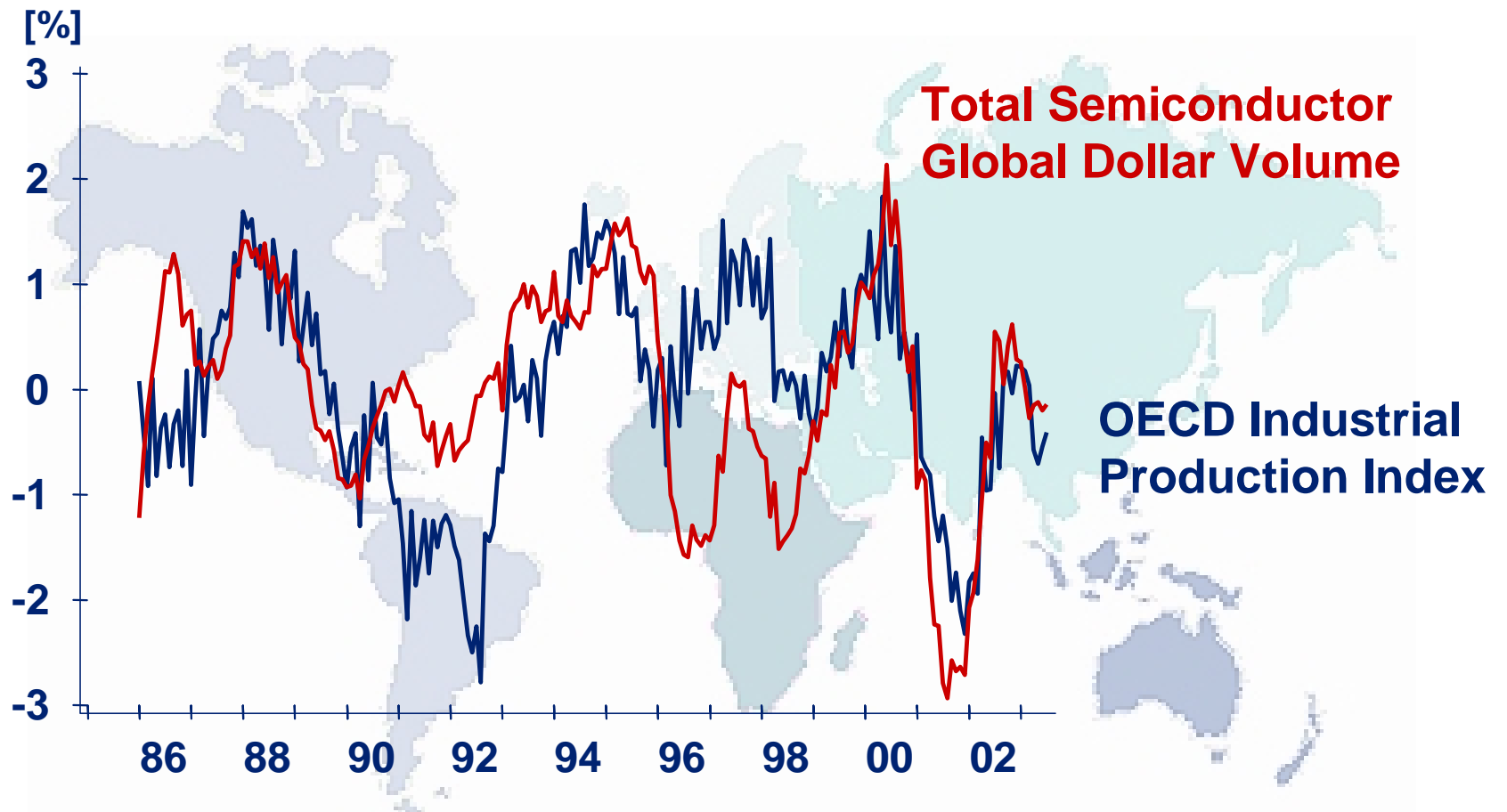
... as Evidenced by Improving Fundamentals and Leading Indicators, ...

## U.S. Real GDP Growth and the Purchasing Manager Index



... and Likely to Positively Influence our Industry

## OECD Industrial Production Index and Semiconductor Market



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## Short-Term Market Outlook

