

# Investigating the Global Trend of Semiconductor Industry by Reviewing the Digital-Analog Converters

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# OUTLINE

2

- **Background**
- **DACs and semiconductor market**
- **The trends of DACs and semiconductor market**
- **The globalization of the semiconductor industry**
- **Summary**

# Background

3

- ★ The trade statistics for semiconductor (Jan. 2010-Oct. 2010 )
- ★ The regional distribution of DAC papers (Jan. 2009-May 2010)



# The source of data



Papers and also technical and trade reports



# DACs and semiconductor market

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- communications, consumer, industrial and instrument, medical electronics and computer
- DACs reflect the market requirements

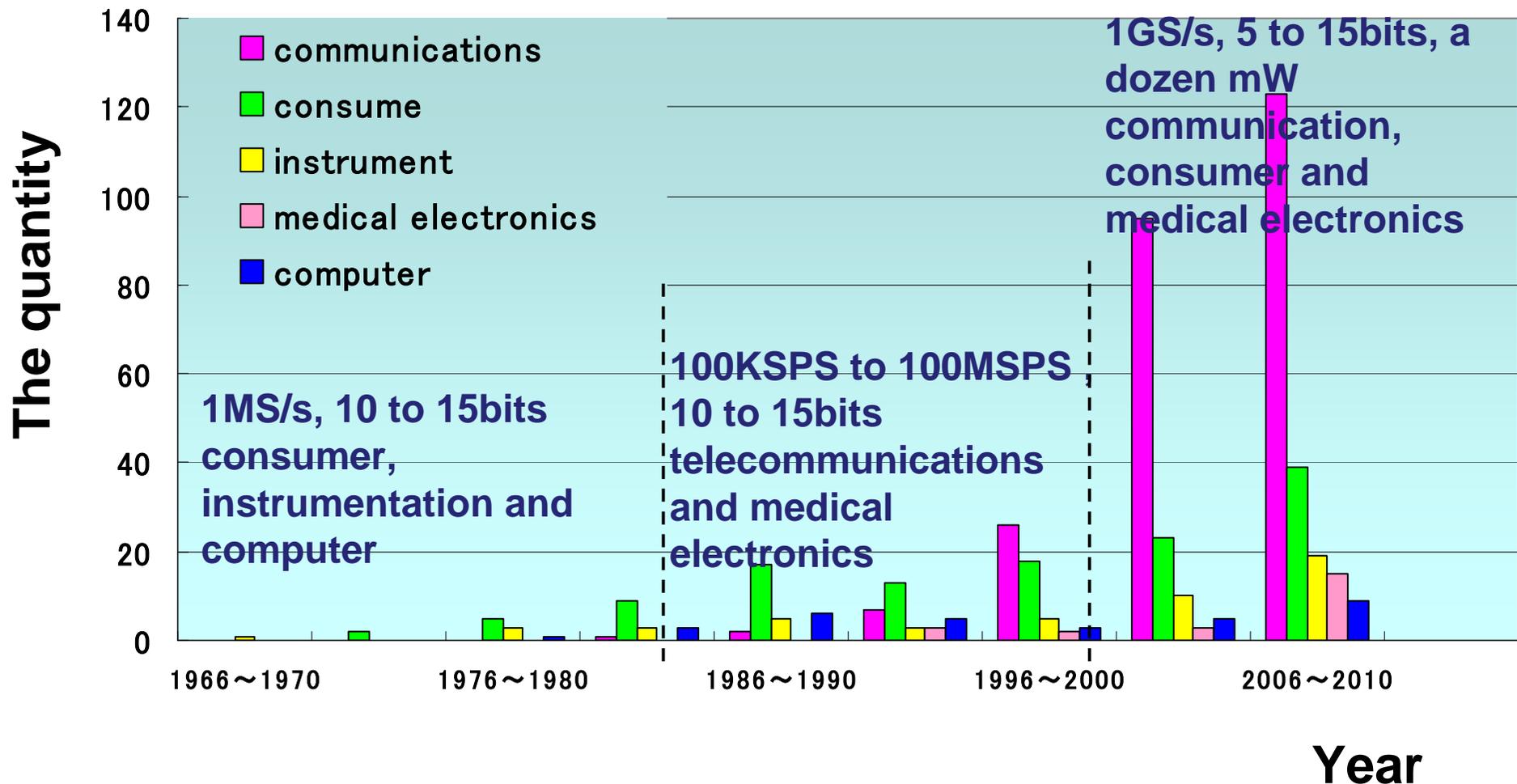


# **The trends of DACs and semiconductor market**

**The application and the regional distribution of the research on DACs and of the semiconductor market**

# The application segment of DAC papers <sup>7</sup>

- The performances of DACs change with product requirements



