

Analog Automation, the Ever Coming Revolution

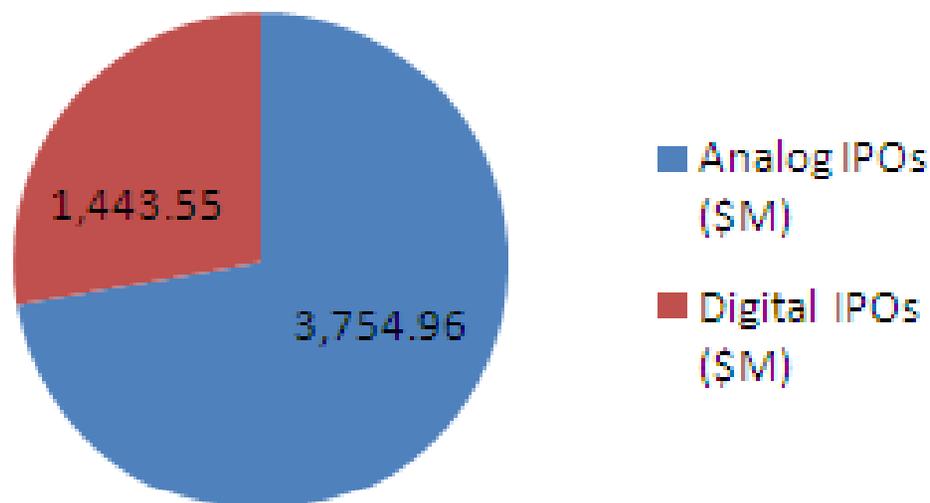
Dr. Juan-Antonio Carballo, IBM

Analog is where business value is moving

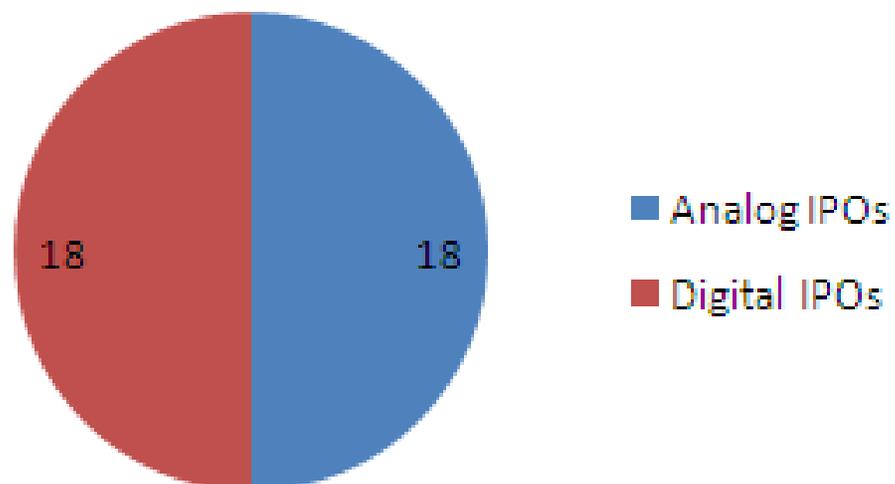
(well , and Software too...)

Just look at semicon IPOs in last 5 years

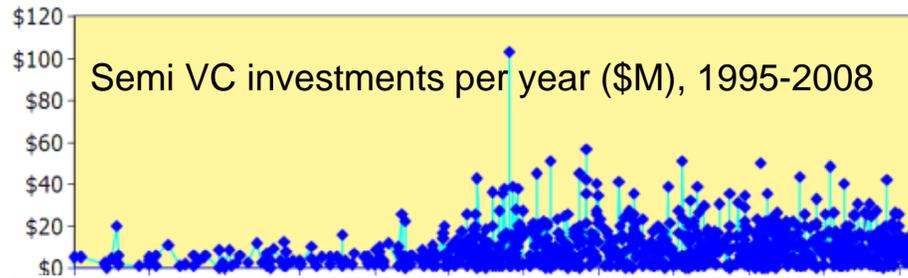
Their value



Their number



A New Level of Collaboration is Needed



Revolution?



Growth players

Semicon VC investment flattening
Increasingly difficult Venture exits
Exploding capital needs

*Co-develop analog
methods and circuits*

**Integrated Design
and Manufacturing**

**Design-to-Fab
Collaboration**

**Fab-to-Fab
Collaboration**

**Private(VC)-Public
Design Collaboration**

80s - Integration

90s – Fabless

2000s - Consortia

2010s - platforms

Fab-compatible semicon platforms
Wildly swinging asset utilization
Exploding capital investment

Large players

So what Should this Collaboration target?



- Analog revolution not even close yet
- What *could* be done to arrive
 - Focus on innovative trade-offs: e.g. area/node for predictability
 - Try: Fewer spins, less capex, less NRE
 - Result: Higher price, revenue, profit → higher ROI
 - Focus on IP and/or services
 - If it's not automated, *reuse* and *reconfigure*
 - High-end analog/RF difficult to reproduce
 - Focus on manufacturing interface
 - Existing gaps in analog DFM/RET/OPC
 - Fast design-driven process reconfiguration/optimization
 - **MEMS! Memory!**
 - Focus on automation
 - First, common analysis and optimization tasks
 - Then synthesis