Macroeconomic Environment

**Demand**

Supply

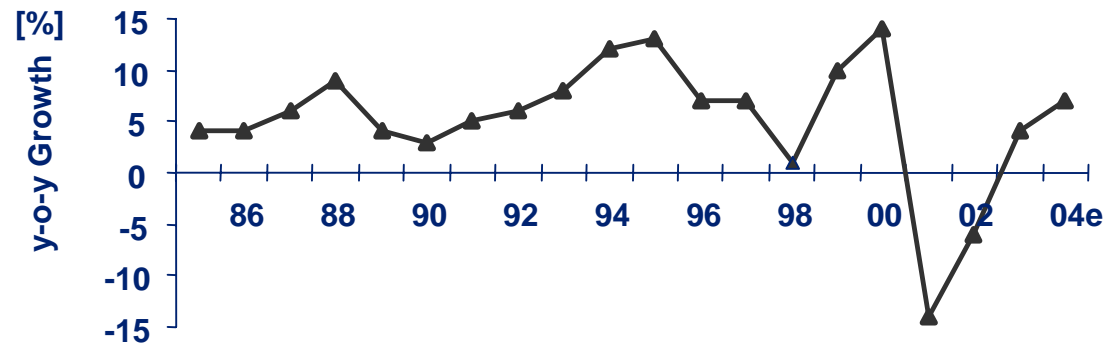
Market Forecast

## Long-Term Industry Trends

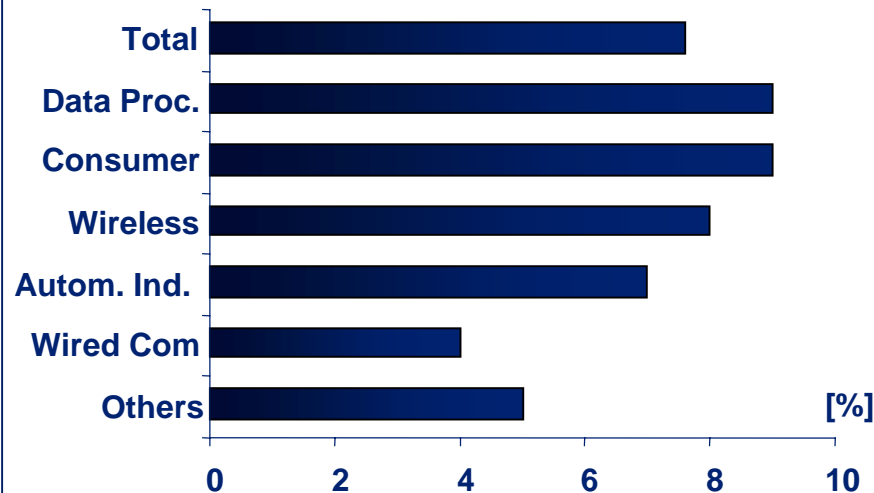


# Higher Growth in Electronic Equipment Demand

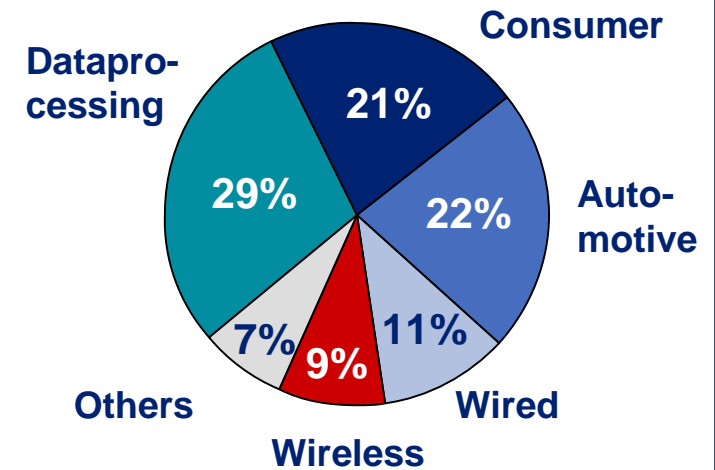
## Electronic Equipment Demand



### Segment Growth in 2004e

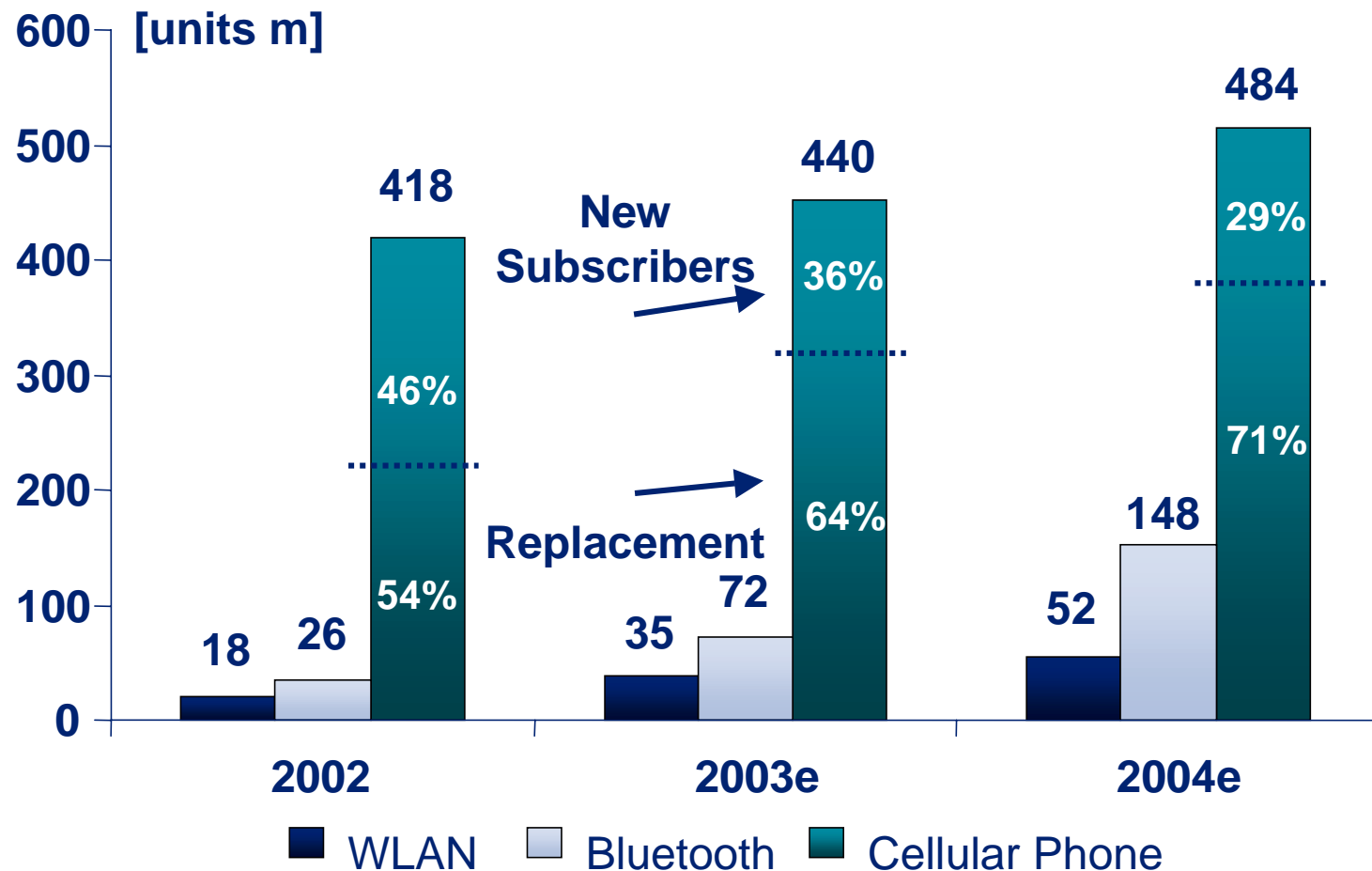


### Segment Split in 2004e



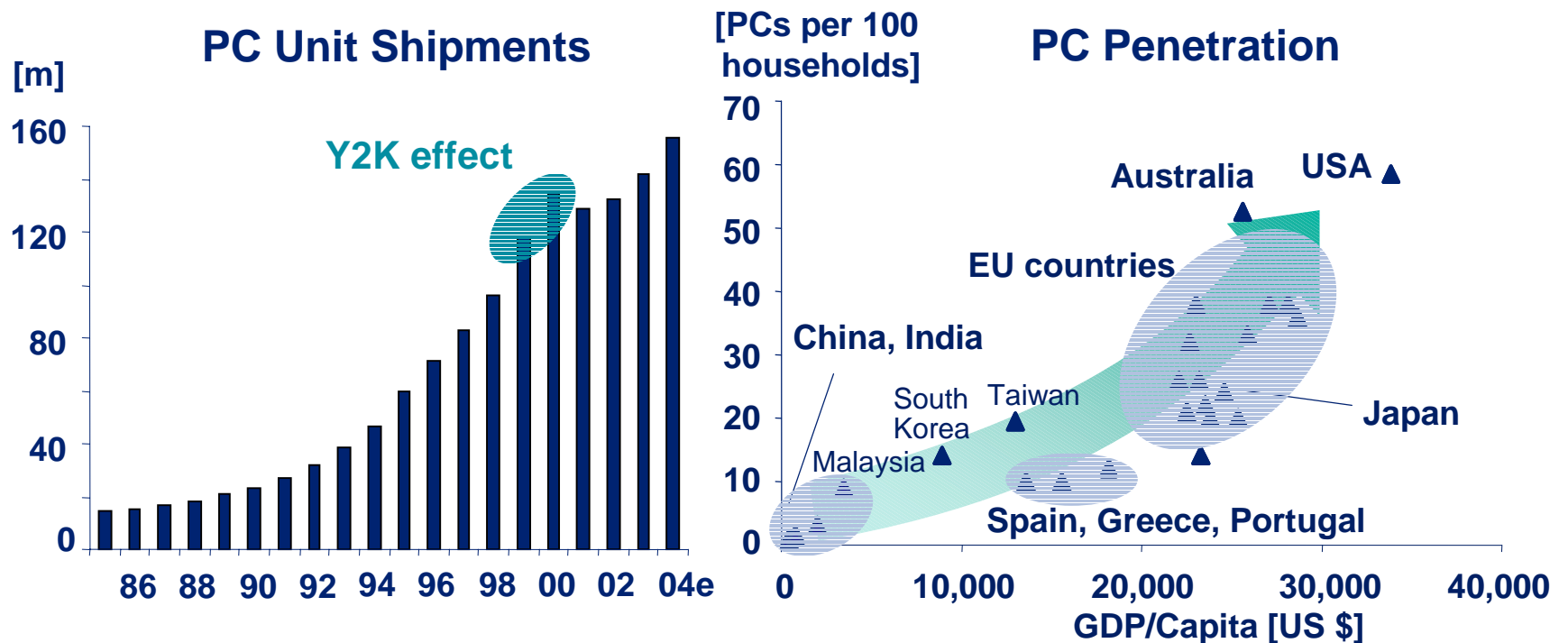
# Feature Enhancements and Adoption of WLAN and Bluetooth Drive Growth in Wireless Communications

## Wireless Communications



# Y2K Replacements and Emerging Countries Expected to Drive PC Unit Sales Growth to 7% in 2003 and 10% in 2004

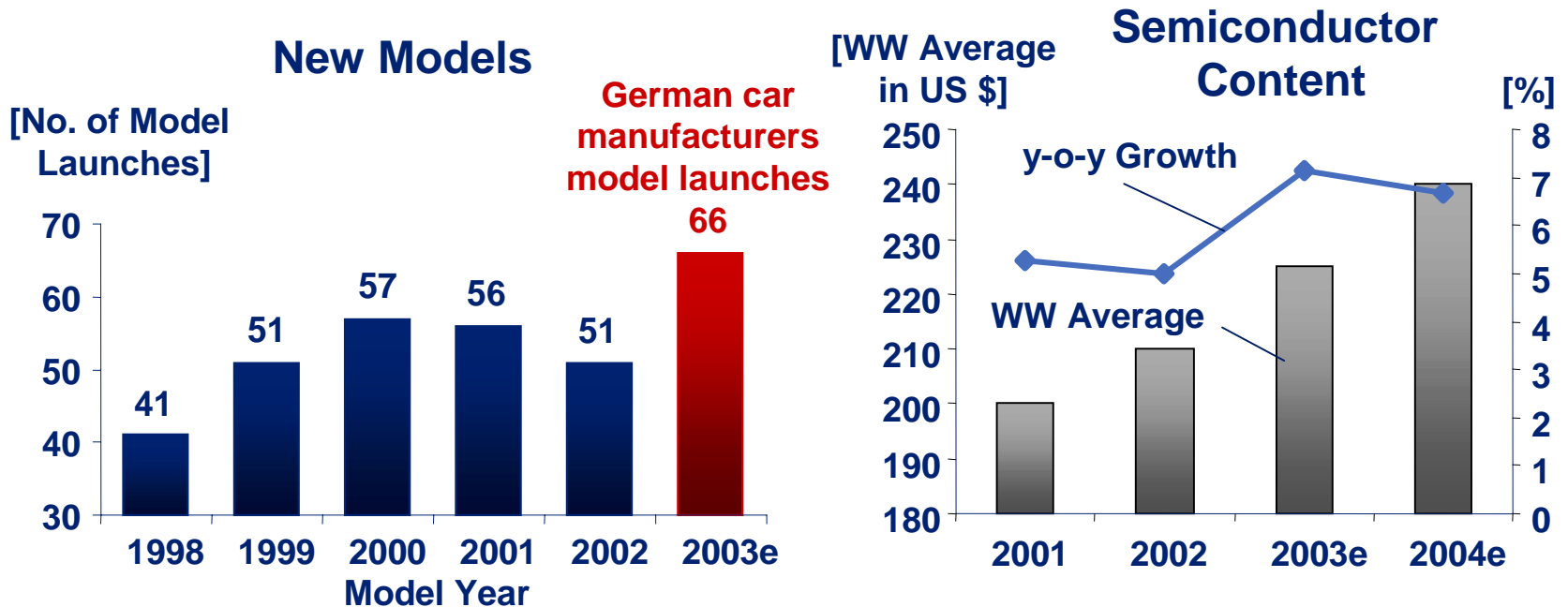
## Dataprocessing



- High growth rates in emerging countries (China 11% y-o-y, India 18% y-o-y)
- High growth rates for mobile PCs (Worldwide 20% in 2003e and 17% in 2004e)

# Launch of New Models and Higher Automotive Electronic Content Spur Growth in Automotive Semiconductors

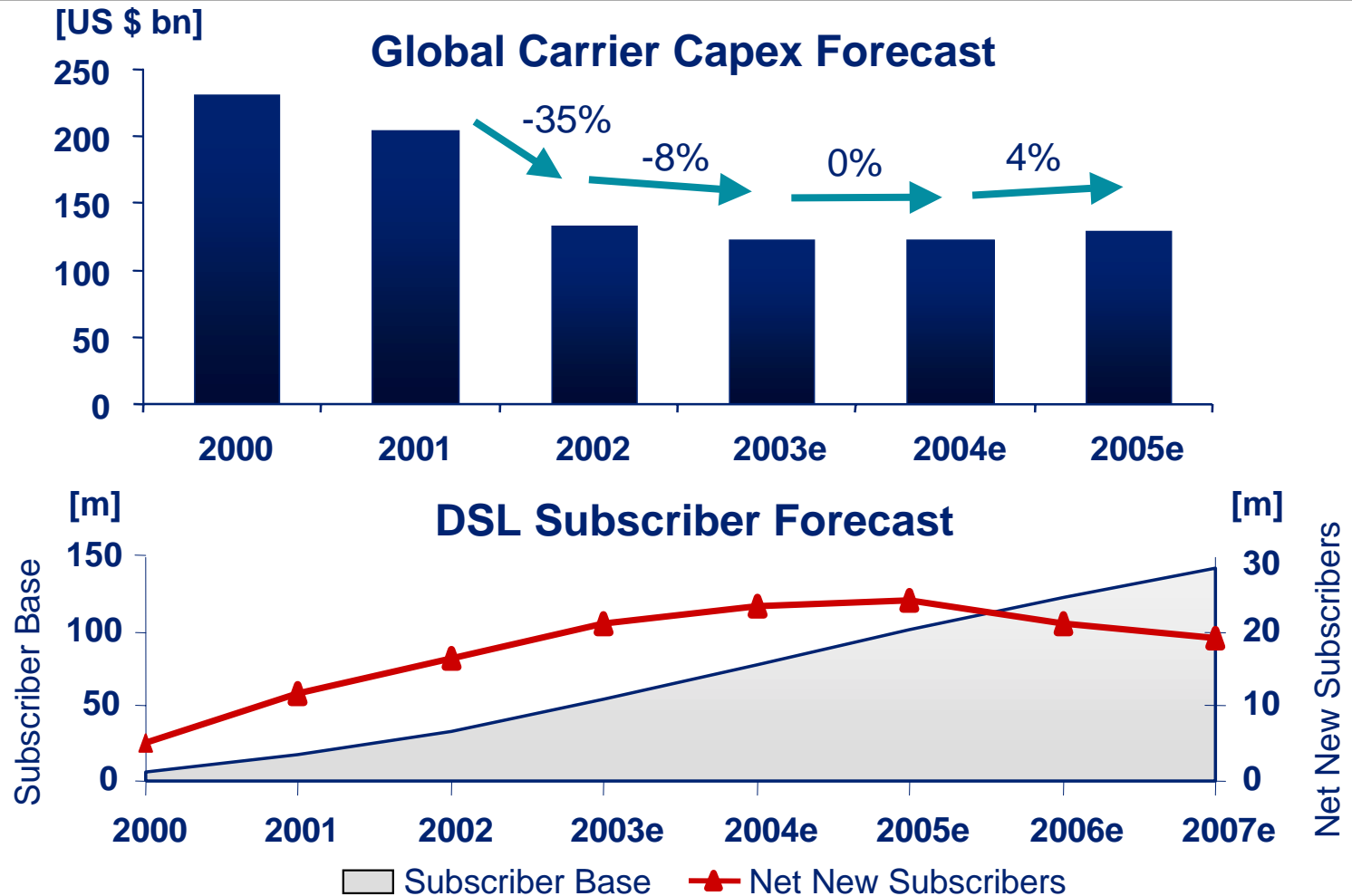
## Automotive



- IAA: Model launches above average
- German car manufacturer model offensive replaces 5 - 7 years old technology by new automotive applications, increasing electronic content
- High volume models will be replaced (e.g. Golf, Opel Astra, BMW 5series)

# Global Carrier Capex is Projected to Bottom out in 2004 and DSL is Seen as Major Market Driver

## Wireline Communications



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## Short-Term Market Outlook

