Market Trends in Test

VLSIresearch

John West
VLSI Research Europe

SWTW

IEEE SW Test Workshop
Semiconductor Wafer Test Workshop
June 10 - 13, 2012 | San Diego, California

Presentation Overview

- **Market Environment**
  - capex, confidence, inventories, and utilization rates
- **ATE Market**
  - sales, buy rate, cost per device tested, & consolidation
- **Test Consumables**
  - probe cards, sockets and interface boards
- **Probe Cards**
  - cost per device tested, and why no consolidation
- **Summary**

2012 Top 10 Capex Spenders

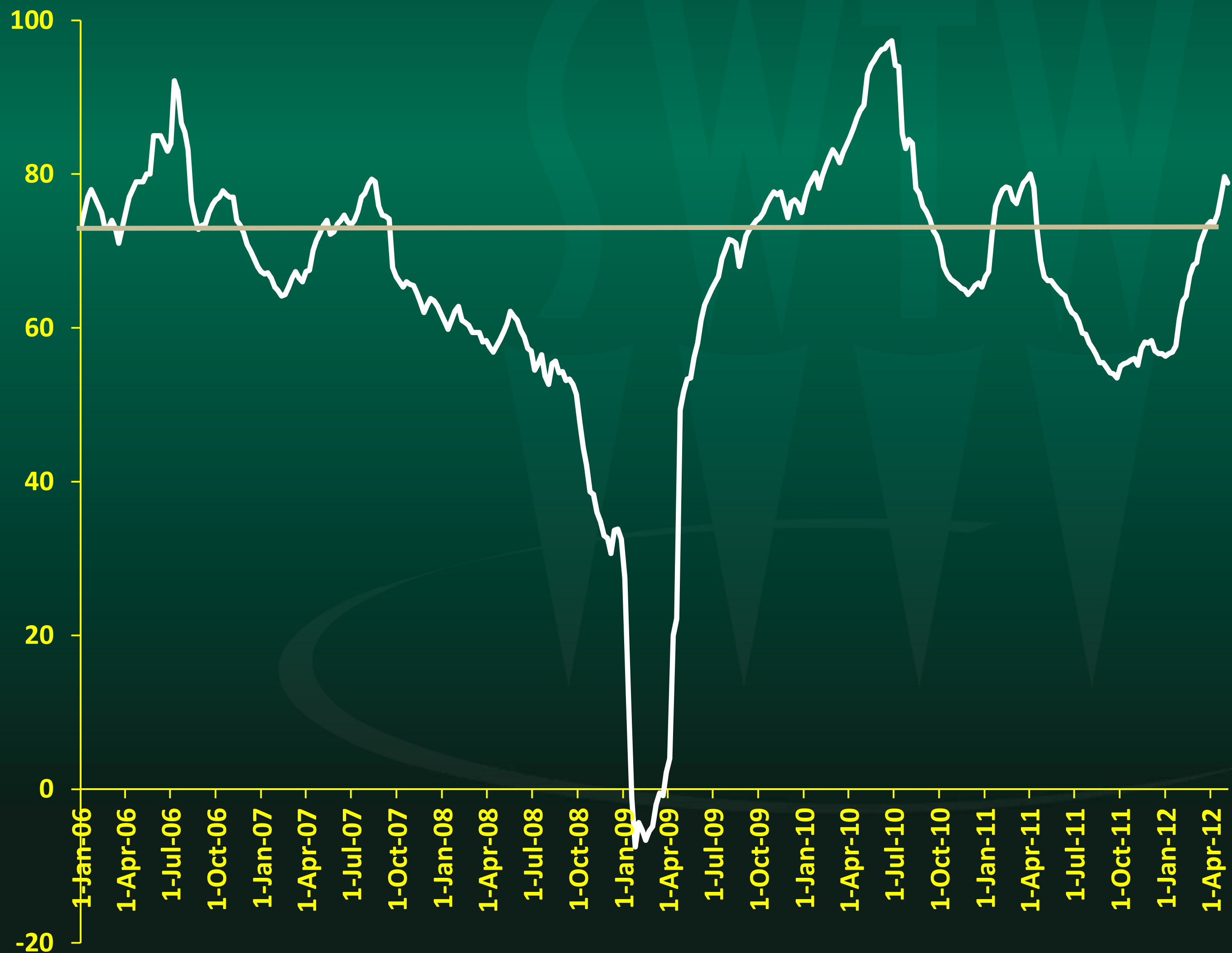
Capital Expenditures by Company, $Bn

	2009	2010	2011	2012e
Samsung	3.9	11.0	11.7	13.6
Intel	4.5	5.2	10.5	12.5
TSMC	2.7	5.9	7.4	8.3
Hynix	0.9	3.0	3.0	3.7
GLOBALFOUNDRIES	0.8	2.8	5.4	3.6
Micron Technology	0.5	1.8	2.8	2.0
UMC	0.5	1.8	1.6	2.0
Toshiba	1.0	2.1	1.6	1.8
SanDisk	0.5	1.1	1.4	1.4
Elpida	0.9	1.3	1.0	0.2
Others	6.9	12.1	10.0	7.6
Total Top 10	23.1	48.1	56.4	56.7
Annual Growth		108.2%	17.3%	0.5%

