



Morgan Stanley

Semi Industry Forum 4.0: *What happens next?*

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Renaissance Period for Semiconductors

Strong Secular Demand Drivers

Tight Supply Exacerbated by COVID Impact

Geopolitical Issues Driving Government Support

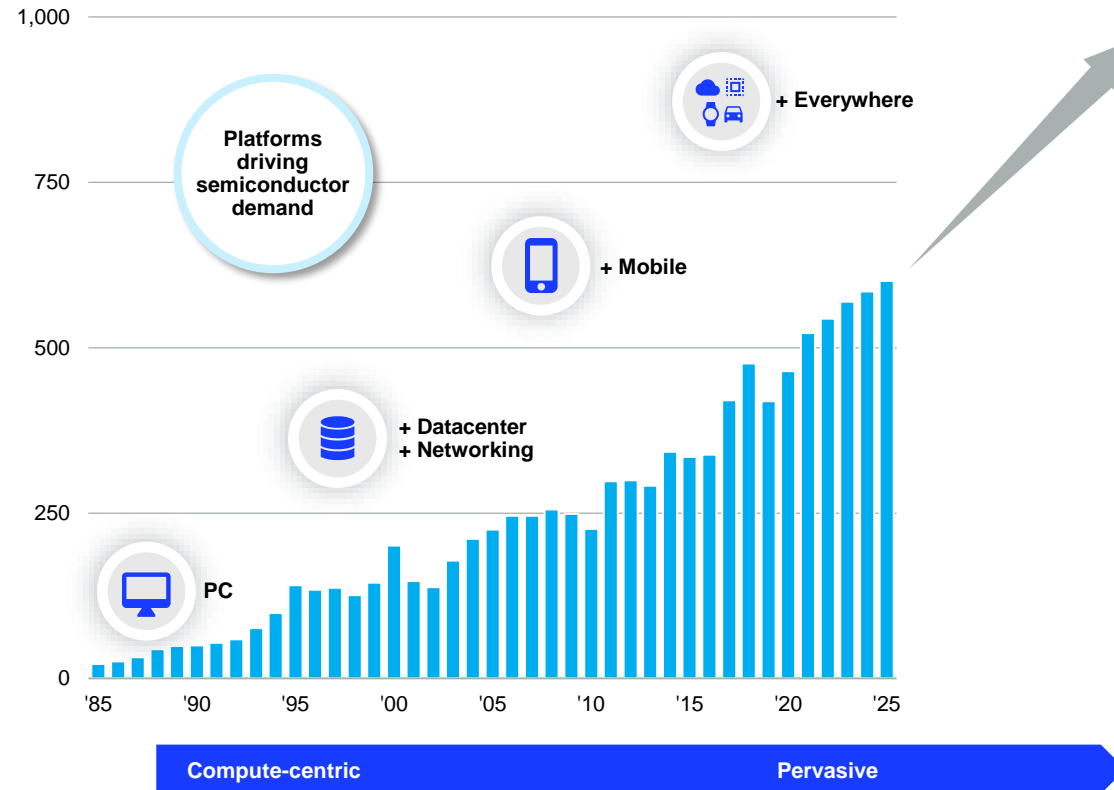
Consolidation From M&A Creating Scarcity Value