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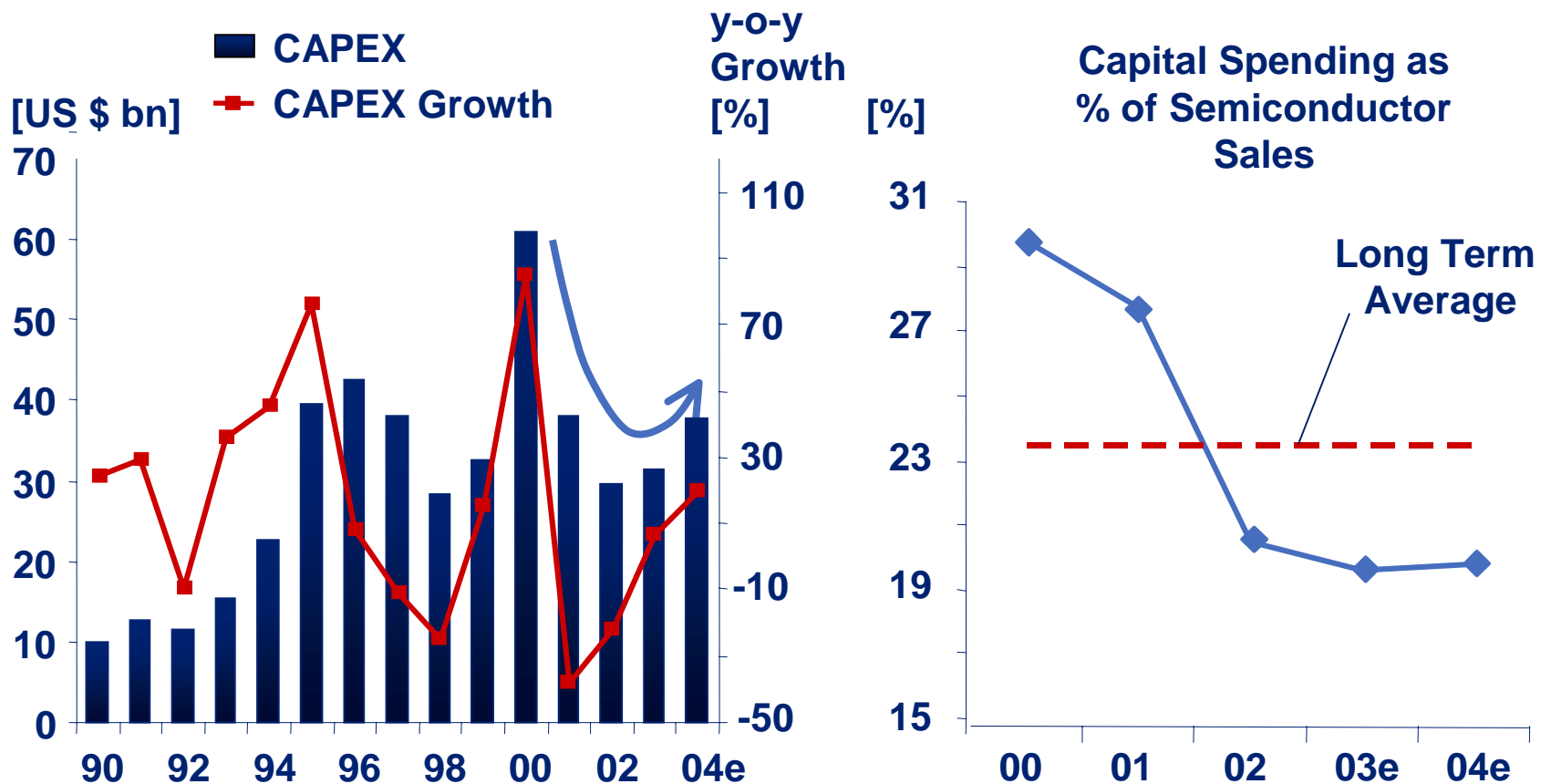
**Supply**

Market Forecast

## Long-Term Industry Trends

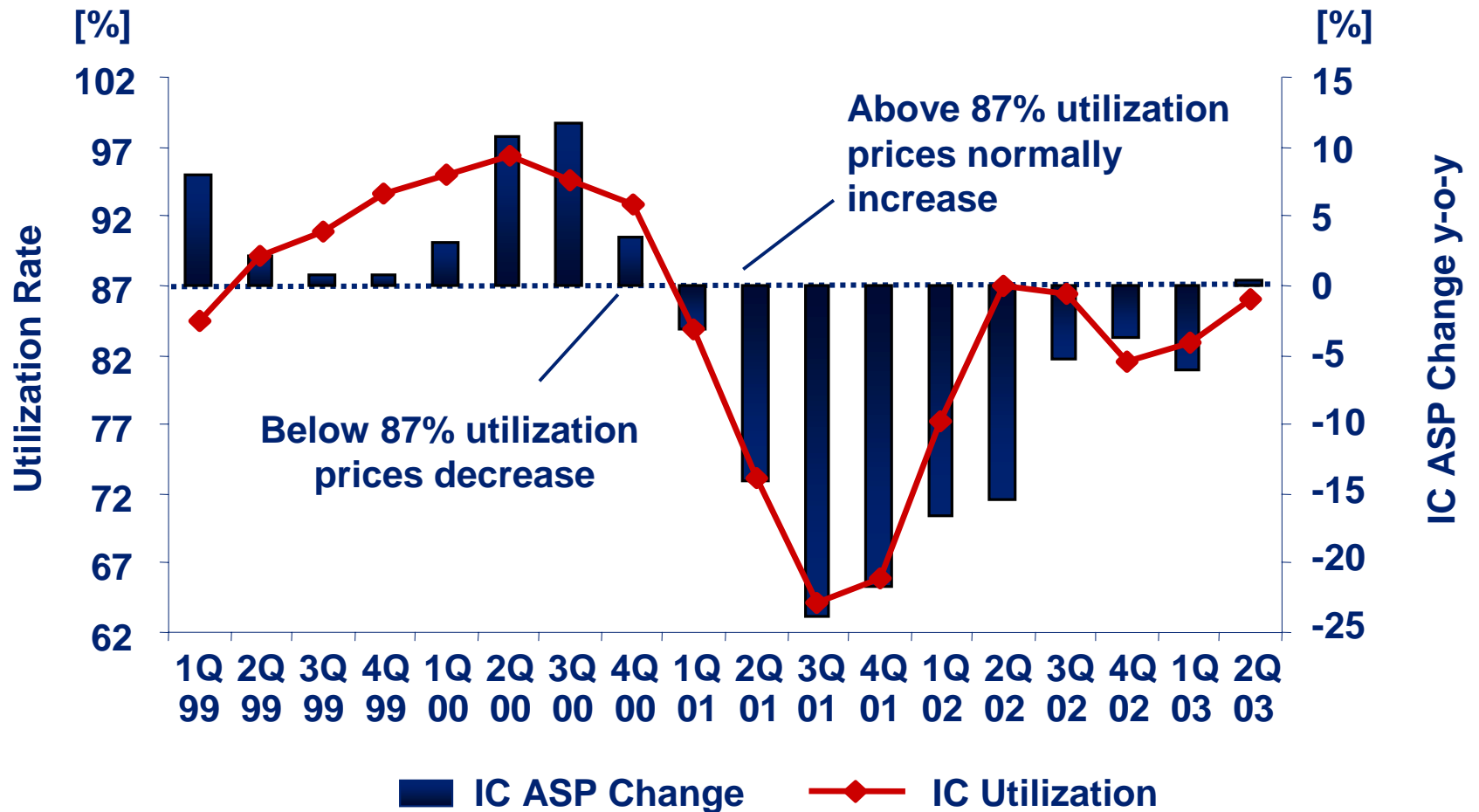
# Semiconductor Capital Spending was Low During the Last 2 Years and is Likely to Stay Below Long Term Average in 2003

## Semiconductor CAPEX



# The Utilization Rate is Approaching the "Magic 87% Margin"

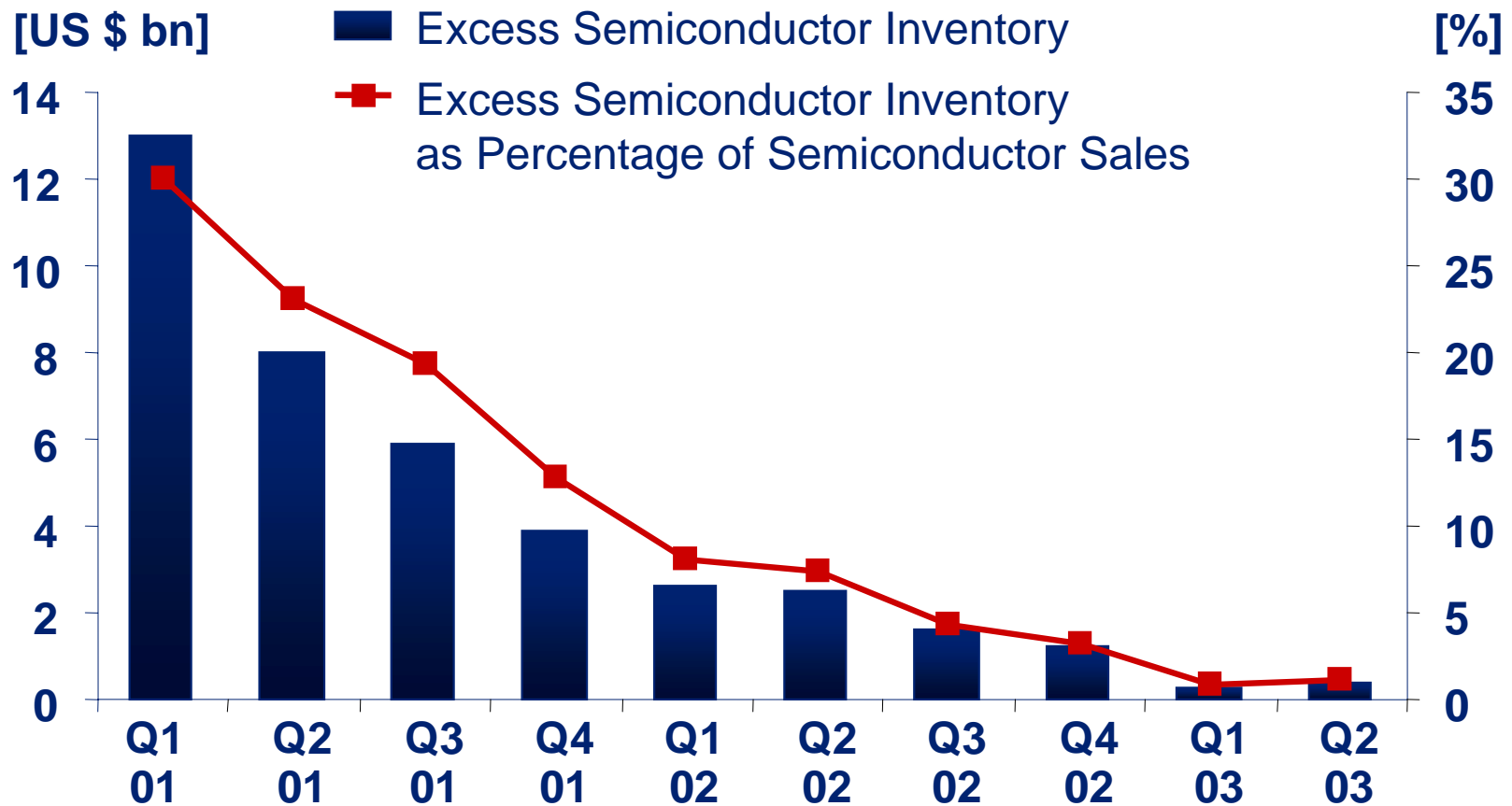
## IC Capacity Utilization and ASP Impact





# Semiconductor Excess Inventories in the Electronic Supply Chain are Back to Industry Normal Levels

## Excess Inventory Situation



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## Short-Term Market Outlook

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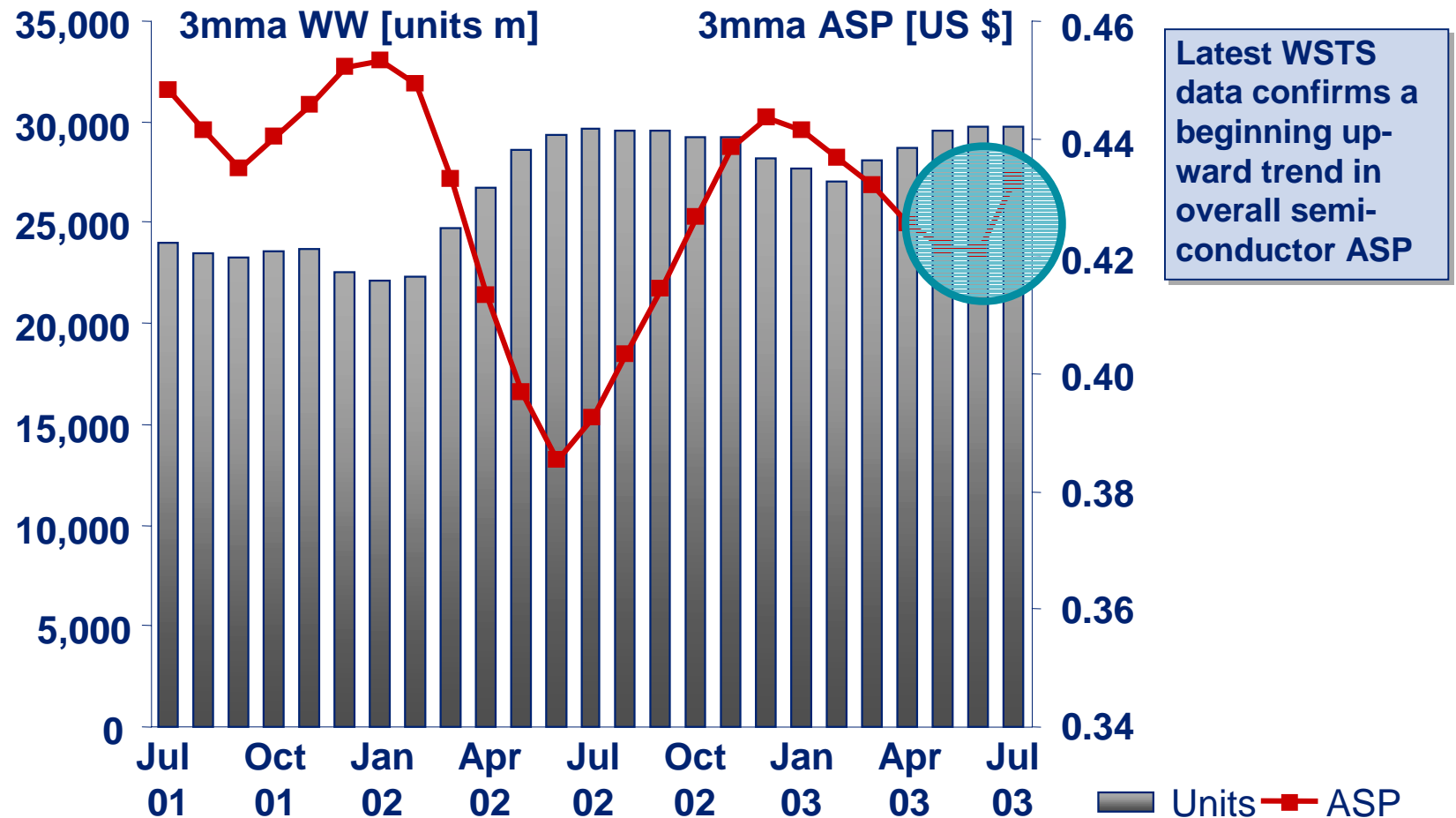
Supply

