Morgan Stanley | RESEARCH

UPDATE

July 1, 2026 04:14 AM GMT

Semiconductors | North America

Semiconductor Inventory Tracker: Not Restocking Yet

Supply chain inventory rose q/q but outperformed seasonality, with below-seasonal producer builds and distributor declines. Supply is tightening, but meaningful restocking has yet to emerge.

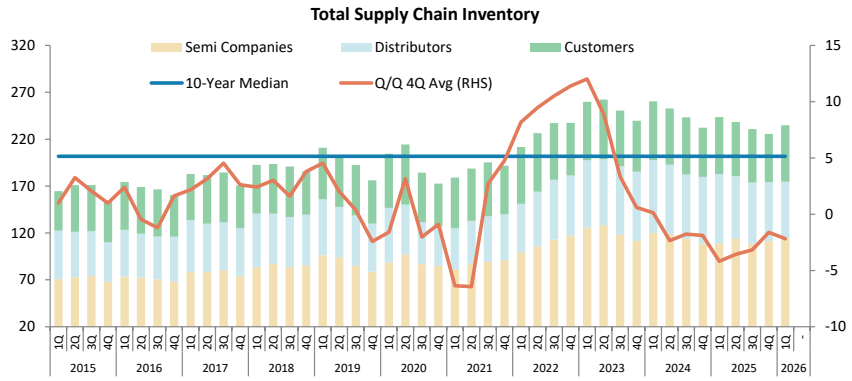
Key Takeaways

- Overall supply chain outperformed seasonality, increasing by less than the typical 1Q increase.
- Producer and disti DOIs outperformed seasonality; customers were ~in-line.
- Auto OEM DOI moved above historical median, while Auto Supplier DOI declined to in-line with historical levels.

Overall supply chain inventory increased q/q in 1Q, but the build was below typical 1Q seasonality. We remain above historical median levels, as distributors declined and producers built less than seasonal levels, while customers were ~in-line. While this is a step in the right direction, we still remain 33 days above historical median for the supply chain, and have not yet seen a broader restocking cycle.

The quarter reflected a mix of normal 1Q inventory build and continued discipline across the supply chain rather than broad restocking. Distributors continue to lean out, producer builds remain relatively steady, and customer trends were mixed. For stocks, we prefer areas where supply/demand is tightening or inventory risk is more defensible, including premium-end analog exposure in ADI and NXP, compute/networking names NVDA, AVGO, and CBRS, memory names MU and SNDK, and semicap names MKSI, KLAC, LRCX and ONTO.

Exhibit 1: Stacked DOI increased 9 days vs. a seasonal 19-day increase and is 33 days above the historical median. Trailing decreased ~2 days.



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Supply Chain Inventory Overview

Supply chain inventory increased q/q in 1Q, but by less than typical seasonality, with customer inventory ~in-line, distributors declining, and producers building less than seasonal levels. Total supply chain DOI increased 9 days q/q vs. a seasonal increase of 19 days, leaving DOI 33 days above the historical median. The improvement was led by distributor lean-out and muted producer builds, while customers were mixed by end market.

Semiconductor customer inventory increased by 9 days, ~in-line with the seasonal increase of 8 days, and now sits above the historical median by 6 days. The only semi customer where DOI decreased was Auto Suppliers (-1 day). Communications (+17 days) and ODMs (+16 days) saw the largest increases q/q. Storage remains slightly below its historical median, while other customers are now in-line (Auto suppliers, Auto OEMs, Consumer) or above (Industrials, Machinery, Computing/Mobile, Contract Manufacturers, and ODMs). Trailing four-quarter inventory increased from last quarter.

Exhibit 2: Semi Customer DOI increased 9 days sequentially to 60 days vs a seasonal increase of 8 days. DOI is above the historical median and trailing 4 quarters increased from last quarter.

