Decoding the Semiconductor Supply Chain

Lee Eden

Pacellico
Insight
Vision
Success

Session Overview

Pacellico

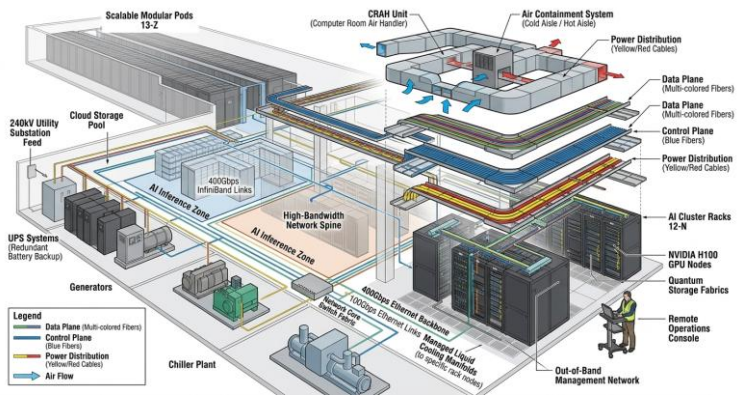
01	02	03	04
Semiconductor Market	**Supply Chain**	**Bullwhip**	**How to Survive and WIN**
What is driving the market and where is it going?	The tiers of the semiconductor supply chain	Why is semiconductor so cyclical?	Key inputs, enablers and outputs for success in semiconductor

Disclaimer The views and projections expressed represent the subjective assessment of Pacellico s.r.o. based on currently available market data. Provided for illustrative purposes only and should not be taken as an indicator or assurance of future business opportunities or performance.

Forecast for the Semiconductor Industry 2026 - 2030

Pacellico

Analyst consensus is variable in magnitude — but the upward trend is undisputed.

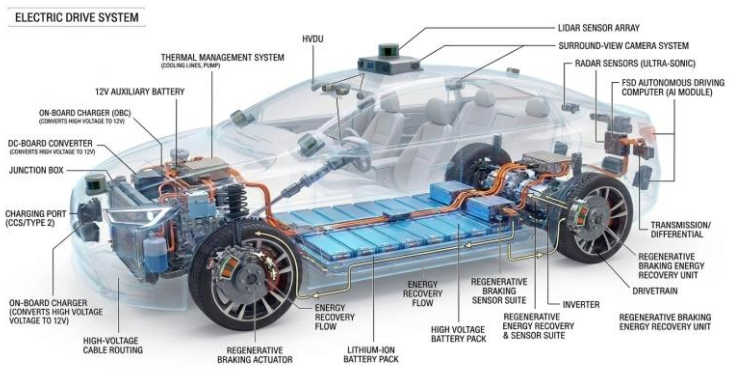


11–27%

CAGR

Data Centres & Servers

Generative AI- LLMs, Graphics Processing, high-bandwidth memory, control systems, satellites and communications.

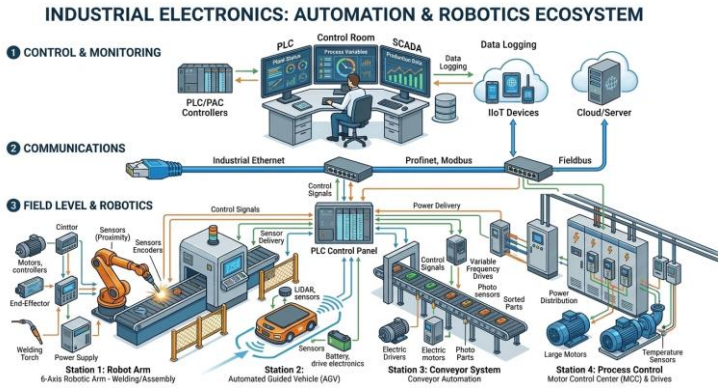


9–11%

CAGR

Automotive

EVs, charging infrastructure, Full Self Driving, battery management, traction inverters, in-vehicle connectivity.



