Semiconductor Downstream Supply Chain: Bottlenecks, Reshoring, and Long-Term Investment Opportunities

Prepared by: Walmer Family Fund **Date:** June 2026 **Classification:** Investment Research

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Executive Summary

The global semiconductor industry crossed $791 billion in revenue in 2025—a$25.61 trillion by 2030. [1] Yet the most consequential constraint on this growth is not the design of chips or the capacity of leading-edge fabs. It is the downstream supply chain: the assembly, packaging, testing, materials, and process infrastructure that converts silicon wafers into functional, shippable semiconductors.

This report argues that the greatest long-term investment opportunity in the semiconductor sector lies not in the chip designers themselves — which are broadly well-owned and richly valued — but in the **structural bottlenecks of the downstream supply chain**. These segments are capital-intensive, technically specialized, geographically concentrated, and increasingly the subject of government-mandated reshoring programs that will deploy hundreds of billions of dollars over the next decade.

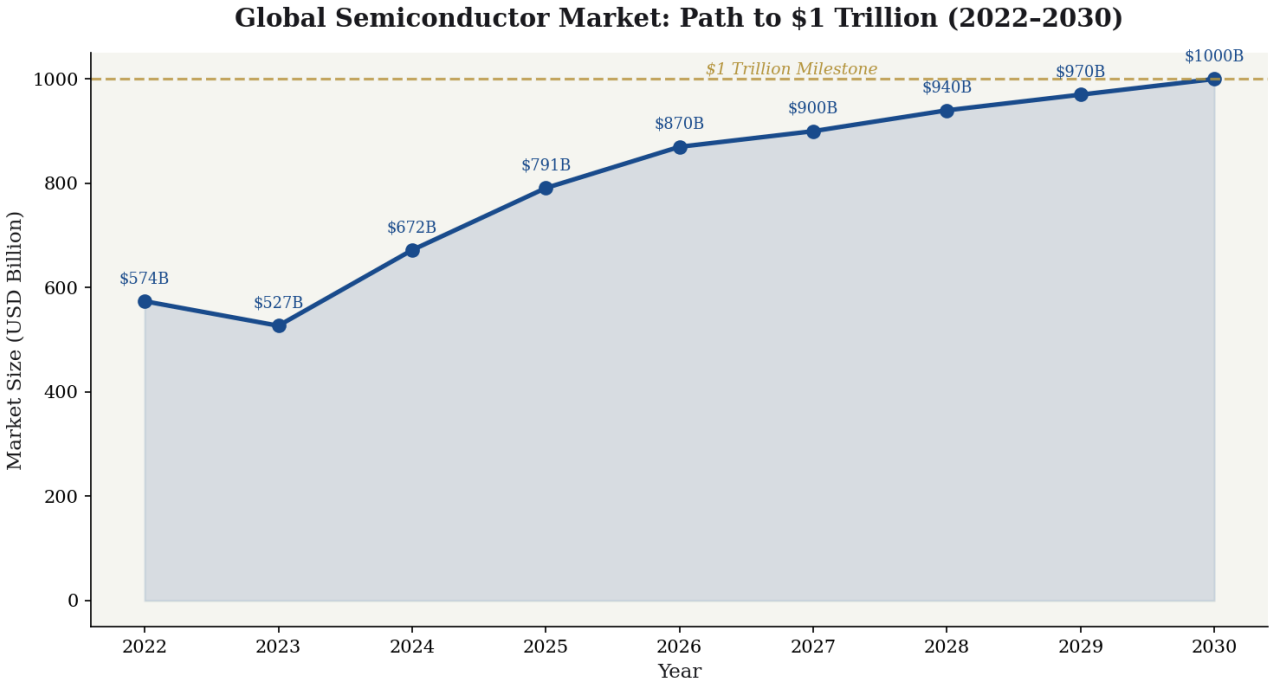
For the Walmer Family Fund, the semiconductor downstream represents a compelling 5–10-year structural thesis: a combination of secular demand growth, acute supply constraints, and a once-in-a-generation policy-driven capital reallocation that will reward patient, well-positioned investors.

Part I: The Global Semiconductor Market

1.1 Market State and Trajectory

Global semiconductor sales reached **$791.7 billion in 2025**, surpassing the previous record set in 2022 and representing the strongest annual growth rate in the industry's modern

history. [1] The primary driver was artificial intelligence infrastructure: data center buildout, GPU procurement, and the proliferation of AI accelerators created demand that overwhelmed available supply across multiple segments of the value chain.



The industry is now on a credible path to **$1 trillion in annual revenue by 2030**, supported by three structural demand pillars. First, AI infrastructure investment shows no sign of deceleration — hyperscalers have committed multi-year capital expenditure programs that will sustain demand for advanced logic and memory chips through the decade. Second, the automotive semiconductor content per vehicle continues to rise as electrification and autonomous driving features proliferate, with the average semiconductor content per vehicle expected to double by 2030. Third, the industrial internet of things, edge computing, and 5G infrastructure represent a broad-based, multi-year demand expansion across mature and advanced nodes alike.

Metric	2024	2025	2030E
Global Semiconductor Revenue	USD 672B	USD 791.7B	USD $_{1,000B}$
YoY Growth	—	+25.6%	~6% CAGR
Chips Sold (units)	950B	1.05T	1.3T
Average Selling Price	$0.71	$0.74	$0.77

1.2 The Concentration Problem

The semiconductor industry is structurally concentrated in ways that create systemic fragility. TSMC commands approximately **67–70% of global foundry market share**, with Samsung a distant second at approximately 7%. [2] This concentration is not merely a competitive observation — it is a geopolitical and supply chain risk that governments across the United States, Europe, Japan, and South Korea have identified as a national security priority.