**Market Forecast**

Long-Term Industry Trends

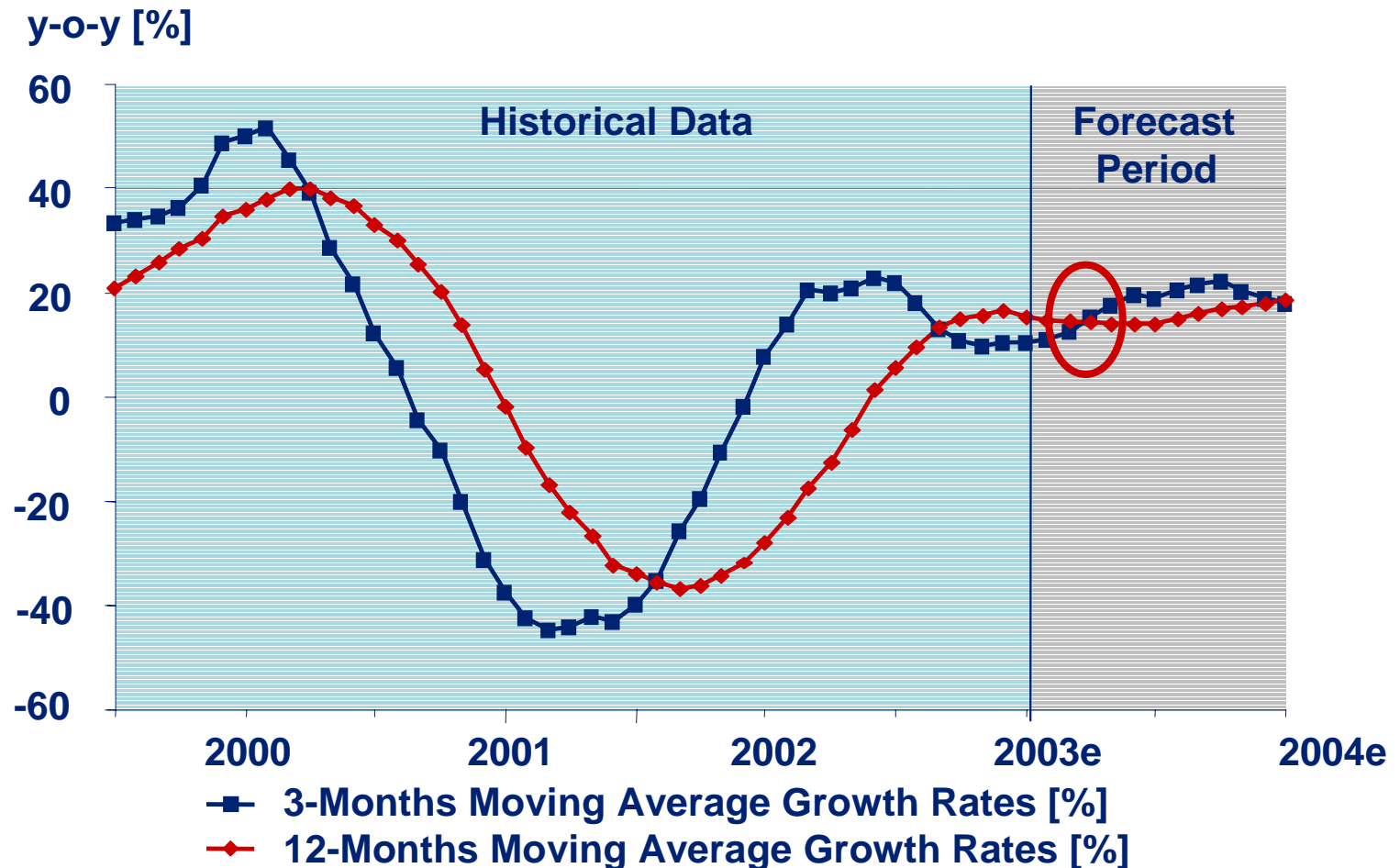
# Firm Unit Demand in Q2 2003 and Shortage of Leading Edge IC Devices Already Caused an Increase in ASP

## Monthly Unit Volume and ASP Development



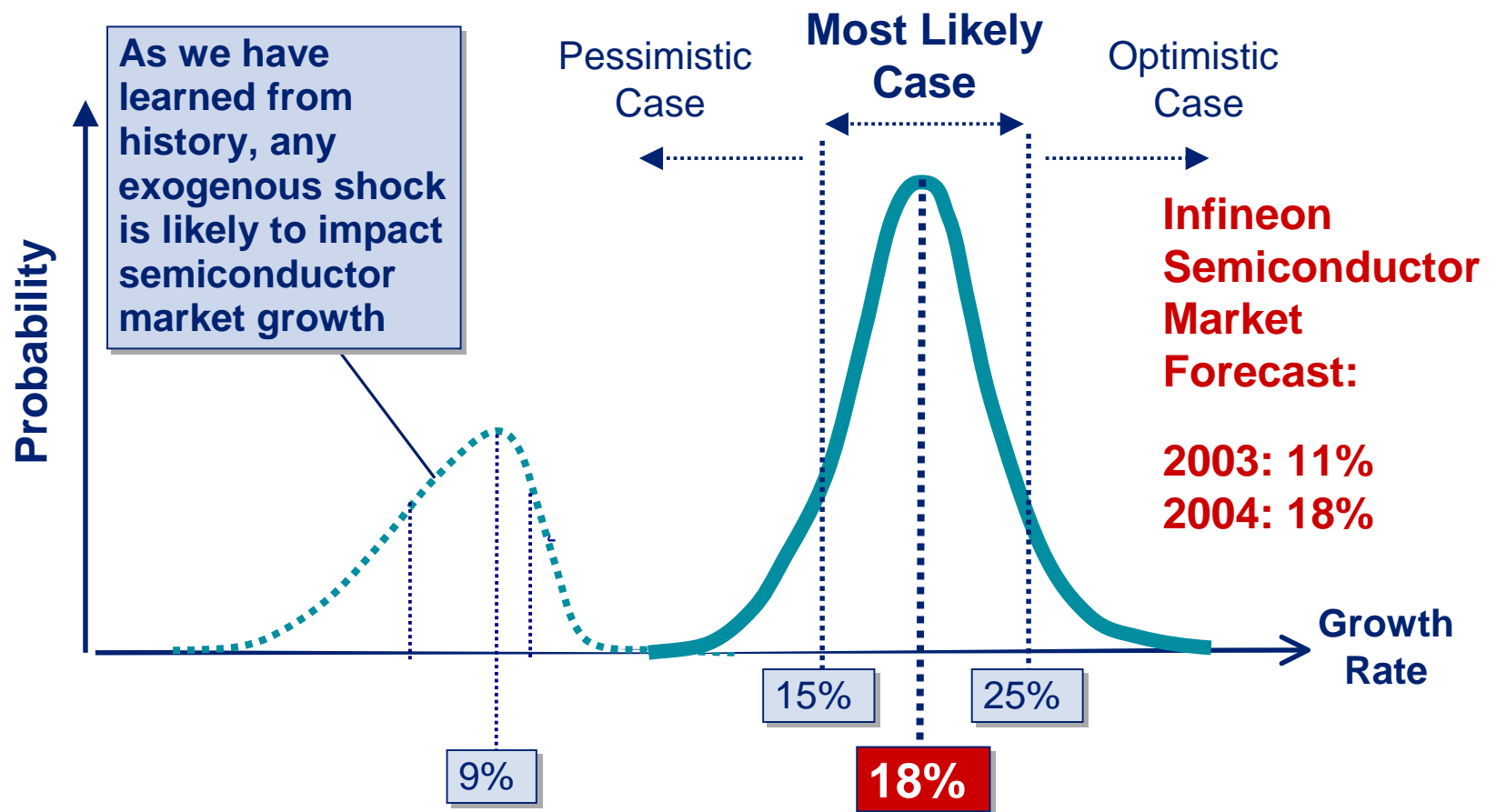
# Our Econometric Forecast Tool Confirms the Upward Trend for the Coming 12 Months

## Monthly Dollar Volume Development



According to Our Analyses only an Exogenous Shock could Push the Market below Double Digit Growth in 2004, ...

## 2004 Semiconductor Forecast Risk Analysis



... a View that is Shared by Major Market Research Companies

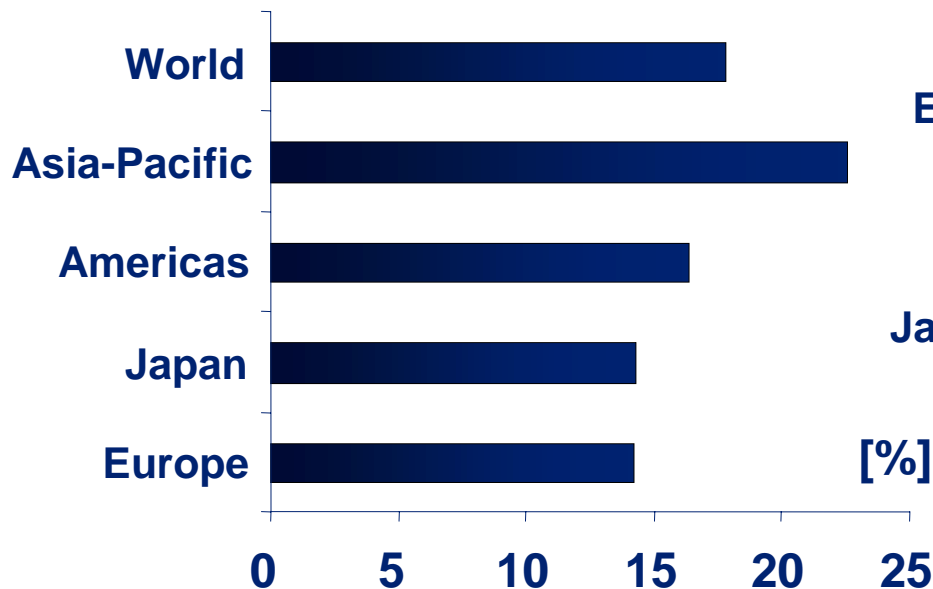
## Semiconductor Market Forecasts

|                            | 2003  |                                 | 2004  |                         |
|----------------------------|-------|---------------------------------|-------|-------------------------|
| <b>Infineon</b>            | 11%   | — no change                     | 18%   | Jan 03                  |
| <b>Future Horizons</b>     | 13.1% | ↓ (18.0%)                       | 25.0% | Jul 03                  |
| <b>VLSI Research</b>       | 11.3% | ↑ (9.3%)                        | 24.5% | Jul 03                  |
| <b>WSTS</b>                | 12.3% | ↑ (11.5%)                       | 18.5% | Jul 03                  |
| <b>IC Insights</b>         | 14.0% | — no change                     | 23.0% | Jul 03                  |
| <b>Gartner / Dataquest</b> | 11.2% | ↑ (8.3%)                        | 21.1% | May 03                  |
|                            |       | Forecast of<br>Previous Quarter |       | Date of<br>Announcement |