7–10%

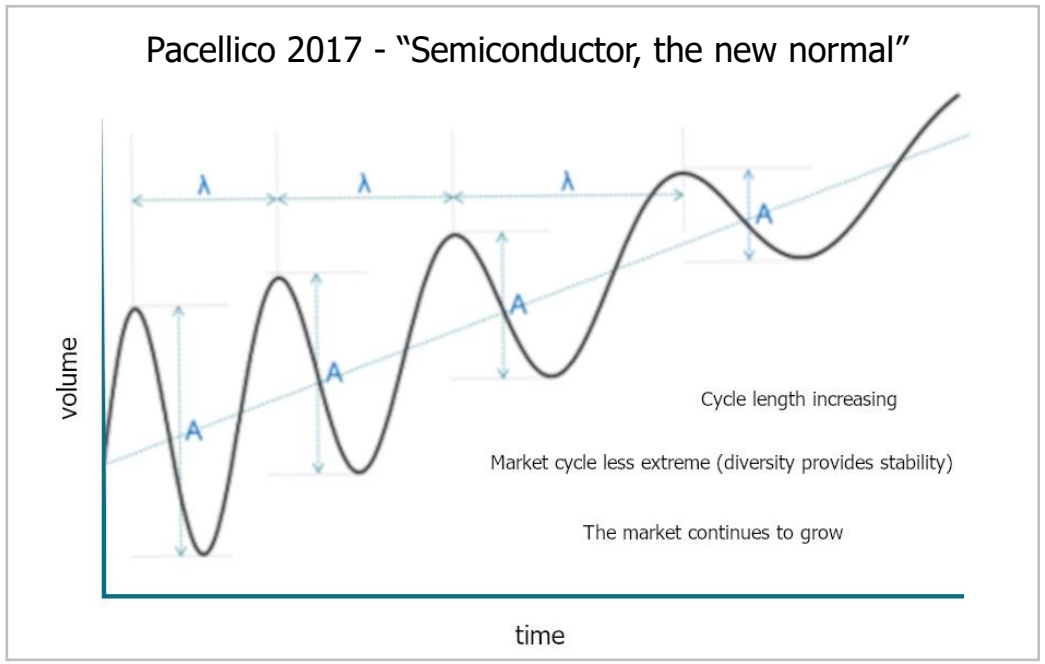
CAGR

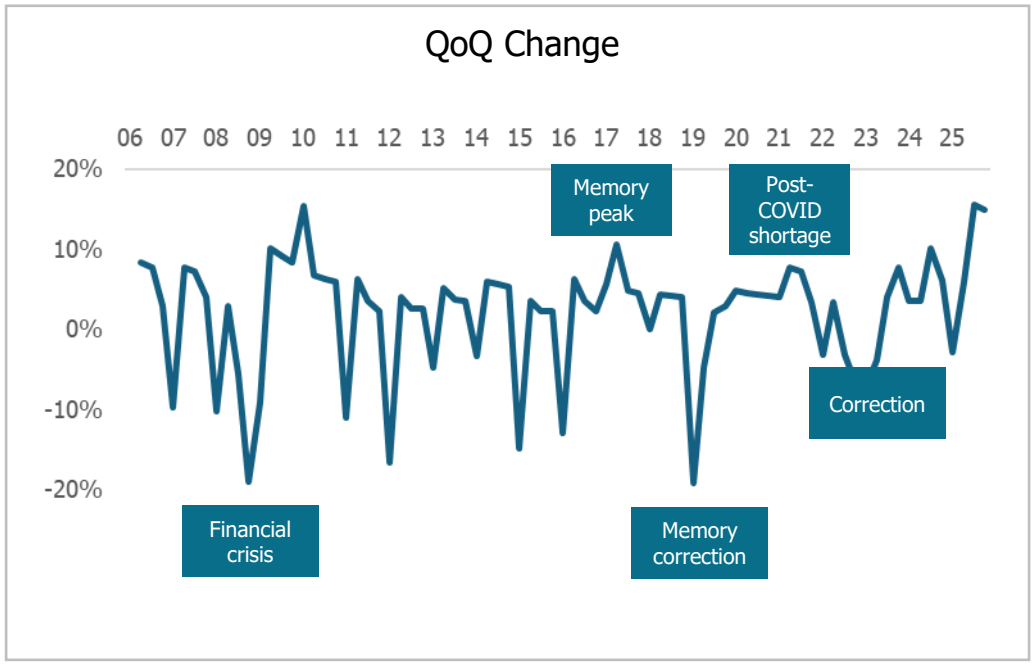
Industrial Electronics

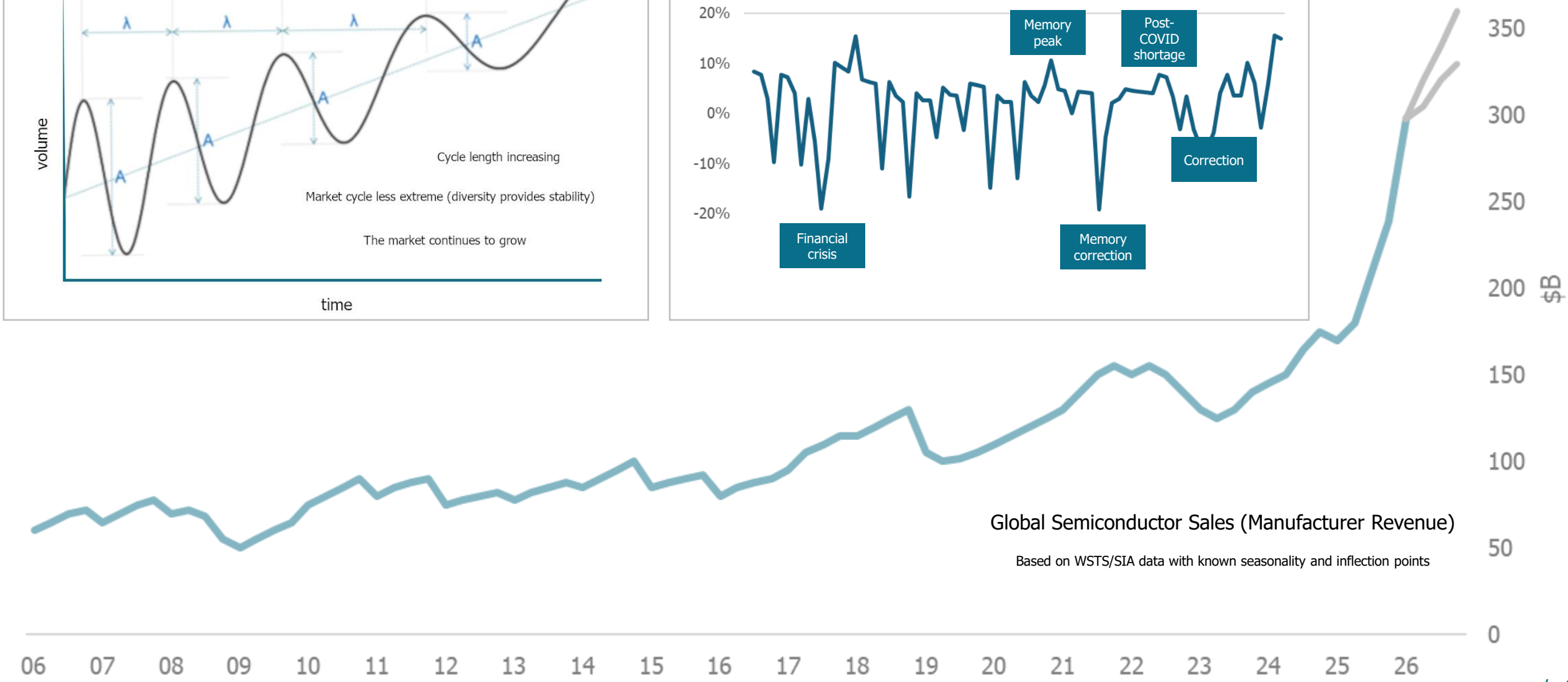
Factory automation, energy storage, power inverters, smart grid and robotics.