Up $6Bn on VLSI's January update

Most of the upgrade is in foundry, the rest is capacity upgrades for memory

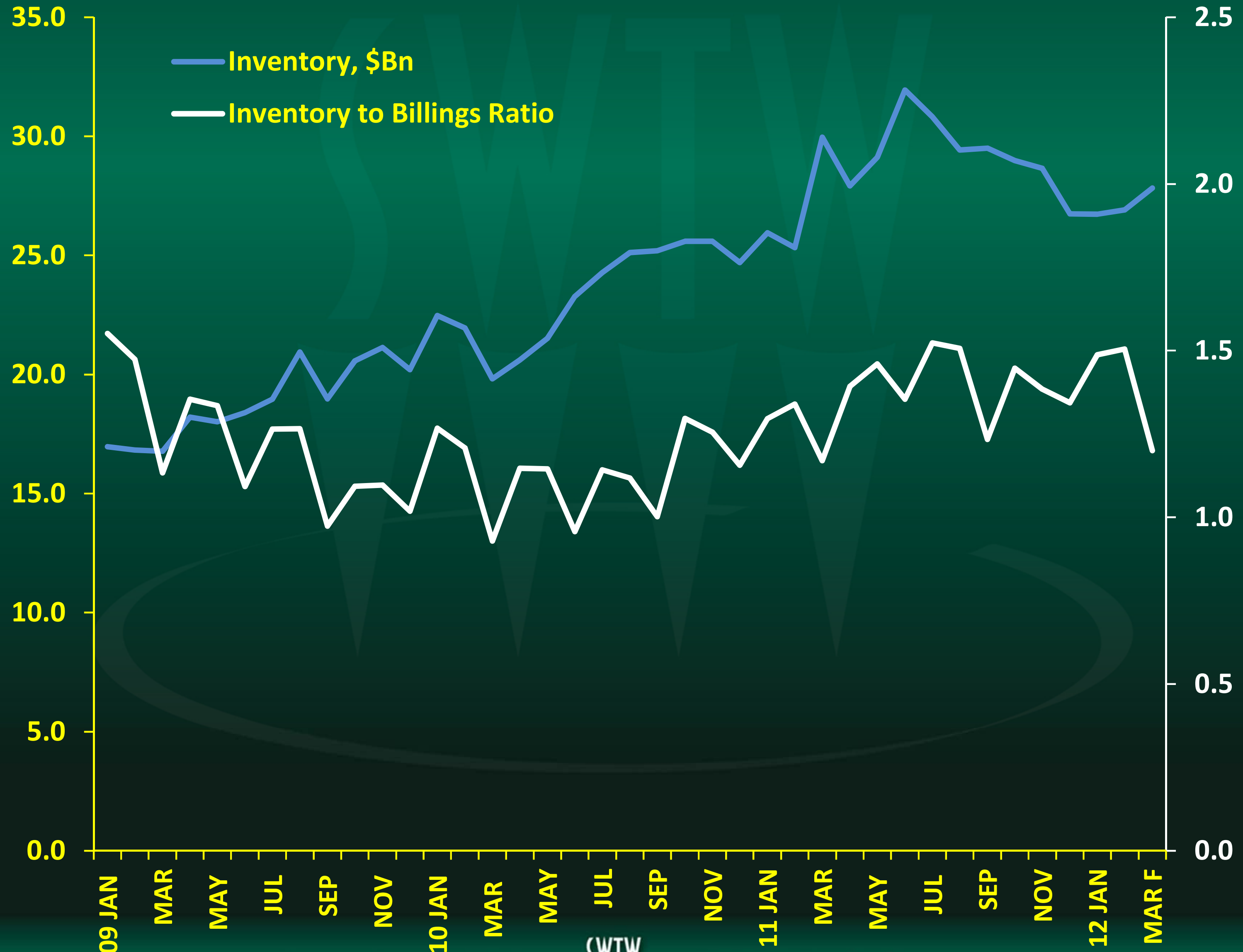
Industry Confidence… it's on the up



