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UPDATE

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Semiconductors | North America

Semiconductor Inventory Tracker: Leaner Channel, Limited Restocking

Total supply chain DOI was ~flat q/q, slightly better than seasonality, but remains 30 days above its historical median (with most of that coming from longer producer cycle times). Inventory trends are improving, particularly in Analog/MCU and Auto, but broad restocking remains elusive.

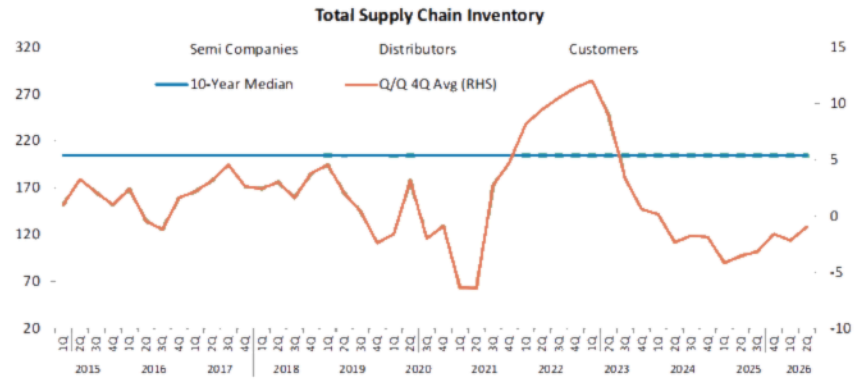
Key Takeaways

- Distributor DOI fell 5 days q/q, compared with a typical ~1-day seasonal decline.
- Producer DOI rose 5 days q/q, ~1 day above seasonal, though Analog/MCU DOI declined 9 days.
- Customer DOI was flat q/q, in-line with seasonality, while Auto OEM and Auto Supplier DOI both fell 3 days and are now below historical medians.

Supply chain DOI was ~flat q/q in 2Q, slightly better than the typical ~1-day seasonal increase, though still 30 days above its historical median. Distributor DOI fell 5 days as COGS growth outpaced inventory growth, while producer DOI rose 5 days, ~in-line with seasonal. Analog/MCU producers were a notable exception, with DOI declining 9 days, while customer DOI remained flat.

The data point to continued inventory discipline rather than a broad restocking cycle. Distributors are running leaner, Analog/MCU inventories are improving, and Auto OEM and Auto Supplier DOI have moved below historical medians. We continue to favor areas where supply/demand is tightening or inventory risk is more defensible: premium-end Analog (ADI, NXP), compute/networking (NVDA, AVGO), and memory (MU, SNDK).

Exhibit 1: Stacked DOI was ~flat q/q, against a seasonal increase of ~1 day.



Source: FactSet, Morgan Stanley Research

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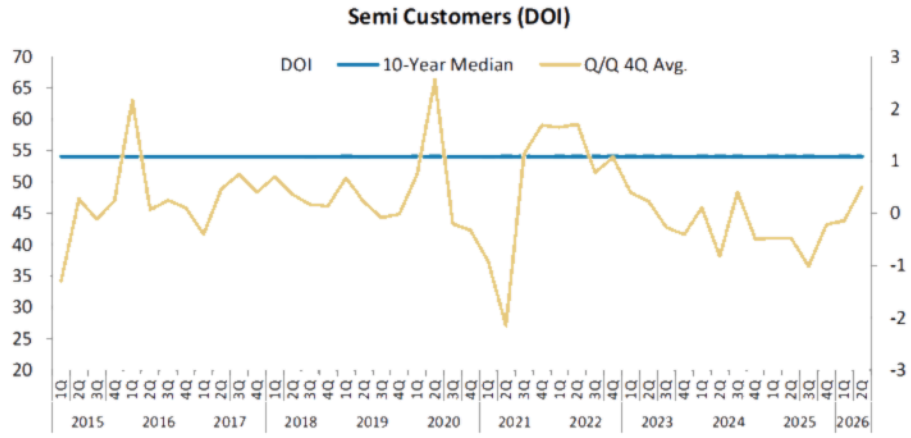
For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

Supply Chain Inventory Overview

Supply Chain Inventory Overview Supply chain DOI was ~flat q/q in 2Q, in-line with a seasonal ~1-day increase, and sits 30 days above the historical median. Distributors drove most of the result, falling more than seasonal as COGS growth outpaced inventory. Producers built ~1 day above seasonal, and customers were in-line.

Semi customer DOI was ~flat q/q at 60 days, in line with seasonality, and remains 6 days above the historical median of 54. Consumer (+15 days), Computing/Mobile (+12) and Communications (+9) saw the largest increases. US Industrials (-6), Machinery (-5), ODMs (-5), Auto OEMs (-3), Auto Suppliers (-3) all declined. Auto OEMs and Auto Suppliers are now below their historical medians and Storage is in line, while the remaining end markets remain above. The trailing 4Q average rose from last quarter.