Source: Top-tier semiconductor analysts, aggregated 2026 outlook.

Semiconductor Market Size







Semiconductor Supply Chain Tiers

Pacellico

Semiconductor Markets

Wafer Fabrication and Tools

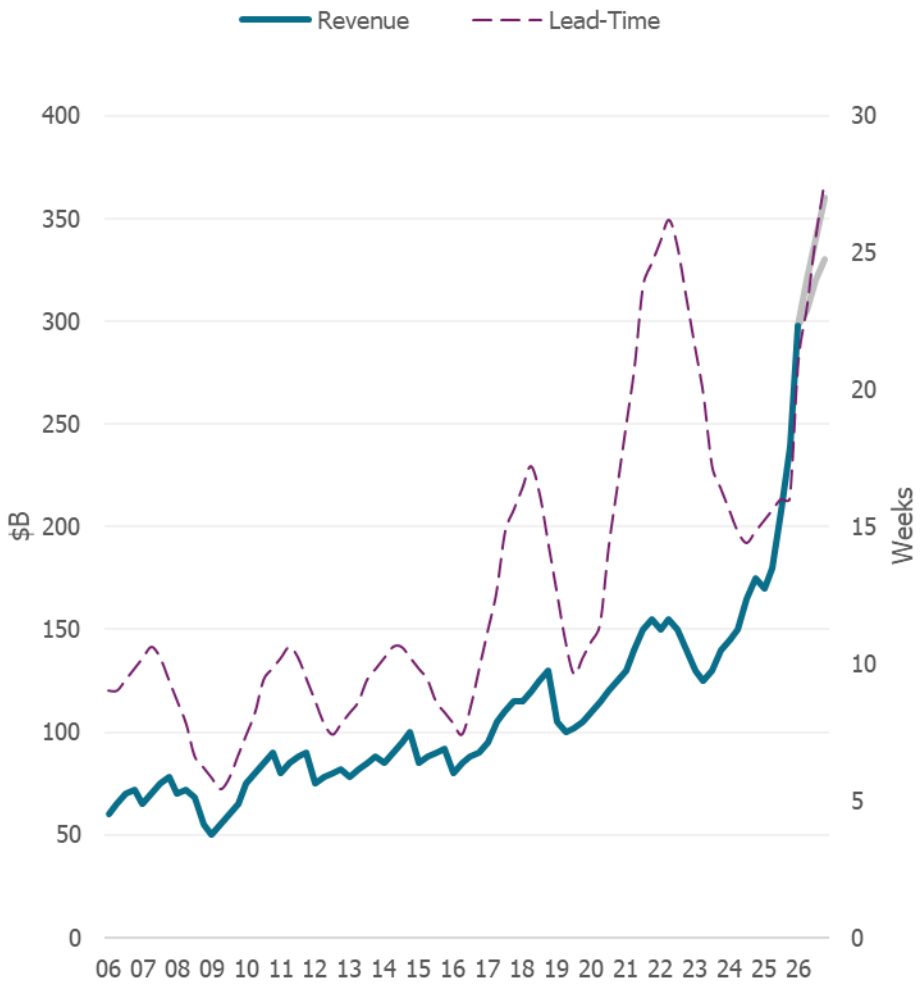
Tier 1: Systems

Tier 2: System Components

Tier 3: Raw Materials

Lead Time

PO lead time increases when capacity is tight



The real lead time to increase capacity is longer

new fab: 3-5 years | existing fab expansion: 9-18 months | tools: 12-24 months

Wafer Fabrication

chambers 1-2 years | valves 6-12 months | pumps 9-18 months

Tier 1: Systems

castings 6-18 months | magnets 12-24 months | electronics 6-12 months | motors 6-12 months