Power Within Tech Sector Shifting To Semiconductors

New Golden Age for Semiconductors

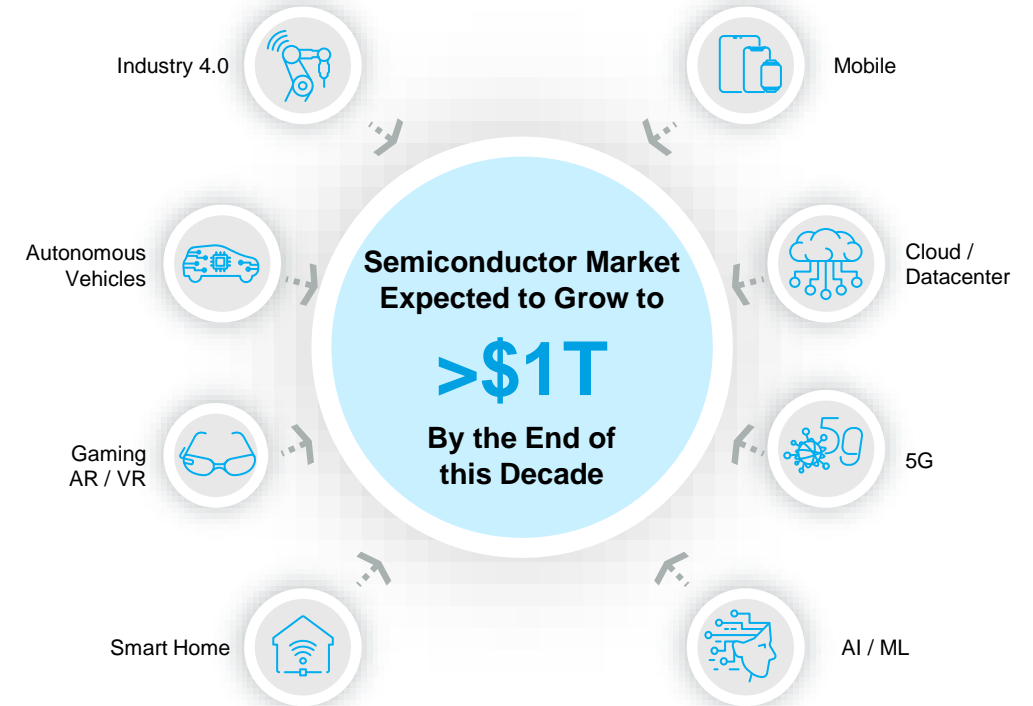
New Golden Age for Semiconductors

Semiconductor Industry Revenue, \$Bn



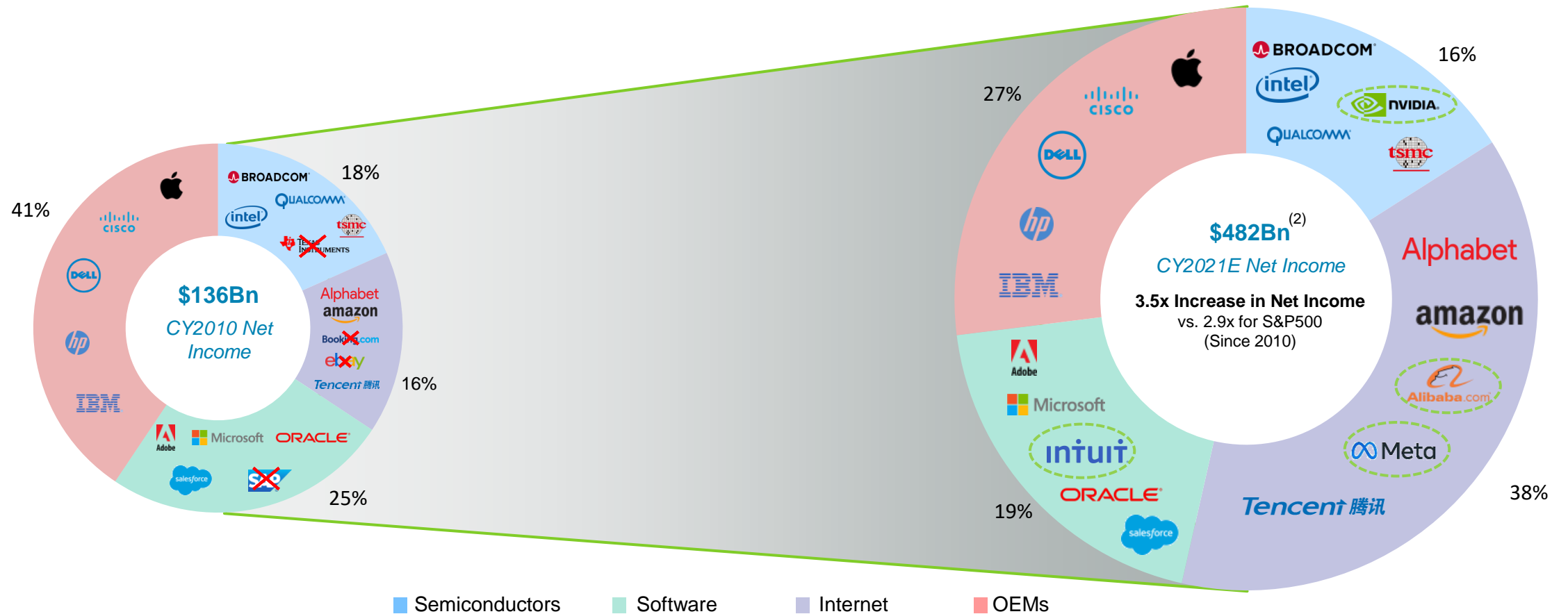
Source: Statista, IDC Worldwide Semiconductor Forecast Update May 2021