Exhibit 2: Semi Customer DOI remained flat sequentially to 60 days, in-line with a seasonal change of 0 days. DOI remains above the historical median and trailing 4 quarters increased from last quarter.



Source: FactSet, Morgan Stanley Research

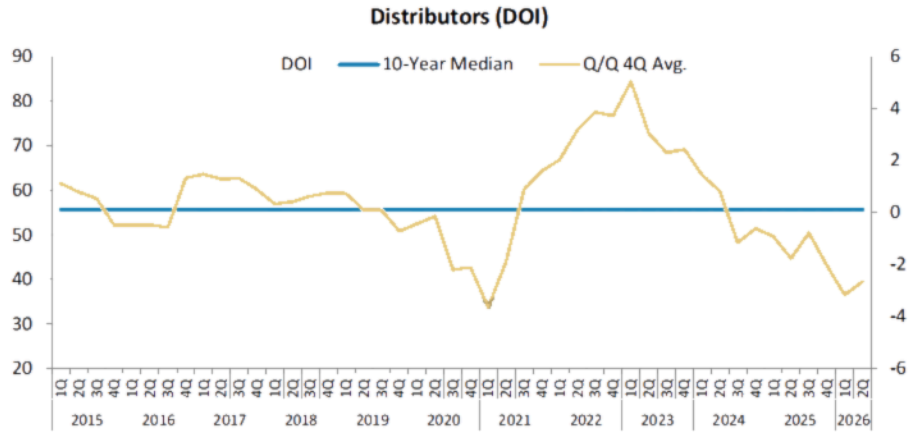
Exhibit 3: Sequential and y/y change in semi customer inventory levels

		Q/Q		Y/Y	
		Change in DOI	Change in $ Inventory	Change in DOI	Change in $ Inventory
Customers	AUTO OEMS	-3	0%	-2	-2%
	AUTO SUPPLIERS	-3	-16%	-4	-18%
	US INDUSTRIALS	-6	3%	-6	4%
	MACHINERY	-5	2%	-5	8%
	COMMUNICATIONS	9	16%	16	32%
	COMPUTING/MOBILE	12	36%	19	92%
	STORAGE	2	7%	0	13%
	CONSUMER	15	9%	-2	-10%
	CONTRACT MANUFACTURERS	-1	13%	0	37%
	ODM'S	-5	9%	10	87%
	TOTAL	**0**	**6%**	**2**	**16%**

Source: FactSet, Morgan Stanley Research

Distributor DOI fell 5 days q/q, more than the seasonal decline of ~1 day, and is now in line with the historical median of 56 days. DOI fell at all three distributors as COGS growth outpaced inventory growth at each. WPG fell the most, down 6 days (inventory +26% vs. COGS +44%), followed by Avnet, down 4 days (+11% vs. +16%), and Arrow, down 1 day (+4% vs. +6%). Inventory dollars still rose at every distributor, and the trailing 4Q average increased from last quarter. *(Arrow and Avnet are not covered by Morgan Stanley Research. WPG is covered by Daniel Yen).*

Exhibit 4: Distributor inventory is at 56 days, down 5 days q/q, above seasonal decrease of 1 day. DOI is in-line with the historical median while trailing 4-quarters increased sequentially.



Source: FactSet, Morgan Stanley Research

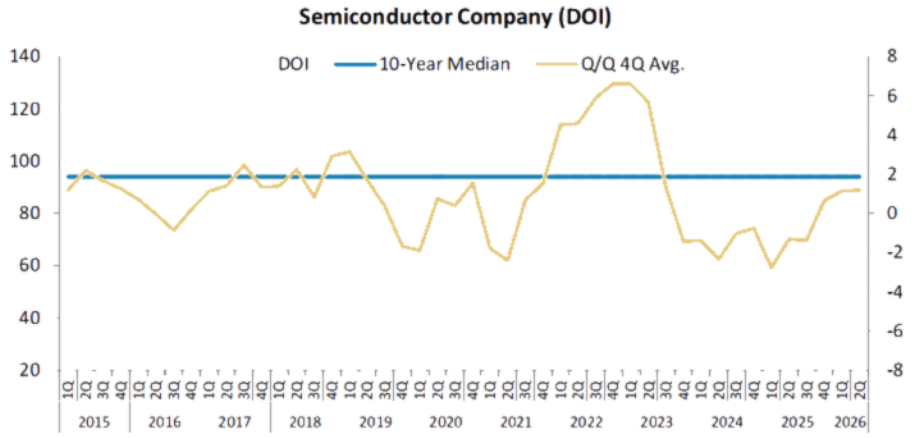
Exhibit 5: Sequential and y/y change in distributor inventory levels

		Q/Q		Y/Y	
		Change in DOI	Change in $ Inventory	Change in DOI	Change in $ Inventory
Distributors	Distributors	-5	13%	-11	29%

Source: FactSet, Morgan Stanley Research

Semiconductor company DOI rose 5 days q/q to 118 days, ~in-line with a seasonal increase of 4 days, and is now 24 days above the historical median. Others (+18 days), Smartphones/Networking/PLDs/Multi-Market (+16) and Foundries (+8) drove the increase. Analog/MCU and Semi Cap Equipment both fell 9 days, and Memory (–5), Components (–4) and Computing (–3) also declined. Inventory dollars rose q/q and y/y in nearly every group; the only flat readings were Analog/MCU q/q and Semi Cap Equipment y/y. The trailing 4Q average edged up in 2Q.