# **The proportion of semiconductor products applications**

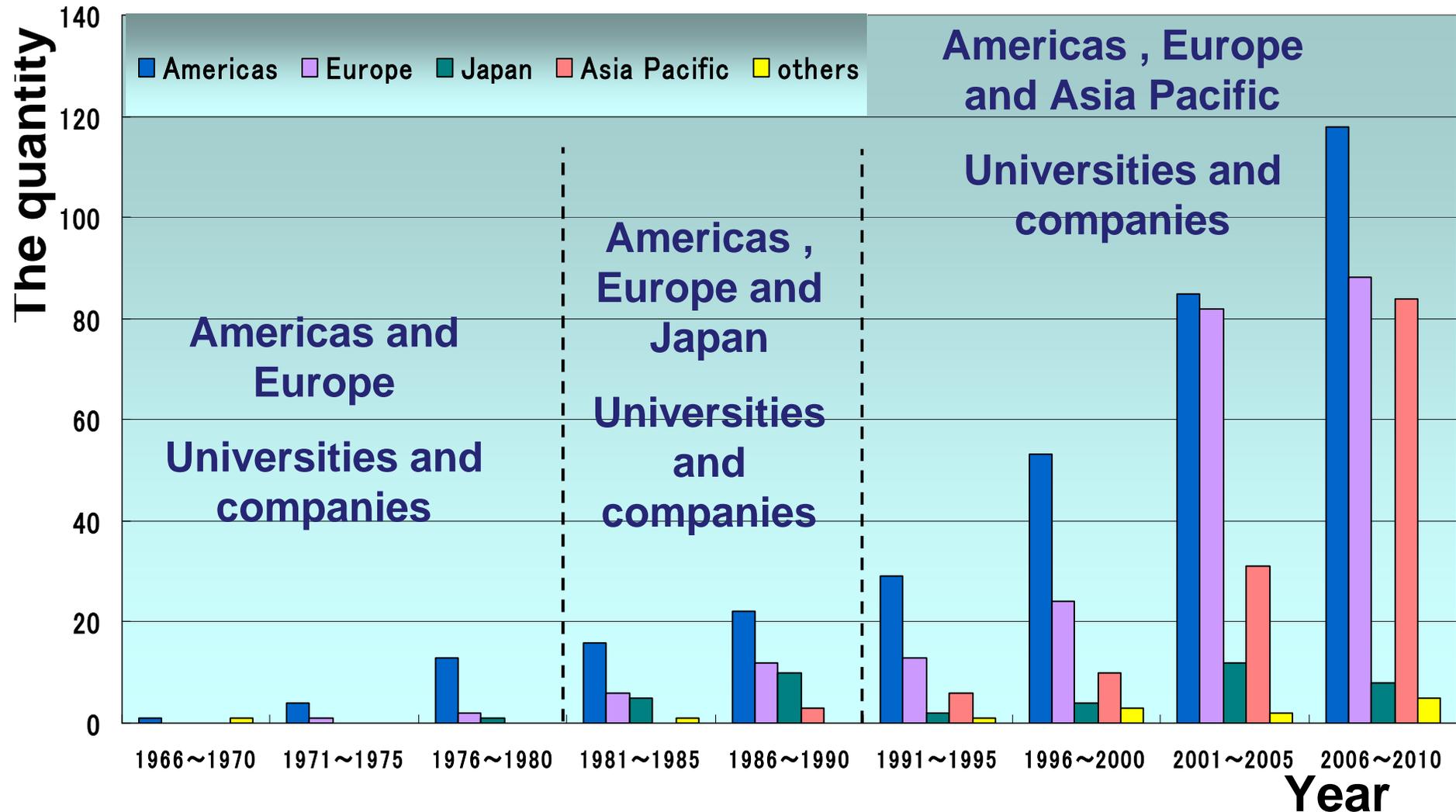
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**Similar to the research on DAC, the development of semiconductor products in different applications and in different periods is changing according to the market demands**

- **From the 80's to the 90's**
  - **computer-related products occupied more than half of semiconductor market sales**
  - **Communication and consumer products occupied 35% in 1990**
  - **Computer-related products occupied 35% in 1990**
- **From the 90's to 21 century**
  - **The share of communication products occupied 15% of semiconductor market sales in 1995**
  - **The share of consumer products occupied 23% of semiconductor market sales in 1995**
- **21 century**
  - **The share of communication products occupied 20% of semiconductor market sales in 2009. especially mobile phones shared 16%**
  - **The share of consumer products occupied 27% of semiconductor market sales in 2009**

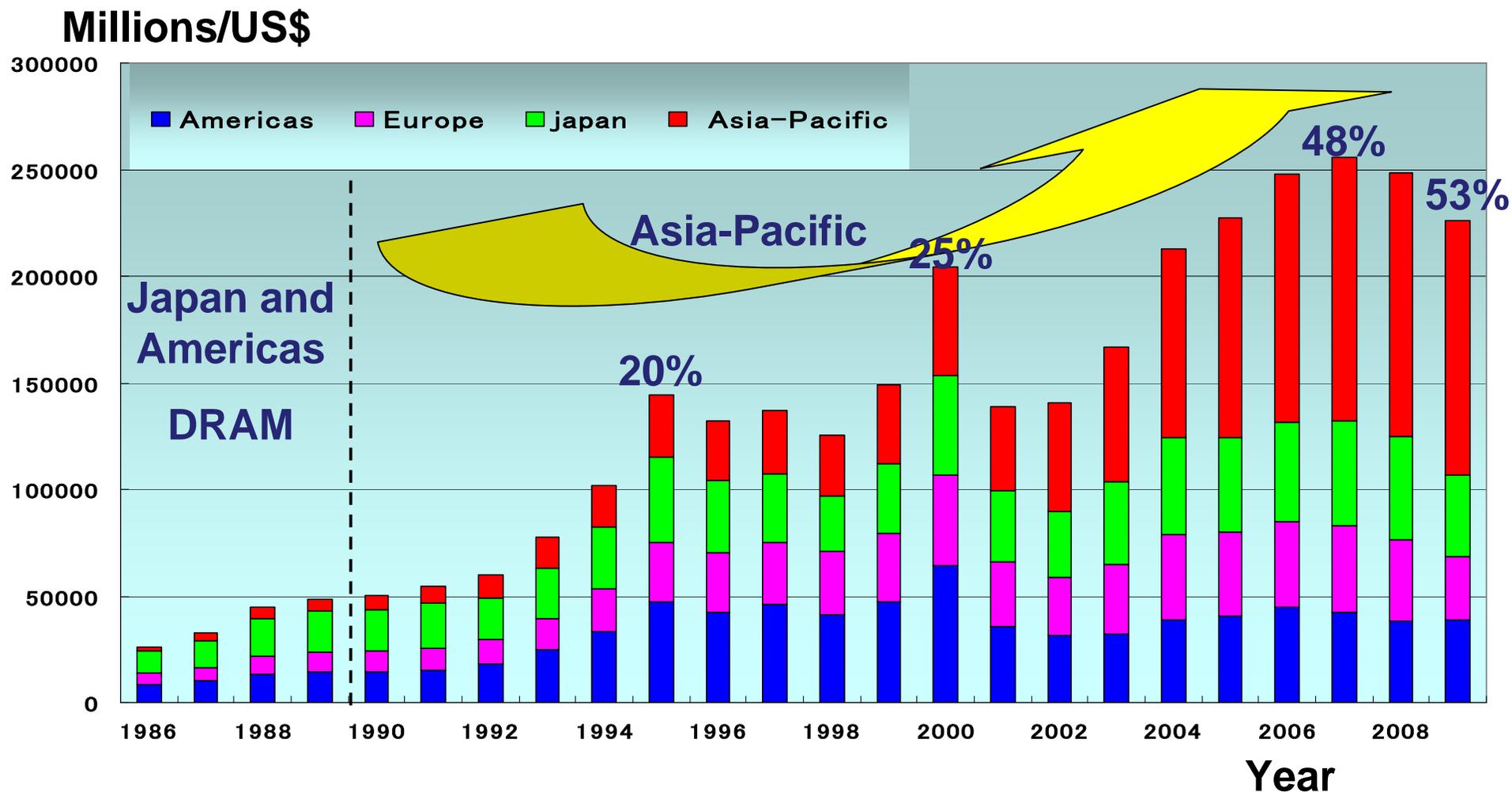
# The regional distribution to the research on DAC<sup>9</sup>

