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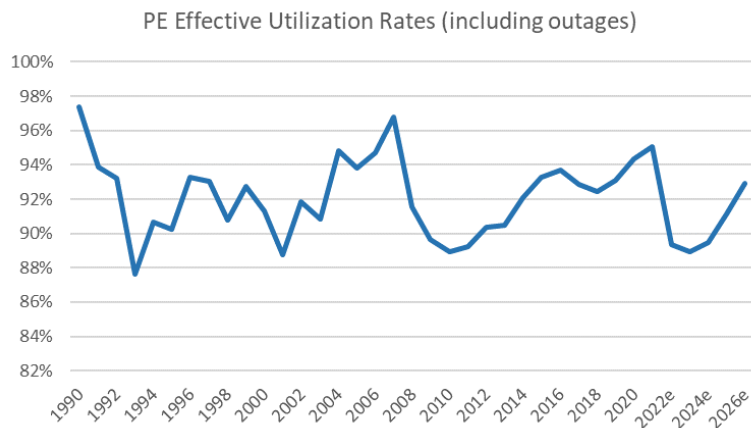
Monthly Data Book

US Chemicals & Agriculture

Monthly Data Book

Our monthly data book highlights end market trends that affect the companies in the Chemicals & Agriculture universe. The data pools together market trends as well as forecasts from our analyst teams for key end markets such as construction, autos, electronics and consumer goods.

Chart of the Month:



Source: Chemical Market Analytics, Morgan Stanley Research
 Note: Assumes outage run rate of 7% (planned and unplanned)

Note of the Month:

[Chemicals: Approaching Trough, But Inflection To Take Time \(ms.com, October 12, 2022\)](#)

Bottom Line. Cutting EPS by ~15% below recently updated 2023 cons. and reducing PTs as we assume weak 2H22 conditions last at least through the first half of 2023. Most upstream names are trading below 10x our revised 2023 EPS, though China and EU complexities may make this metric less valuable this cycle.

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US Chemicals Monthly Data Book – Key Conclusions

Chemical railcar volume is up 2.8% Y/Y YTD. Chemical railcar loads were up 2.8% YTD in the most recent week (vs. +5.6% in 2021). This represents a decrease from the +3.5% YTD increase result last month (vs. +5.6% in 2021).

Leading indicators of industrial production rise in China, fall in US and Europe. PMI levels in the US fell to 50.9 in September (vs. 52.8 in August, 52.8 in July and 53.0 in June). China's PMI rose to 50.1 in September (vs. 49.4 in August, 49.0 in July and 50.2 in June). PMI levels in the Eurozone fell to 48.4 in September (vs. 49.6 in August, 49.8 in July and 52.1 in June).

North America Polyethylene (PE) market update: The domestic PE market trended downwards this week amid softening demand and macroeconomic headwinds. Preliminary trade data suggests PE operating rates were 77.2% in September, the lowest level since the winter freeze in 2021 as producers cut back on production in an attempt to keep prices from sliding further. Despite reduced rates, trade sources indicate supply availability remains ample. Looking ahead, a large US producer is expected to shut down LDPE production for planned maintenance, which may affect the availability of LDPE in the domestic market. Overall US spot domestic prices were down week-over-week, with HDPE blow molding and LLDPE butene prices down 3cpp, and LDPE GP film prices down 4cpp. Meanwhile, in the export market, prices have been relatively stable over the last several weeks. US spot export prices were flat to down week-over-week, with HDPE blow molding and LLDPE butene prices flat, but LDPE GP film prices down 1cpp. Preliminary trade data suggests PE exports in September were similar to levels seen in August. Please see our recent Polyethylene S&D update inside here: [Chemicals: Approaching Trough, But Inflection To Take Time \(12 Oct 2022\)](#)

North America Polypropylene (PP) market update: Notably, preliminary trade data suggests total sales in September was the weakest month since April, 2020 at just 1.31 billion pounds. CMA expects domestic demand improvement in 4Q22 given converters have meaningfully destocked in recent months. Operating rates in September were reportedly 72.9%, and CMA forecasts rates near 72% in 4Q22 on expectations that producers work down inventory levels. Days of inventory increased 3.5 days month-over-month to 44 days in September. Interestingly, trade sources indicate PP export interest has increased in recent weeks, and CMA expects this trend to continue with more volumes exported in the weeks ahead due to increased availability of supply and declining propylene prices. Overall US domestic spot prices were down 7cpp week-over-week to 48cpp on a FOB Houston basis - a meaningful decline on the back of market expectations for a large decline in propylene prices in October. For context, CMA forecasts US propylene contract prices will fall 5cpp in October versus September.