The downstream supply chain is similarly concentrated. The majority of outsourced semiconductor assembly and test (OSAT) capacity is located in Taiwan, South Korea, Malaysia, and China. Specialty chemical and materials suppliers — many of them small, single-site operations — are clustered in Japan, South Korea, and Germany. The result is a supply chain that is efficient under stable conditions but profoundly fragile under disruption.

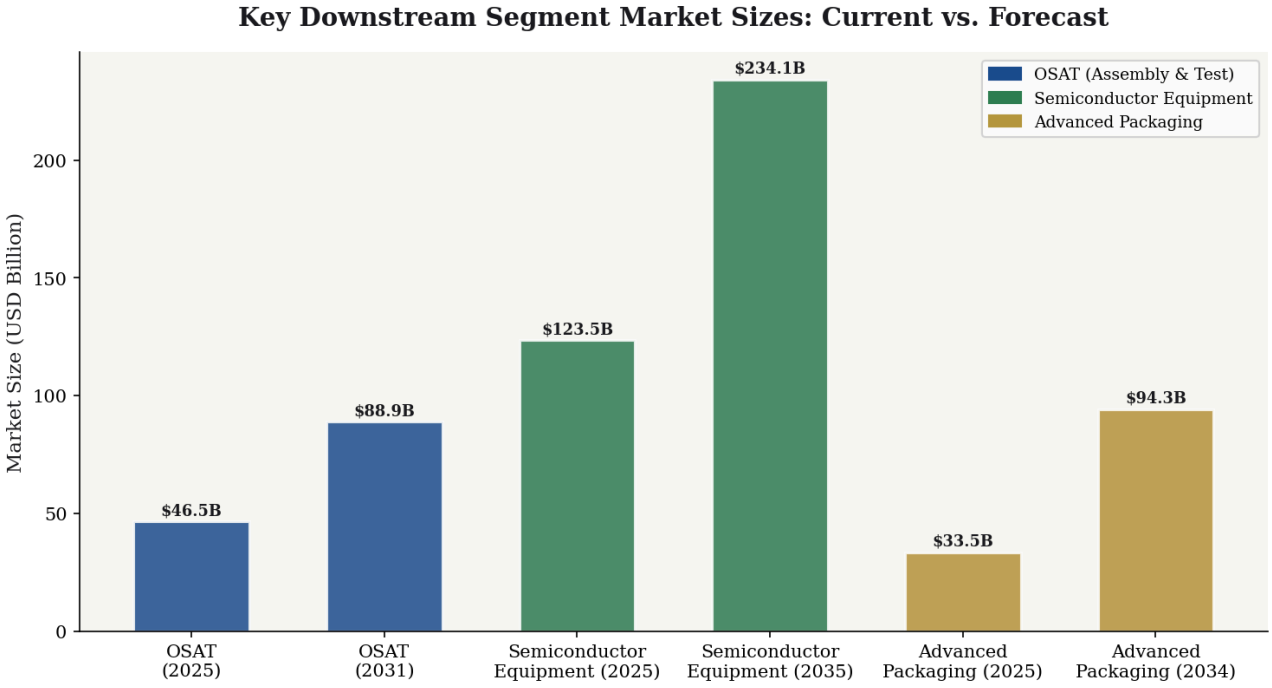
Part II: The Downstream Supply Chain — Where the Bottlenecks Are

2.1 Anatomy of the Downstream

The semiconductor value chain can be divided into two broad phases. The **front-end** encompasses wafer fabrication — the deposition, lithography, etching, and doping processes that create transistors on silicon. The **back-end** encompasses everything that happens after the wafer leaves the fab: wafer dicing, die packaging, interconnect formation, testing, and final assembly. The back-end is also referred to as OSAT (Outsourced Semiconductor Assembly and Test) when performed by contract manufacturers.

A third layer — **process materials and equipment** — underlies both phases. Specialty chemicals, process gases, ultra-pure water systems, photomask blanks, and the capital equipment used in both front-end and back-end manufacturing represent critical inputs without which no chip can be produced, regardless of fab capacity.

The investment thesis of this report focuses on the back-end and materials layers, where structural bottlenecks are most acute, reshoring investment is most active, and the universe of investable public companies is most accessible.



2.2 Advanced Packaging: The Single Tightest Bottleneck

Advanced packaging has emerged as the most critical constraint in the AI-driven semiconductor cycle. Traditional packaging places a single die in a protective housing with wire-bond connections. Advanced packaging — encompassing technologies such as **CoWoS (Chip-on-Wafer-on-Substrate), HBM (High Bandwidth Memory) stacking, Fan-Out Wafer-Level Packaging (FOWLP), and 2.5D/3D integration** — places multiple dies in close proximity, dramatically increasing bandwidth and reducing latency.

NVIDIA's H100 and H200 GPUs, AMD's MI300X, and virtually every AI accelerator of consequence requires advanced packaging. CoWoS capacity became the single tightest supply bottleneck in 2023–2025, with TSMC — the dominant provider — unable to meet demand despite doubling capacity in 2024 and committing approximately $3 billion to further CoWoS expansion. [3]

The global advanced packaging market was valued at **$33.5 billion in 2025** and is projected to reach **$94.33 billion by 2034**, growing at a CAGR of approximately 11%. [4] This growth rate substantially exceeds the broader semiconductor market, reflecting the structural shift toward heterogeneous integration as a primary performance scaling mechanism.

2.3 OSAT: Assembly, Test, and the Back-End Bottleneck

The OSAT market — which encompasses the full range of outsourced back-end services including packaging, burn-in, and final test — was valued at **$46.5 billion in 2025** and is projected to reach **$88.9 billion by 2031** at a CAGR of 11.5%. [5] The market is dominated by

Asian providers: ASE Technology (Taiwan), Amkor Technology (US-listed, with primary operations in Asia), and JCET (China) collectively account for the majority of global capacity.