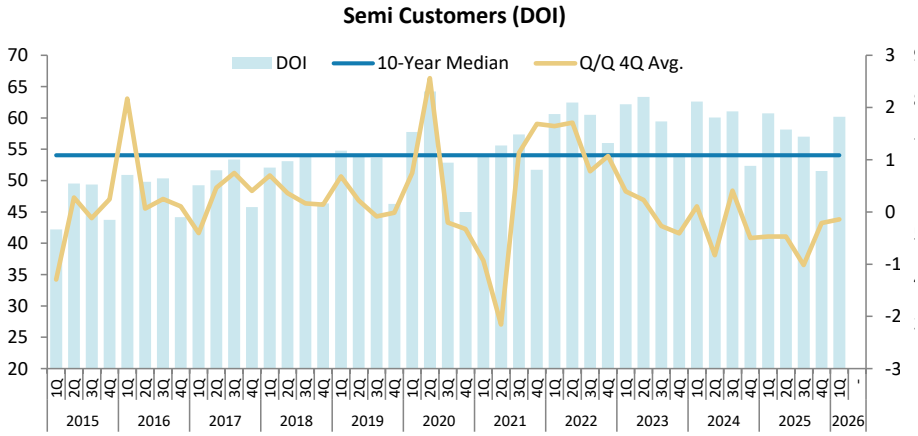


Exhibit 3: Sequential and y/y change in semi customer inventory levels

		Q/Q		Y/Y	
		Change in DOI	Change in $ Inventory	Change in DOI	Change in $ Inventory
Customers	AUTO OEMS	7	7%	-1	3%
	AUTO SUPPLIERS	-1	1%	-2	2%
	US INDUSTRIALS	8	4%	-4	7%
	MACHINERY	5	7%	-10	9%
	COMMUNICATIONS	17	11%	6	21%
	COMPUTING/MOBILE	11	27%	3	42%
	STORAGE	0	1%	-12	4%
	CONSUMER	4	-5%	-6	-7%
	CONTRACT MANUFACTURERS	13	8%	-5	24%
	ODM'S	16	45%	13	108%
	TOTAL	**9**	**11%**	**-1**	**15%**

Distributor inventory decreased by 2 days q/q, below a seasonal increase of 4 days, but still sits 7 days above the historical median of 54 days. DOI declined q/q at WPG and Avnet, driven by COGS growth outpacing inventory growth (WPG: inventory +18% vs. COGS +21%; Avnet: inventory +3% vs. COGS +13%), while Arrow's DOI increased by 2 days. Absolute $ of inventory increased for each distributor. Trailing 4-quarter decreased in the first quarter.
covered by Daniel Yen.)

Exhibit 4: Distributor inventory is at 61 days, down 2 days q/q, below the seasonal increase of 4 days. DOI is 7 days above the historical median while trailing 4-quarters decreased sequentially.

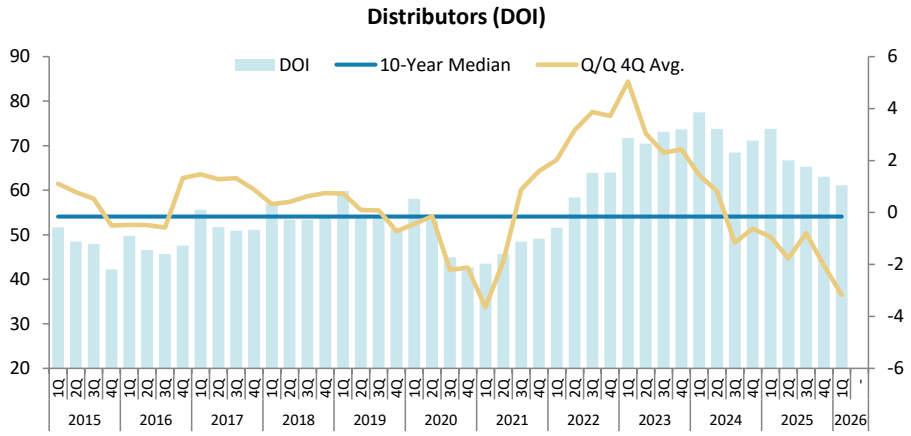


Exhibit 5: Sequential and y/y change in distributor inventory levels

		Q/Q		Y/Y	
		Change in DOI	Change in $ Inventory	Change in DOI	Change in $ Inventory
Distributors	Distributors	-2	11%	-13	11%

Semiconductor company inventory days went up by 2 days q/q, below the seasonal increase of 5 days, and is now 23 days above the historical median. The DOI increase was driven by Smartphones (20.8%) and Foundries (10.8%), while other sectors showed marginal changes in the range of -3.5% (Semi Cap Equipment) to +1.9% (Computing). Change in absolute $ inventory was broadly up across the board both q/q and y/y, with the exception of Memory holding ~flat y/y. Trailing 4-quarters DOI across semi companies slightly increased in 1Q.

Exhibit 6: Semiconductor Company inventory is at 114 days, up 2 days q/q, below the seasonal increase of 5 days. DOI is 23 days above the historical median and trailing 4-quarters increased.