Exhibit 6: Semiconductor Company inventory is at 118 days, up 5 days q/q, which is 1 day above the seasonal increase of 4 days. DOI is 24 days above the historical median and trailing 4-quarters increased.



Source: FactSet, Morgan Stanley Research

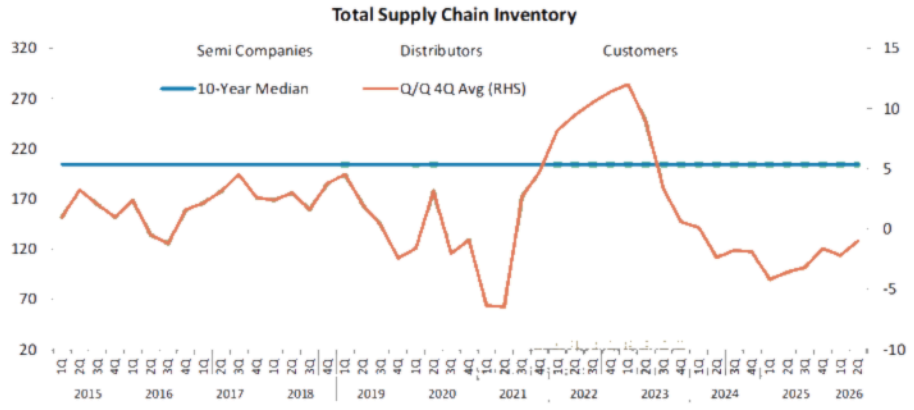
Exhibit 7: Sequential and y/y change in semi company inventory levels

		Q/Q		Y/Y	
		Change in DOI	Change in $ Inventory	Change in DOI	Change in $ Inventory
Semi Companies	Computing	-3	14%	11	59%
	Analog/MCU	-9	0%	-15	2%
	Smartphones/Networking/PLD's/I	16	11%	16	16%
	Memory	-5	8%	-9	8%
	Foundries	8	19%	10	20%
	Semi Cap Equipment	-9	2%	-41	0%
	Components	-4	6%	-3	24%
	Others	18	18%	17	20%
	TOTAL	**5**	**11%**	**5**	**20%**

Source: FactSet, Morgan Stanley Research

Total supply chain DOI across producers, distributors and customers was flat q/q, roughly in-line with the typical 1 day seasonal increase, and is now tracking at 30 days above the historical median. Distributors were the main source of a decline, falling 5 days against a seasonal decline of ~1 day. Customers were in-line with seasonality, while producers built ~1 day more than seasonal. Strong COGS and revenue growth continues to pull distributor days lower. For the supply chain overall, the trailing 4Q average rose ~1 day from last quarter.

Exhibit 8: Total supply chain inventory remained flat q/q, less than the seasonal increase of 1 day. DOI is 30 days above the historical median, and trailing 4-quarters upticked slightly.



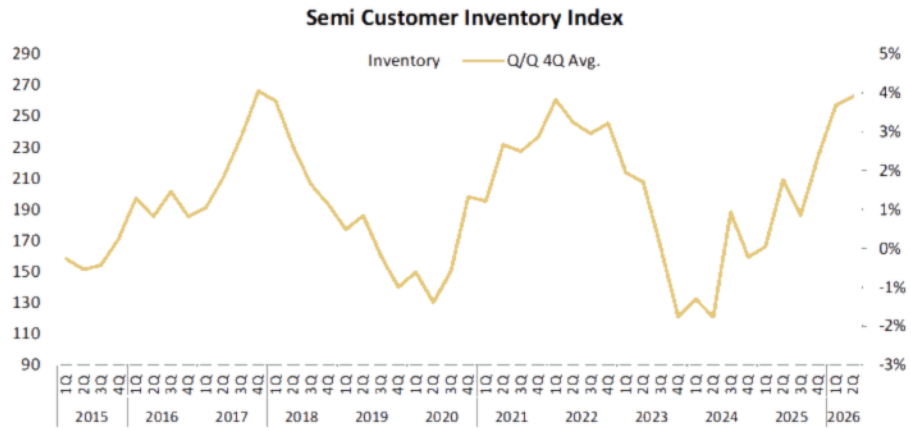
Source: FactSet, Morgan Stanley Research

Semi Inventory Analysis: DOI ~flat at Customers, lower at Distributors, higher at Producers.