Tier 2: System Components

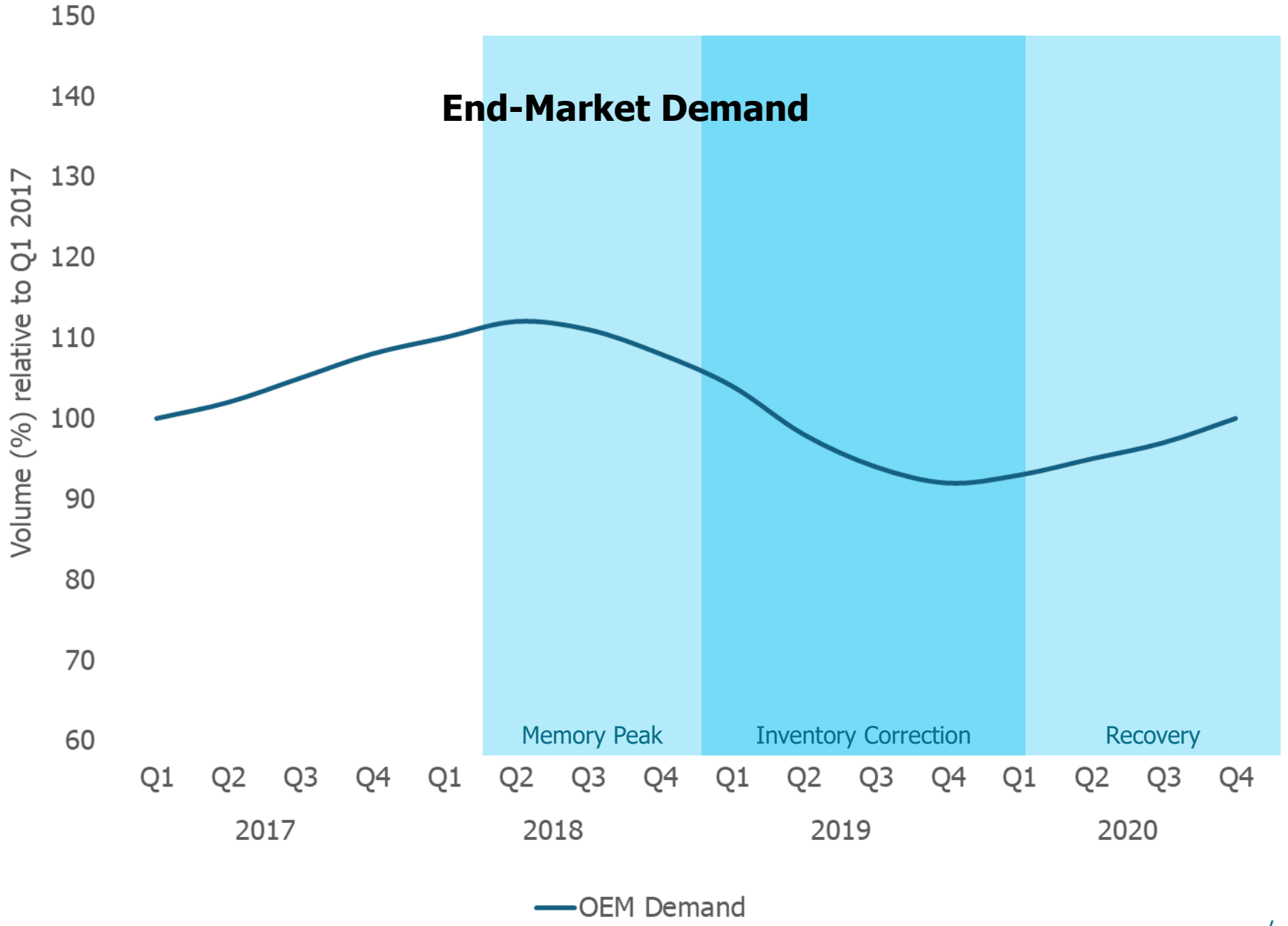
electronics 6-12 months | raw metals 3-9 months | processed metals 3-6 months | rare earth 2-5 years ?

Tier 3: Raw Materials

Bullwhip, 1. Small Demand Slowdown Begins the Cycle

Pacellico

Memory Peak 2018 Q2-Q4
Inventory Correction 2019
Recovery 2020 (start of COVID)

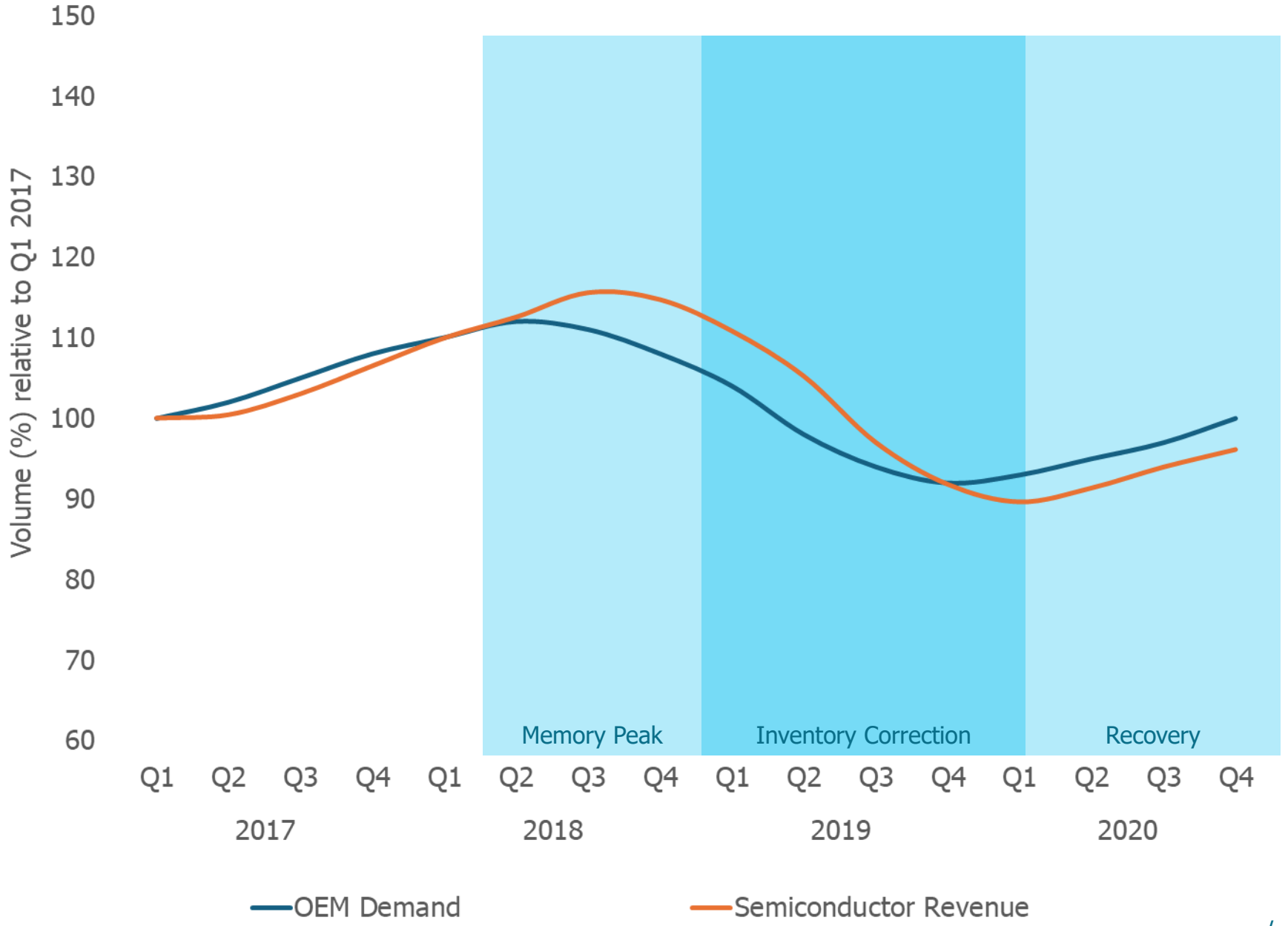


Bullwhip, 2. Inventory Triggers Semiconductor Correction

Pacellico

Memory Peak 2018 Q2-Q4
Inventory Correction 2019
Recovery 2020 (start of COVID)