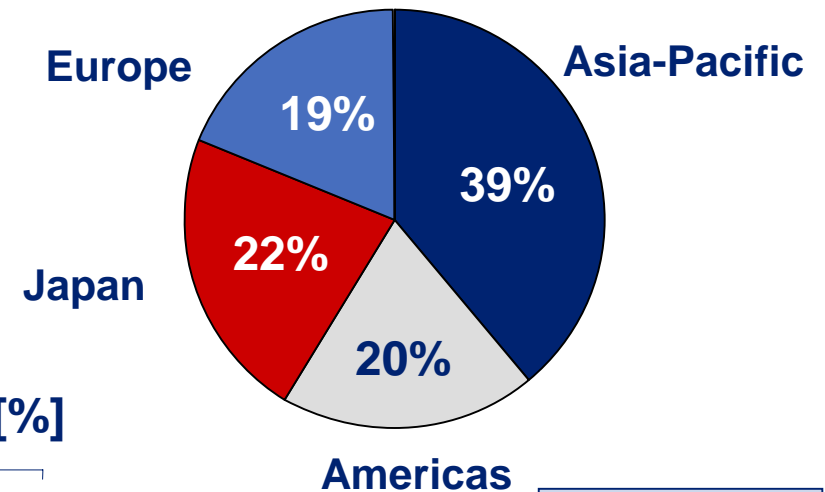
# Asia-Pacific will Lead Global Semiconductor Growth in 2004

## Semiconductor Market Forecast by Region

Regional Growth in 2004e



Regional Split in 2004e

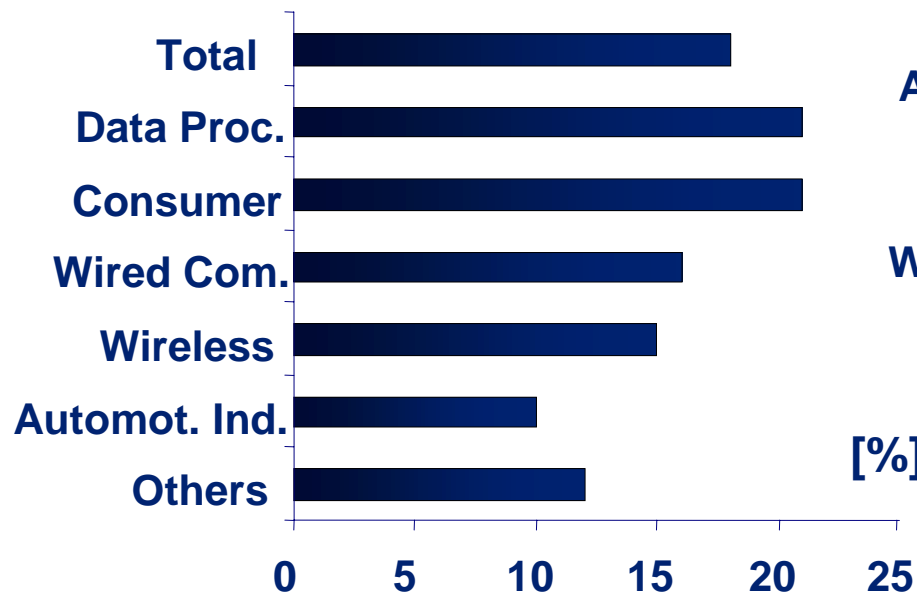


**Estimated  
total market  
size in 2004:  
US \$ 184bn**

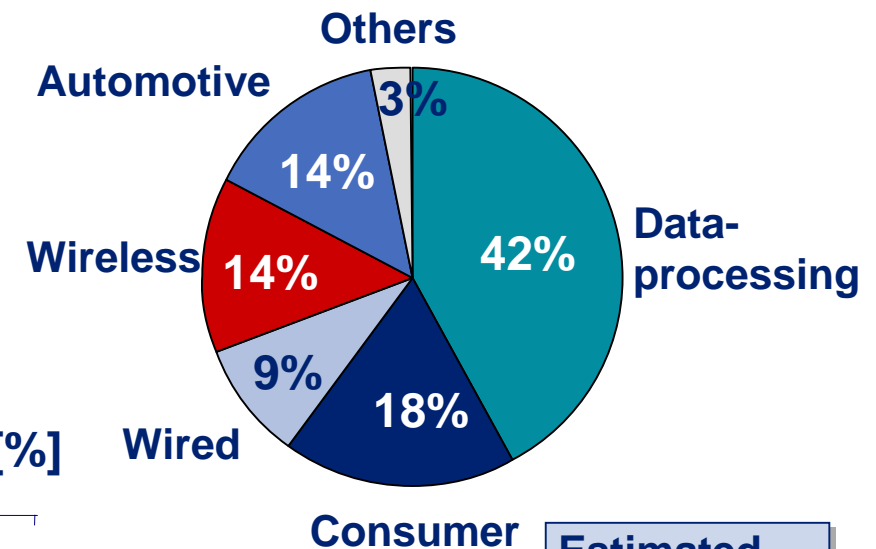
# Dataprocessing Continues to be the Most Important Segment in 2004

## Semiconductor Market Forecast by Segment

Segment Growth in 2004e



Segment Split in 2004e



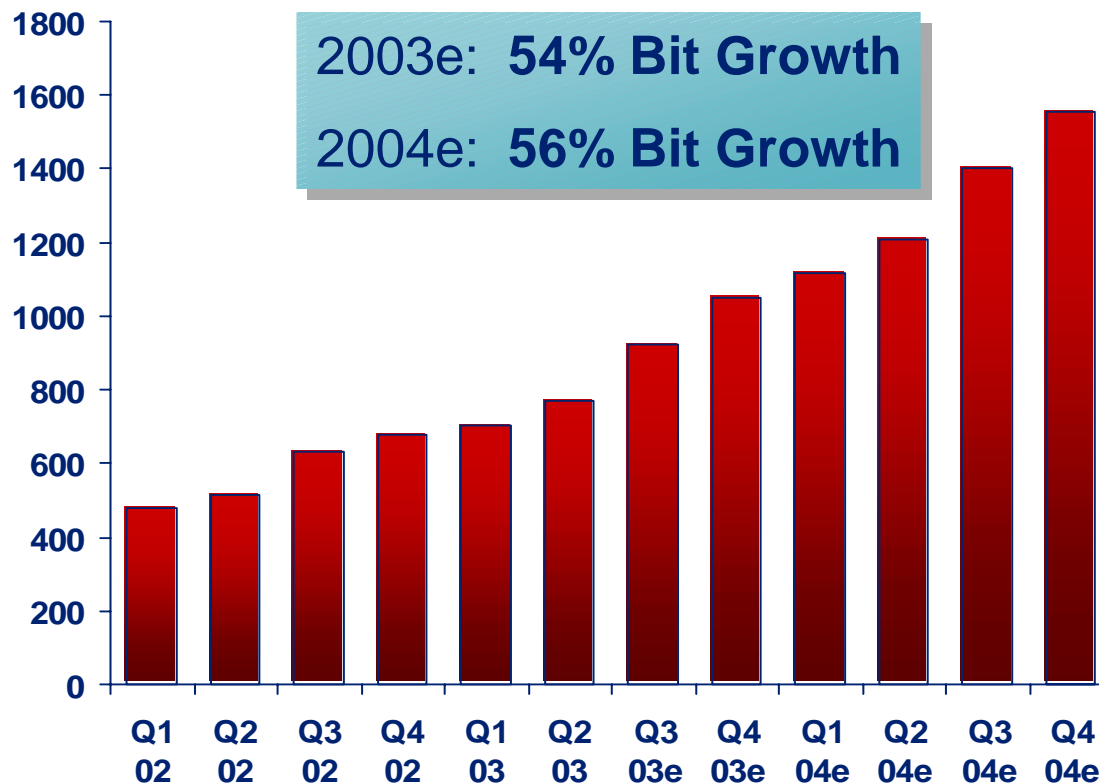
**Estimated  
total market  
size in 2004:  
US \$ 184bn**



# PC Unit Sales and Server Shipments Forecast to Bring DRAM Bit Growth to 54% in 2003 and 56% in 2004

## DRAM Demand

[million 256 Mbit]



## Demand

- Higher growth in PC (7% in 2003 and 9.9% in 2004) and Server (11.6% in 2003 and 11.7% in 2004) unit sales
- Replacement cycle of 3-4 years
- Faster processor speeds require high performance DRAMs
- Price elasticity
- OEMs qualify fewer suppliers with technology leadership
- Long term bit growth 50-60%

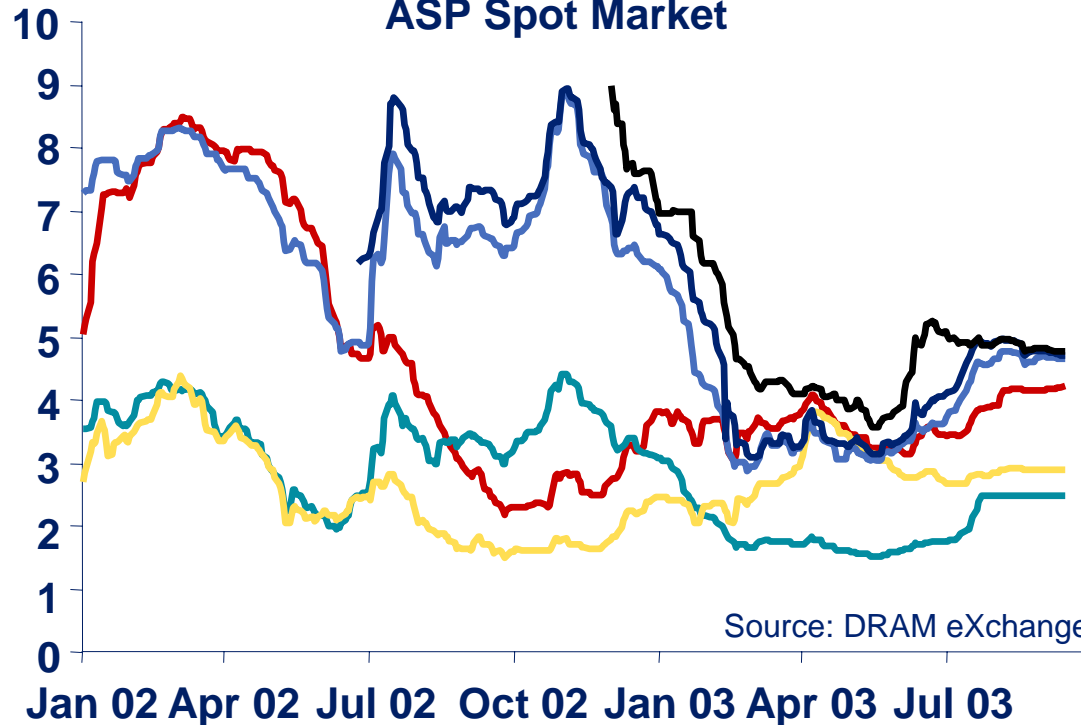
# DRAM Prices have Stabilised Due to Tight Supply Situation

## DRAM ASP and Supply

— 256M SDRAM    — 128M DDR    — 128M SDRAM  
— 256M DDR266    — 256M DDR333    — 256M DDR400

[US \$]