Broad Range of Secular Megatrends Driving Semiconductor Industry Growth Acceleration to Support Digital Transformation



Source: IDC Worldwide Semiconductor Forecast Update May 2021

Few Changes in Players but Dramatic Shift in Composition of Largest Tech Companies Since 2010



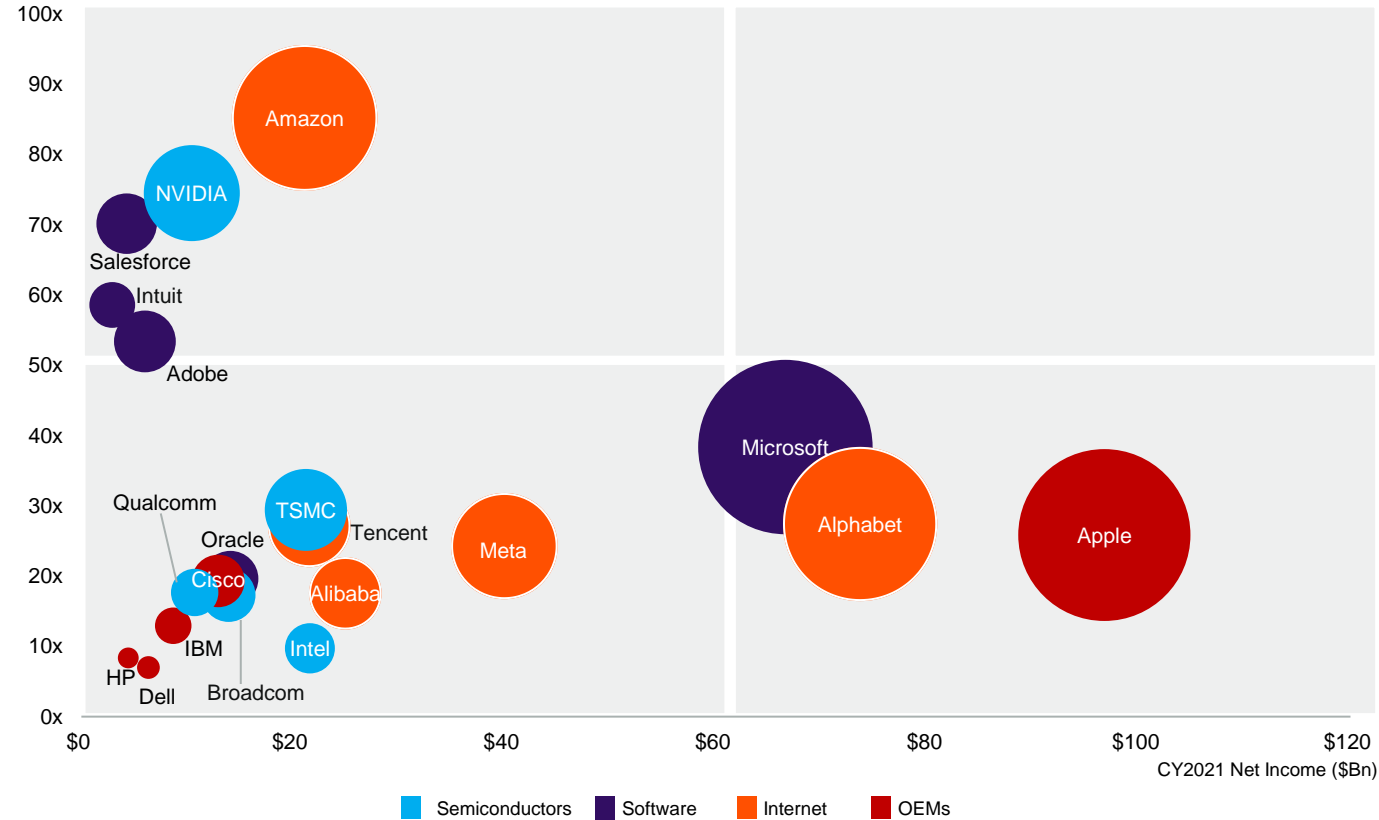
Source: Capital IQ; charts represent the aggregate net income contribution of the 5 largest tech companies in each industry vertical based on largest market cap as of the measurement date