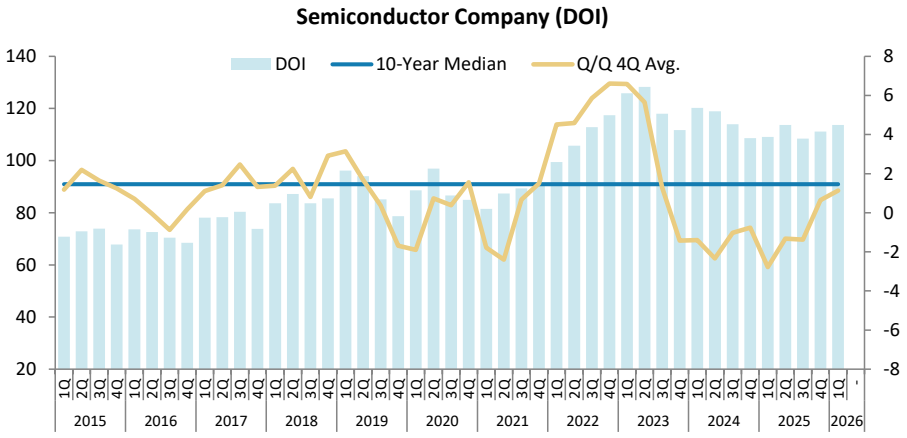
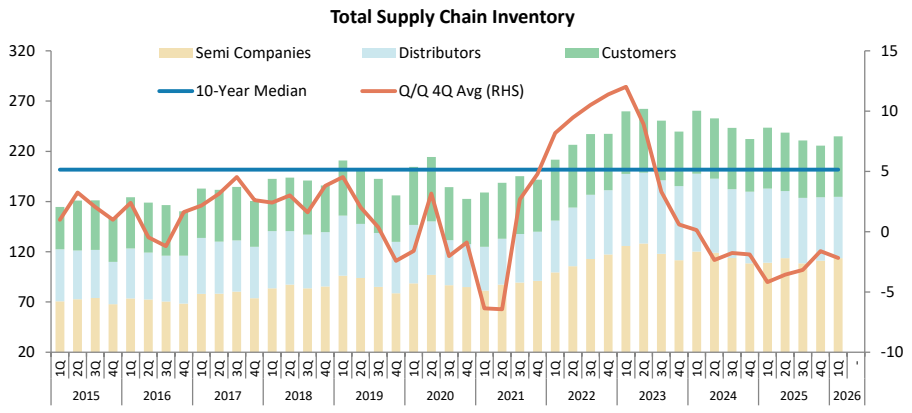


Exhibit 7: Sequential and y/y change in semi company inventory levels

		Q/Q		Y/Y	
		Change in DOI	**Change in $ Inventory**	**Change in DOI**	**Change in $ Inventory**
Semi Companies	Computing	2	13%	31	54%
	Analog/MCU	-2	0%	-9	5%
	Smartphones/Networking/PLD's/I	21	10%	28	31%
	Memory	0	3%	-40	-1%
	Foundries	8	6%	1	15%
	Semi Cap Equipment	-6	0%	-24	5%
	Components	0	10%	-2	25%
	Others	1	3%	3	5%
	TOTAL	**2**	**5%**	**5**	**16%**

Total supply chain DOI across producers, distributors, and consumers increased 9 days q/q, increasing 10 days less than seasonality, and is now tracking 33 days above the historical median. Distributor and Company DOI both outperformed seasonality, with Distributors showing the greatest seasonal difference, decreasing by 2 days compared to a seasonal increase of 4. Customers DOI was ~in-line with seasonality, increasing by 1 day more than seasonal levels. Distributors in particular appear to be leaning out, driven by high COGS and revenue growth. Trailing 4-quarter DOI average was ~flat for the supply chain overall.

Exhibit 8: Total supply chain inventory increased 9 days q/q, less than the seasonal increase of 19 days. DOI is 33 days above the historical median, and trailing 4-quarters was flat.



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

Customer Inventory

Semi customer inventory DOI increased more than seasonality. Absolute inventory levels increased q/q for all end markets except for Consumer. COGS decreased in Auto OEMs, US Industrials, Communications, Computing/Mobile, Consumer, and Contract Manufacturers, and increased in Auto Suppliers, Machinery, Storage, and ODM's.

Exhibit 9: Semi Customer Inventory Index increased 10.8% and trailing 4-quarters increased 3.7%.