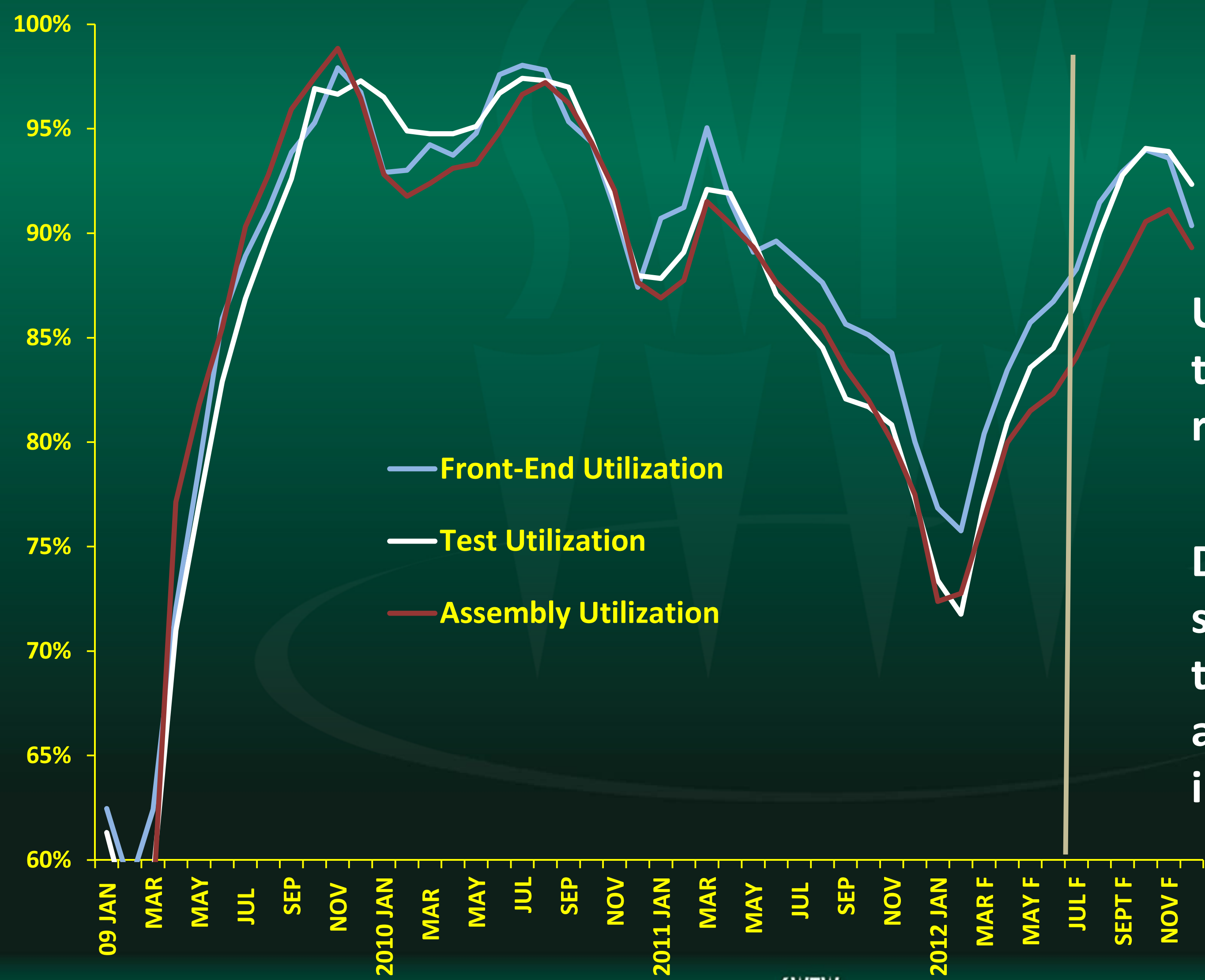
Confidence above the 75^{0} growth line

Driven by foundries, subcons and SOC for computing

Inventories… under control



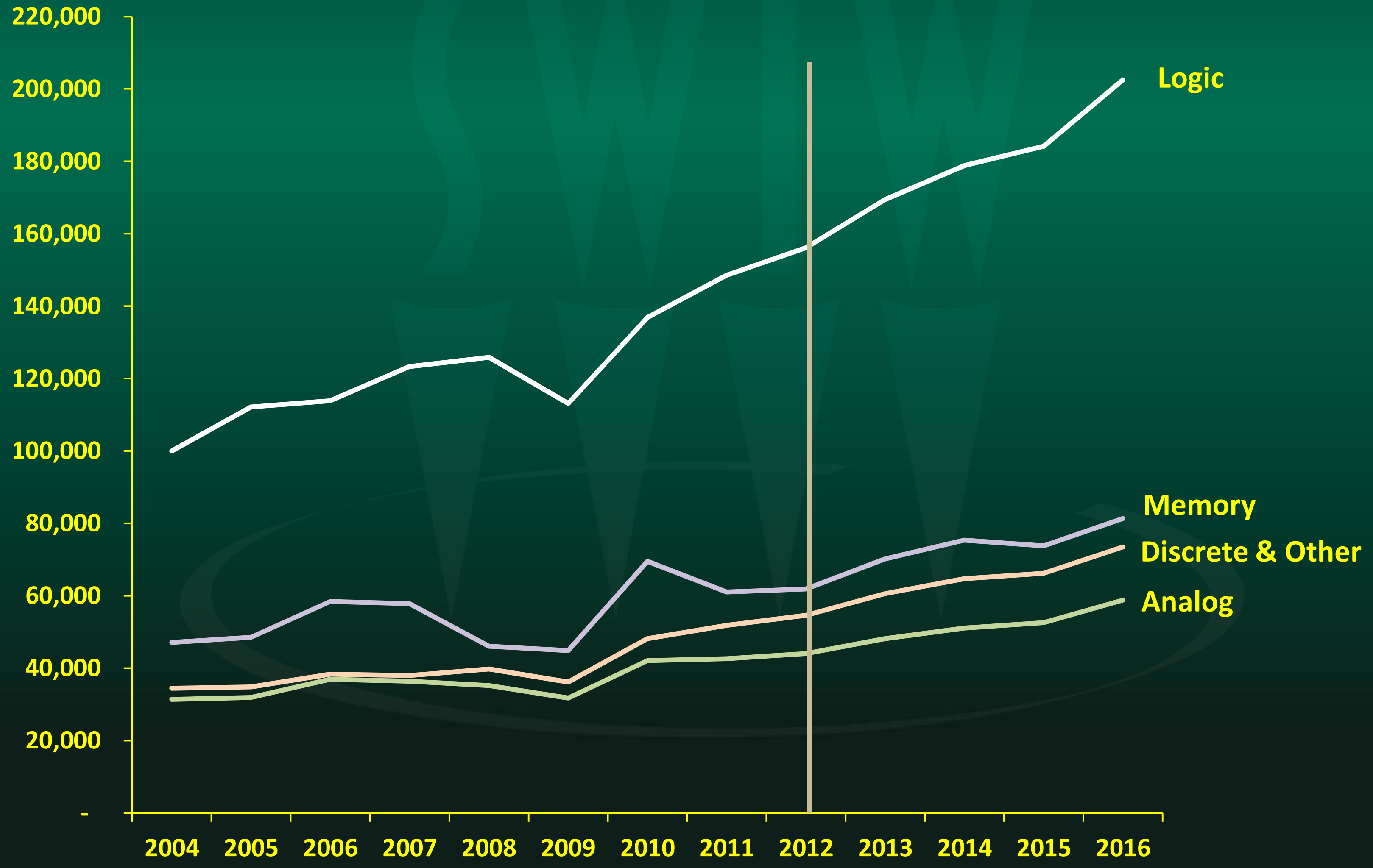
Utilization Rates… improving



Utilization rates at the subcons are rising fast

Driven primarily by strong demand in the mobile space amid new product introductions