- Notes:
 1. As of 8/17/2020
 2. Market data as of 11/11/2021

Largest Semiconductor Companies Growing Slower than Tech Peers but Generating Significant Free Cash Flow

CY2021 Net Income vs. P / E

CY2021 P / E



Notes:
 1. Market data and Thomson estimates as of 11/8/2021
 2. Defined as EBITDA – Capex

○ Size of Bubble = Market Cap

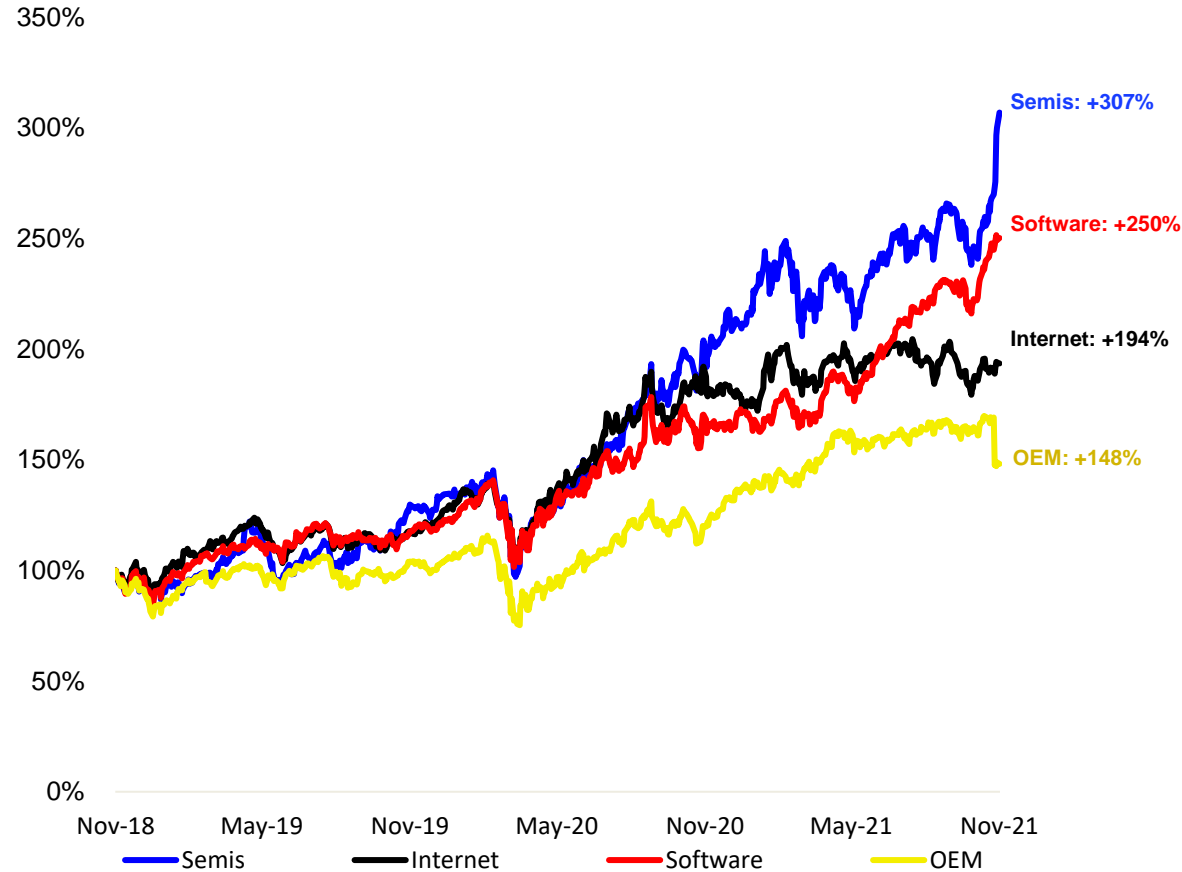
Key CY2021E Segment Combined Metrics for Top 5 Players