Testing is the fastest-growing sub-segment within OSAT, forecast to grow at a **10.35% CAGR through 2031**. [6] As chip complexity increases — more transistors, more interconnects, more heterogeneous die configurations — the cost and time required for comprehensive testing rises disproportionately. A modern AI chip may require hundreds of hours of burn-in and functional testing before it can be shipped.

2.4 Specialty Chemicals and Process Materials

Semiconductor manufacturing consumes an extraordinary variety of specialty chemicals: photoresists, chemical mechanical planarization (CMP) slurries, etchants, cleaning agents, dielectric materials, and deposition precursors. Many of these chemicals are produced by a small number of highly specialized suppliers, often with single-site production facilities. A disruption at any one of these facilities can halt production across multiple fabs simultaneously.

The specialty chemicals and materials segment are also where some of the most durable competitive moats exist. Qualification cycles for new chemical suppliers can take 12–24 months, creating significant switching costs and pricing power for established suppliers. Entegris, following its acquisition of CMC Materials in 2022, has positioned itself as the dominant US-listed provider of advanced semiconductor materials, with a portfolio spanning CMP slurries, filtration systems, and process chemicals. [7]

2.5 Process Equipment: The Long-Lead-Time Constraint

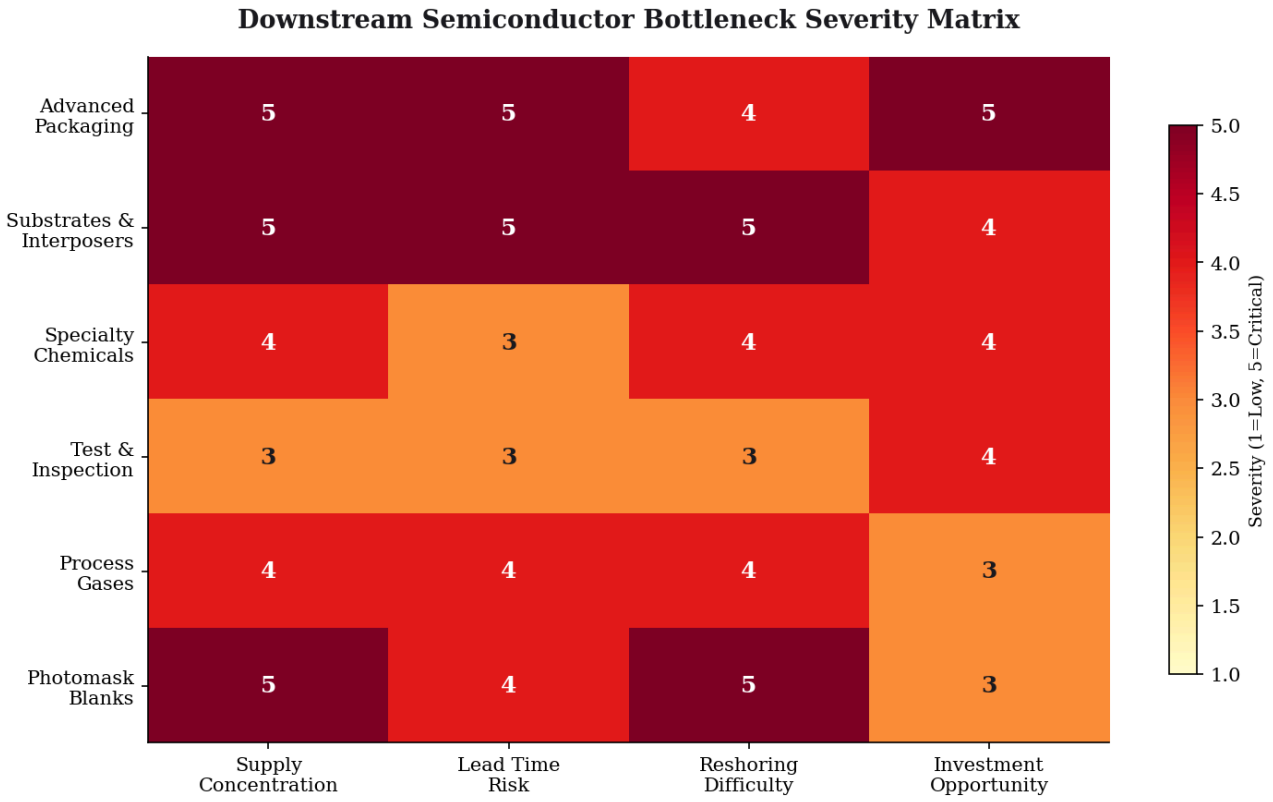
Semiconductor process equipment — the tools used in deposition, etch, lithography, metrology, and inspection — represents the most capital-intensive layer of the supply chain. Lead times for advanced equipment tools can extend to 12–18 months, and the manufacturing of these tools is itself highly concentrated. ASML holds a monopoly on EUV lithography machines; Applied Materials, Lam Research, and KLA Corporation collectively dominate deposition, etch, and process control.

The semiconductor capital equipment market was valued at **$123.5 billion in 2025** and is projected to reach **$234.1 billion by 2035** at a CAGR of approximately 7.2%. [8] This growth is driven by the global fab construction wave: over $640 billion in announced semiconductor supply chain investments in the United States alone, with comparable programs in Europe, Japan, and South Korea. [9]

2.6 Photomask Blanks: The Hidden Chokepoint

Photomask blanks — the substrates on which circuit patterns are written before being projected onto wafers — represent one of the least-discussed but most critical bottlenecks in the supply chain. EUV photomask blanks are produced by only two companies globally: HOYA Corporation (Japan) and AGC (Japan). Advanced chips now require 70–100+ mask layers, each requiring a flawless blank. [10]

The EUV photomask blanks market was valued at **$1.8 billion in 2025** and is growing rapidly as EUV adoption expands. The extreme concentration of supply — two Japanese companies serving the entire global semiconductor industry — makes this segment a strategic chokepoint that governments and chipmakers are actively seeking to address.