Semiconductor suppliers react aggressively as inventories accumulated



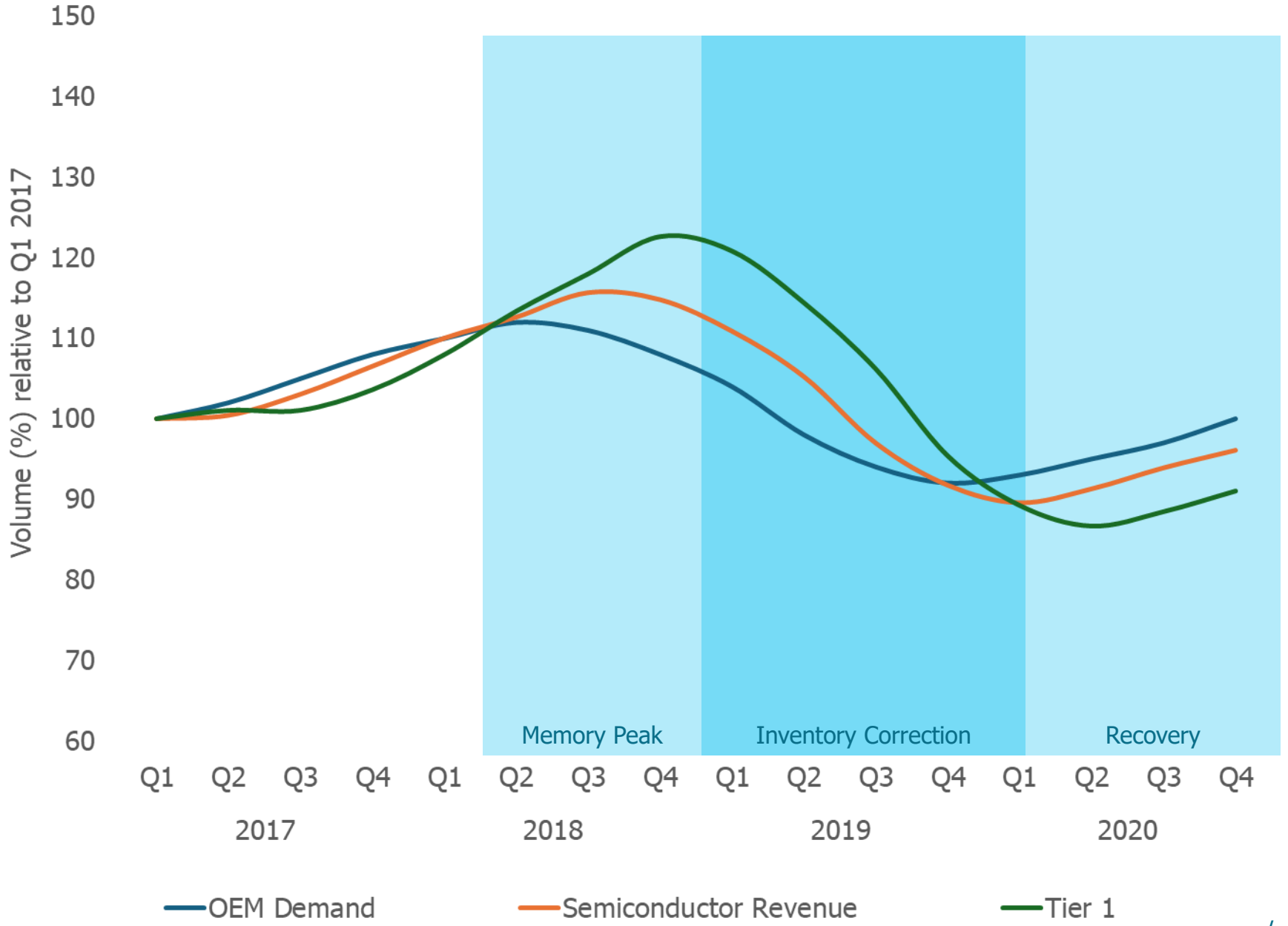
Bullwhip, 3. Tier 1 Downturn Amplified by Backlog Inertia

Pacellico

Memory Peak 2018 Q2-Q4
Inventory Correction 2019
Recovery 2020 (start of COVID)