- The globalization trend of The research on DAC is confirming, with America, Europe, Asia-Pacific and Japan gradually acting as the core



# The regional distribution of the semiconductor market

- The semiconductor market rising spiral
- The globalization trend of The semiconductor market is confirming, with Asia-Pacific acting as the core

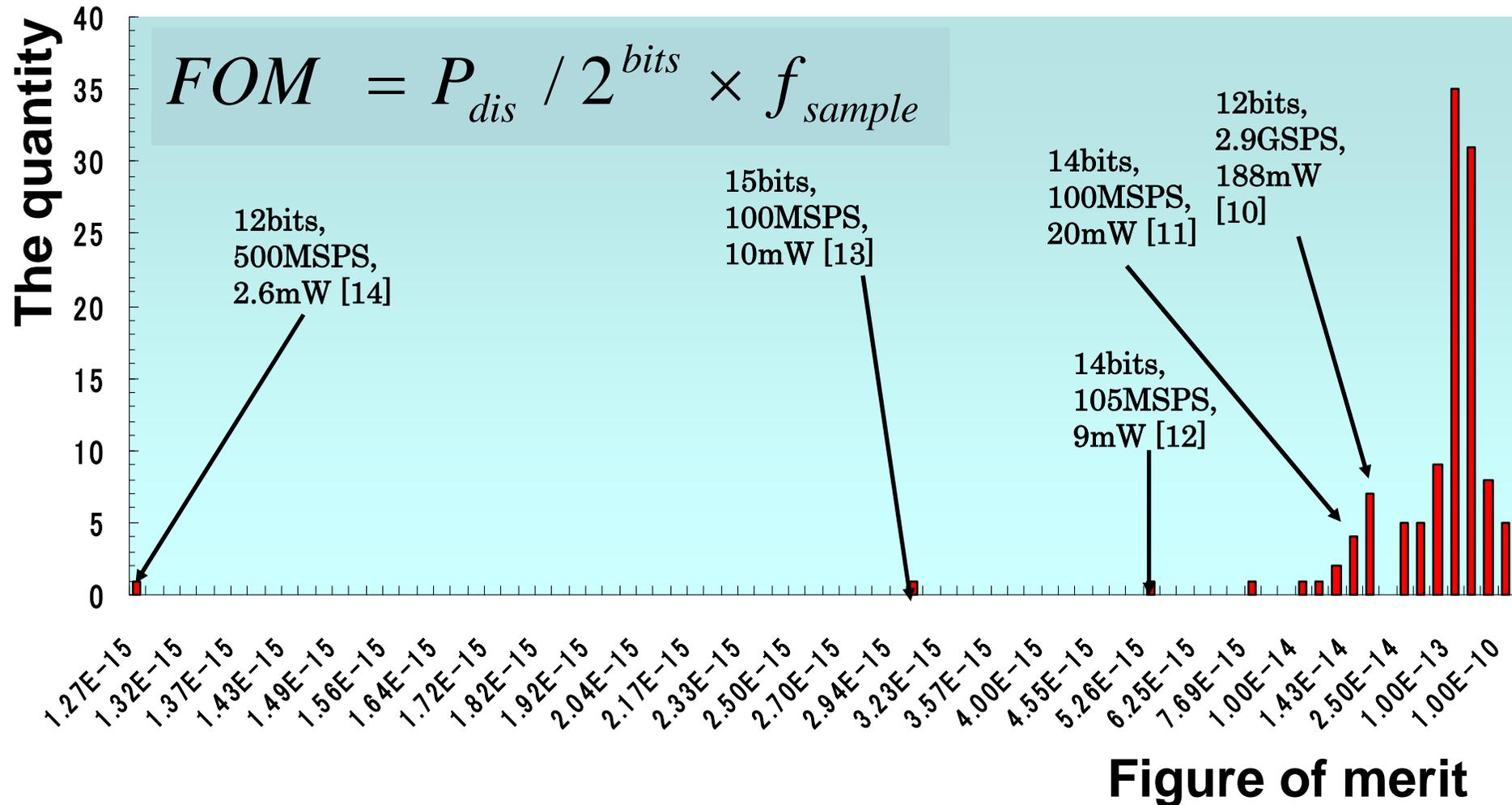


Data source: WSTS, Graphics: Han Bing

EDSSC 2010 15- 17 December 2010 Hong Kong, China

# Figure of merit of DACs

- The smaller the better



# Some information about Technology and market <sup>12</sup>

- **1 Technology**

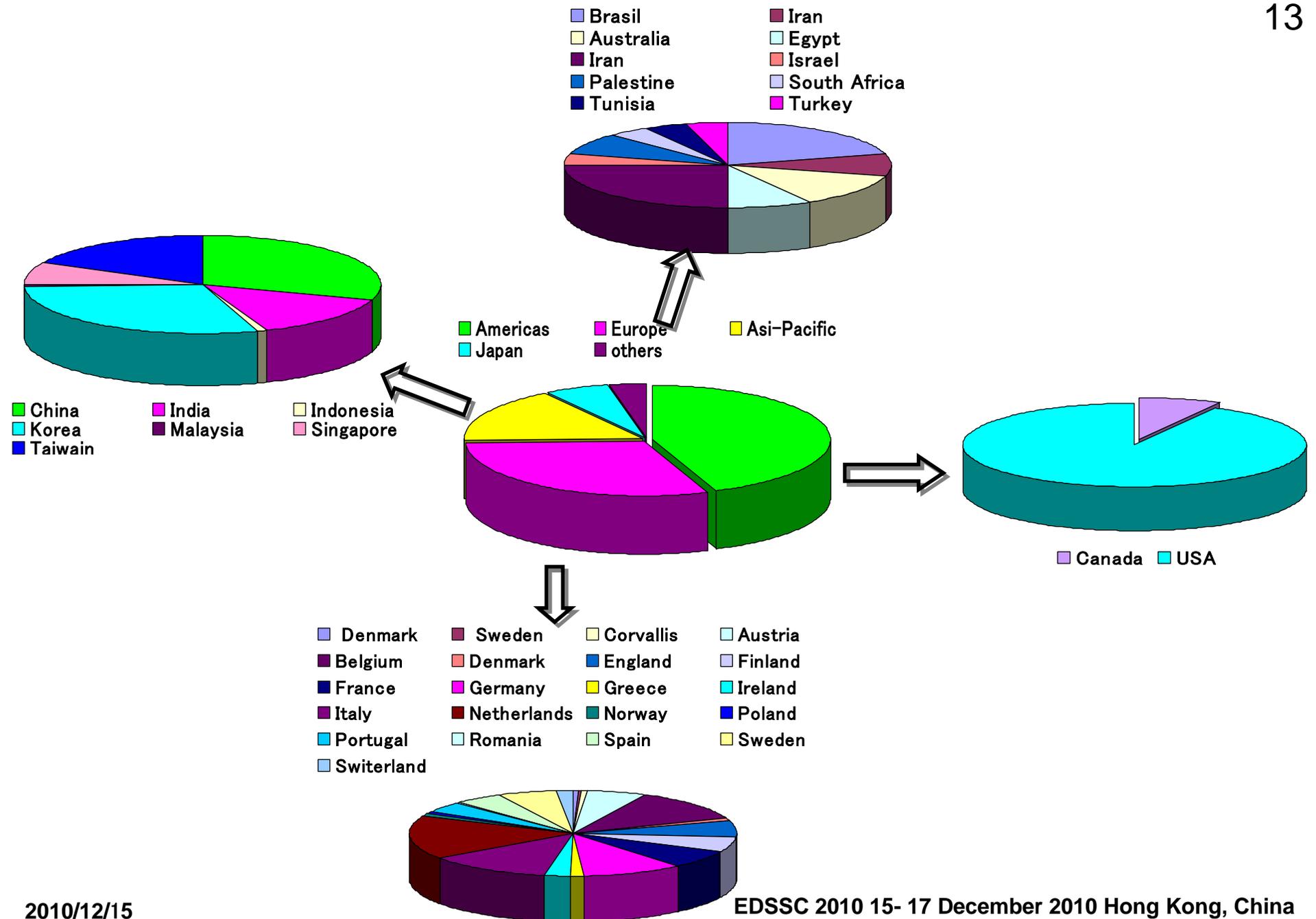