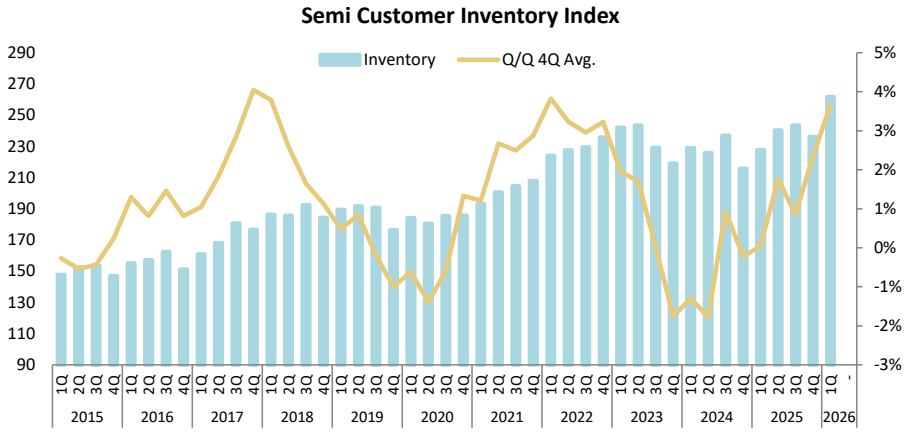


Exhibit 10: Semi Customer DOI increased 9 days sequentially to 60 days vs a seasonal increase of 8 days. DOI is above the historical median and trailing 4 quarters increased from last quarter.

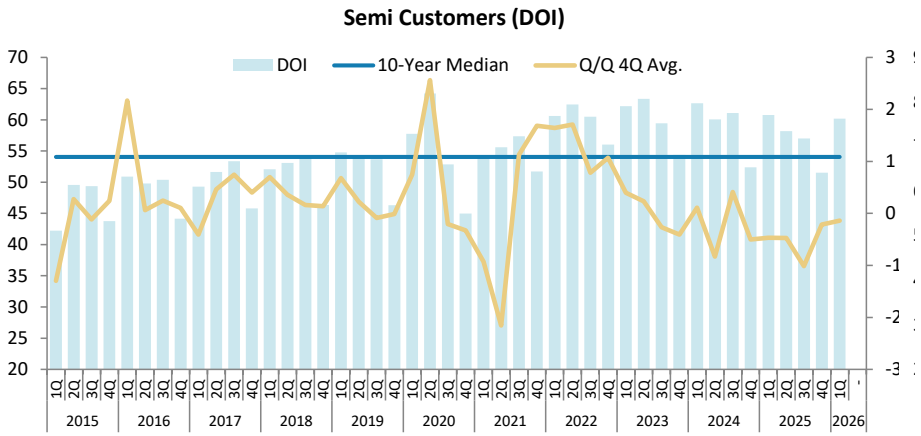


Exhibit 11: Auto OEM DOI increased 7 days q/q and is above the historical median (56). Trailing 4-quarters decreased from last quarter.

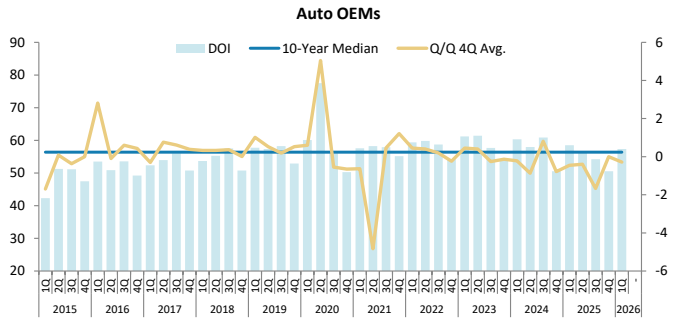


Exhibit 12: Auto suppliers DOI decreased 1 day q/q and is in-line with the historical median. Trailing 4-quarters increased q/q.

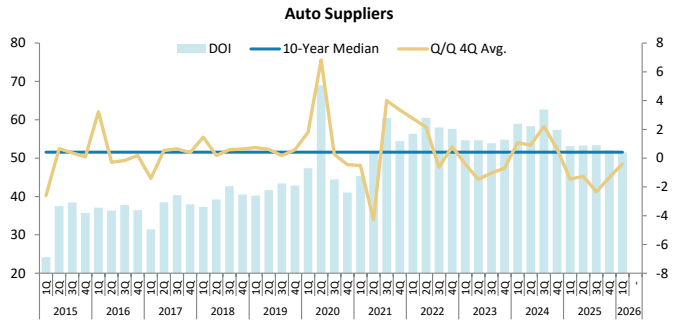


Exhibit 13: Industrial DOI increased 8 days q/q, tracking 19 days above the historical median. Trailing 4-quarters declined q/q.