### ASP Spot Market

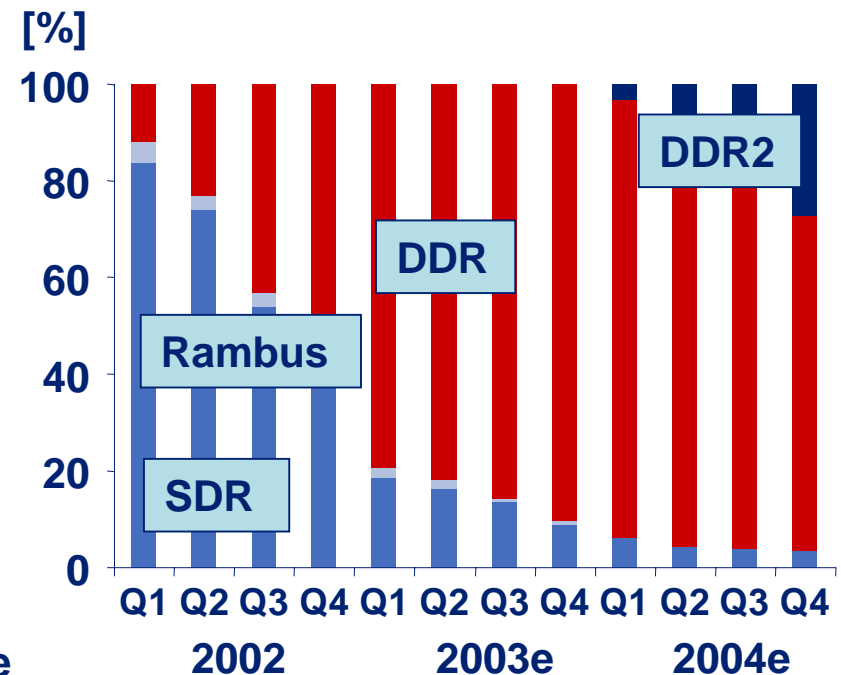
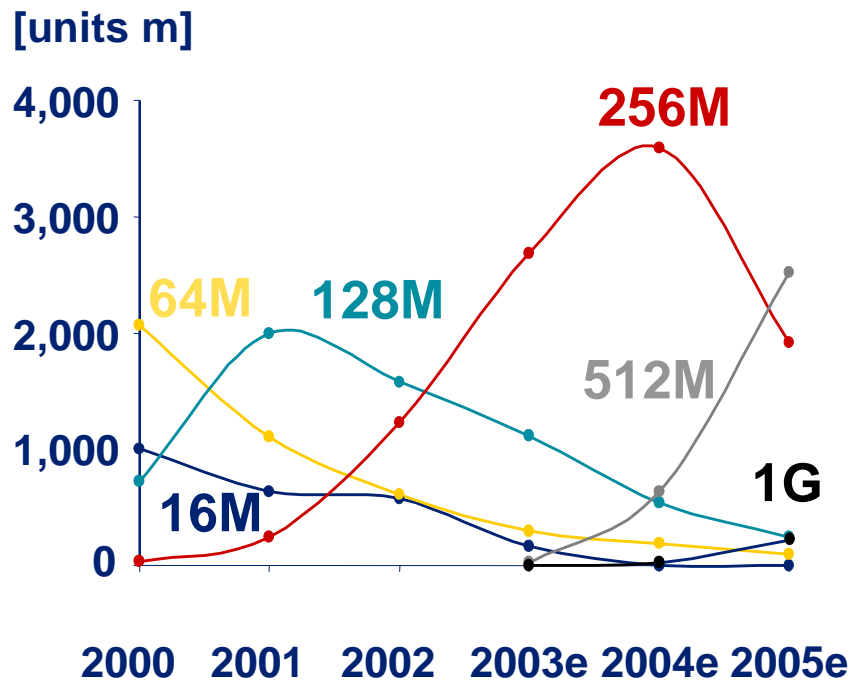


### Supply

- Reduction of capex in 2001 and 2002 leads to only moderate capacity extensions and delayed introduction of 300mm production by competition
- Bit supply is expected to grow 50% in 2003
- Consolidation in the DRAM market is ongoing
- Shift to high-end DDR products

# Demand for Performance Drives Evolution of DRAM Generations and Interface Technology

## DRAM by Generation and Interface



- The stronger penetration of dual channel systems in branded OEM desktop PCs has increased the usage of 512MB configurations

- Major brand desktop PCs completed transition to DDR
- DDR333 and DDR400 penetration increased due to Springdale chipset adoption

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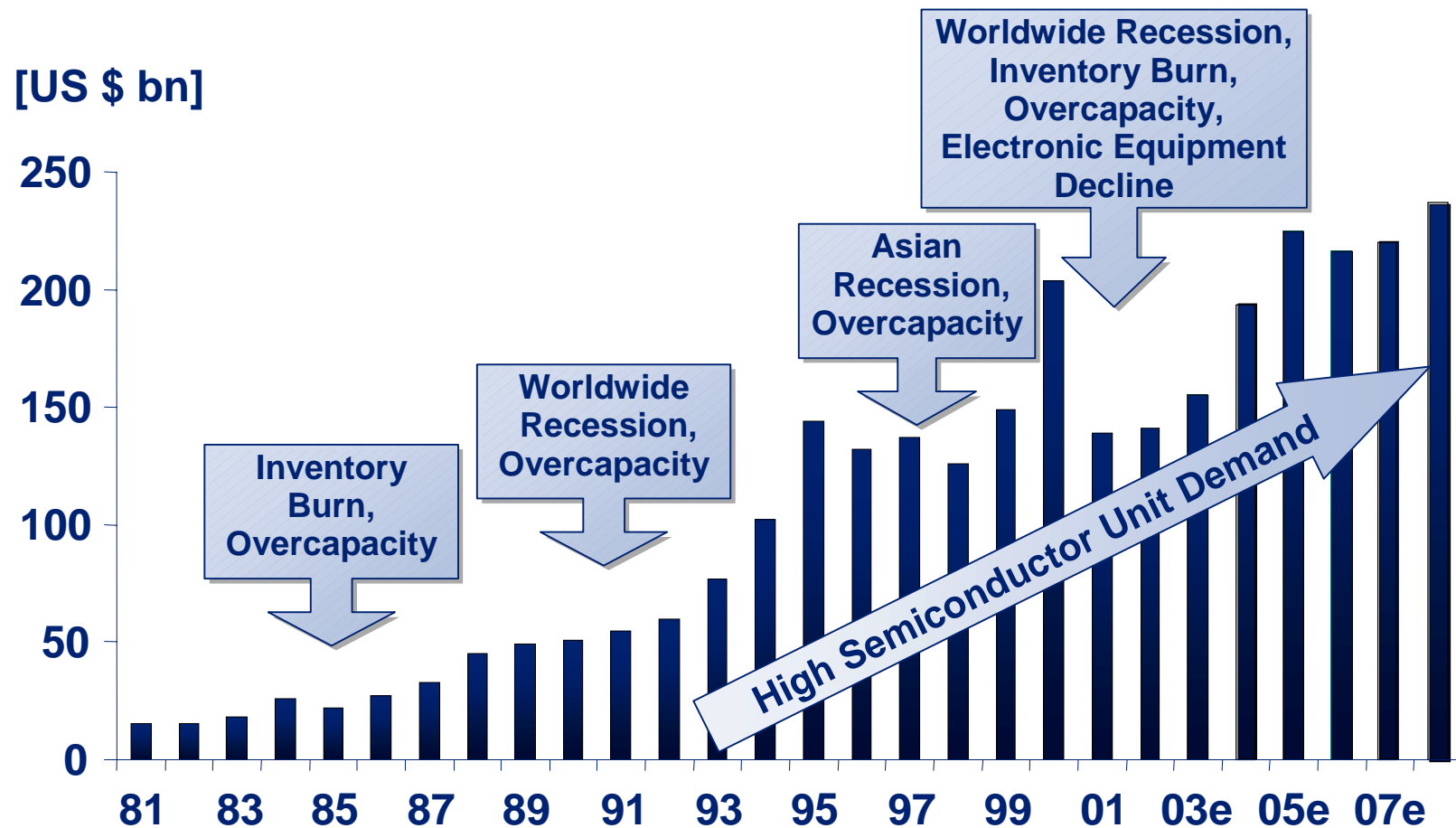
Supply

Market Forecast

## Long-Term Industry Trends

# The Semiconductor Market is Projected to Remain Cyclical

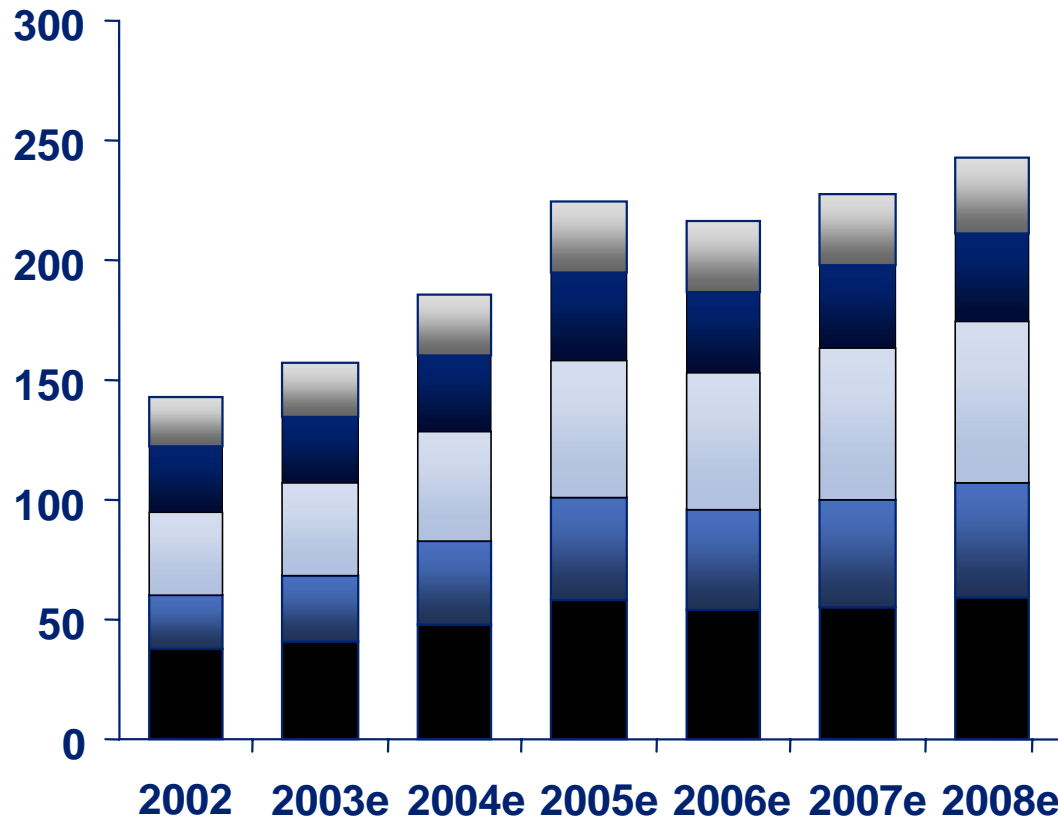
## Worldwide Semiconductor Market History and Forecast