- From March to June in 2010, semiconductor products using 60nm or smaller process accounted for 38% of all. The dimensions of semiconductor process tend to be smaller in size

- That super-fast (such as 32GSPS), low power consumption (150uW) , smaller area (0.0066mm<sup>2</sup>), high resolution (24bit) , low power supply(0.5V) DACs had been designed

- **Market**

- The popular products in the near future will be mainly audio-visual entertainment products, mobile wireless applications, electrical, water and power metering devices, medical electronics and automotive industrial applications products, enterprises network and other mature terminals markets etc

# The countries distribution to the research on DAC



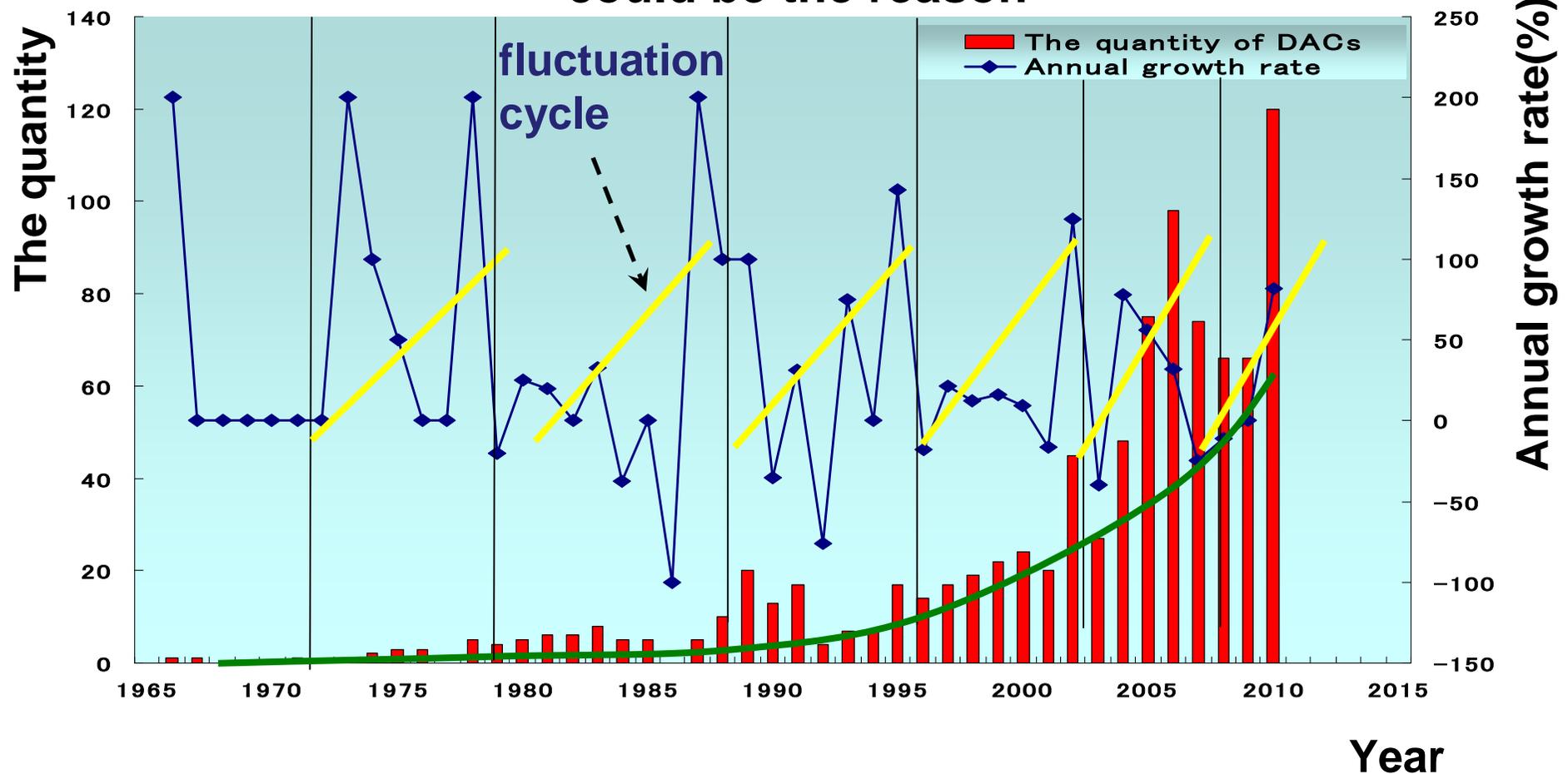
# **The globalization of the semiconductor industry**

