



2010: In Search Of Answers

EDAC Panel Presentation – John Kibarian

Discussion document

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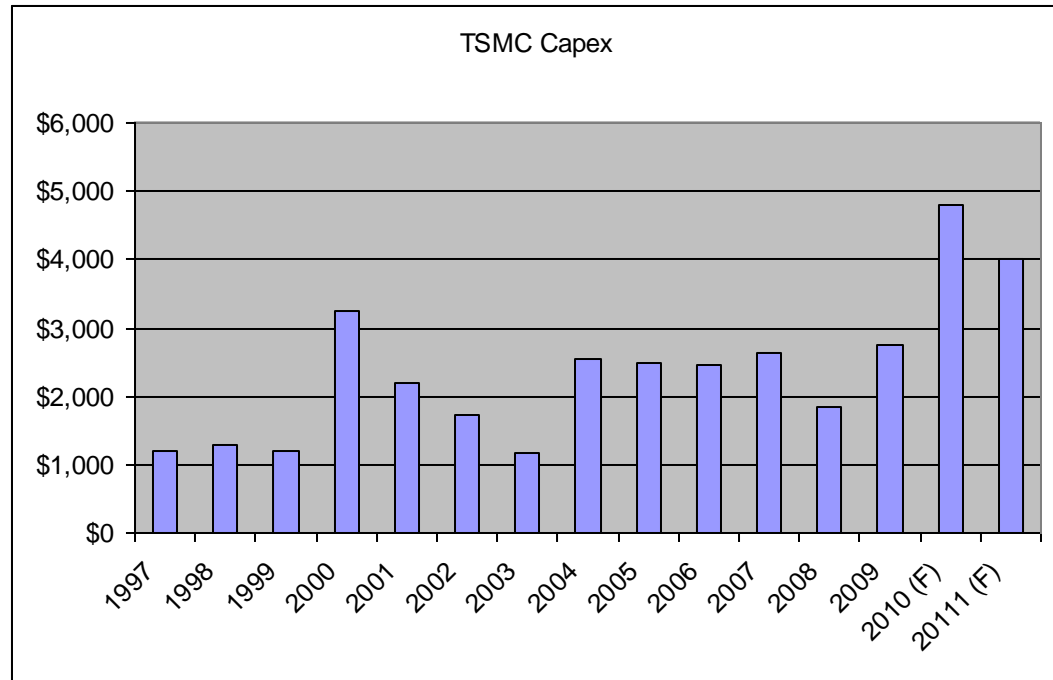
2010: In Search of Answers

- **Are we over shooting logic capacity or is this growth sustainable?**
- **What flavor of 28nm technology will win?**
 - Which will address the variability crisis?
 - What does it mean for designers?

Are We Overshooting Capacity or is this Growth Sustainable?

TSMC

“2010 capital expenditure to be around US\$4.8 billion ”
Jan 29, 2010



Global Foundries

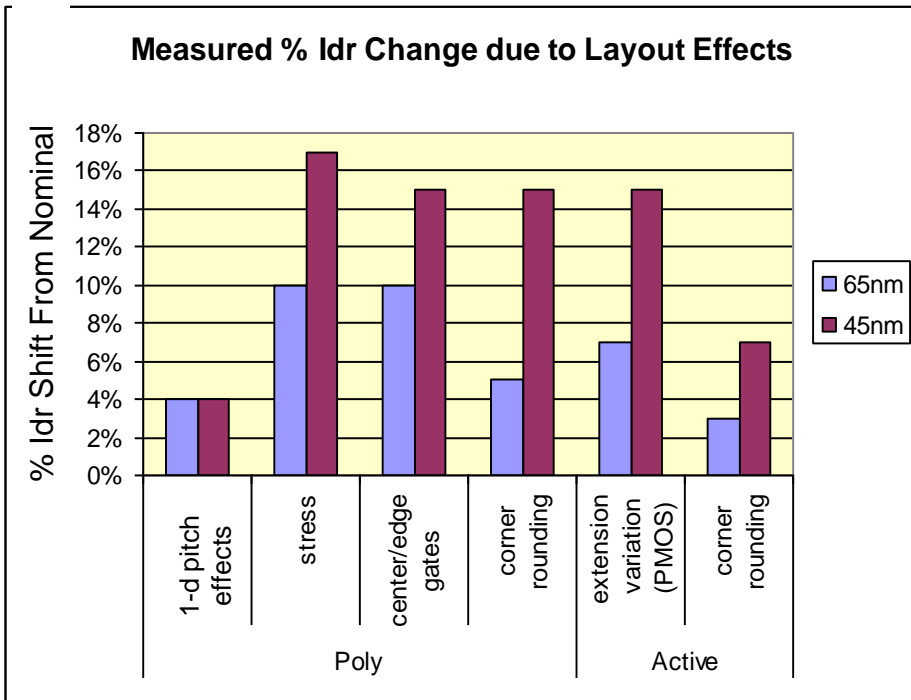
“THE COMPANY HAS US\$10 BILLION IN FINANCIAL COMMITMENT FROM INVESTORS TO SUPPORT ITS EXPANSION PLANS.