Semiconductors, $M

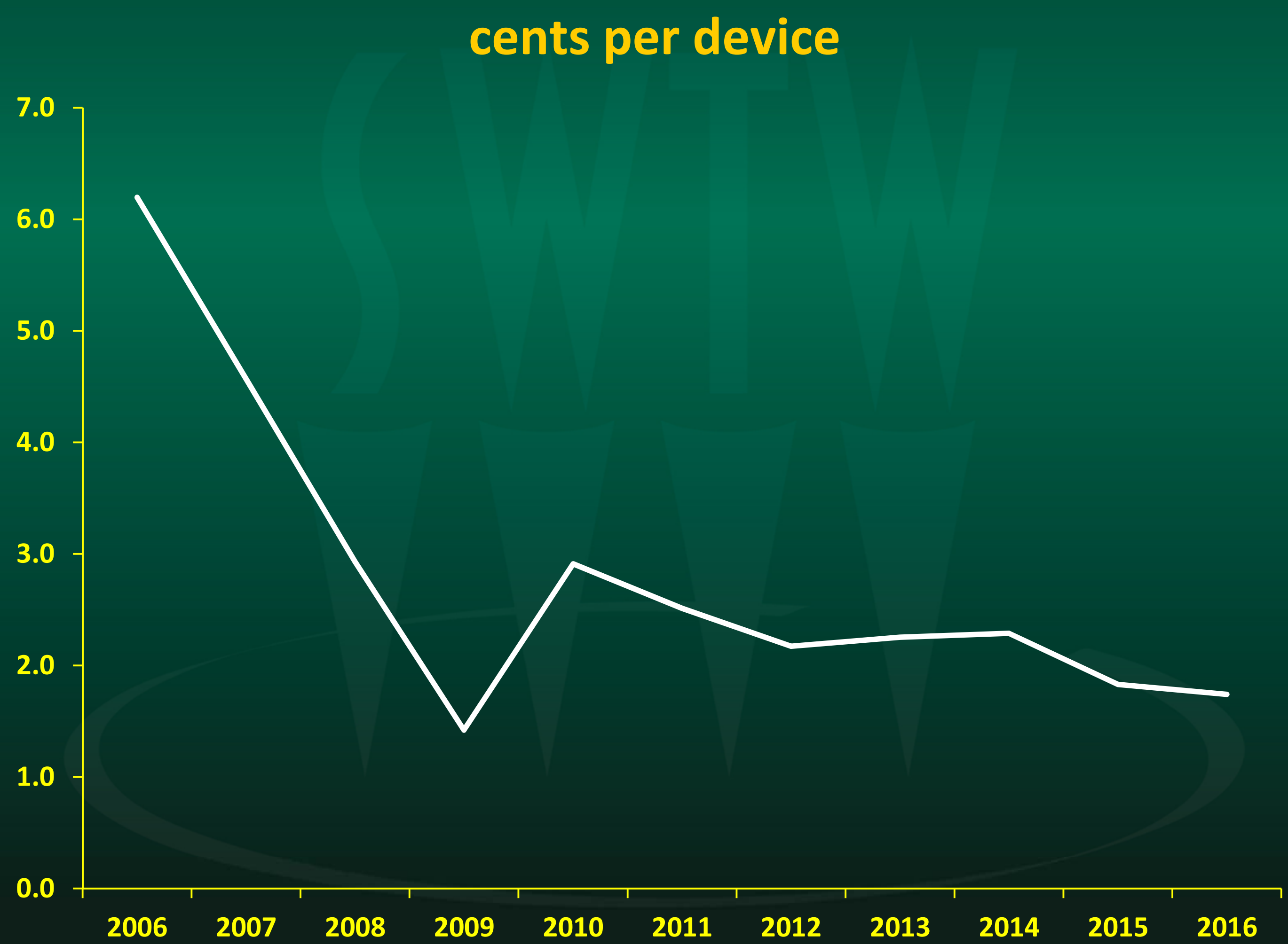


ATE Systems, $M… the outlook's flat

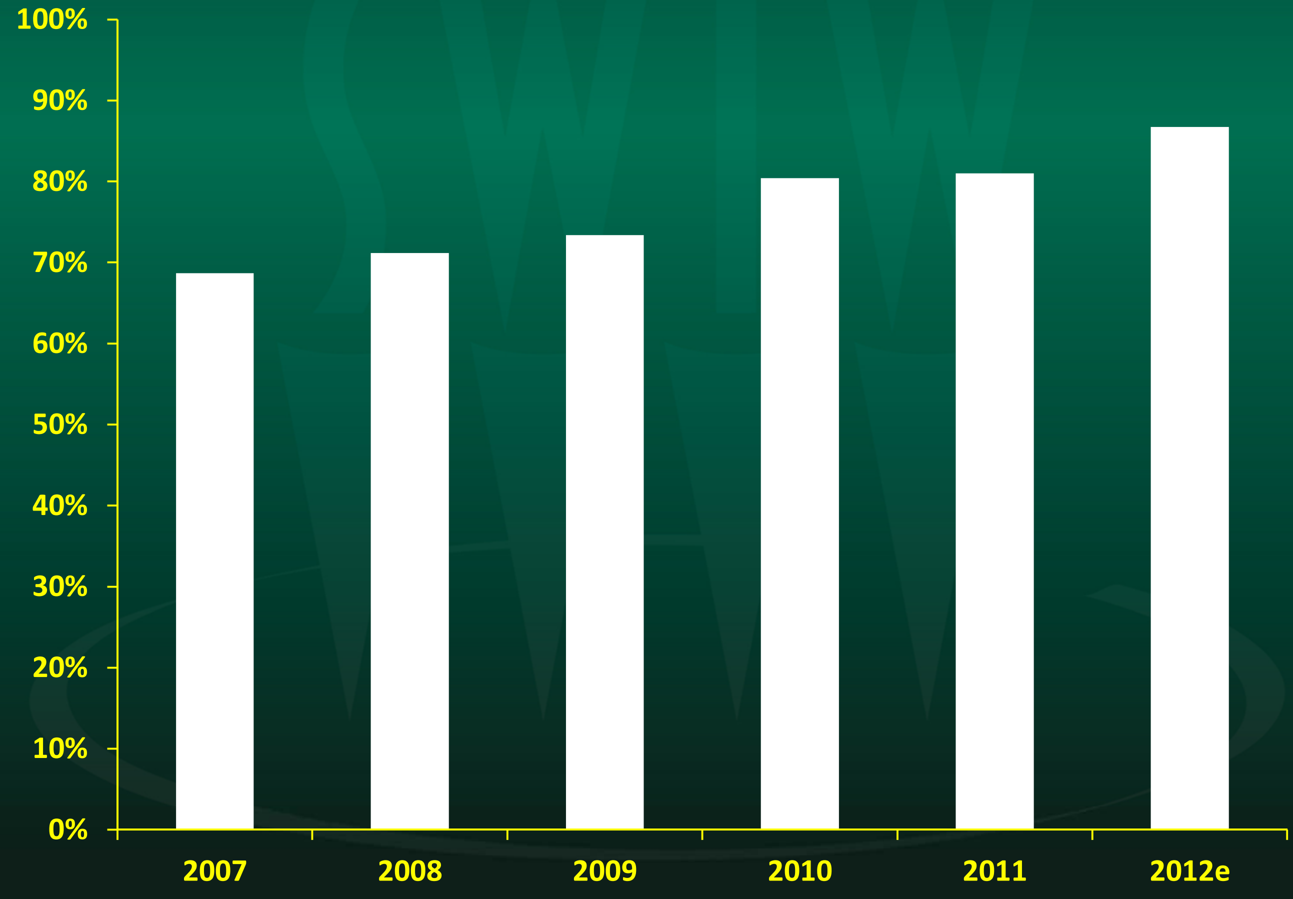
ATE Buy Rate

ATE as a % of device sales

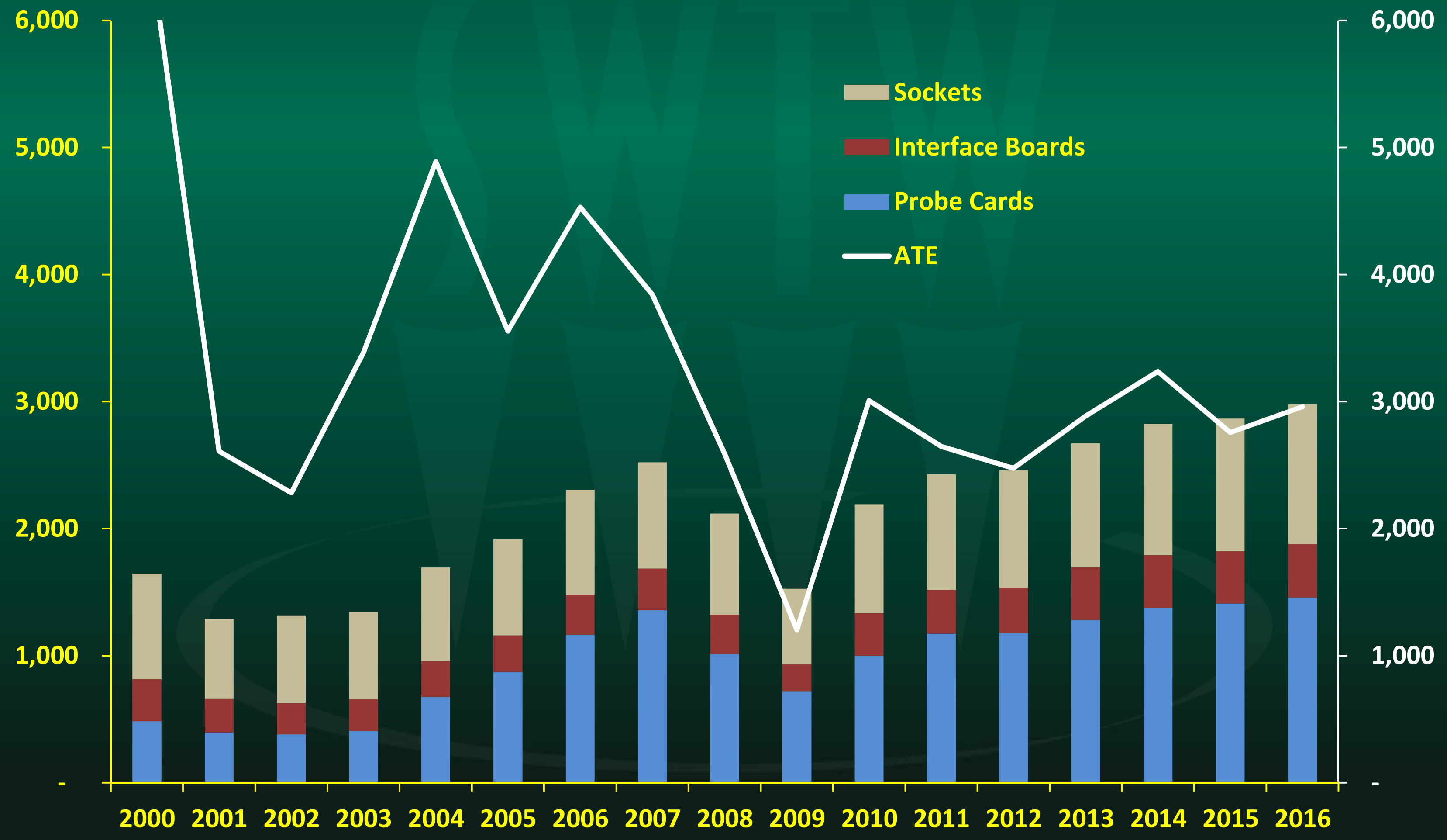
ATE Cost per Device Tested