**(Technology and market promote the globalization of the semiconductor industry)**

# The trend of the research on DAC

15

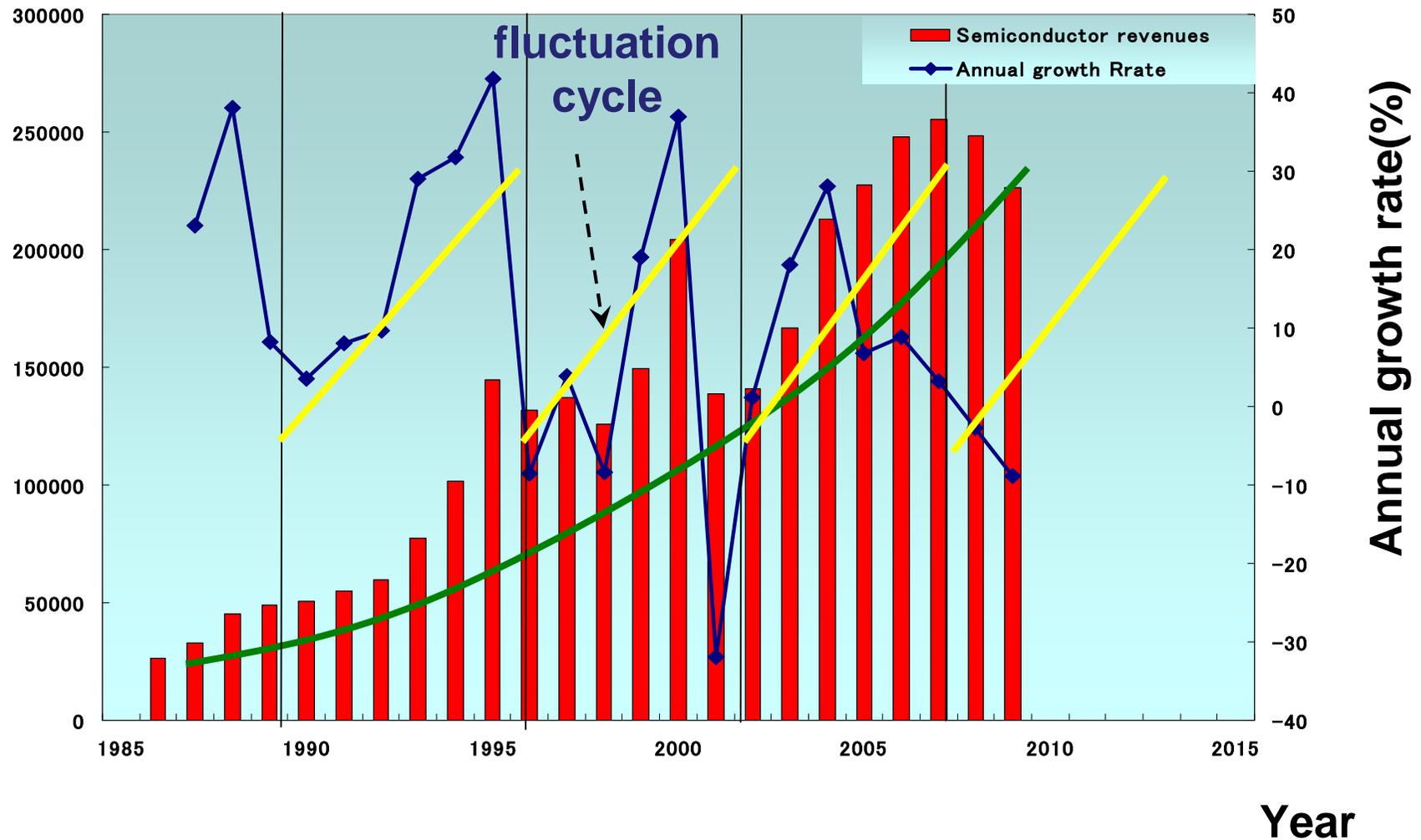
- There is a fluctuation cycle almost every five years (obviously after 1985)
  - Oversupply, Global recession and technology development could be the reason



# The trend of worldwide semiconductor market <sup>16</sup>

- There is a fluctuation cycle almost every five years
  - Oversupply, Global recession and technology development could be the reason