Revenue / Growth (\$Bn / %)	FCF Margin ⁽²⁾ (%)
Semiconductors	
\$220 / 16%	28%
Software	
\$278 / 20%	37%
Internet	
\$1,069 / 31%	18%
OEMs	
\$657 / 18%	25%

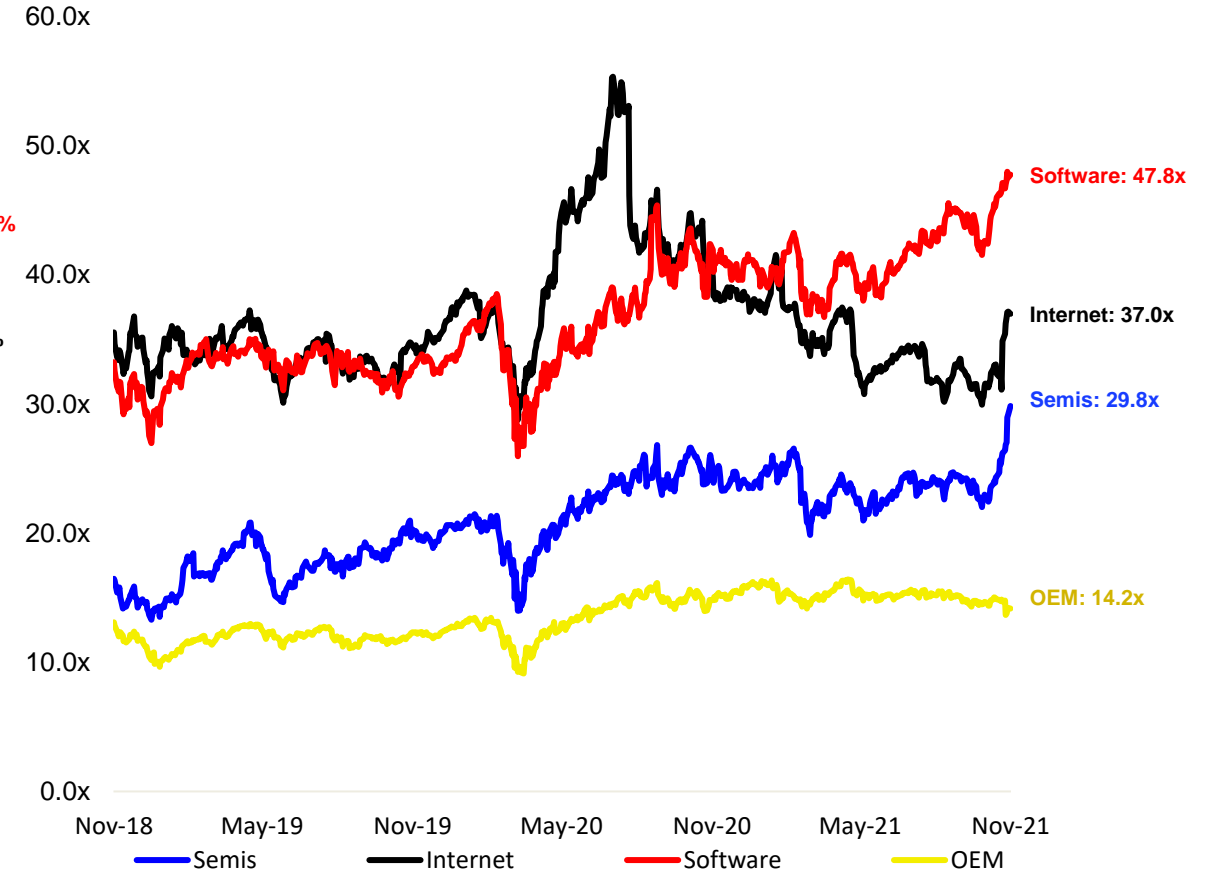
Top Semiconductor Companies have Meaningfully Outperformed Peers in Other Tech Sectors