Customer Inventory

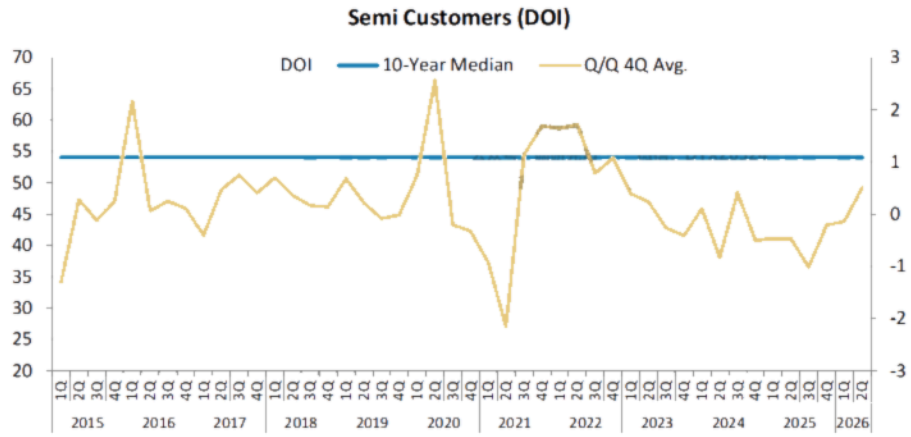
Semi customer DOI was ~flat q/q, in line with seasonality. Absolute inventory rose q/q across most end markets, while Auto OEM inventories were flat and Auto Supplier inventories declined. COGS declined in Auto Suppliers and Consumer and rose in Auto OEMs, US Industrials, Machinery, Communications, Computing/Mobile, Storage, Contract Manufacturers and ODMs.

Exhibit 9: Our Semi Customer Inventory Index increased 6.5% and trailing 4-quarters increased 3.9%.



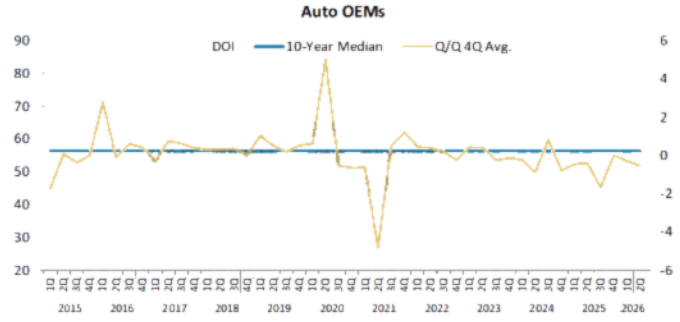
Source: FactSet, Morgan Stanley Research

Exhibit 10: Semi Customer DOI remained flat sequentially to 60 days, in-line with a seasonal change of 0 days. DOI remains above the historical median and trailing 4 quarters increased from last quarter.



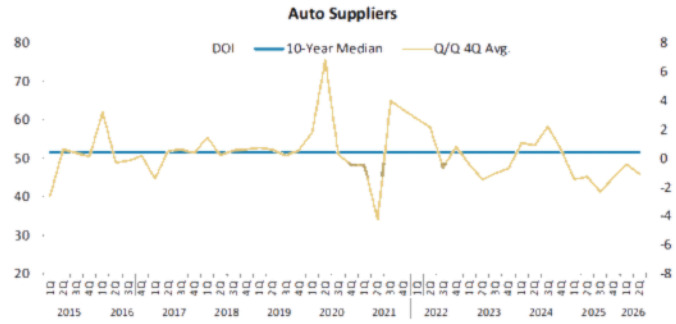
Source: FactSet, Morgan Stanley Research

Exhibit 11: Auto OEM DOI fell 3 days q/q and has moved below the historical median of 56 days. The trailing 4Q average declined from last quarter.



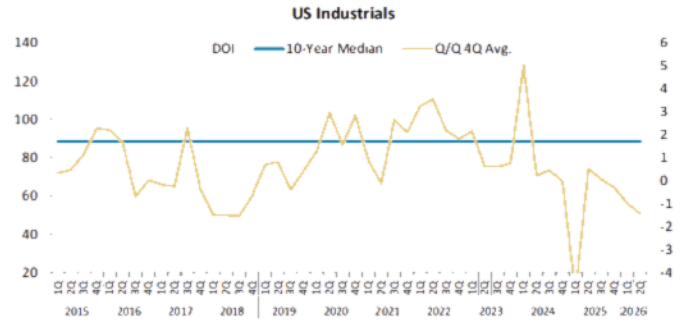
Source: FactSet, Morgan Stanley Research

Exhibit 12: Auto Supplier DOI fell 3 days q/q and sits below the historical median. The trailing 4Q average declined.