Semiconductor suppliers react aggressively as inventories accumulated

Subsystem suppliers face order cancellations and backlog uncertainty



Bullwhip, 4. Production Commitments Drive Bullwhip

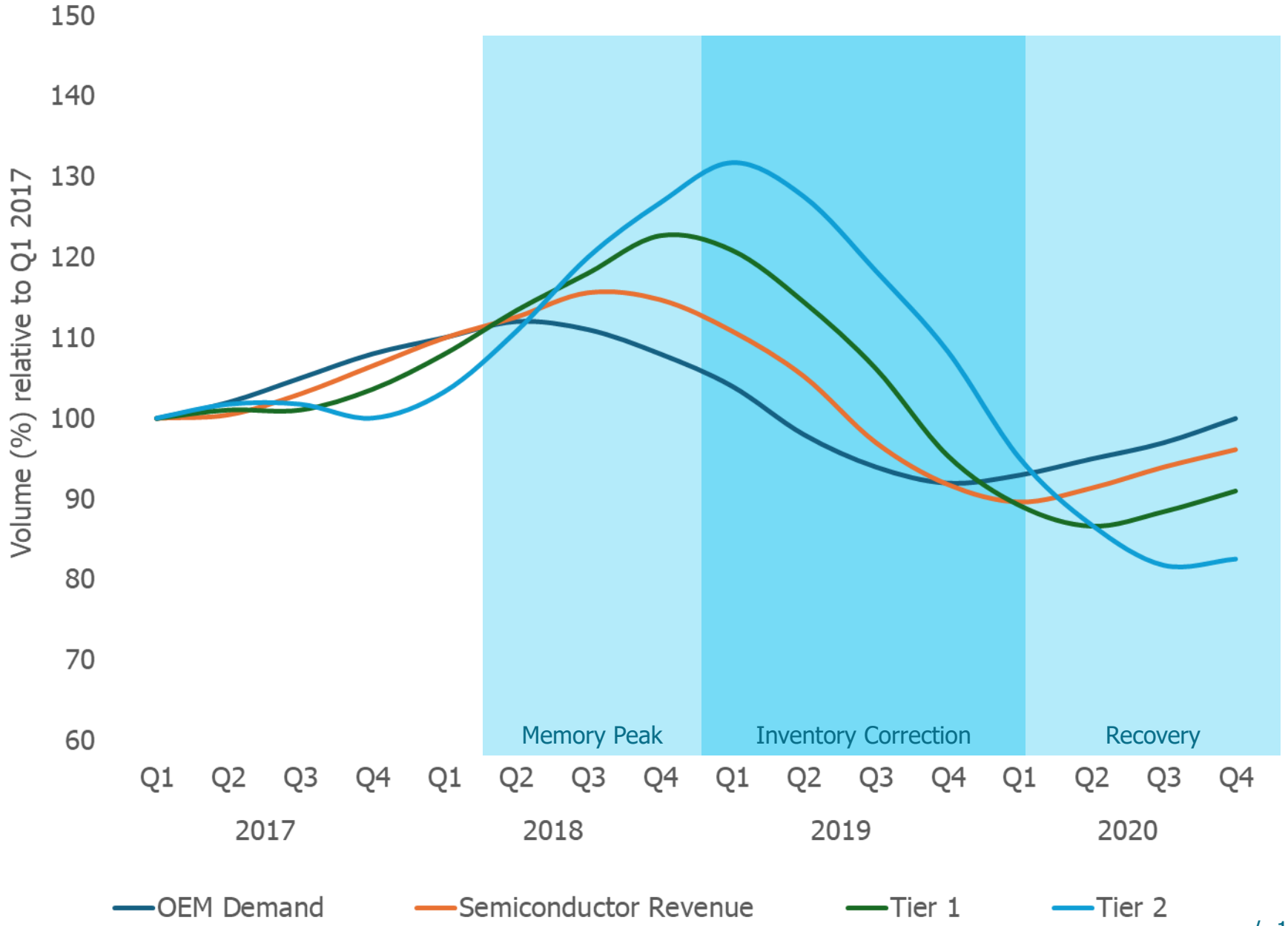
Pacellico

Memory Peak 2018 Q2-Q4
Inventory Correction 2019
Recovery 2020 (start of COVID)

Semiconductor suppliers react aggressively as inventories accumulated

Subsystem suppliers face order cancellations and backlog uncertainty

Further upstream, production commitments could not unwind quickly



Bullwhip, 5. Small Changes Become Major Upstream Volatility

Pacellico

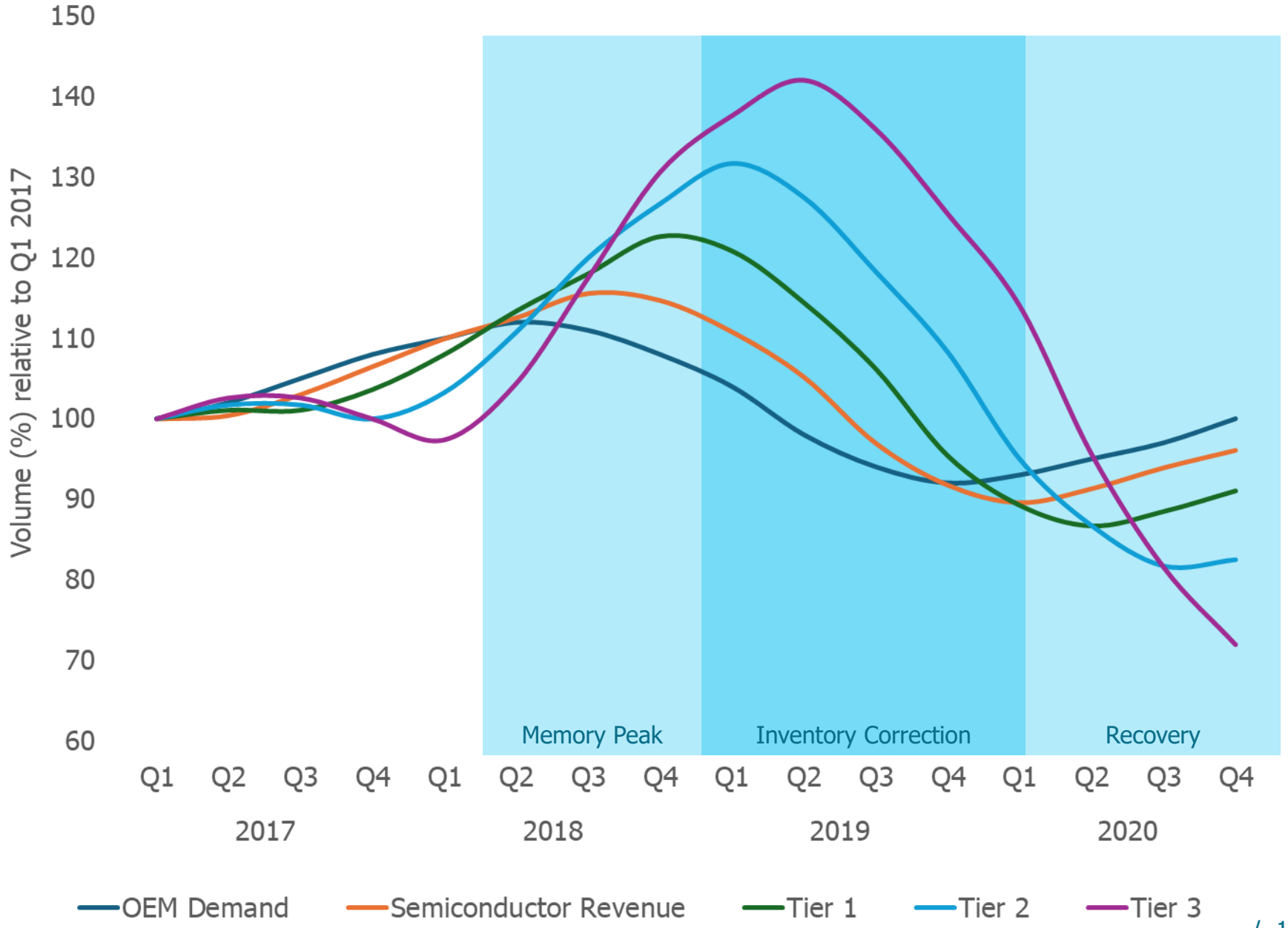
Memory Peak 2018 Q2-Q4
Inventory Correction 2019
Recovery 2020 (start of COVID)