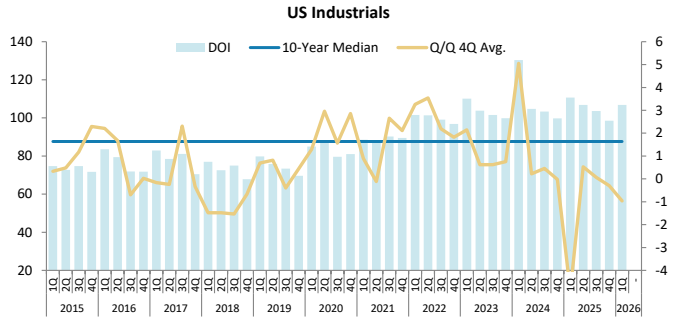


Exhibit 14: Machinery DOI increased by 5 days q/q, tracking 13 days above the historical median. Trailing 4-quarters increased q/q.

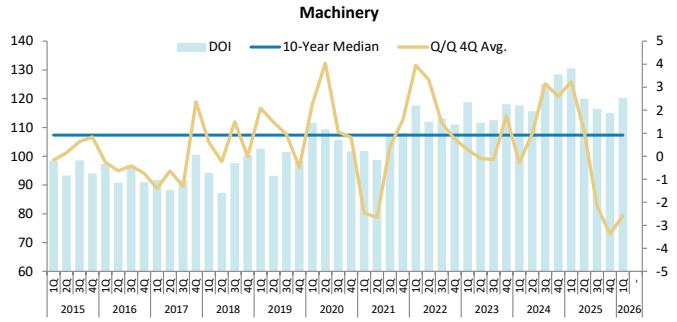


Exhibit 15: Communications DOI increased 17 days q/q, tracking 23 days above the historical median. Trailing 4-quarters increased q/q.

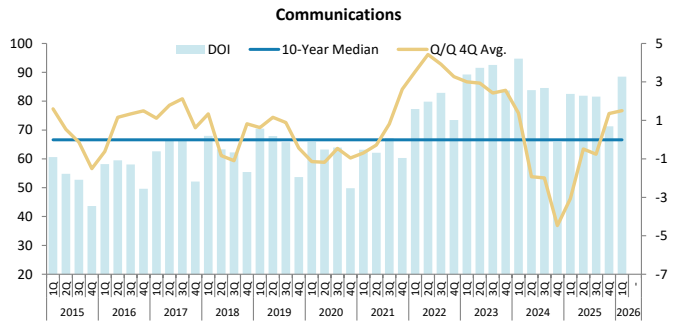


Exhibit 16: Computing/Mobile company DOI increased by 11 days q/q, tracking 12 days above the historical median. Trailing 4-quarters increased sequentially.

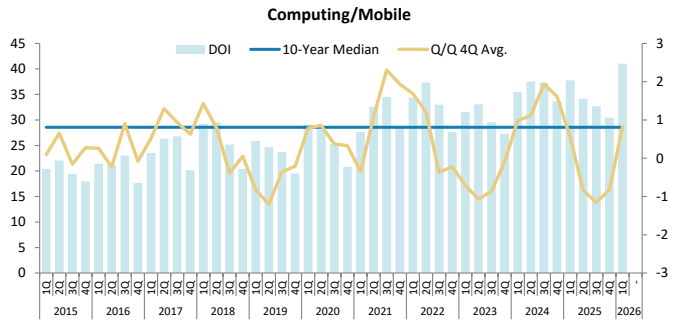


Exhibit 17: Storage DOI remained flat q/q, now tracking 2 days below the historical median. Trailing 4-quarters increased from last quarter.

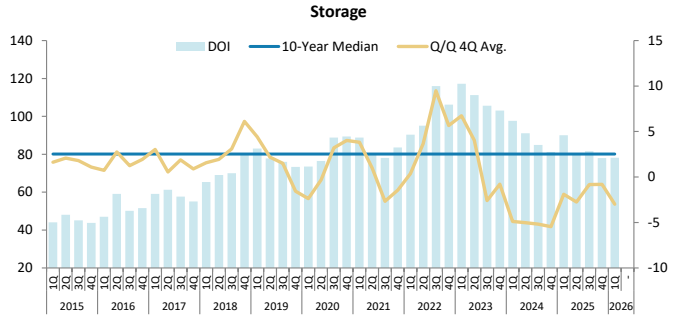


Exhibit 18: Consumer company DOI increased 4 days q/q, now tracking 2 days above the historical median. Trailing 4-quarters decreased.

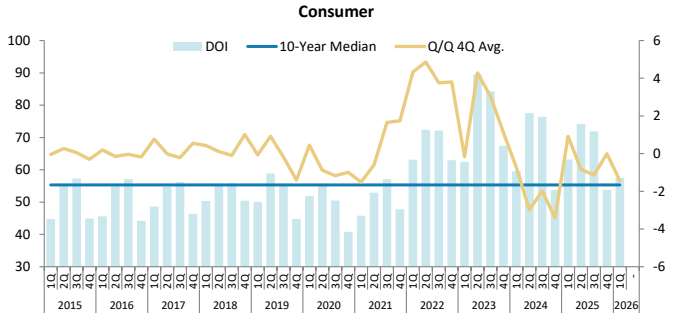


Exhibit 19: Contract manufacturers DOI increased 13 days q/q, tracking 7 days above the historical median. Trailing 4-quarters decreased from last quarter.