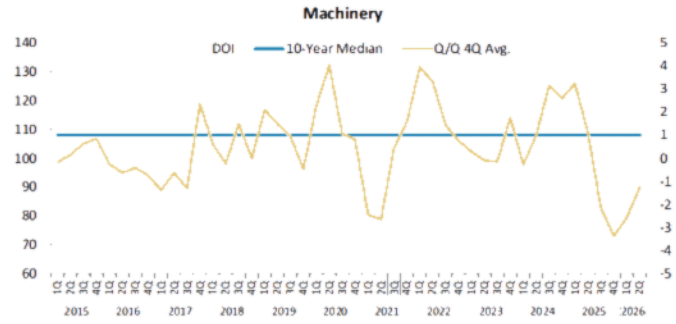
Source: FactSet, Morgan Stanley Research

Exhibit 13: Industrial DOI decreased 6 days q/q, tracking 13 days above the historical median. Trailing 4-quarters declined q/q.



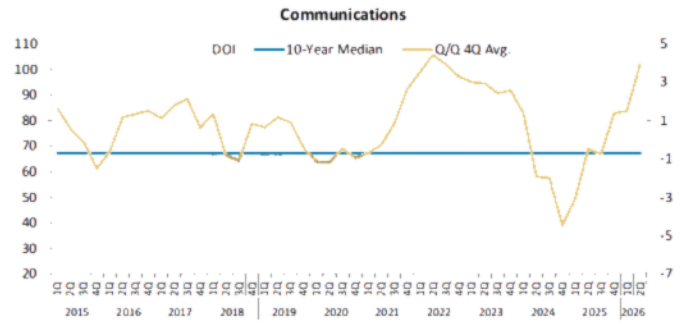
Source: FactSet, Morgan Stanley Research

Exhibit 14: Machinery DOI decreased by 5 days q/q, tracking 7 days above the historical median. Trailing 4-quarters increased q/q.



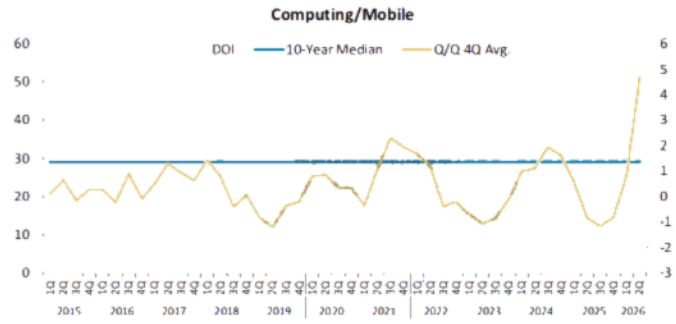
Source: FactSet, Morgan Stanley Research

Exhibit 15: Communications DOI increased 9 days q/q, tracking 30 days above the historical median. Trailing 4-quarters increased q/q.



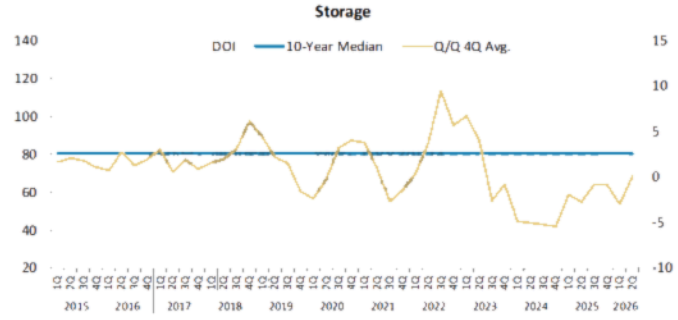
Source: FactSet, Morgan Stanley Research

Exhibit 16: Computing/Mobile company DOI increased by 12 days q/q, tracking 24 days above the historical median. Trailing 4-quarters increased sequentially.



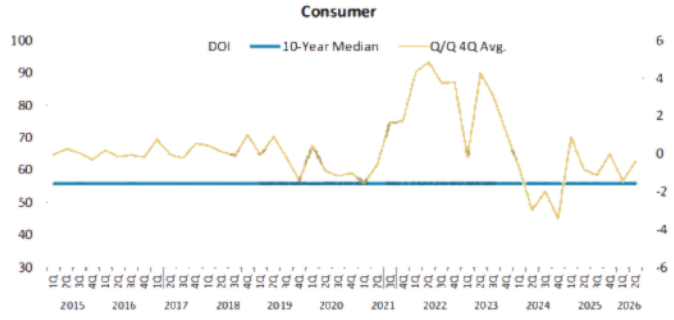
Source: FactSet, Morgan Stanley Research

Exhibit 17: Storage DOI increased by 2 days q/q, now tracking in-line with the historical median. Trailing 4-quarters increased from last quarter.