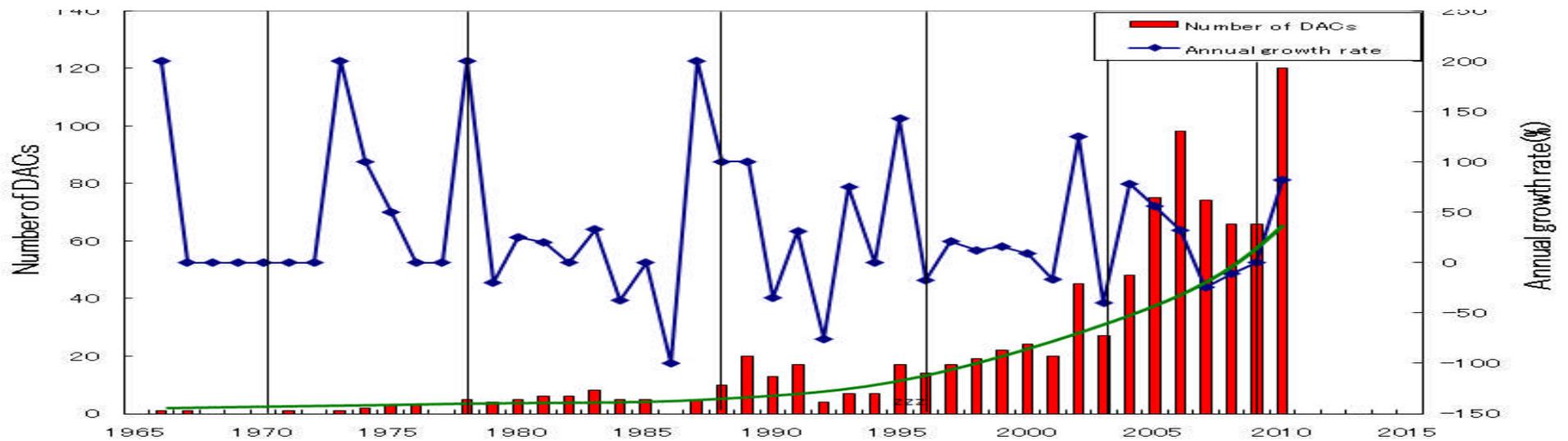
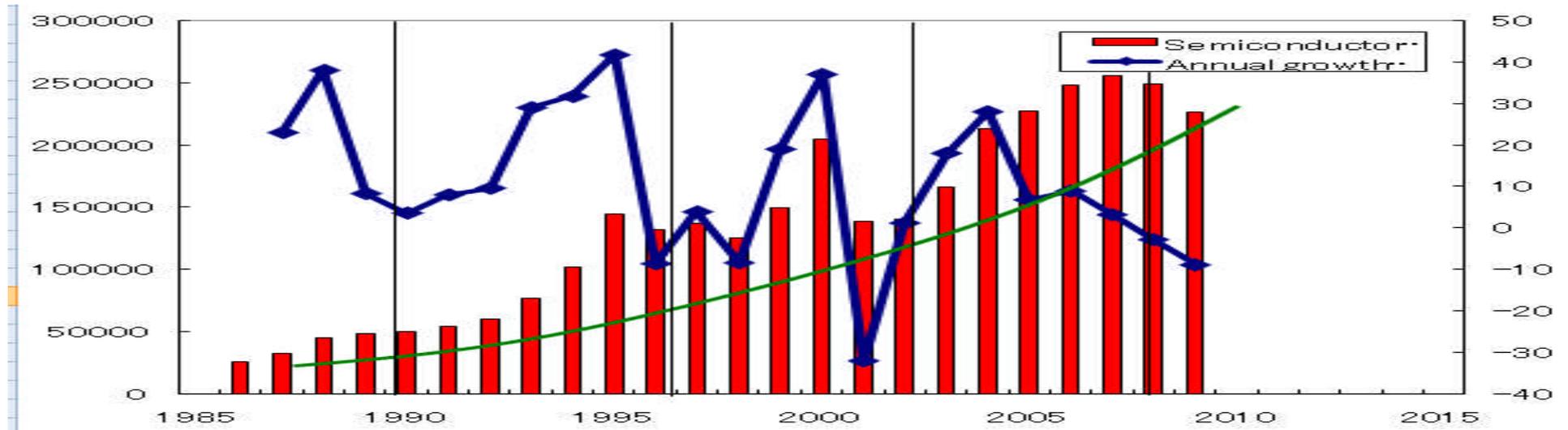
Semiconductor revenues in Millions of US\$



Data source: WSTS, Graphics: Bing Han

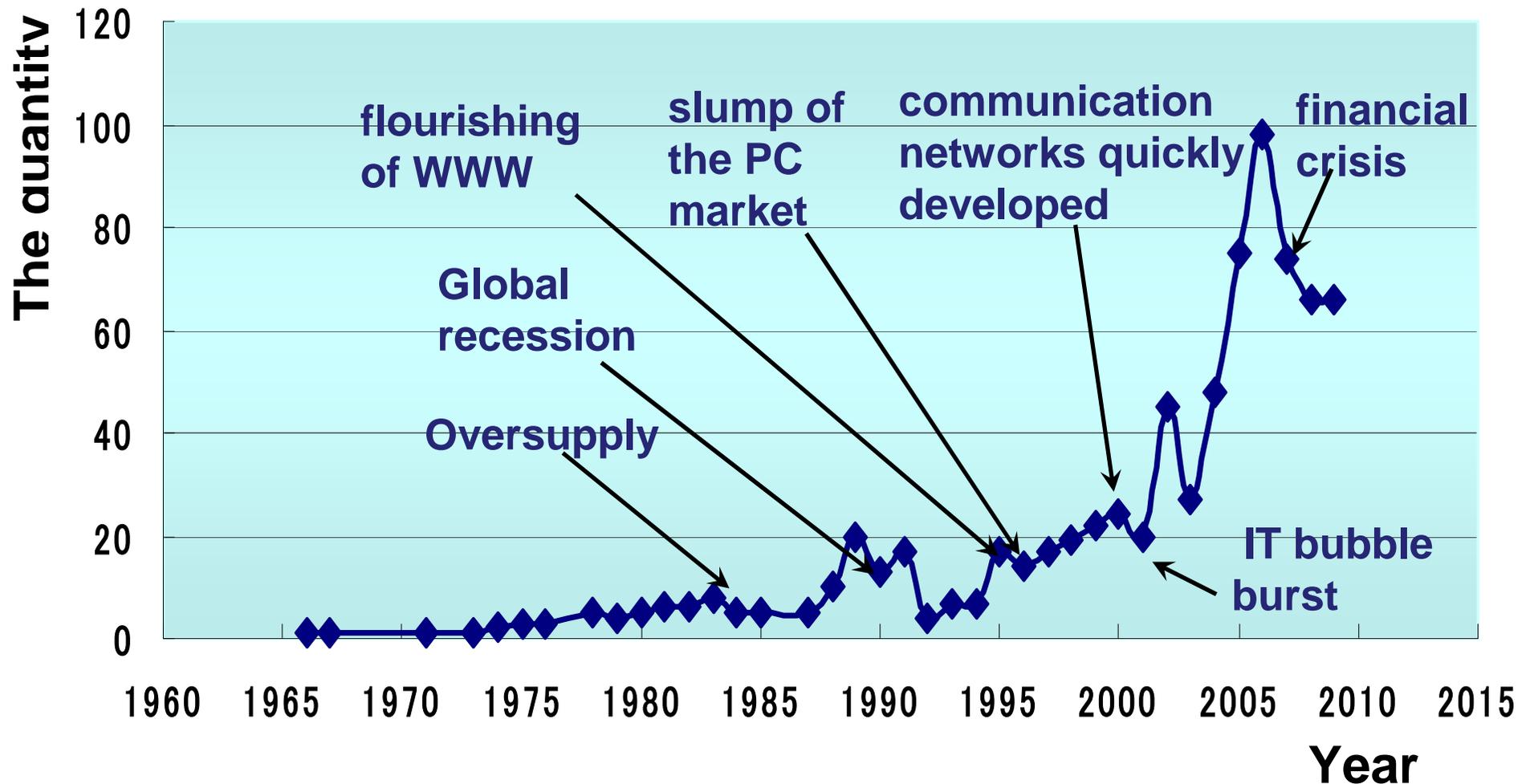
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# The trend of DAC papers and of worldwide semiconductor market