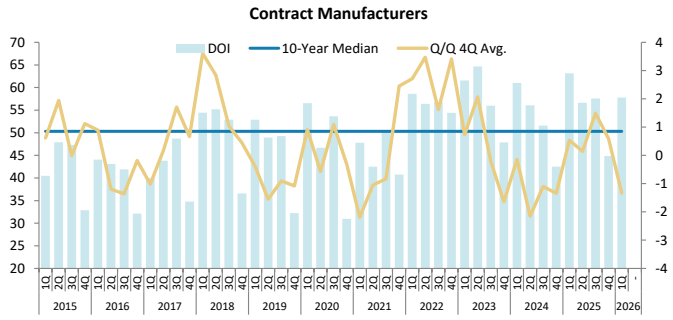
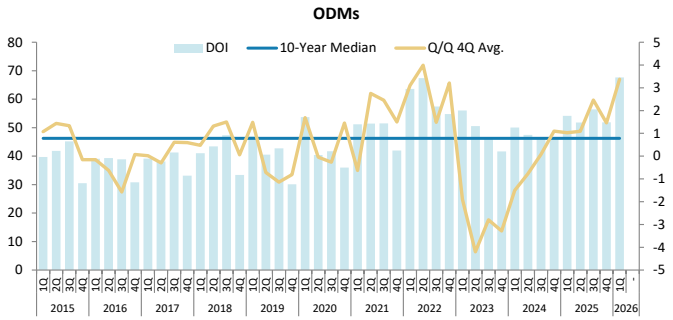


Exhibit 20: ODM DOI increased 16 days q/q, tracking 21 days above historical median. Trailing 4-quarter increased from last quarter.



Distributor Inventory

Distributor DOI decreased 2 days q/q, outperforming a seasonal increase of 4 days. DOI is tracking 7 days above the historical median.

Exhibit 21: Distributor Inventory index increased 10.8% sequentially, and trailing 4-quarters increased from last quarter.

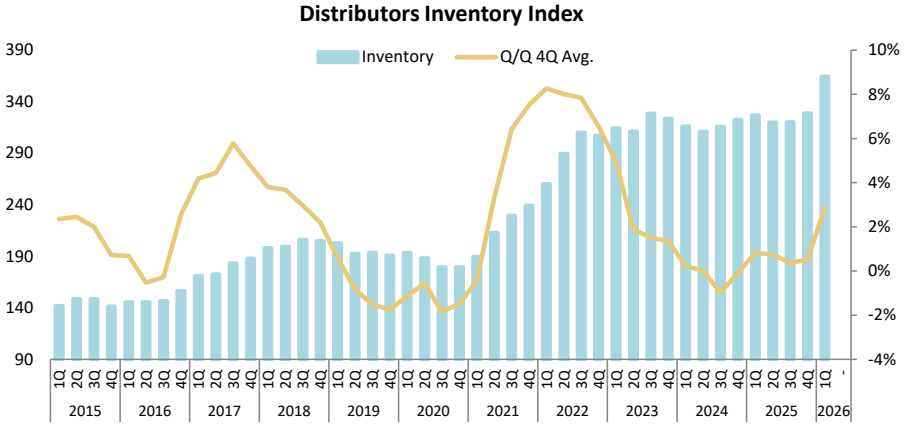
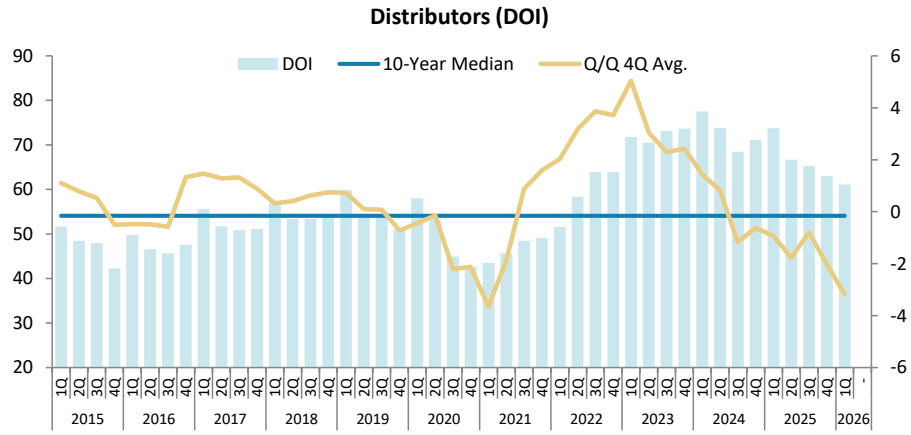


Exhibit 22: Distributor inventory is at 61 days, down 2 days q/q, below the seasonal increase of 4 days. DOI is 7 days above the historical median while trailing 4-quarters decreased sequentially.