THE COMPANY SAID IT AIMS TO EXPAND ITS PRODUCTION CAPACITY TO 1.6 MILLION 300-MILLIMETER WAFERS ANNUALLY BY 2014, ROUGHLY 2.5 TIMES ITS CURRENT CAPACITY”

-Wall Street Journal, Jan 12, 2010

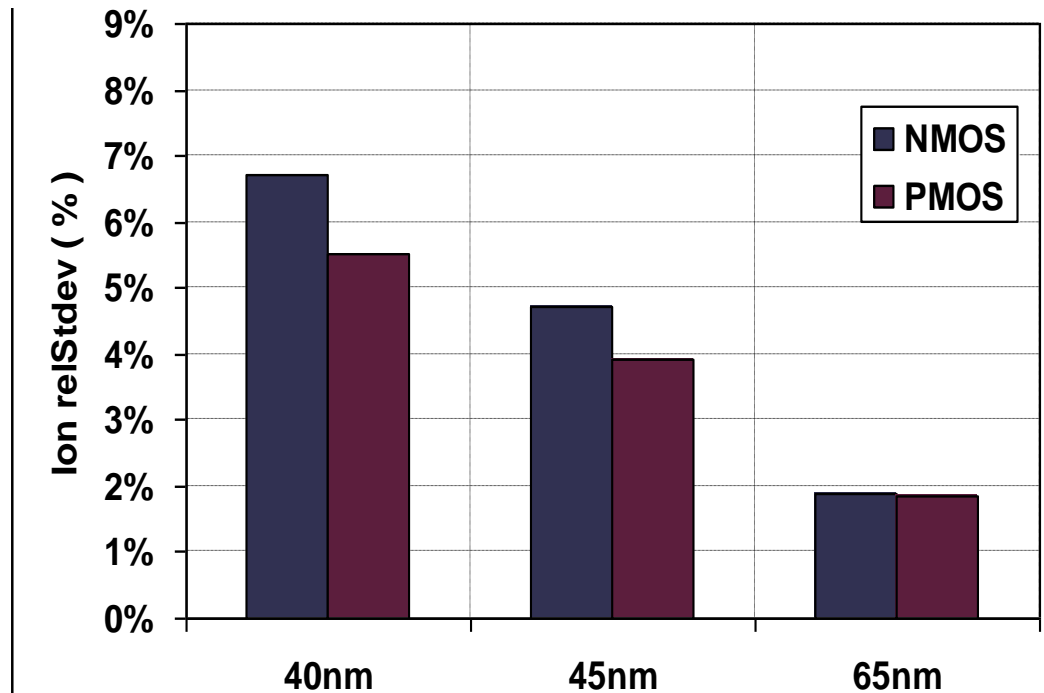
What Flavor of 28nm Technology Wins?

45/65 nm PMOS Measurement
Layout Dependency



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40/45/65 nm Random Variability



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Implications of Escalating Layout Dependent and Random Variability:

- SRAM sensitivities are causing delays at 45/40, and will be showstoppers at 32/28 without HKMG
- SPICE model accuracy is inherently flawed due to layout dependencies
- Leakage power and Vth variability problems are becoming exponentially more severe
- Process readiness assessments failing to cover complexity of design space being used