Mixed week for urea prices on supply and macro volatility. Urea names noted sharp swings last week with urea prices moving similarly on a flux of news including various European nitrogen production switching ammonia plants back on, the potential for German/EU support/subsidies to 'heavy/large industries', Russia stating it does not intend to increase mobility on the Ukraine front, etc. At the same time, the Indian IPL tender is still collecting offers with expectation for 1.2-1.5mT to be purchased overall, with China potentially supply 200-300kT, assuming it receives an export inspection certificate. US NoLa urea prices were -\$11/st to \$595-630/st fob with a temporary halt to barge traffic along the lower Mississippi River (cleared on October 10th). Brazil urea prices were stable WoW at \$630-660/t cfr yet supply of Russian, Venezuelan and Iranian product remains ample. France urea prices were +€33/t to \$835-845/t fca following a flurry of activity in the prior week, and buyers currently price checking, with the intention of potentially securing volumes next week. As a result, Egypt urea prices gained +\$30/t to \$760/t fob.

For additional weekly commentary please see: [HERE](#) and [HERE](#)

US Chemicals Monthly Data Book – Research Highlights (1 of 4)

[Chemicals: Approaching Trough, But Inflection To Take Time](#) **October 12, 2022** Cutting EPS by ~15% below recently updated 2023 cons. and reducing PTs as we assume weak 2H22 conditions last at least through the first half of 2023.

[Corteva Inc.: Simplification, Accountability, & Acceleration](#) **September 14, 2022** Corteva remains our Top Pick following Tuesday's Investor Day.

[Paper & Packaging: Disciplined Beverage Can S&D](#) **September 7, 2022** We're cutting our '22 demand outlook but stay positive. We see: i) a disciplined supply response in the current backdrop, ii) demand pressures abating by '23, iii) signs that secular aluminum can story is intact, and iv) bad news now priced in. Reiterate OW on Crown, EW on Ball and AMBP.

[Corteva Inc.: Plan Moving Forward; Raising EPS and PT](#) **August 8, 2022** Overweight rated Corteva remains our top pick as we raise both our earnings estimates and our price target. Nonetheless, we think there is more value creation to come

[Sherwin-Williams Co.: Thoughts Post 2Q](#) **July 28, 2022** We are reducing our estimates and PT (from \$330 to \$300) following yesterday's disappointing 2Q22 results and outlook.

[CF Industries & Nutrien: Is The Floor The Ceiling Again?](#) **June 24, 2022** We have been getting significant incoming investor questions regarding the ~50% decline in NoLa Urea urea prices since the March 2022 peak, with many of the same investors noting that EU natural gas prices (the high cost global feedstock) have only declined by ~30% from their peak, leaving current NoLa urea prices below the break even price for importation of high cost EU product into the US.

[LyondellBasell Industries N.V.: CEO Dinner Takeaways](#) **June 22, 2022** We hosted LyondellBasell's new CEO, Peter Vanacker, for a dinner at Morgan Stanley's New York headquarters. Below are some quick key takeaways.

[Agriculture & Food: Food Security & Inflation: From Seeds to Stores](#) **June 13, 2022** While we see a wide range of future food prices, our base case view is below consensus, and we recommend owning predominantly "downstream" companies that are cheaper and benefit from lower food input costs. We assess scenarios and associated impacts on a global basis

[Ardagh Metal Packaging S.A.: Step In The Right Direction](#) **June 2, 2022** Ardagh Metal Packaging (AMBP) announced several capital strategy changes that we believe were meaningful steps in the right direction toward better aligning the company's strategy with investors

[Mosaic Company: Phosphate Primer](#) **May 31, 2022** Diagraming global phosphate market dynamics. We are often asked to discuss nitrogen, phosphate and potash market dynamics from a S&D, cost curve, and trade flows perspective. Of the three nutrients, investors generally have the toughest time defining the ebbs and flows of the phosphate cycle, and how prices and spreads should behave at different points of the cycle.

[Linde PLC: Margin Parity 2.0: Narrowing the Gap, but a Higher Bar](#) **May 24, 2022** We reiterate our Overweight rating. Linde remains in the sweet spot of: i) defensive growth; ii) strong — through the cycle — pricing power; iii) substantial self-help levers to pull on the income statement, balance sheet, and cash flow statement; and iv) a pole position from which to participate in the new hydrogen economy.