Last 3 Years

Indexed Share Price Performance by Top 5 Companies in Each Sector⁽²⁾



NTM P / E Multiple By Sector

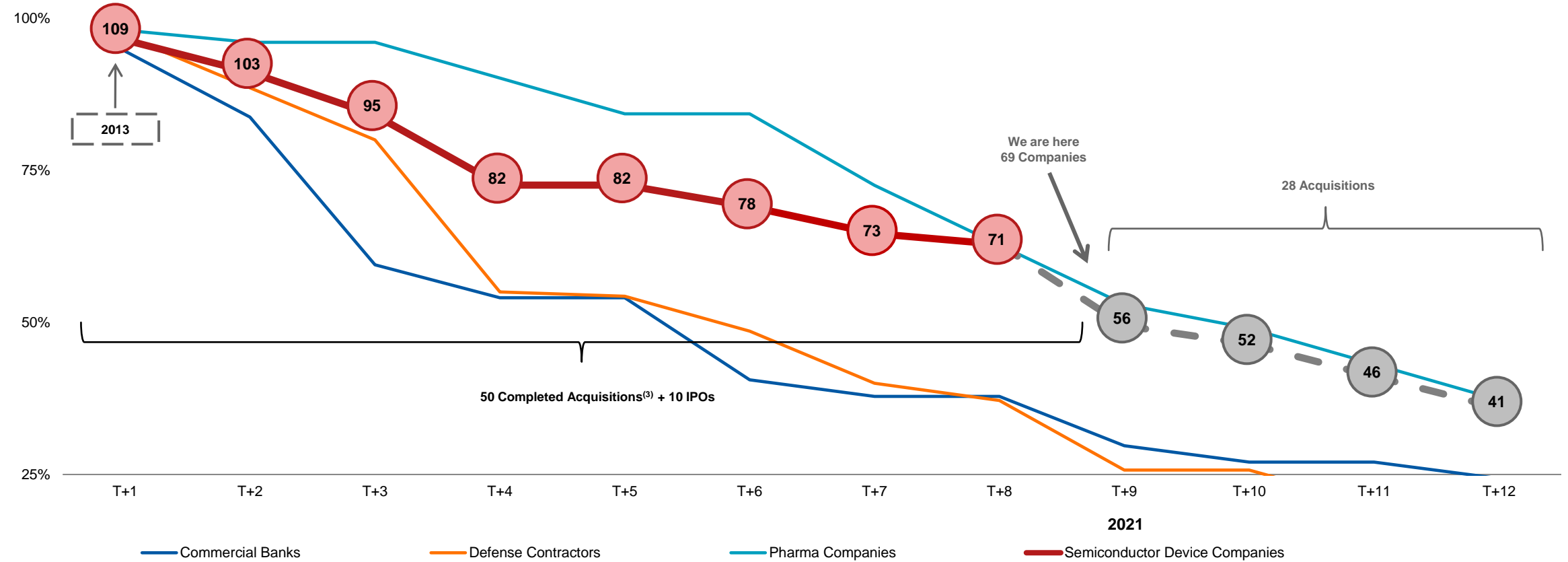


Notes:
 1. Market data and Refinitiv consensus as of 11/8/2021
 2. Top 5 companies by market cap. Semis companies include: NVIDIA, TSMC, Qualcomm, Broadcom, Intel. Internet companies include: Amazon, Alphabet, Tencent, Meta, Alibaba. Software companies include: Microsoft, Adobe, Salesforce, Oracle, Intuit. OEM companies include: Apple, Cisco, IBM, Dell, HP