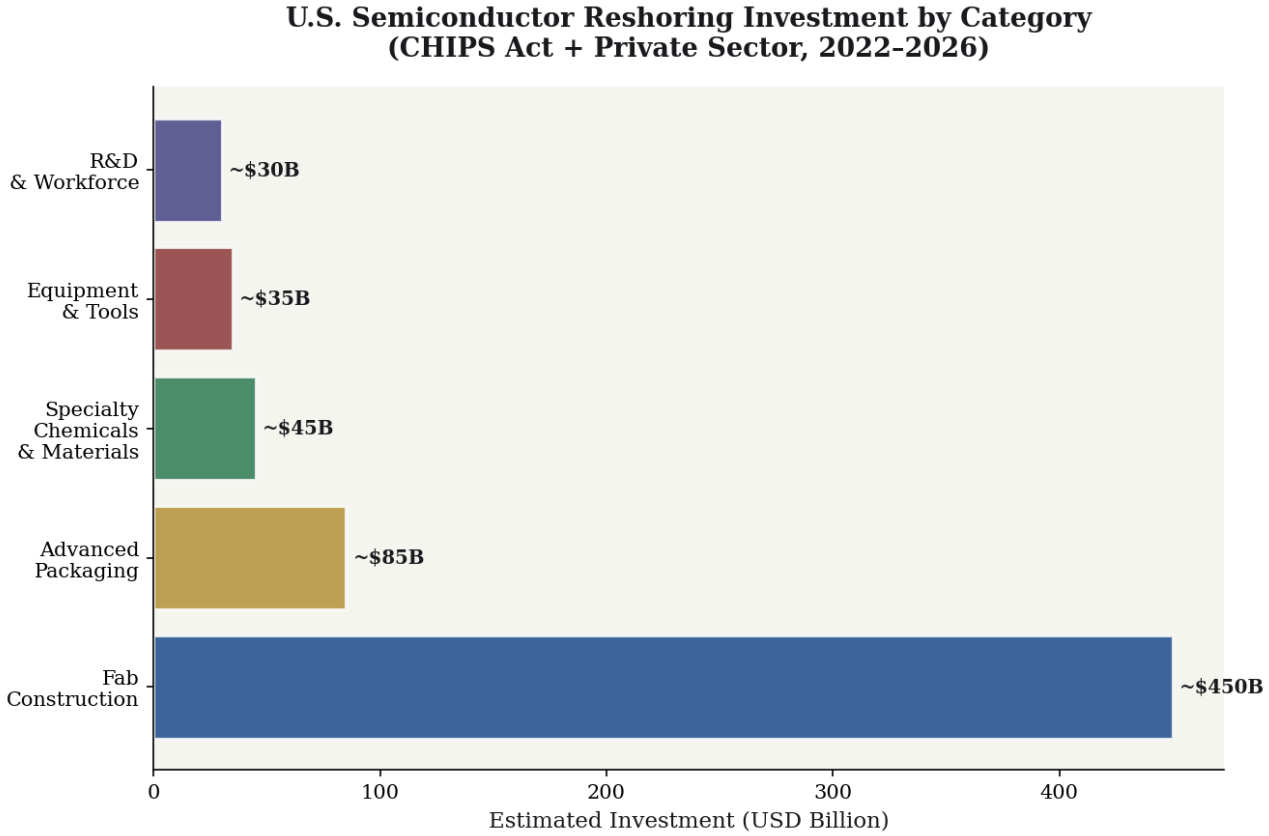


Part III: The Reshoring Imperative

3.1 Policy Drivers

The geopolitical awakening to semiconductor supply chain vulnerability — accelerated by the 2020–2022 chip shortage, the Russia-Ukraine war's disruption of neon gas supply, and escalating US-China technology tensions — has produced the largest coordinated industrial policy intervention in the history of the semiconductor industry.

In the United States, the **CHIPS and Science Act** (2022) allocated $52.7 billion in direct subsidies for semiconductor manufacturing and research, alongside a $25 645 billion in announced semiconductor supply chain investments** across more than 140 projects in 30 states as of May 2026. [9]



Comparable programs are underway in Europe (the European Chips Act, targeting €43 billion in public and private investment), Japan (over $13 billion in government subsidies for TSMC's Kumamoto fab and related supply chain), and South Korea (the K-Chips Act, providing tax credits of up to 25% for semiconductor investment).

3.2 The Back-End Gap

A critical observation from the SIA's 2024 supply chain resilience report is that the reshoring wave has been disproportionately focused on **front-end fab capacity**, while the back-end — packaging, testing, and assembly — has received far less attention and investment. [11] This creates a structural imbalance: even if the United States successfully reshores advanced logic and memory fabrication, the chips produced in those fabs will still need to be packaged and tested, largely in Asia.

This gap is beginning to be addressed. SK Hynix has announced an advanced packaging investment at Purdue Research Park in Indiana. Amkor Technology has received $400 million in CHIPS Act incentives for its new advanced packaging facility in Peoria, Arizona. Intel's

packaging operations in Arizona are expanding. But the scale of back-end investment remains a fraction of front-end investment, and the lead time to build and qualify new packaging capacity is measured in years, not months.

For investors, this gap represents a durable structural opportunity: companies that provide back-end services, packaging equipment, and materials are positioned to benefit from a multi-year wave of capacity investment that is only beginning.

Part IV: Investment Implications — US-Listed Public Companies

4.1 Framework for Stock Selection

The investment thesis for semiconductor downstream stocks rests on four criteria. First, the company must operate in a segment with structural supply constraints — not merely cyclical tightness. Second, the company must have a defensible competitive position, ideally with high switching costs, proprietary technology, or qualification-based moats. Third, the company must be a direct beneficiary of the reshoring investment wave, either through direct CHIPS Act awards, expanded domestic capacity, or increased demand from reshoring fabs. Fourth, the company must be publicly traded on a US exchange (NYSE or NASDAQ), ensuring liquidity and accessibility.