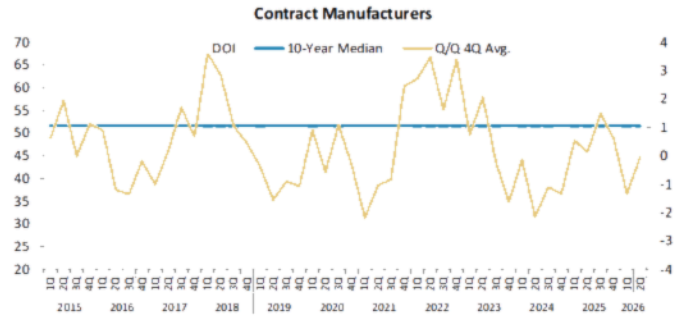
Source: FactSet, Morgan Stanley Research

Exhibit 18: Consumer company DOI increased 15 days q/q, now tracking 17 days above the historical median. Trailing 4-quarters increased.



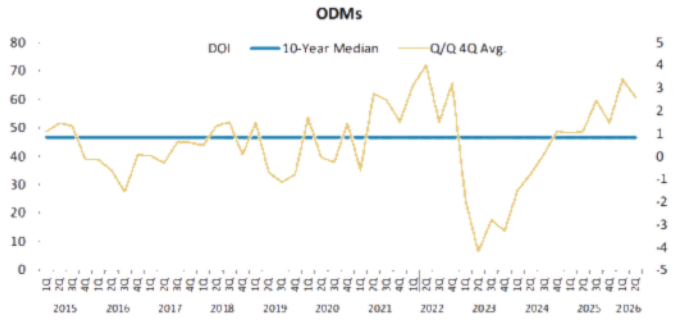
Source: FactSet, Morgan Stanley Research

Exhibit 19: Contract manufacturers DOI decreased 1 day q/q, tracking 5 days above the historical median. Trailing 4-quarters increased from last quarter.



Source: FactSet, Morgan Stanley Research

Exhibit 20: ODM DOI decreased 5 days q/q, tracking 16 days above historical median. Trailing 4-quarter decreased from last quarter.

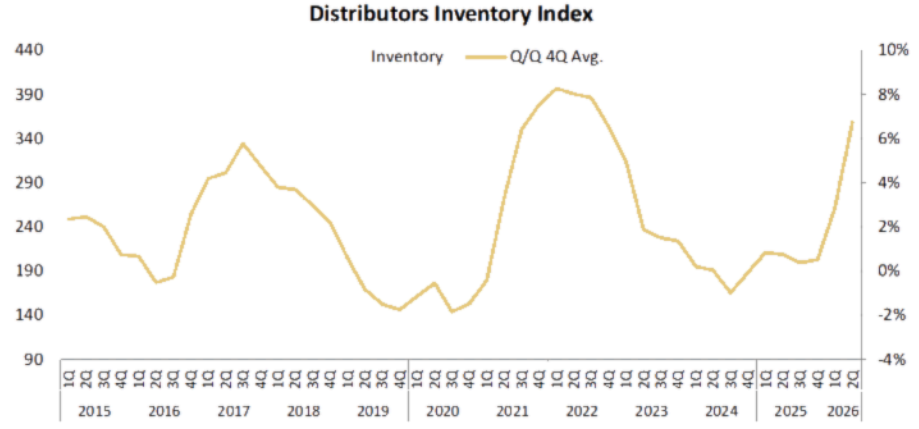


Source: FactSet, Morgan Stanley Research

Distributor Inventory

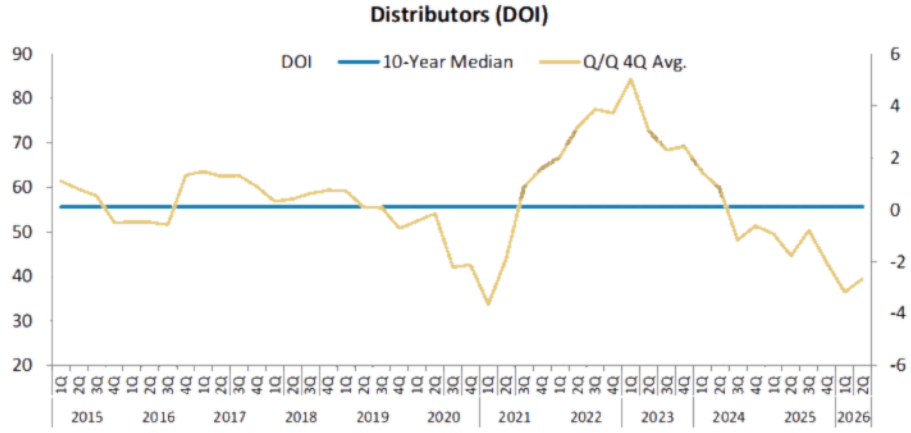
Distributor DOI fell 5 days q/q, ahead of the ~1-day seasonal decline, and is tracking in-line with the historical median.

Exhibit 21: Distributor Inventory index increased 13.5% sequentially, and trailing 4-quarters increased from last quarter.



Source: FactSet, Morgan Stanley Research

Exhibit 22: Distributor inventory is at 56 days, down 5 days q/q, above seasonal decrease of 1 day. DOI is in-line with the historical median while trailing 4-quarters increased sequentially.