Secular Consolidation Trend Should Continue

All Companies on a Relative Basis as a % of Initial Consolidation

2013 – 2024E

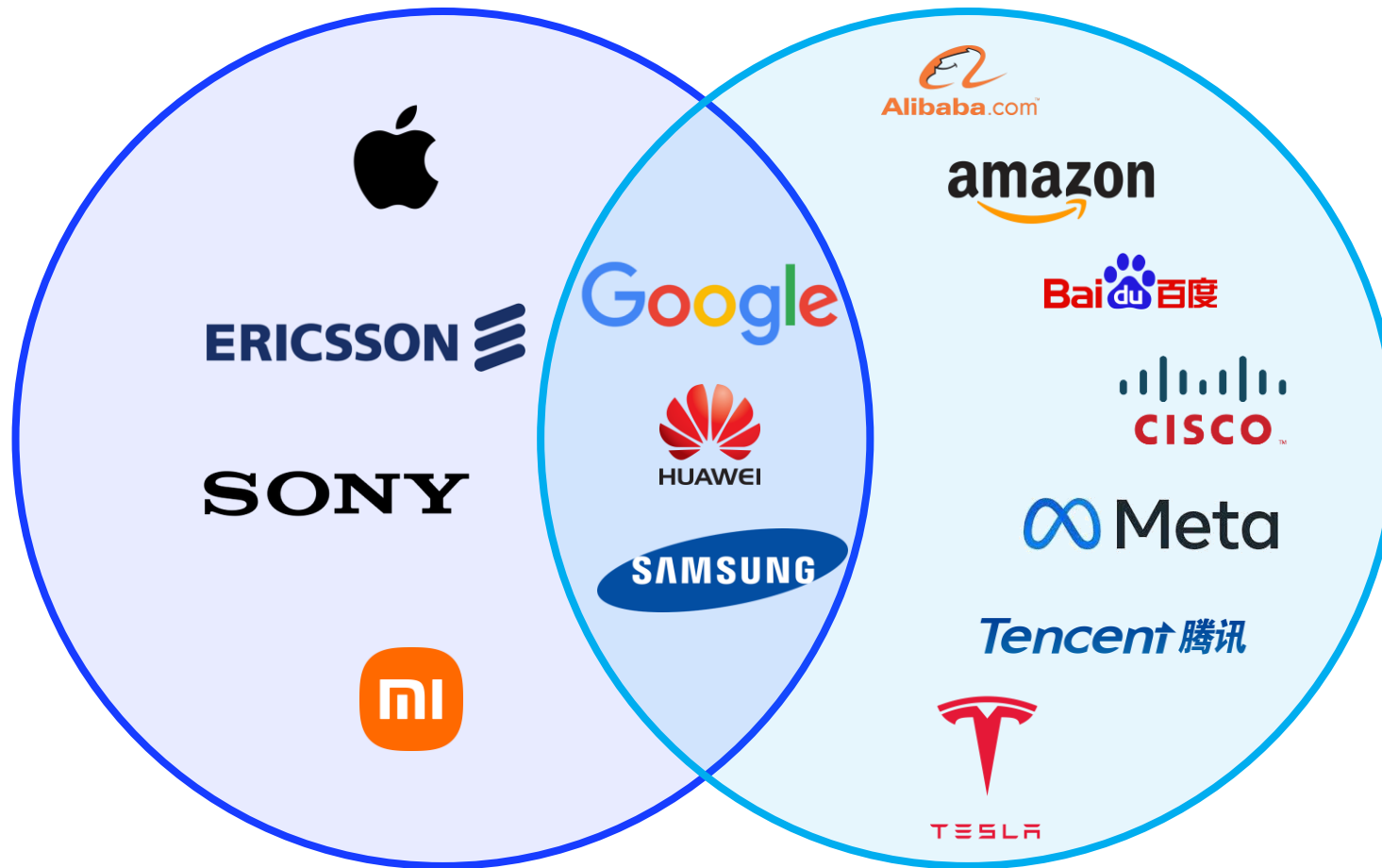


Notes:
 1. Market Data as of November 2021
 2. Excludes Chinese IPOs since 2013
 3. Excludes 4 companies with less than \$100MM in revenue at time of acquisition

Companies With Semiconductor-Based Vertical Integration Strategies

Mobile / Compute

AI / Datacenter



Pros and Cons of Vertical Integration

Pros	
✓	Differentiation of end product or service features
✓	Potential time-to-market advantages
✓	Eliminate margin stack to IC suppliers
✓	Opportunity to better control destiny

Cons	
✗	Structurally lower margins than software and services businesses
✗	Lack of scale and breadth creates inefficiencies
✗	Poor execution will likely harm overall business and destroy value
✗	Merchant suppliers should be able to lead and out-innovate captive players

GlobalFoundries is A Microcosm of How the Balance of Power is Shifting in Semiconductors