Producer Inventory

Semiconductor company DOI increased less than seasonality. DOI decreased the most for Semi Cap Equipment and Analog/MCU while Memory was ~flat. Overall DOI momentum increased again consecutively.

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

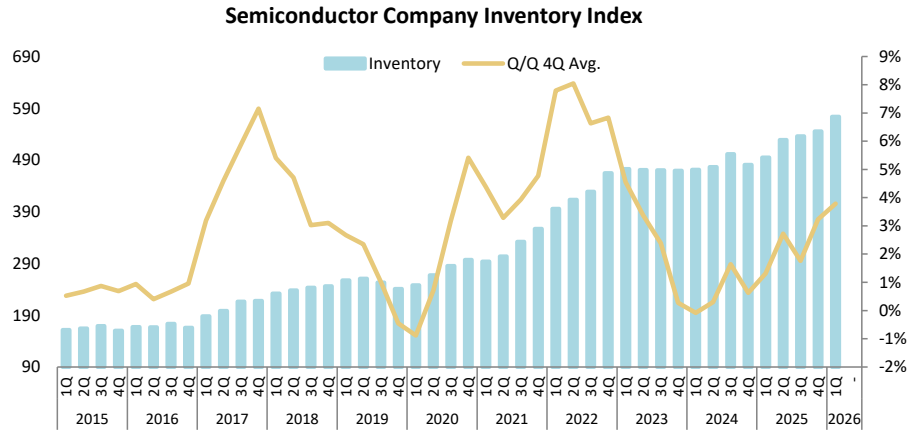




Exhibit 24: Semiconductor Company inventory is at 114 days, up 2 days q/q, below the seasonal increase of 5 days. DOI is 23 days above the historical median and trailing 4-quarters slightly increased.

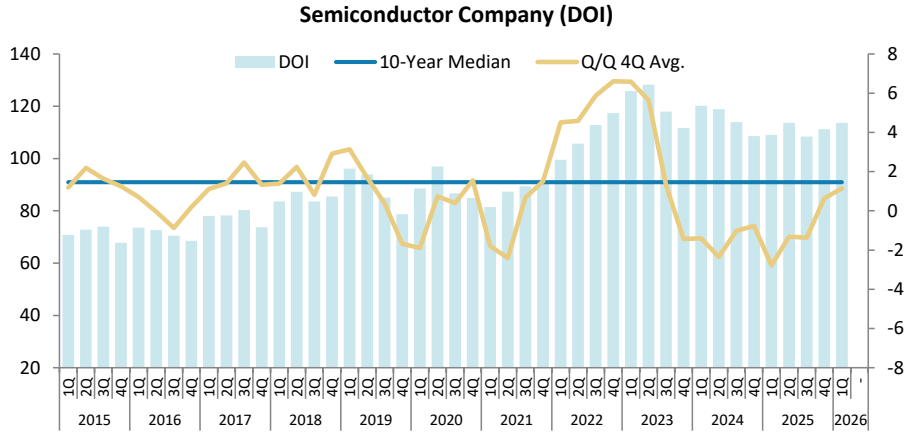


Exhibit 25: Computing group DOI increased 2 days q/q, now tracking 28 days above the historical median. Trailing 4-quarters increased.

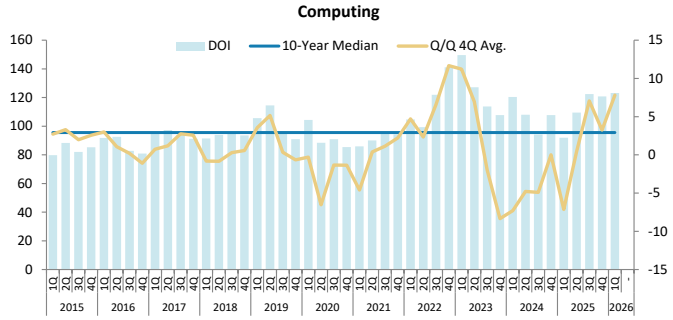


Exhibit 26: Analog/MCU group DOI decreased 2 days q/q, now tracking 45 days above the historical median. Trailing 4-quarters fell q/q.