Applying these criteria, we identify **ten companies** across four downstream segments as the most compelling long-term investment opportunities.

4.2 Segment 1: OSAT and Advanced Packaging

Amkor Technology (NASDAQ: AMKR)

Amkor is the largest US-listed OSAT provider and the only major Western-headquartered company with global scale in advanced packaging. The company provides turnkey packaging and test services across a full range of technologies, including advanced packages such as flip-chip, wafer-level packaging, and system-in-package. Amkor has been awarded $400 million in CHIPS Act incentives for its new advanced packaging facility in Peoria, Arizona — the first advanced packaging facility of its kind in the United States.

Revenue grew 27.5% year-over-year to $7.07 billion (TTM). The company trades at 33.8x forward earnings, reflecting the market's recognition of its strategic positioning. The Arizona facility represents a structural inflection point: Amkor will be the primary domestic

advanced packaging provider for US government-sensitive chips and a key beneficiary of the back-end reshoring wave.

Metric	Value
Ticker	AMKR
Price	$82.78
Market Cap	$20.5B
Revenue (TTM)	$7.07B
Revenue Growth	+27.5%
Forward P/E	33.8x
Gross Margin	14.4%
52-Week Range	19.79–83.30

Investment Thesis: Amkor is the only US-listed pure-play OSAT with advanced packaging capabilities and direct CHIPS Act funding. As the back-end reshoring wave accelerates, Amkor's Arizona facility positions it as the domestic packaging partner of choice for US government and defense-sensitive semiconductor programs.

4.3 Segment 2: Semiconductor Process Equipment

Applied Materials (NASDAQ: AMAT)

Applied Materials is the world's largest semiconductor equipment company by revenue, providing materials engineering solutions across deposition, etch, ion implantation, thermal processing, and inspection. The company's equipment is used in virtually every advanced semiconductor manufacturing process, making it a direct beneficiary of every new fab construction project globally.

Revenue of $29.0 billion (TTM) grew 11.4% year-over-year. With a gross margin of 49.0% and operating margin of 31.9%, Applied Materials demonstrates the exceptional economics of the equipment segment — high recurring revenue from service and parts, strong pricing power, and structural demand tied to the global fab buildout.

Metric	Value
Ticker	AMAT
Price	$567.25
Market Cap	$450.4B
Revenue (TTM)	$29.0B
Revenue Growth	+11.4%
Forward P/E	34.9x
Gross Margin	49.0%
Operating Margin	31.9%
52-Week Range	154.47–569.95

Investment Thesis: Applied Materials is the broadest-based beneficiary of the global fab construction wave. Every new fab — whether in Arizona, Ohio, Germany, or Japan — requires Applied Materials equipment. The company's scale, technology breadth, and service revenue create a durable competitive moat.

Lam Research (NASDAQ: LRCX)

Lam Research specialises in etch and deposition equipment — two of the most critical process steps in advanced semiconductor manufacturing. The company's ALTUS and Kiyo systems are essential for the production of advanced logic and memory chips. Revenue of $21.7 billion (TTM) grew 23.8% year-over-year, reflecting strong demand from both AI-driven logic investment and the recovery of memory spending.

Metric	Value
Ticker	LRCX
Price	$366.81
Market Cap	$458.7B
Revenue (TTM)	$21.7B
Revenue Growth	+23.8%
Forward P/E	46.0x
Gross Margin	50.0%
Operating Margin	35.0%
52-Week Range	87.75–373.82

Investment Thesis: Lam Research's dominance in etch and deposition — processes that become more critical as transistor geometries shrink — gives it structural pricing power and a direct link to every advanced node transition. The company is a core holding in any semiconductor equipment portfolio.

KLA Corporation (NASDAQ: KLAC)

KLA is the global leader in process control and yield management — the inspection and metrology systems that identify defects and measure critical dimensions during chip manufacturing. As chips become more complex and defect tolerances tighter, the value of KLA's systems increases disproportionately. A single missed defect at the 3nm node can render an entire wafer worthless.

KLA's gross margin of 61.4% is the highest in the equipment sector, reflecting the company's near-monopoly position in several critical inspection categories. Revenue grew 11.5% year-over-year to $13.1 billion (TTM).

Metric	Value
Ticker	KLAC
Price	$254.54
Market Cap	$332.5B
Revenue (TTM)	$13.1B
Revenue Growth	+11.5%
Forward P/E	50.4x
Gross Margin	61.4%
Operating Margin	41.2%
52-Week Range	83.22–254.93

Investment Thesis: KLA's process control monopoly becomes more valuable with every node transition. As chips grow more complex, the cost of undetected defects rises, making KLA's systems indispensable. The company's 61% gross margin and 41% operating margin reflect a business with exceptional pricing power and structural competitive advantages.

4.4 Segment 3: Specialty Materials and Chemicals

Entegris (NASDAQ: ENTG)

Entegris is the dominant US-listed provider of advanced semiconductor materials and process solutions. Following its 2022 acquisition of CMC Materials, the company offers the industry's most comprehensive portfolio of CMP slurries, filtration systems, specialty chemicals, and contamination control products. These materials are consumed in every advanced semiconductor manufacturing process and cannot be easily substituted.

The company's two-segment structure — Materials Solutions (MS) and Advanced Purity Solutions (APS) reflects their dual role as both a chemical supplier and a contamination control specialist. Gross margin of 44.8% reflects the premium pricing power of qualified, specification-critical materials.