# The quantity of DAC papers over year 18

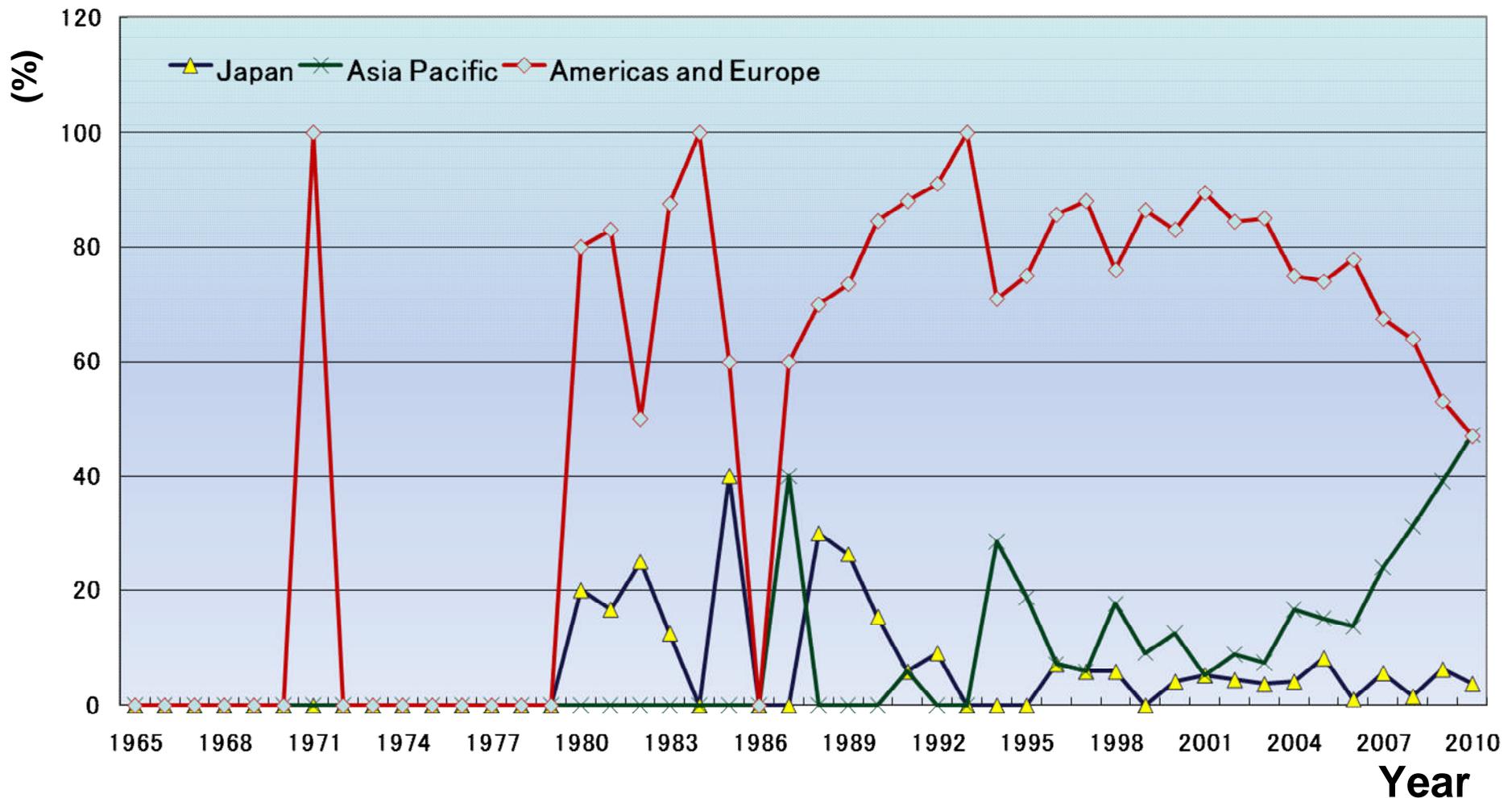
- The research on DAC rising spiral
- The research on DAC affected by the market demands



# Region share of DAC papers

- From the 60's to the 80's ,Americas and Europe
- In the 80's, Japan consumer and DRAM
- From the 80's to the 90's , Asia-Pacific and Japan, China, Taiwan, South Korea, Singapore and India
- From the 90's, Asia-Pacific