# China Becomes a Major Semiconductor Market Due to Production Move and Increasing Wealth

## Semiconductor Consumption by Region

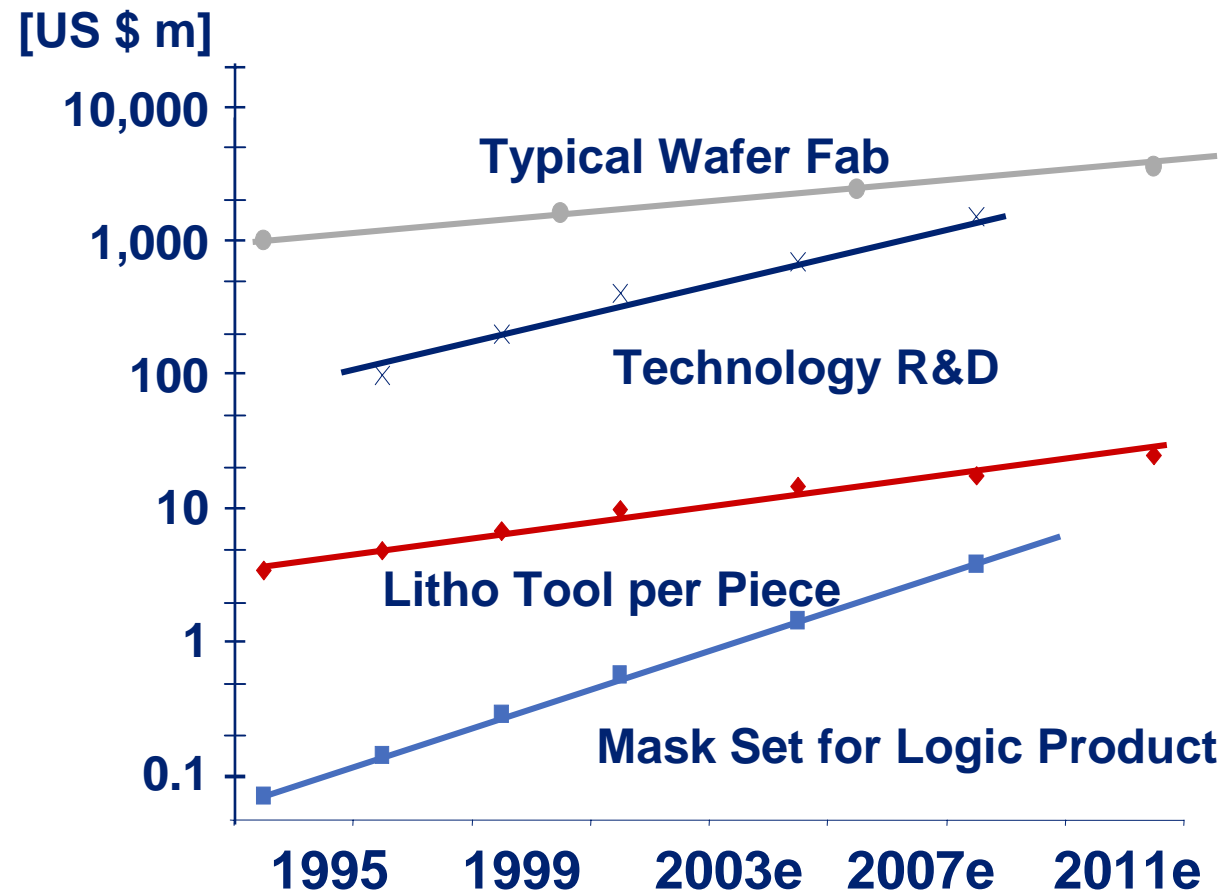
[US \$ bn]



| Region         | CAGR 02-08 |
|----------------|------------|
| Japan          | 8%         |
| EMEA           | 6%         |
| Asia w/o China | 12%        |
| China          | 14%        |
| America        | 8%         |

# Investments in Leading Edge Technology is Projected to Become More and More Expensive, ...

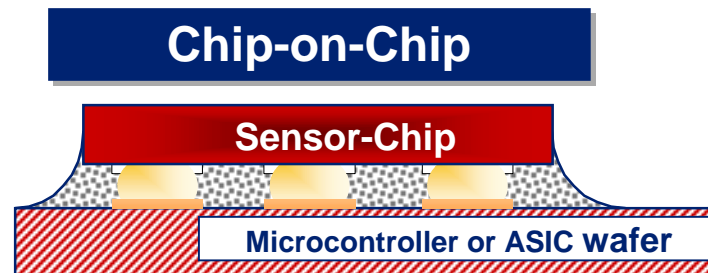
## Technology Cost Trends





... Innovative Concepts are Required to Reduce Cost and Optimize Performance ...

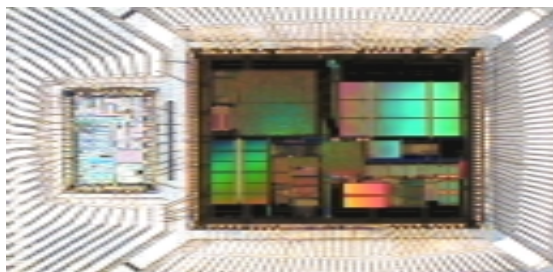
## Emerging Trend from System-on-Chip to System-in-Package



3-D Stack



Multichip Package

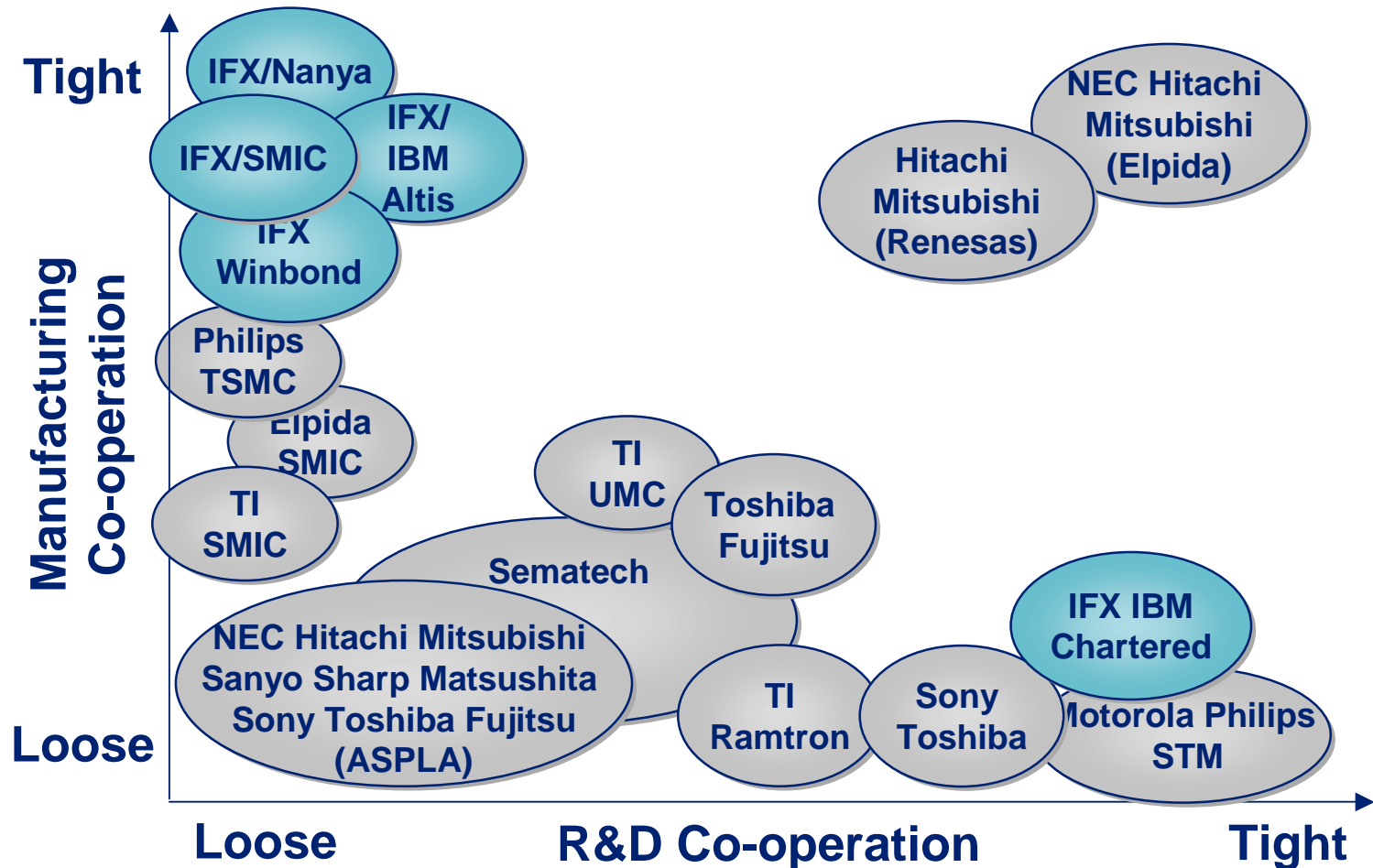


- Cost advantages ...
  - Faster time-to-market ...
  - Lower verification effort over System-on-Chip ...
- ... require new package-solutions