Metric	Value
Ticker	ENTG
Price	$150.52
Market Cap	$22.9B
Revenue (TTM)	$3.24B
Revenue Growth	+5.0%
Forward P/E	32.6x
Gross Margin	44.8%
Operating Margin	17.9%
52-Week Range	67.97–159.15

Investment Thesis: Entegris benefits from the same qualification-based moats that protect all specialty chemical suppliers — but at a scale that no competitor can match. As advanced node transitions accelerate demand for more sophisticated process chemicals, Entegris's portfolio breadth and customer relationships create a durable competitive position.

MKS Instruments (NASDAQ: MKSI)

MKS Instruments provides foundational technology solutions to semiconductor manufacturing, including gas delivery systems, pressure and flow controllers, power delivery systems, and advanced process control instruments. The company's products are embedded in virtually every semiconductor process tool, making it a critical sub-supplier to the equipment OEMs.

Revenue of $4.07 billion (TTM) grew 15.2% year-over-year. MKS's forward P/E of 23.8x is the most attractive valuation in the group, reflecting the market's underappreciation of its structural positioning as a sub-supplier to the equipment industry.

Metric	Value
Ticker	MKSI
Price	$355.69
Market Cap	$24.0B
Revenue (TTM)	$4.07B
Revenue Growth	+15.2%
Forward P/E	23.8x
Gross Margin	46.6%
Operating Margin	16.0%
52-Week Range	88.49–359.35

Investment Thesis: MKS Instruments is the most attractively valued stock in the group at 23.8x forward earnings. Its role as a critical sub-supplier to equipment OEMs means it participates in every new tool installation globally, with recurring revenue from replacement parts and service.

4.5 Segment 4: Test, Inspection, and Metrology

FormFactor (NASDAQ: FORM)

FormFactor designs and manufactures probe cards — the precision instruments used to test semiconductor wafers before they are diced and packaged. Every wafer produced at every advanced fab in the world must be tested with probe cards, and FormFactor holds a leading market position in the most technically demanding segments, including advanced logic and HBM memory probing.

Revenue grew 32.0% year-over-year to $840 million (TTM), driven by strong demand from AI chip production. The company’s probe cards are a consumable product — they wear out and must be replaced — providing a recurring revenue stream that is directly tied to wafer production volumes.

Metric	Value
Ticker	FORM
Price	$139.21
Market Cap	$10.9B
Revenue (TTM)	$840M
Revenue Growth	+32.0%
Forward P/E	49.9x
Gross Margin	42.2%
Operating Margin	17.7%
52-Week Range	26.08–159.09

Investment Thesis: FormFactor's probe cards are a high-value consumable in the semiconductor manufacturing process. As wafer complexity increases — more layers, tighter tolerances, higher bandwidth requirements — the technical demands on probe cards increase, supporting pricing power and market share for the technology leader.

Kulicke & Soffa (NASDAQ: KLIC)

Kulicke & Soffa designs and manufactures wire bonding and advanced packaging equipment — the tools used to connect semiconductor dies to their packages and substrates. The company's ball bonding, wedge bonding, and advanced packaging equipment is used across a wide range of end markets, from automotive and industrial chips to advanced AI packages.

Revenue grew 49.8% year-over-year to $768 million (TTM), reflecting the recovery of the advanced packaging equipment cycle. With a gross margin of 53.6% and a forward P/E of 26.7x, Kulicke & Soffa offers an attractive combination of quality and valuation.

Metric	Value
Ticker	KLIC
Price	$113.13
Market Cap	$5.92B
Revenue (TTM)	$768M
Revenue Growth	+49.8%
Forward P/E	26.7x
Gross Margin	53.6%
Operating Margin	15.9%
52-Week Range	31.32–115.27

Investment Thesis: Kulicke & Soffa is a direct beneficiary of the advanced packaging investment wave. As heterogeneous integration becomes the primary performance scaling mechanism, demand for advanced packaging equipment will grow structurally. The company's 53.6% gross margin reflects the technical differentiation of its products.

Onto Innovation (NASDAQ: ONTO)

Onto Innovation provides process control and inspection equipment for advanced packaging and semiconductor manufacturing. The company's lithography systems and macro-defect inspection tools are used in advanced packaging processes, making it a direct beneficiary of the CoWoS and HBM packaging buildout.

Revenue grew 9.5% year-over-year to $1.03 billion (TTM). Onto Innovation's 54.2% gross margin reflects its positioning in technically demanding, high-value inspection applications.

Metric	Value
Ticker	ONTO
Price	$323.88
Market Cap	$16.1B
Revenue (TTM)	$1.03B
Revenue Growth	+9.5%
Forward P/E	33.5x
Gross Margin	54.2%
Operating Margin	16.8%
52-Week Range	89.40–326.96

Investment Thesis: Onto Innovation's focus on advanced packaging inspection positions, it at the intersection of two structural growth trends: the advanced packaging buildout and the increasing importance of process control at every step of the packaging process.

Cohu (NASDAQ: COHU)