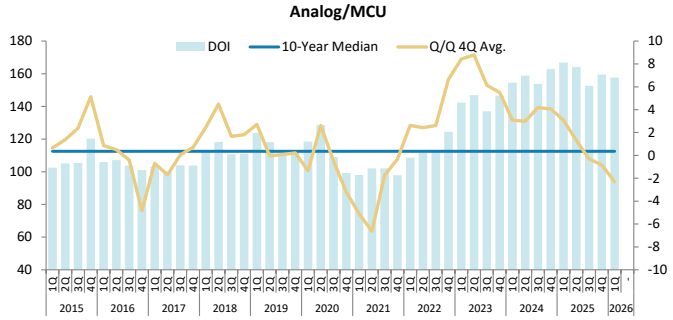


Exhibit 27: Smartphone DOI increased 21 days q/q, now tracking 37 days above the historical median. Trailing 4-quarters increased q/q.

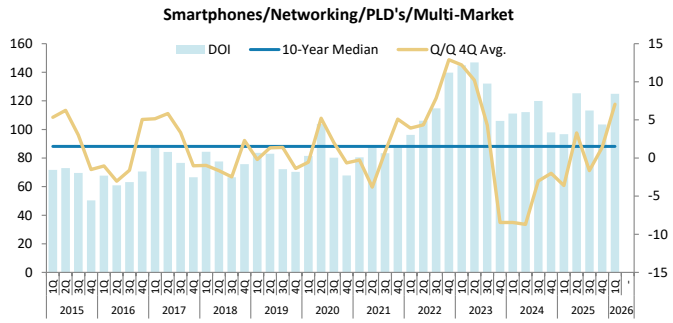


Exhibit 28: Memory group DOI remained flat q/q, now tracking 8 days above the historical median. Trailing 4-quarters decreased.

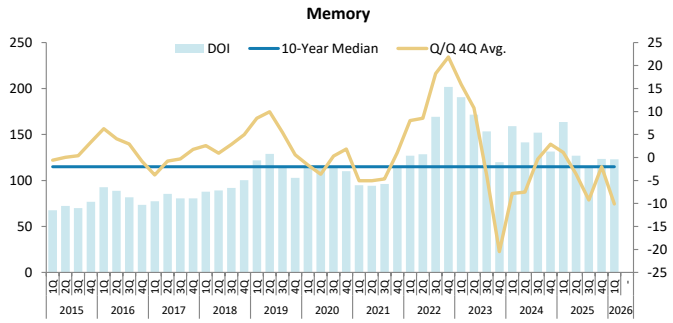


Exhibit 29: Foundry group DOI increased by 8 days q/q, now tracking 8 days above the historical median. Trailing 4-quarters increased.

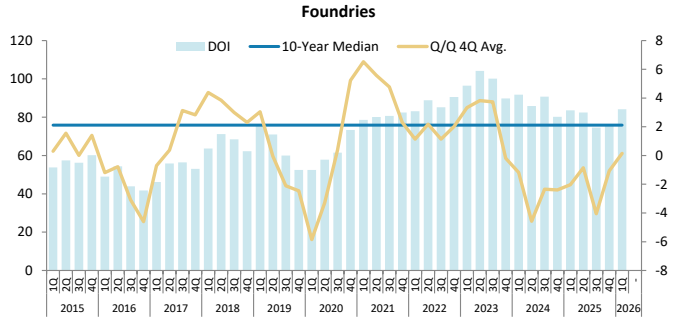


Exhibit 30: Semi Cap Equipment group DOI decreased 6 days q/q, now tracking 11 days above the historical median. Trailing 4-quarters decreased from last quarter.

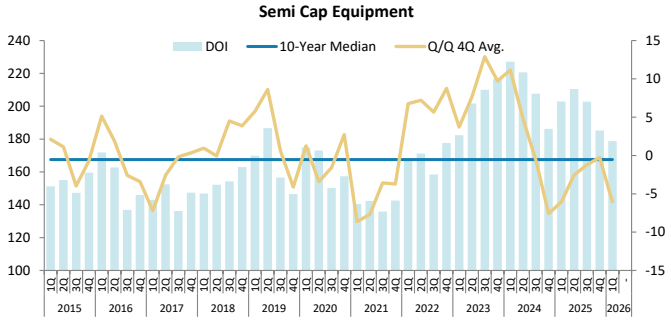


Exhibit 31: Components group DOI was ~flat q/q, now tracking 1 day above the historical median. Trailing 4-quarters increased from last quarter.