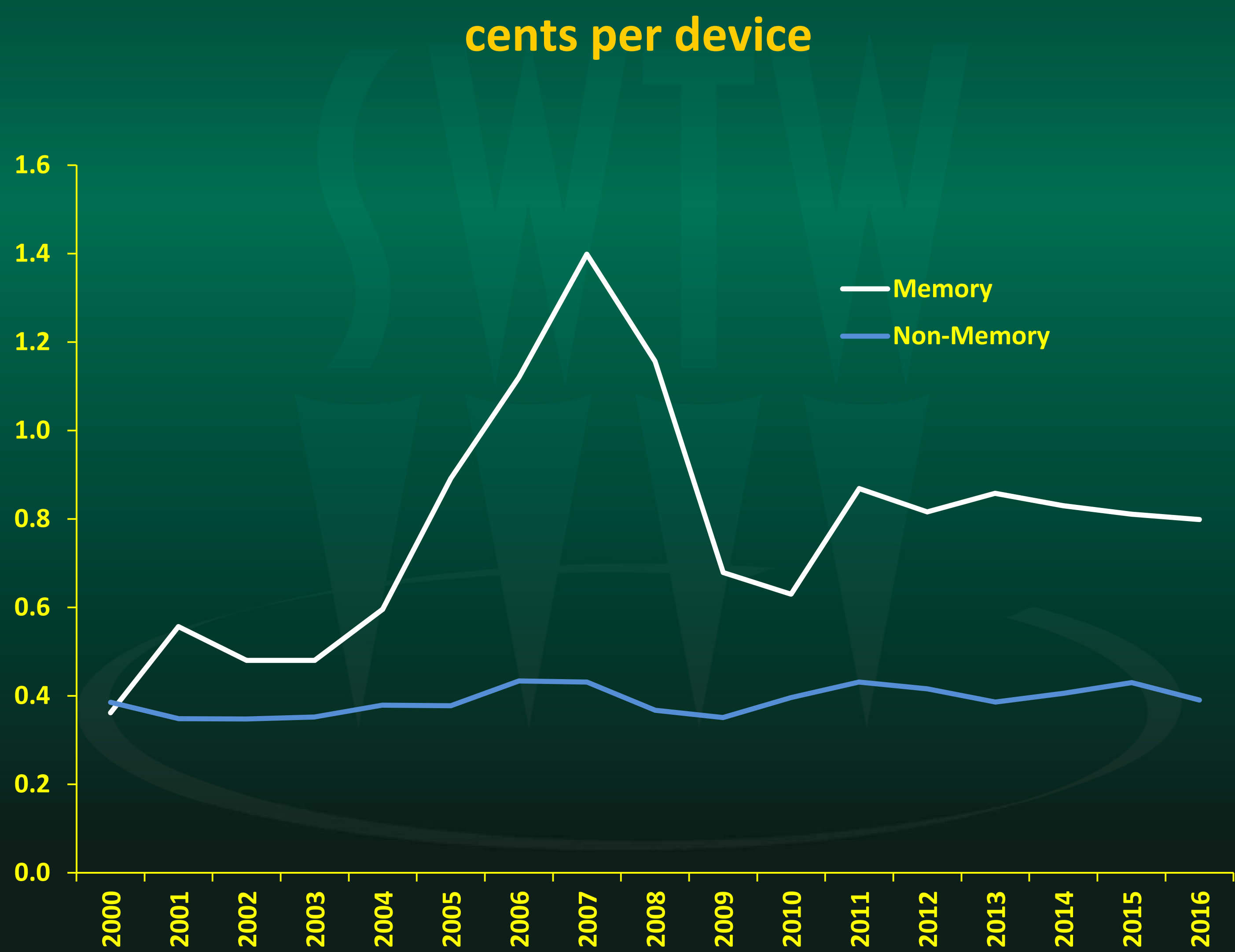
Top 3 ATE Vendors' Share of Market



Total Cost of Test, $M



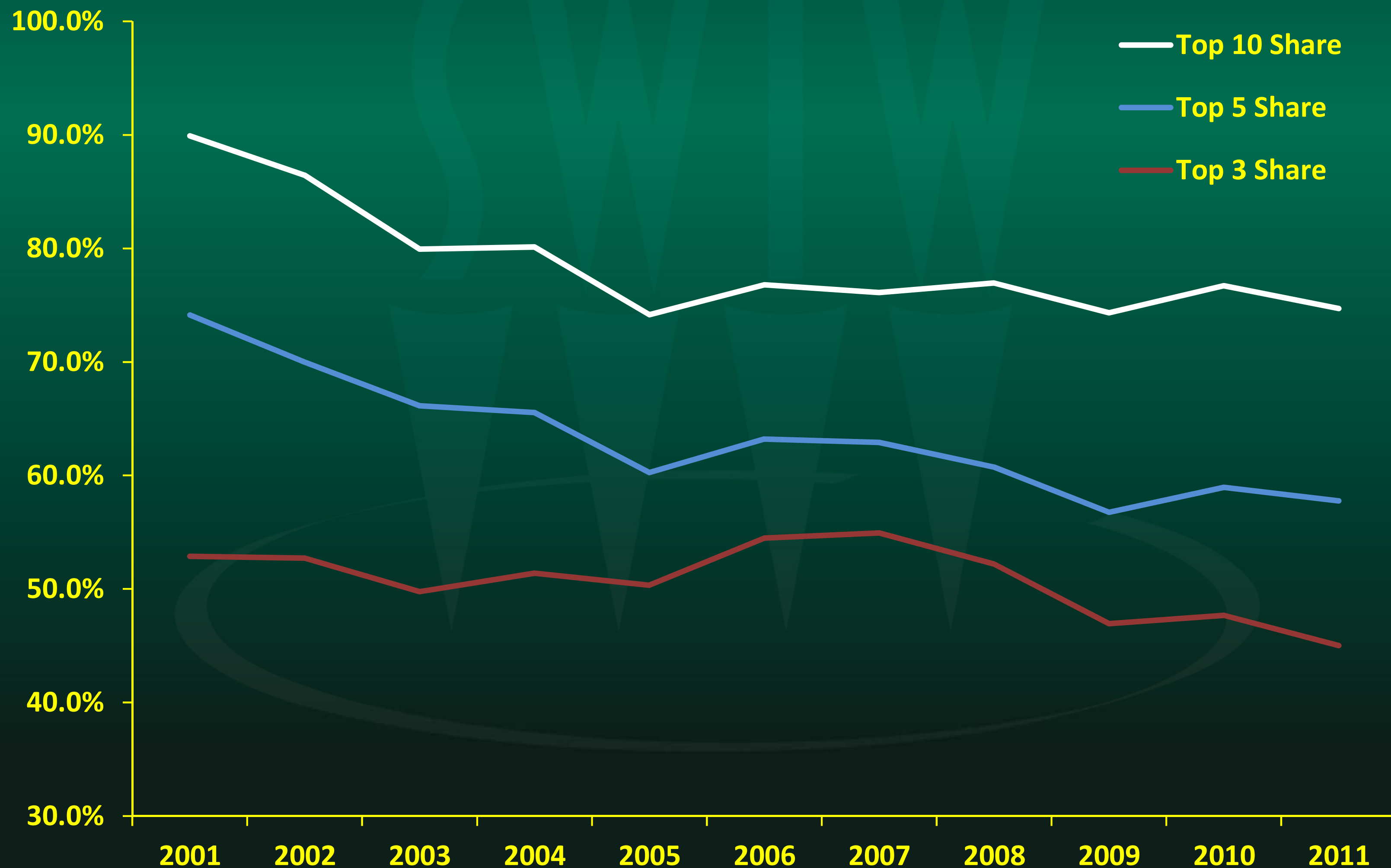
Probe Card Cost per Device Tested



Why are costs per device not falling?

- **Transition from Cantilever to Advanced**
  - doesn’t drive down cost per device tested
- **Average Selling Prices are Falling**
  - but at the same rate as IC average selling prices
- **Industry Consolidation**
  - fewer suppliers, but no consolidation at the top

Probe Card Consolidation?



Summary

- **Semiconductors**
  - 2012: revenues up 4%, units up 7%
- **Semi Equipment**
  - at least as good as 2011
- **ATE Equipment**
  - 2012: down 6.5% to $2.5Bn
- **IC Probe Cards**
  - 2012: flat at $1.2Bn

Thank You

John West
VLSI Research Europe
Cambridge, UK
+44 1223 393633
johnwest@vlsiresearch.com