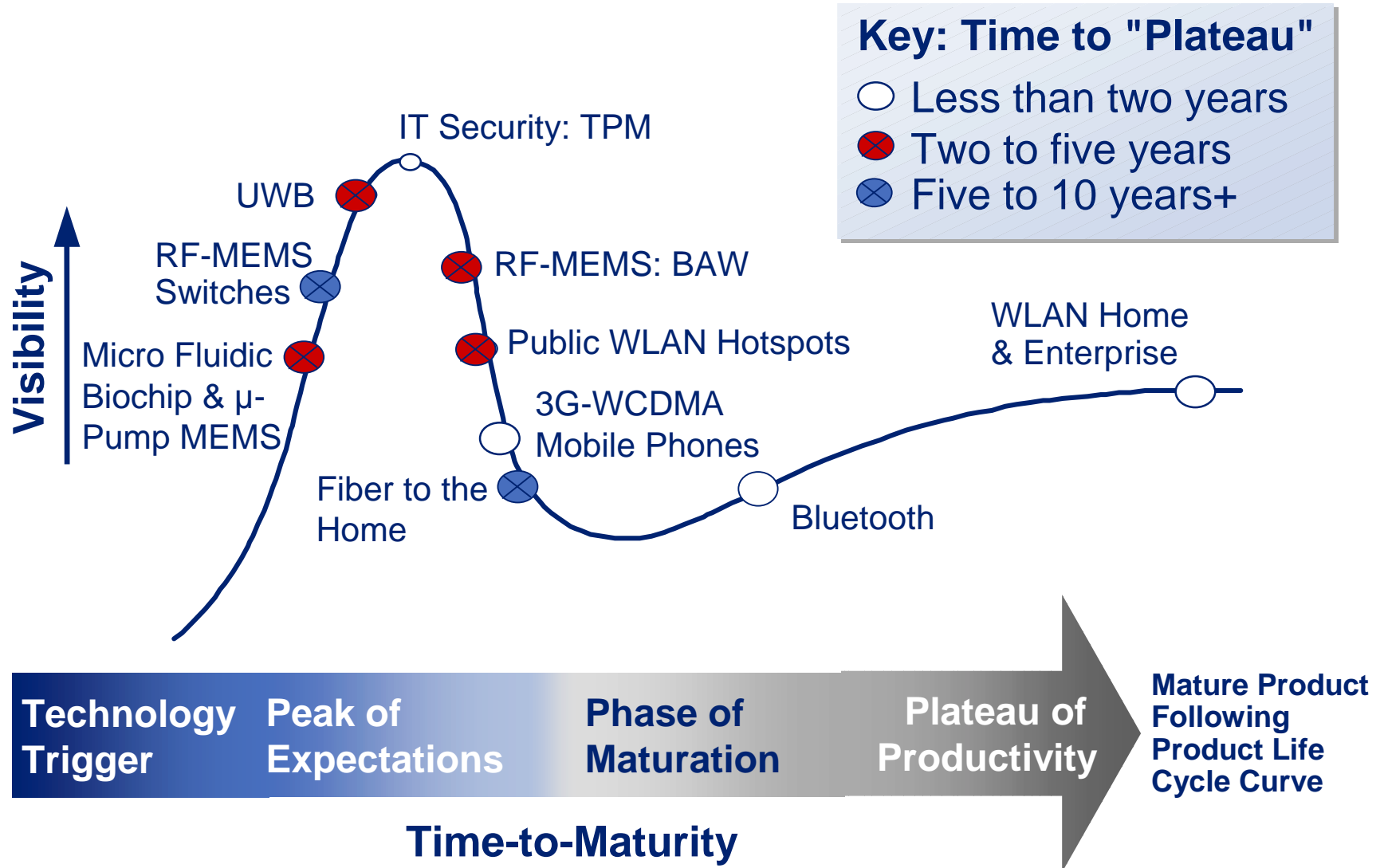


... but also Industry Co-operations and Mergers  
are Bound to Increase

## Alliances in Manufacturing and R&D

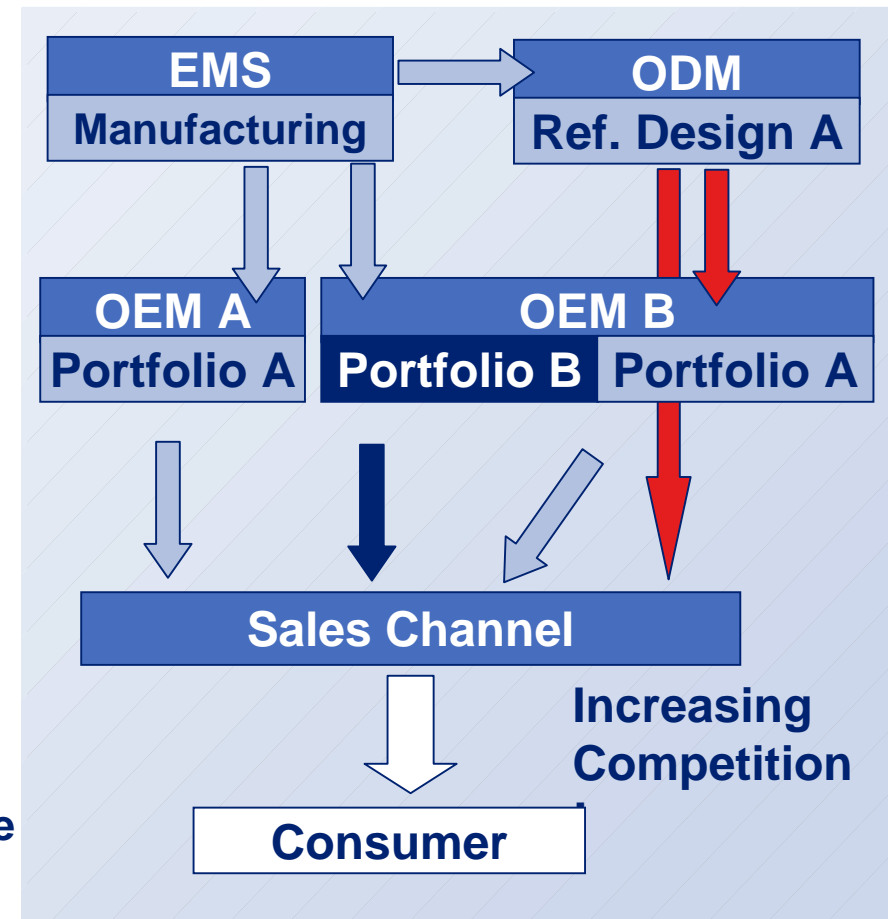
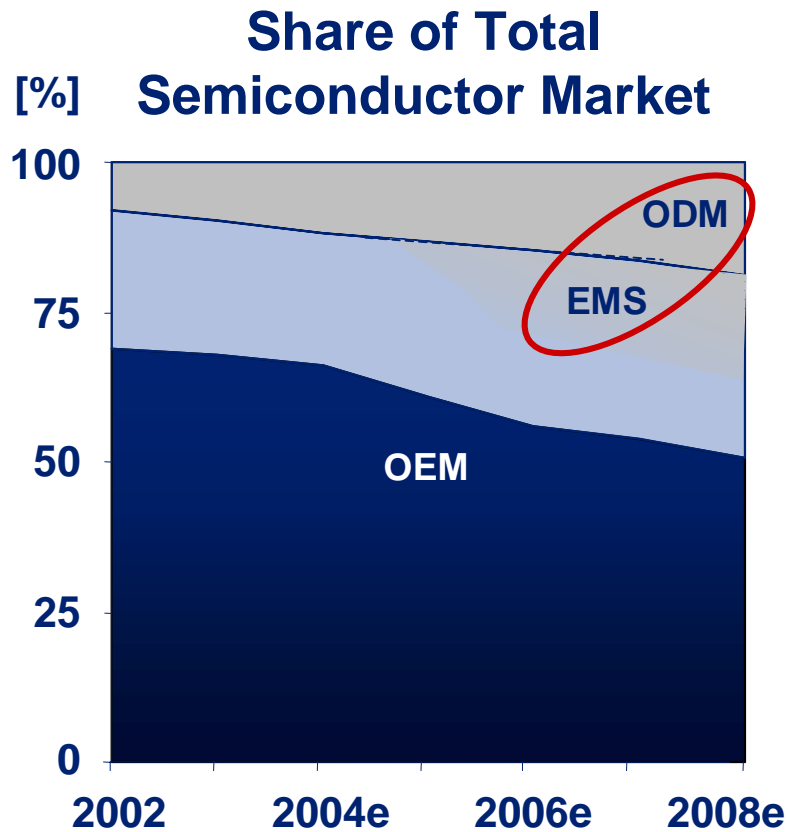


# The Hype Cycle Analysis Unveils Many Promising Emerging Technologies



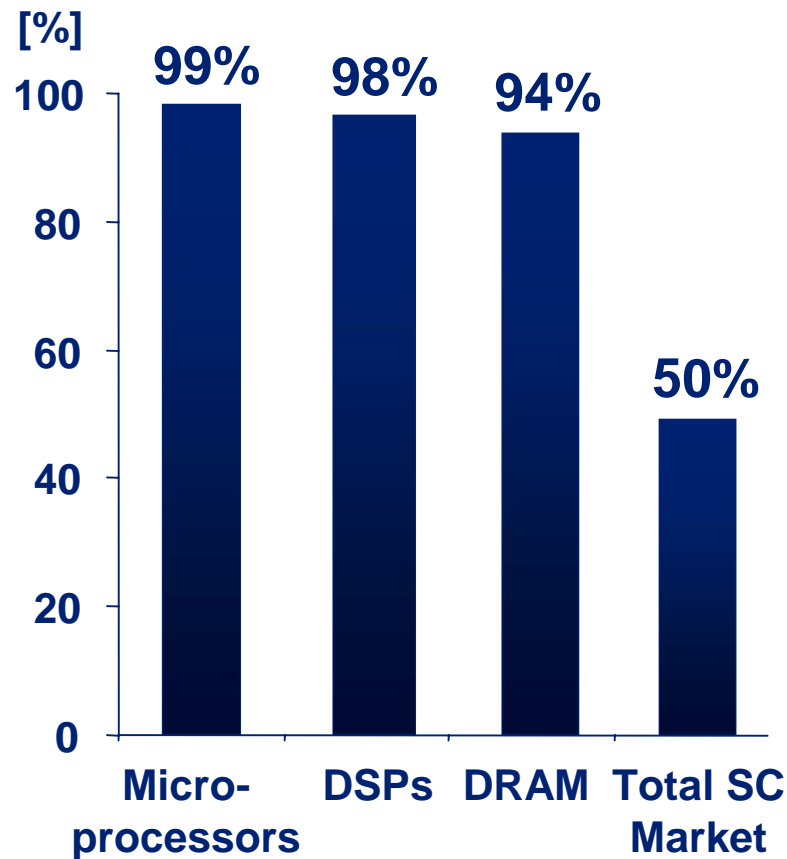
# The Share of EMS' and ODMs is Likely to Increase in the Future and to Extend the Semiconductor Value Chain

## New Business Models

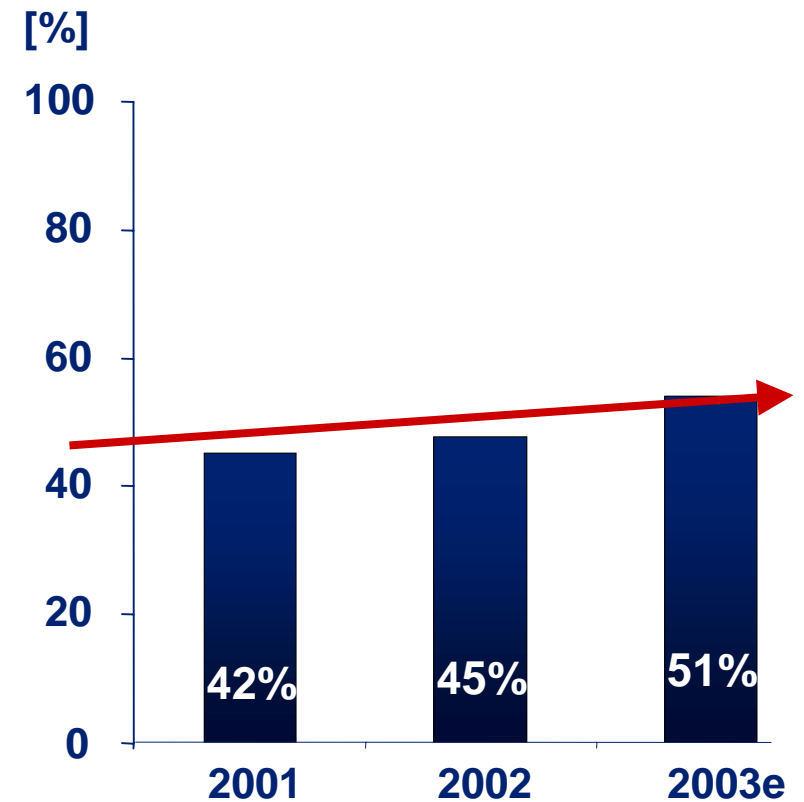


# Concentration in the Semiconductor Industry is Visible both at the Product Level and in Market Capitalization

## Concentration by Product Type and Market Capitalization



■ Market Share of Top 10 in 2002

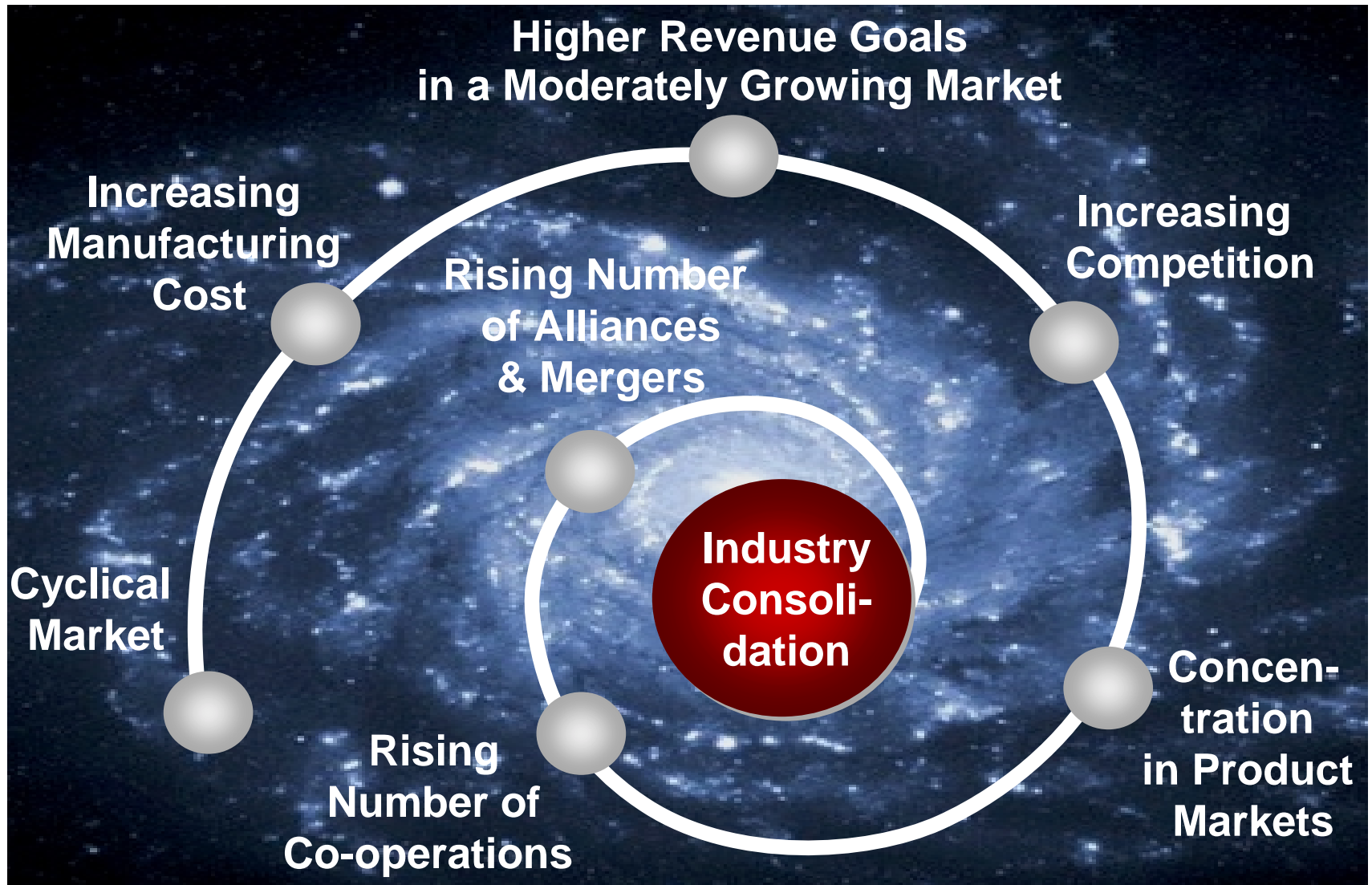


■ Market Capitalization of Top 10

Source: Infineon estimates; Goldman Sachs; Gartner

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## Consolidation with only a Few Top Players





**Never stop thinking.**