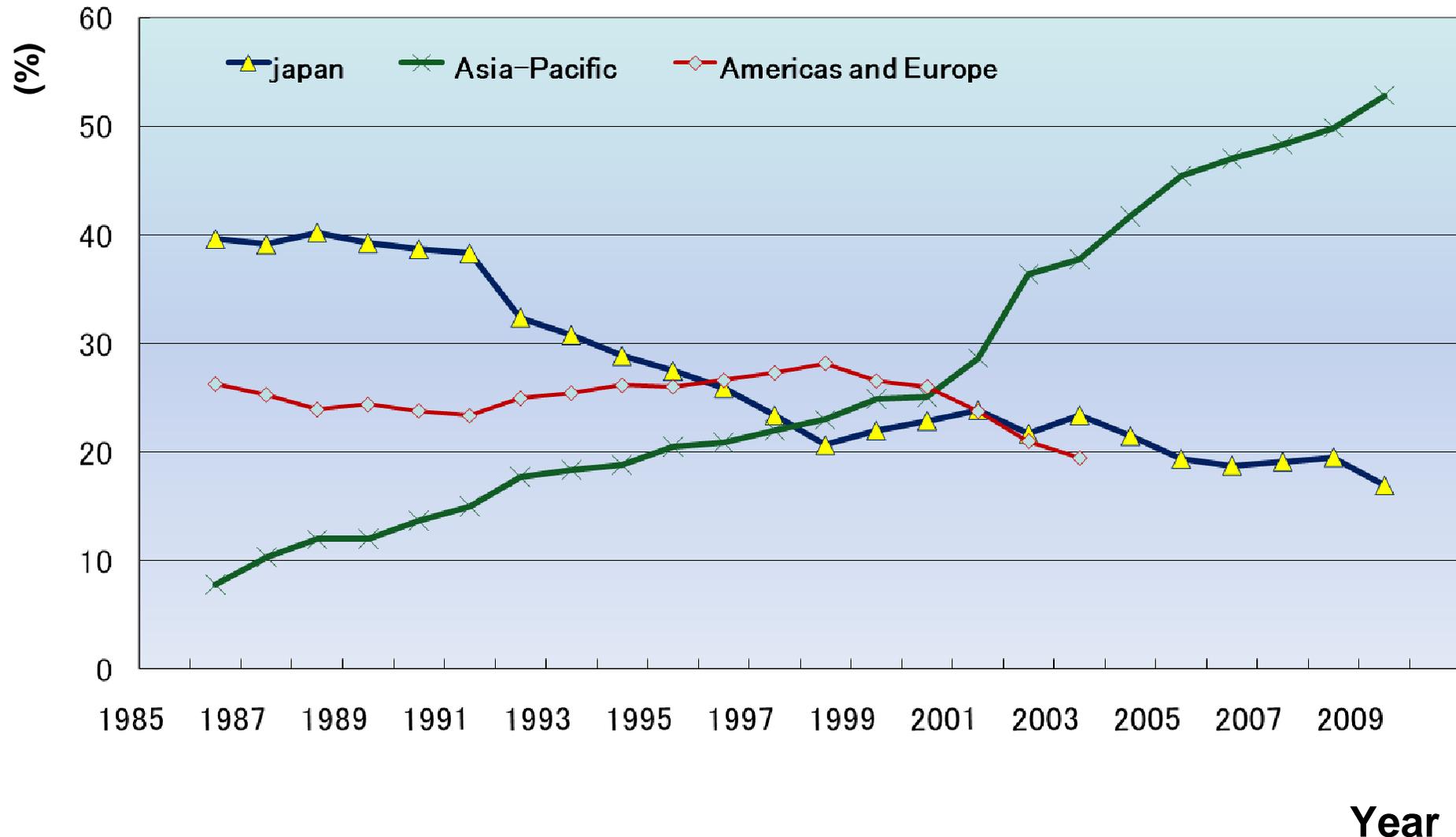
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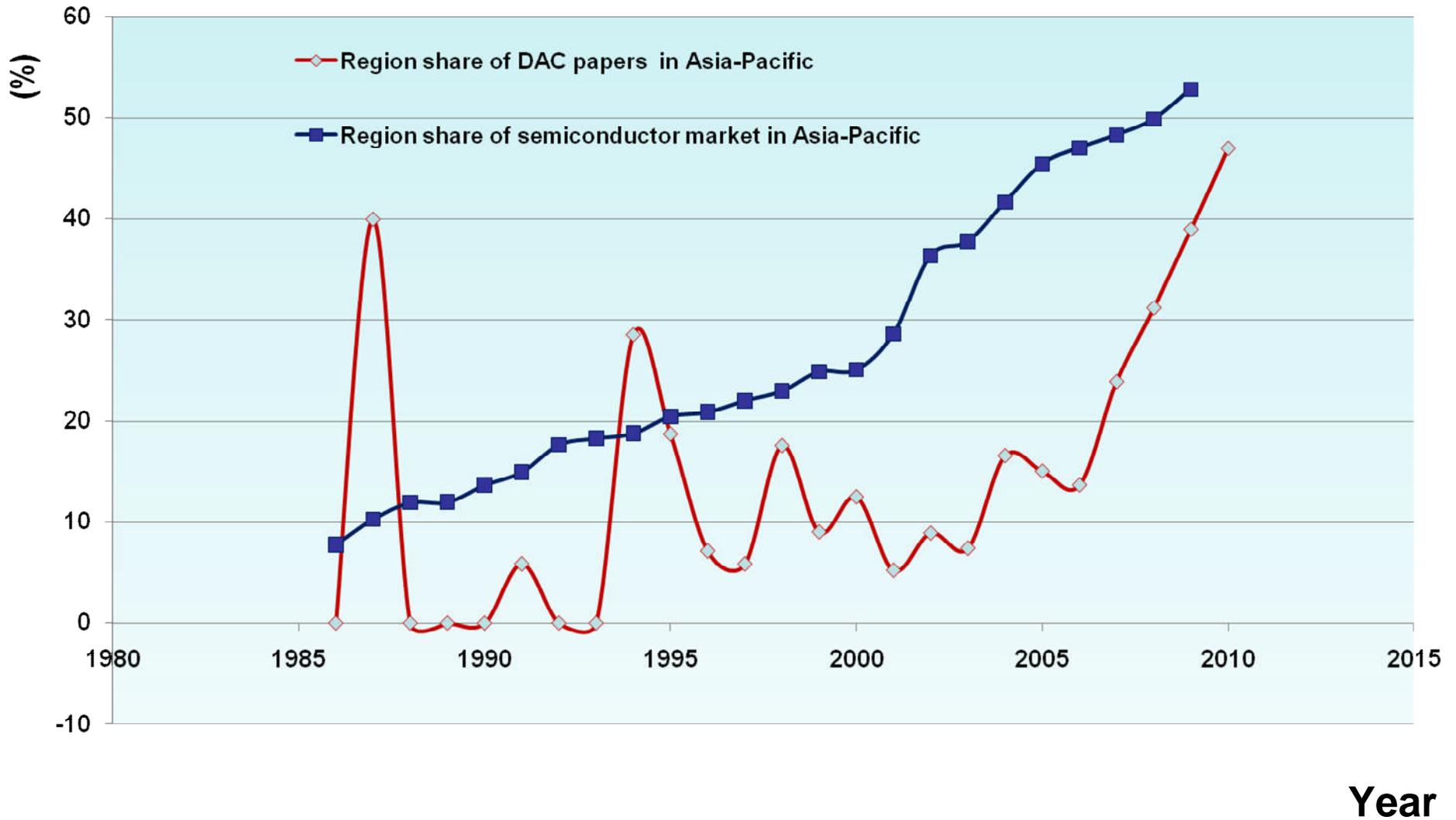
# Region share of semiconductor market

20

- In the 80's, Japan, consumer and DRAM
- In 1983, Korea's Samsung DRAM
- In 1987, Taiwan's TSMC was established , foundry businesses
- From the 90's , Asia-Pacific, China, Taiwan, South Korea, Singapore and India



# Region share of DAC papers and of semiconductor market in Asia-Pacific<sup>21</sup>



# Summary

22

- **1 Statistical analysis of DAC papers**

- The performances of DACs change with product requirements
- The research and development status of DAC confirm to the globalization trend of semiconductor technology and America, Europe, Asia-Pacific and Japan is gradually acting as the core

- **2 Semiconductor market analysis**

- The semiconductor industry is developed by the constantly emerging of new applications
- The center of the global semiconductor market has changed from advanced countries to emerging countries

- **3 The globalization of the semiconductor industry**

- Technology and market promote the globalization of the semiconductor industry
- The future semiconductor industry will no longer simply focus on the production line construction and the market sales. The design will occupy an increasing share

**Thank you for your  
attention**