Select Customer Commitments

	Year Signed	Contract Duration (Years)	Revenue Commitment (\$Bn)	Technology	Core End Products
Customer 1	2021	4	>\$3.0	FinFET, CMOS, BCD CMOS, FDX™, RF SOI	Various Mobile Products
Customer 2	2021	6	>\$2.5	eNVM CMOS	NFC and UWB Secure Element, Secure Cards
Customer 3	2021	3	>\$1.5	FinFET	Various Computing Products, Automotive Processors
Customer 4	2021	4	>\$1.5	eNVM CMOS	Automotive MCU, Secure Cards
Customer 5	2021	4	>\$1.5	RF SOI	Various Mobile Products
Customer 6	2020 / 2021	4	>\$1.5	FinFET, CMOS	High-End Image Sensor and DTV Processor
Customer 7	2021	5	>\$1.5	BCD CMOS	Mobile Audio, Haptic and Power
Customer 8	2021	5	>\$1.0	FinFET	Various Computing Products
Customer 9	2021	4	>\$1.0	CMOS, FDX™	Various Mobile Products
Customer 10	2020 / 2021	5	>\$1.0	CMOS	Image Sensor Processors
Customer 11	2021	4	>\$0.5	FinFET	Network and Connectivity Infrastructure Processors
Customer 12	2021	3	>\$0.5	RF SOI, SiGe, BCDLite™	Various Mobile Products

>\$2.5Bn in Advanced Payments and Capacity Reservation Fees ⁽¹⁾

Notes:

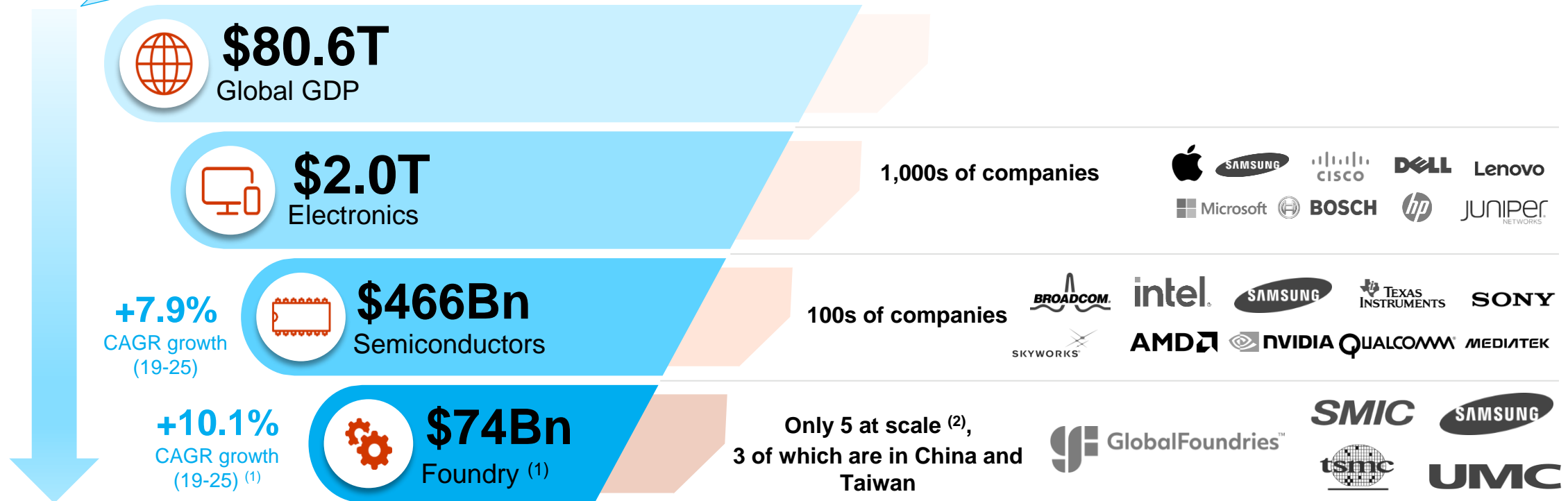
1. As of 11/1/2021



Semiconductors Will Become Increasingly More Powerful Within the Tech Sector

Market Size (2020)

The Balance of Power is Shifting to the Semiconductor Ecosystem



Source: Derived from Gartner data. Gartner Forecast, Semiconductor Foundry Revenue Supply and Demand Worldwide 2Q21 Update, July 2021

Notes:

- 1. Excluding memory
- 2. Excludes smaller foundry players, defined as those with less than \$2Bn of foundry revenue (e.g., Intel, Skywater, Tower, WIN)



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