Semiconductor suppliers react aggressively as inventories accumulated

Subsystem suppliers face order cancellations and backlog uncertainty

Further upstream, production commitments could not unwind quickly

When the signal reaches Tier 3, the correction has amplified dramatically



How to Survive and WIN

Sales & Operations Planning

Supply chain flexibility and resilience

Revenue & Market Share

Customer management

Organisation, Skills and Tools

Optimised working capital & profit

Inputs | Enablers | Outputs

Sales & Operations Planning

Pacellico

Monthly management process to:

- Validate and challenge customer demand
- Explore and select constrained supply scenarios:
  - Internal capacity
  - Outsourced capacity
  - Material availability
  - Inventory & working capital
- Align, commit and execute

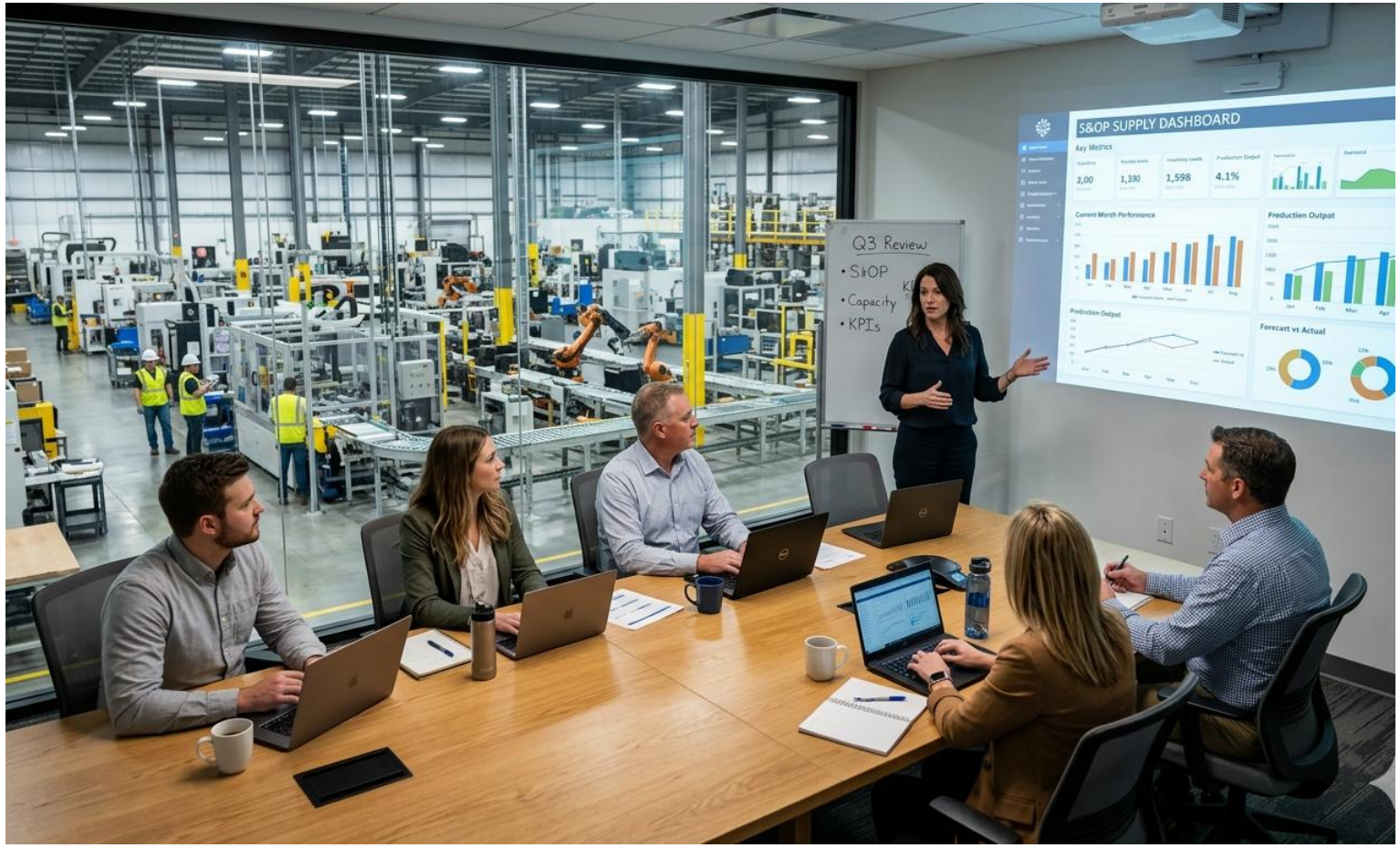
Lead-time ↘

Inventory ↘

Customer Satisfaction ↗

Operational Flexibility ↗

Sales Forecast → Review & Validation → Demand Challenge → Supply Review → Executive Approval