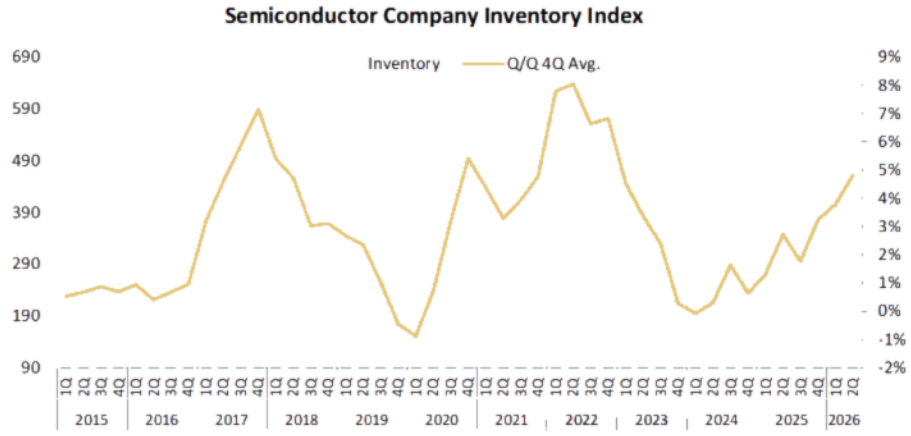


Source: FactSet, Morgan Stanley Research

Producer Inventory

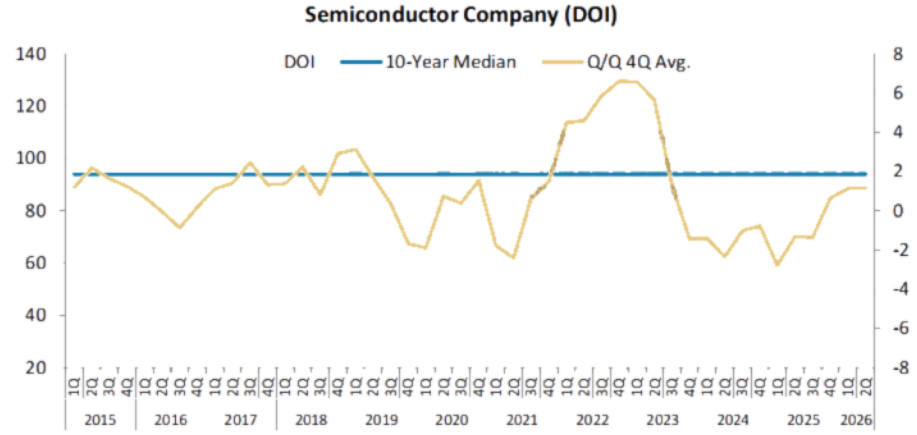
Semiconductor company DOI rose slightly more than seasonal. Analog/MCU and Semi Cap Equipment posted the largest declines, while the trailing 4Q average rose again.

Exhibit 23: Semi Company inventory index increased 5.2% q/q, with trailing 4-quarters increasing.



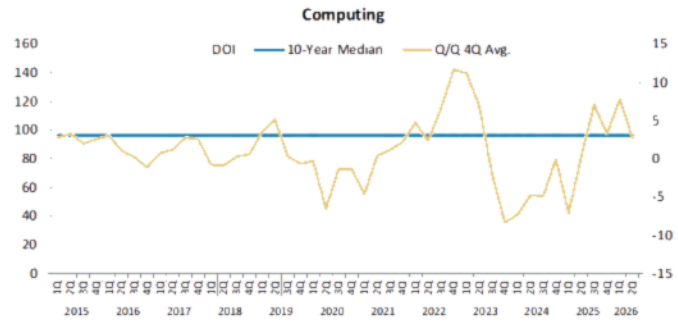
Source: FactSet, Morgan Stanley Research

Exhibit 24: Semiconductor Company inventory is at 118 days, up 5 days q/q, which is 1 day above the typical seasonal increase of 4 days. DOI is 24 days above the historical median and trailing 4-quarters slightly increased.



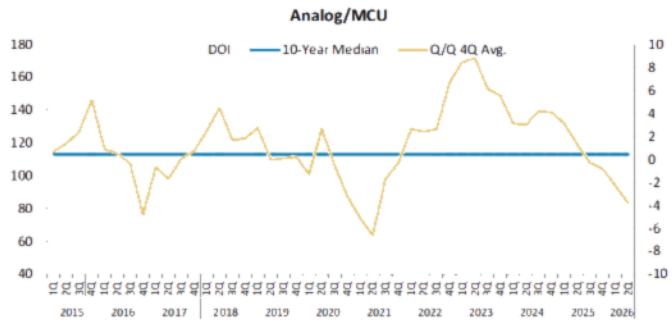
Source: FactSet, Morgan Stanley Research

Exhibit 25: Computing group DOI decreased 3 days q/q, now tracking 24 days above the historical median. Trailing 4-quarters decreased.