[Chemicals: Paint Read Across From HD & LOW Results](#) **May 19, 2022** 1Q22 conference call commentary from Home Depot and Lowe's (HD/LOW - covered by Simeon Gutman) remains supportive of our bullish view on the US do-it-for-me (i.e., professional) architectural paint cycle. Home Depot and Lowe's both highlighted: (i) strong home improvement project backlogs; (ii) continued strength within the pro channel; (iii) near-term outperformance for the paint category; and (iv) improvements of in-stock levels.

US Chemicals Monthly Data Book – Research Highlights (2 of 4)

[Corteva Inc.: Takeaways From CEO/CFO meetings: More, Better, Faster In Progress...](#) **May 18, 2022** We hosted a day of investor meetings with both Chuck Magro (CEO) and Dave Anderson (CFO)

[Sherwin-Williams Co.: Spring Survey Supportive](#) **May 17, 2022** Our survey shows: i) the demand backlog remains at record levels; ii) paint supply is normalizing at Sherwin/Lowe's stores; iii) Sherwin and its stores are still the most preferred paint/place to purchase, with user frequency increasing; iv) pros are still hiring; and v) pricing is expected

[Chemicals: Albemarle Corporation: Thoughts Post Large Lithium Guidance Increase:](#) **May 9, 2022** We remain Underweight Albemarle but raise our price target from \$80 to \$135 to reflect materially higher EBITDA in the Lithium segment than we previously expected (though much more so in 2022 and 2023 than in 2024+).

[Paper & Packaging: Ball Corporation: Thoughts Post 1Q22; Lower PT to \\$75](#) **May 9, 2022** More balanced Risk/Reward now priced in. We believe the sell off in Ball Corp. (BLL) shares last week was a result of more than just the company's 1Q22 earnings.

[Chemicals: Agricultural Products: ADM & BG – Raising EPS & PTs](#) **May 2, 2022** We are raising estimates and price targets for ADM (\$69 to \$94) and Bunge (\$98 to \$120) in the context of a widening bear case to bull case skew.

[Chemicals: Sherwin-Williams: Thoughts Post 1Q](#) **April 28, 2022** We are reiterating our Overweight rating, but reducing our PT from \$375 to \$330 to reflect: i) lower peer and market multiples year-to-date; ii) a reduction to our still above consensus base case EPS forecast for 2023 (\$12 versus \$12.65, previously, and consensus of ~\$11); and iii) the reduced likelihood of our bull case for \$13-\$14 of EPS in 2023 given the Russian/Ukraine conflict has raised energy costs and therefore limited the potential for deflation.

[Paper & Packaging: Beverage Can S&D Update](#) **April 12, 2022** While the range of outcomes around bev can demand has widened, our updated S&D suggests a slightly improved base case. Further, we think the long term secular trend remains healthy and thus we would continue to be buyers of Crown (CCK).

[Westlake Corp: Takeaways From 2022 Investor Day](#) **April 8, 2022** Westlake hosted its 2022 Investor Day yesterday, April 7, 2022. Below are some highlights and key takeaways:

[Nutrien Ltd: CFO Meeting Takeaways](#) **April 1, 2022** We hosted meetings featuring Pedro Farah, EVP & CFO; Jeff Holzman, VP of Investor Relations; Melanie Christianson, Director of Investor Relations; Jeff DeMars, SVP Treasury & Tax; and Carolyn Engel, SVP Retail Finance

[Paper & Packaging: Aluminum Update](#) **March 28, 2022** Last week, our Global Commodity Strategists raised their outlook for Aluminum Prices (see [HERE](#)) for 2022/23/24/25 by +9%/+15%/+15%/+10% respectively versus their prior estimates.

[Chemicals: Fertilizers: Exploring Value Through Peak and Trough](#) **March 17, 2022** Amid a highly fluid soft commodity/fertilizer market backdrop, we lay out Bull-Base-Bear Case scenarios for our fertilizer coverage in terms of earnings, FCF, and valuation. We now think above mid-cycle earnings power will last at least until 2024.