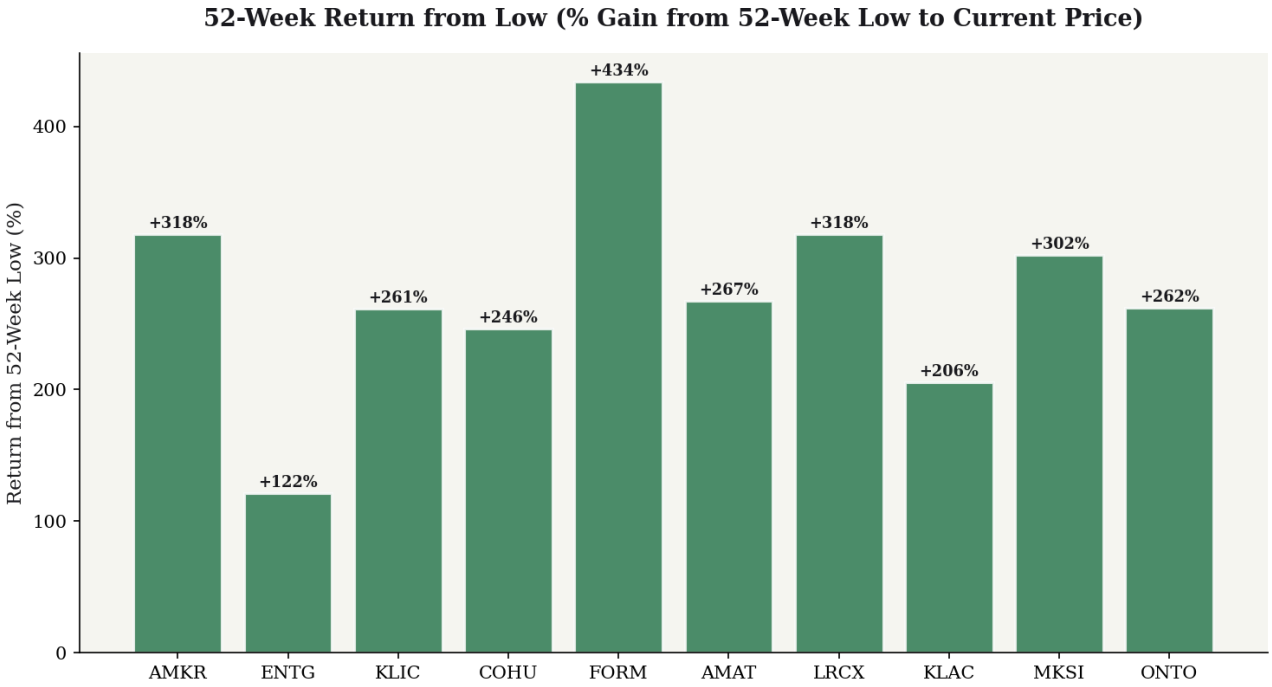
Cohu provides semiconductor test and inspection automation systems, including handlers, contactors, and test interface solutions. The company serves the automotive, industrial, and mobile semiconductor markets — segments that are recovering from the 2023–2024 downturn and are expected to see sustained growth as automotive electrification and industrial automation drive chip content expansion.

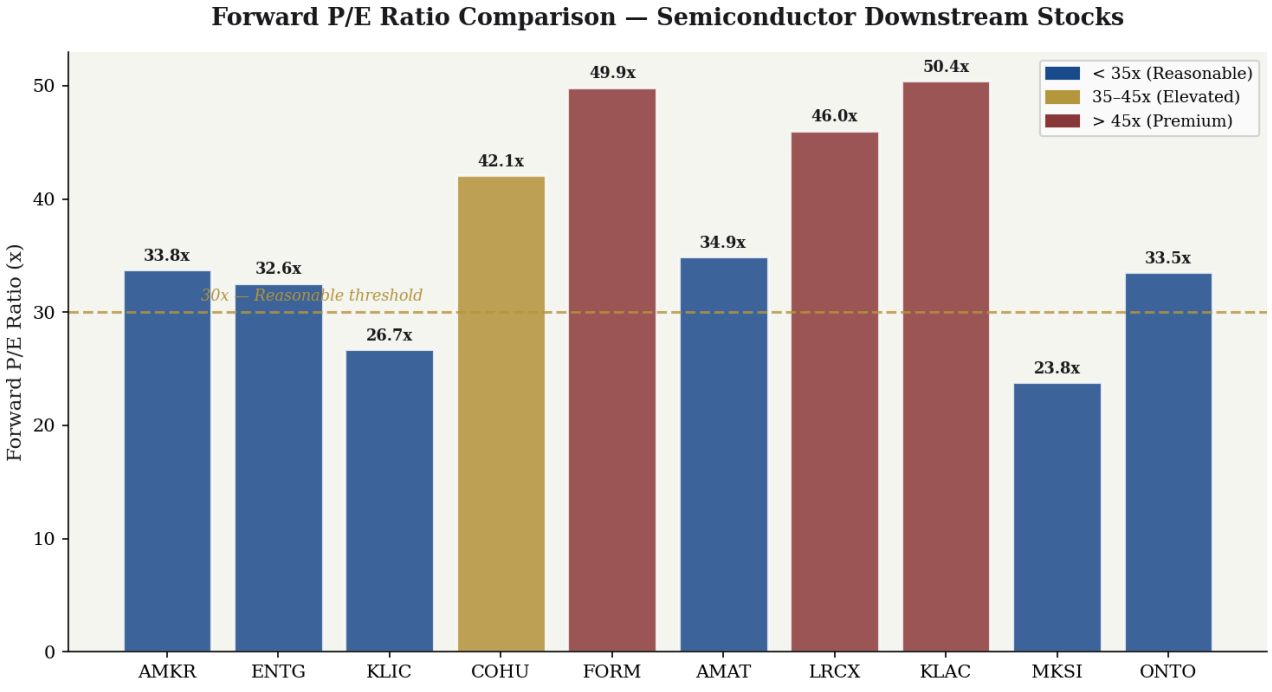
Metric	Value
Ticker	COHU
Price	$61.33
Market Cap	$2.89B
Revenue (TTM)	$481M
Revenue Growth	+29.3%
Forward P/E	42.1x
Gross Margin	43.5%
52-Week Range	17.71–61.80

Investment Thesis: Cohu is a recovery play on the automotive and industrial semiconductor test market, with a forward P/E that reflects the market's expectation of significant earnings recovery as these end markets normalise.