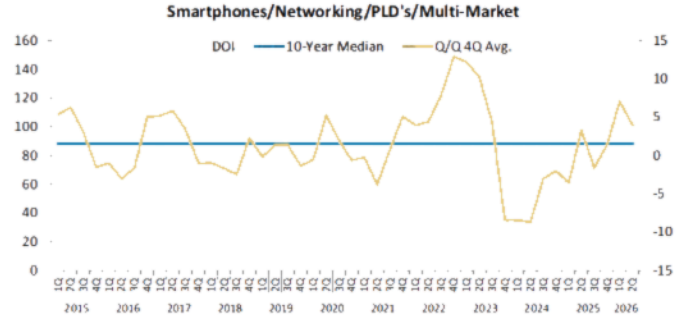
Source: FactSet, Morgan Stanley Research

Exhibit 26: Analog/MCU group DOI decreased 9 days q/q, now tracking 36 days above the historical median. Trailing 4-quarters fell q/q.



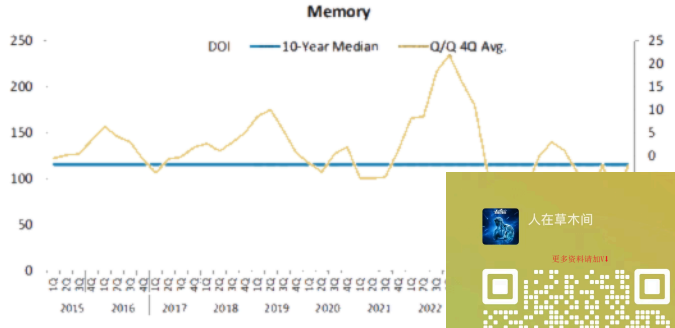
Source: FactSet, Morgan Stanley Research

Exhibit 27: Smartphone DOI increased 16 days q/q, now tracking 53 days above the historical median. Trailing 4-quarters decreased q/q.



Source: FactSet, Morgan Stanley Research

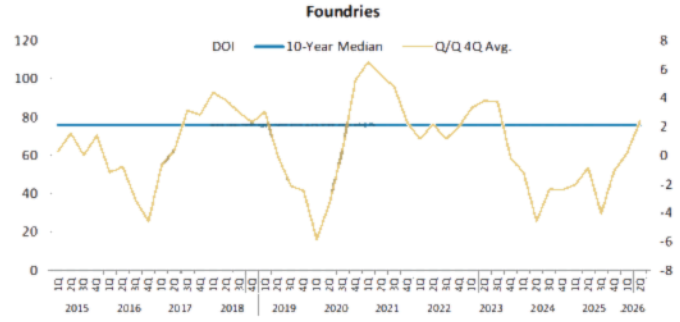
Exhibit 28: Memory group DOI decreased 5 days q/q, now tracking 3 days above the historical median. Trailing 4-quarters increased.



Source: FactSet, Morgan Stanley Research

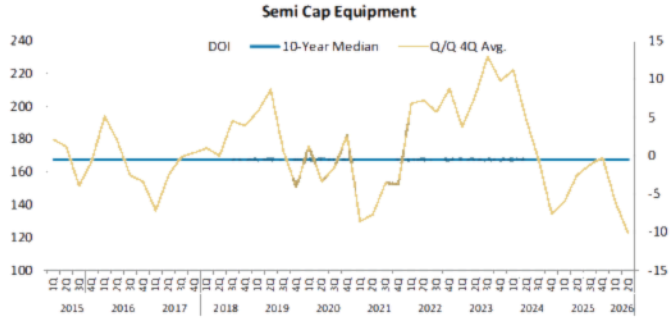
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Exhibit 29: Foundry group DOI increased by 8 days q/q, now tracking 16 days above the historical median. Trailing 4-quarters increased.



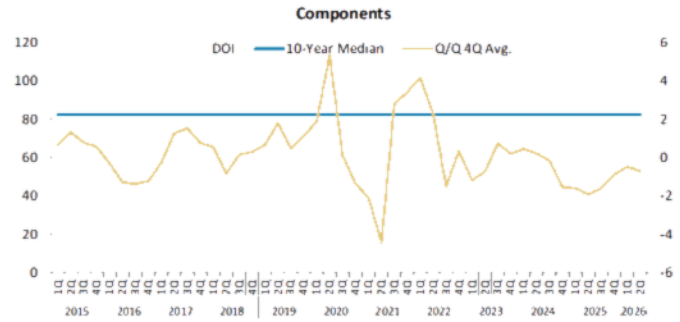
Source: FactSet, Morgan Stanley Research

Exhibit 30: Semi Cap Equipment group DOI decreased 9 days q/q, now tracking 2 days above the historical median. Trailing 4-quarters decreased from last quarter.



Source: FactSet, Morgan Stanley Research

Exhibit 31: Components group DOI decreased 4 days q/q, now tracking 3 days below the historical median. Trailing 4-quarters decreased from last quarter.



Source: FactSet, Morgan Stanley Research