[Olin Corp: Plant Shutdown Raises Demand Concerns](#) **March 15, 2022** Despite Olin's Epoxy guidance cut, the financial implications ultimately reported may be less clear cut given the likelihood of tighter S&D's and higher commodity prices. Regardless, we remain Equal-weight on Olin as this development underscores our ongoing concern that recent "gully" in epoxy demand could last longer than anticipated. Indeed, we think Olin's plant shut down is the first in what markets fear may be more outages and guidance cuts to come as a result of the Russia/Ukraine conflict. We would expect this latter point and its implications to be the bigger takeaway and focus for investors broadly.

US Chemicals Monthly Data Book – Research Highlights (3 of 4)

[Westlake Corp: Model Update – Raising EPS and PT](#) *March 14, 2022* We are raising our PT from \$116 to \$120, but remain Equal-weight Rated. We continue to have a positive bias on Westlake relative to the rest of our coverage and see an attractive bull/bear skew. We adjust our bull case scenario to \$165 (+38% upside; previously \$140) and our bear case scenario to \$85 (-29% downside; previously \$74).

[Diversey Holdings, Ltd: Oversold – Thoughts Post 4Q](#) *March 11, 2022* We reiterate our Overweight rating, but reduce our EBITDA forecasts and our price target as discussed below. Put simply, we think Diversey has been oversold versus peers and offers a compelling absolute opportunity (e.g., further pricing, COVID revenue recovery, self-help on cost structure) as well as a compelling near term relative opportunity (e.g., Diversey has already guided for Russia/Ukraine while peers will have to contend with this at or before 1Q22 reporting)

[Agriculture: Russia may halt fertilizer exports](#) *March 4, 2022* The Russian Industry and Trade Ministry has recommended to temporarily halt the export of fertilizers mostly due to logistical problems. As per consultancy CRU on March 1st, a number of European fertilizer importers were reportedly unwilling to commit to Russian fertilizer cargoes amid the potential for sanctions, non-performance issues and payment problems. Allegedly, some ship-owners were also unwilling to load fertilizer from Russian origin. Later this week, Indian importer IPL is reportedly said not to be willing to accept urea shipments that have been sourced from Russia, under the February 7th import tender.

[Chemicals: 10 Year Bond Yields No Statistically Significant Impact On Multiples](#) *March 2, 2022* Our work shows no statistical significance between 10 year bond yields and NTM chemical valuation multiples. We think that this is likely because other company/sector specific factors generally/ultimately predominate over bond yields in terms of share price movement.

[Chemicals: Urea surges; Potash up; Phosphate jumps; China efficiency ambition; Soy crush mixed](#) *February 28, 2022* Urea market springs to life on Russia/Ukraine conflict. After a number of quiet weeks, buyers returned to the urea market last week and prices climbed across key regions with the Eastern European conflict viewed as the key driver: a likely tighter supply backdrop - almost for sure in the near-term - amidst uncertainty associated with both natural gas costs and export disruption potential from both Russia and Ukraine, whether it be due to logistical issues or sanctions potential

[Chemicals: Corporate Access Day 1 Takeaways](#) *February 14, 2022* We detail key discussions / debates between investors and the Chemicals companies that we hosted. High level takeaways below. Company specific discussions inside this note

[CF Industries: 4Q21 As Preannounced; Outlook Positive](#) *February 14, 2022* We detail key discussions / debates between investors and the Chemicals companies that we hosted. High level takeaways below. Company specific discussions inside this note

[Ecolab Inc: 2022 Guide In Line with Pre-Announcement](#) *February 11, 2022* We expect a neutral response to 4Q results and 2022 outlook that are largely in line with the company's pre-announcement

[FMC Corporation: Raise PT As We Roll Out To 2023](#) *February 11, 2022* Following 4Q21 results and a well framed 2022 outlook, we update our estimates (2022 trimmed, but 2023 increased) and increase our price target to \$125 as we roll valuation out to 2023.

[Celanese Corp: 4Q21 Below; 2022 Reaffirmed](#) *January 27, 2022* We expect a neutral response to results and outlook

[Chemicals: Coatings Raw Mats Tracker: Gradual Slope of Descent Likely](#) *January 26, 2022* December HIRS +12.5% vs. +16.1%; +7.6% on an extra work day. November P&WP sales +9.7% vs. +7.7%; +4.7% on an extra day. DIY appears to remain elevated. Raws availability limiting 1H22 volumes, but we expect a robust DIFM backlog/Sherwin share gains in 2023 and a DIY soft landing

US Chemicals Monthly Data Book – Research Highlights (4 of 4)

Paper & Packaging: 2022 Outlook – Changing with the Times *January 20, 2022* Narratives in Packaging are evolving from: 1) raw material declines to pricing, 2) delevering to shareholder returns, 3) shares rebounding to multiple contraction, and 4) tightening to normalizing beverage can S&D. We adjust EPS/PTs; Upgrade SEE to OW, reiterate our CCK OW, and downgrade BLL to EW.