4.6 Stock Summary Table

Ticker	Company	Segment	Price	Mkt Cap	Rev Growth	Fwd P/E	Gross Margin
AMKR	Amkor Technology	OSAT / Adv. Packaging	$82.78	$20.5B	+27.5%	33.8x	14.4%
AMAT	Applied Materials	Process Equipment	$567.25	$450.4B	+11.4%	34.9x	49.0%
LRCX	Lam Research	Etch & Deposition	$366.81	$458.7B	+23.8%	46.0x	50.0%
KLAC	KLA Corporation	Process Control	$254.54	$332.5B	+11.5%	50.4x	61.4%
ENTG	Entegris	Specialty Materials	$150.52	$22.9B	+5.0%	32.6x	44.8%
MKSI	MKS Instruments	Process Gases & Controls	$355.69	$24.0B	+15.2%	23.8x	46.6%
FORM	FormFactor	Probe Cards / Test	$139.21	$10.9B	+32.0%	49.9x	42.2%
KLIC	Kulicke & Soffa	Bonding Equipment	$113.13	$5.92B	+49.8%	26.7x	53.6%
ONTO	Onto Innovation	Advanced Pkg Inspection	$323.88	$16.1B	+9.5%	33.5x	54.2%
COHU	Cohu	Test Automation	$61.33	$2.89B	+29.3%	42.1x	43.5%





Part V: Long-Term Structural Thesis (5–10 Year Horizon)

5.1 The Secular Demand Case

The long-term demand case for semiconductor downstream investment rests on three pillars that are independent of any single product cycle or technology generation.

Artificial Intelligence Infrastructure: The AI buildout is not a cyclical phenomenon — it is a structural reorientation of global computing infrastructure. Every AI model requires chips; every chip requires packaging, testing, and materials. The advanced packaging market alone is projected to grow from $33.5 billion in 2025 to 94.3 billion by 2034. [4] This growth will require a proportional expansion of packaging equipment, inspection tools, and process materials.

Automotive Electrification: The average electric vehicle contains approximately $1,000–$1,500 in semiconductor content, compared to $400–600 for a conventional internal combustion vehicle. As the global automotive fleet transitions to electric, the incremental semiconductor demand is measured in hundreds of billions of dollars annually. Automotive chips have strict reliability requirements that drive disproportionate demand for test and inspection services.

Reshoring and Geopolitical Diversification: The $645 billion in announced US semiconductor investments, combined with comparable programs in Europe and Japan, will require a proportional investment in back-end infrastructure, materials supply, and process equipment. This is a decade-long capital deployment cycle that will sustain demand for downstream semiconductor companies regardless of the broader economic cycle.

5.2 The Moat Structure

The competitive moats in semiconductor downstream are among the most durable in the technology sector. Qualification cycles — the process by which a new supplier's materials or equipment is validated for use in a production process — can take 12–24 months and cost millions of dollars. Once a supplier is qualified, switching costs are extremely high: the risk of introducing yield loss or contamination by changing a qualified supplier is simply too great for most chipmakers to accept without compelling reason.

This creates a structural advantage for established suppliers: they are effectively insulated from competition by the qualification process itself. New entrants must invest years and substantial capital before they can compete for production contracts, and even then, they face the challenge of displacing incumbents who have built deep customer relationships and process knowledge over decades.

5.3 Portfolio Construction

For a long-term structural portfolio in semiconductor downstream, we suggest a tiered approach. The **core tier** consists of the large-cap equipment companies — Applied Materials, Lam Research, and KLA Corporation — which offer broad exposure to the global fab buildout with exceptional financial quality. These three companies collectively represent the backbone of semiconductor manufacturing infrastructure.

The **growth tier** consists of mid-cap companies with more concentrated exposure to specific high-growth segments: Amkor Technology (advanced packaging reshoring), Entegris (specialty materials), and FormFactor (probe cards for advanced logic and HBM). These companies offer higher growth potential but also higher concentration risk.

The **opportunistic tier** consists of smaller companies with attractive valuations and specific catalysts: MKS Instruments (most attractive forward P/E in the group at 23.8x), Kulicke & Soffa (advanced packaging equipment recovery), and Onto Innovation (advanced packaging inspection).

Part VI: Risk Matrix

Risk Factor	Severity	Time Horizon	Mitigation
US-China export control escalation	High	Near-term	Diversify across companies with varying China exposure
Advanced packaging capacity overbuild	Medium	Medium-term	Focus on consumables (FormFactor) and materials (Entegris) over pure equipment
AI capex cycle deceleration	High	Near-term	Weight toward automotive/industrial exposure (Cohu, KLIC)
CHIPS Act funding delays or reversal	Medium	Near-term	Amkor's Arizona facility already funded; risk is to future awards
Geopolitical disruption (Taiwan)	Critical	Long-term	Reshoring thesis is the hedge — accelerates domestic investment
Technology transition risk (new packaging paradigms)	Medium	Long-term	Diversify across equipment, materials, and test
Valuation compression in risk-off environment	High	Near-term	Size positions appropriately; these are long-duration assets

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Conclusion

The semiconductor downstream supply chain is the most structurally important and least adequately invested segment of the global technology supply chain. While chip designers and leading-edge fabs attract the majority of investor attention and capital, the back-end

infrastructure that converts silicon into functional semiconductors is simultaneously the tightest bottleneck, the largest beneficiary of reshoring policy, and the segment with the most durable competitive moats.

For the Walmer Family Fund, the downstream semiconductor thesis aligns with our core investment principles: long-duration thinking, structural rather than cyclical positioning, and a focus on businesses with defensible competitive advantages. The companies profiled in this report — spanning OSAT, process equipment, specialty materials, and test and inspection — represent a diversified exposure to a decade-long capital deployment cycle that will reshape the geography and resilience of global semiconductor manufacturing.

The $645 billion announced US semiconductor investments is not a one-time event. It is the beginning of a multi-decade reorientation of the most strategically important industry in the global economy. Patient capital, positioned in the right segments of the downstream supply chain, will compound significantly over the 5–10-year horizon.

References

This report is prepared for informational and investment research purposes only. All market size figures represent estimates from third-party research firms and may vary across sources due to differing scope definitions and methodologies. This report does not constitute investment advice. All stock data as of June 14, 2026.

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