Customer Collaboration

Develop cross-functional engagement between the customer's organisation and your own:

- Key Account Management and Senior Management at all levels
- Engineering & Sourcing ↔ customer R&D
- Quality ↔ Supplier Quality
- Order desk ↔ planners, buyers

To:

- Collaborate on supply chain flexibility and risk reduction
- Get early signals and intel on where demand is really going
- Influence DFx to reduce TCO

Supply Chain Flexibility and Resilience

Key suppliers hold buffer-stocks of raw materials and finished product to support short lead-times

- Provide rolling forecast
- Shared liability signed off in balanced contract
- Clearly defined flexibility expectations and limits

Develop solutions to outsource manufacturing to support in-house capacity flexibility

Map out, understand and mitigate supply constraints in sub-tiers

Organisation, Skills, Tools

Risks and rewards are high in Semiconductor:

- Invest in training and developing your organisation
- Pay for best-in-class skills and capabilities, especially in account management, project management, planning, and sourcing
- Make full use of technology tools and AI to embrace the complexity and make big data work for you

The AI Opportunity

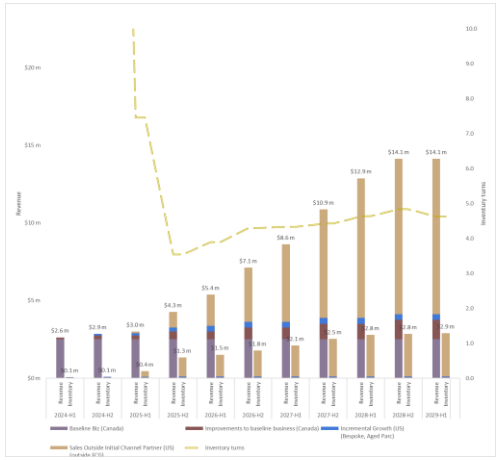
Explore the potential of AI to optimize your business. Examples:

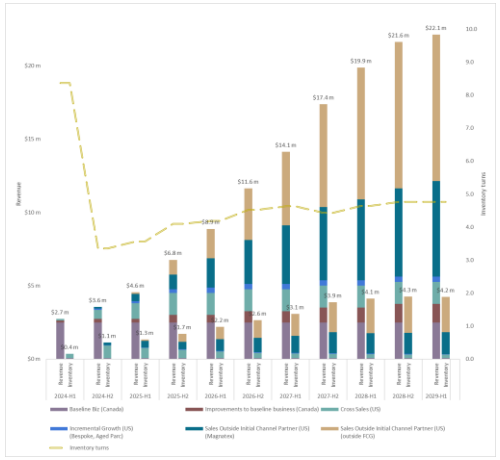
- Demand modelling with machine learning
- LLM-generation of work instructions and technical documentation, and as the technician's assistant
- Cleaning and validation of large datasets
- Process and (finally) use IOT machine data to improve yields and performance

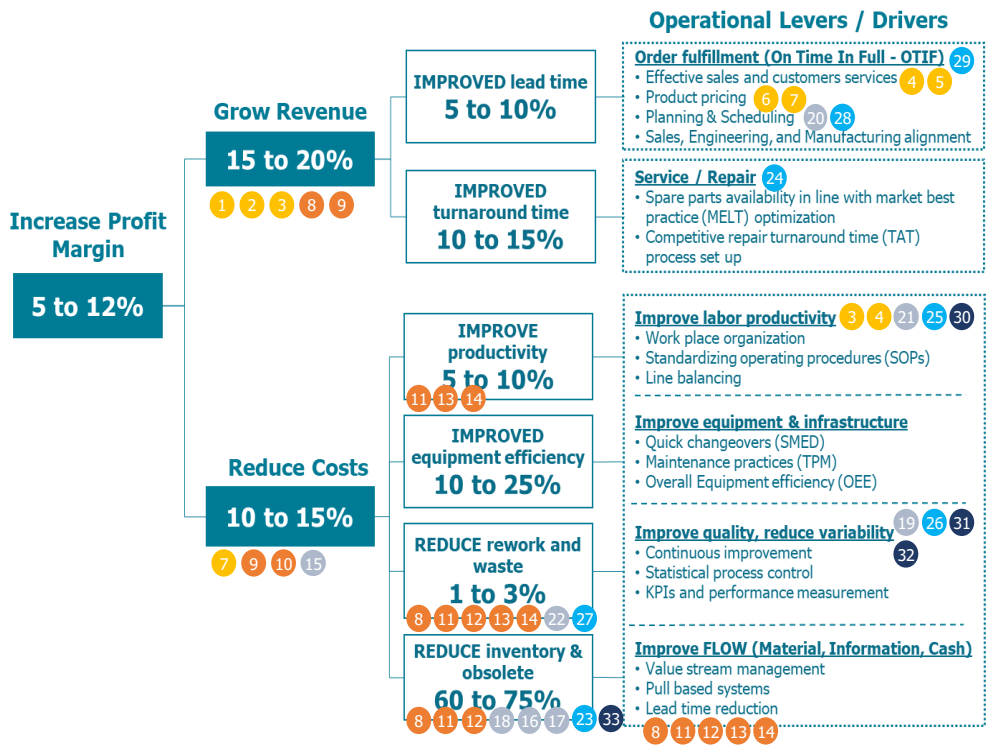
The Semiconductor Business Case

By leveraging best practice in semiconductor market segment management:

- Maximize customer satisfaction
- Minimize risk
- Optimize P&L and balance sheet
- Grow market share







Thank You

Pacellico

Insight
Vision
Success