Huntsman Corp: Change is Never Easy *January 14, 2022* We Reiterate our Overweight rating and \$47 price target (~23% upside) following the launch of a proxy contest at Huntsman. We believe the confluence of fundamentals and self-help could drive further positive earnings revisions with our 2024e EBITDA +11% above consensus.

Chemicals: Correction: 2022 Outlook – A More Gradual Slope of Descent *January 12, 2022* Four key themes: i) raw materials (a more gradual "slope of descent"); ii) self-help (core to our OW calls on CTVA, HUN & LIN); iii) free cash flow use for commodity cos; and iv) chemical recycling of plastic (2022 ESG driver). We adjust EPS/PTs

Global e-learning: Global Chemicals *January 11, 2022* In this presentation, we discuss the industry structure across geographies, how chemical markets will evolve in the coming year, regional nuances in equity performance and how chemical companies are positioning themselves to achieve their energy transition and sustainability goals.

Chemicals: TiO₂ - S&D Outlook From The Bottom Up *December 14, 2021* We introduce a bottom-up TiO₂ S&D model, informing our view that TiO₂ capacity utilization will peak in 2022, followed by a soft landing in 2023. We see a balanced bull/bear skew for TiO₂ equities, but reiterate our preference for TROX.

Agribusiness: Grains: Enough Supply in 2022 In Spite of Higher Input Costs *December 14, 2021* The rally of fertilizers has raised concerns about the grain output in 2022. We believe farmer margins in key regions are still attractive at current prices and see higher risks related to dry weather in a La Niña year. Still, we expect no supply disruptions for now and see downside risk to soybean prices.

Sustainability: 15 Stocks for the Year Ahead *December 14, 2021* As we look ahead, we highlight 15 sustainability-focused stocks with compelling investment theses for 2022.

Eastman Chemical Co.: Conviction Building *December 8, 2021* \$450mm of chemical recycling EBITDA by 2026 was well above our Base Case. Nonetheless, the stock was up just ~\$4 per share today versus our \$10-\$50 range of outcomes. Eastman indicated a significant project announcement should come in 1H22; we expect the stock to re-rate once things are "official."

Corteva Inc.: More, Better, Faster; Top Pick *November 15, 2021* We reiterate our Overweight rating on Corteva following meetings with new Corteva CEO Chuck Magro and (recently hired) CFO hire Dave Anderson at our annual Global Ag & Chems Conference (held live at MS HQ no less). We increase our price target from \$55 to \$60 (as we roll forward to 2023). We also increase our Bull Case from \$65 to \$81 as we contemplate improved volume, pricing and cost dynamics versus our prior Bull Case. We are also making Corteva a Top Pick.

Sherwin-Williams Co.: Fall Survey: Demand Still Building *November 8, 2021* Our survey shows: i) a record demand backlog that is still building; ii) paint has indeed been hard to come by, but SHW has had greater availability and is getting rewarded for it; iii) pros are hiring (versus previously just letting the backlog build); and iv) pricing is expected.

Sherwin-Williams Co.: The Slope of the Descent *October 27, 2021* 4Q21 likely represents the raw mats "peak point of pain", but "the slope of the descent" probably won't allow for raws normalization until 2Q22, and significant deflation until 2H22. Net, 2022 is a tale of two-halves, and 2023 is when run-rate demand is served at higher ASPs and lower COGS

Chemicals: Virtual China Trip - Disruption Ahead? *October 12, 2021* Recently we hosted Wanhua, Ningbo Shanshan, Sinofert and Adisseo in the first of our quarterly China call series. The discussions centered on energy availability, "dual controls", demand, and rising capex. Feedback remains constructive on demand, while production and supply constraints are a risk.

Coverage Universe Risk-Reward Snapshot

Ticker	Present Price	Risk-Reward Snapshot					Risk-Reward Methodology		
		Bear	Base	Bull	PT	Bear	Base	Bull	
Overweights									
Sherwin-Williams Co.	SHW	\$205.68	\$200	\$300	\$400	\$300	~20x 2023 Bear Case EPS of ~\$10	~26x ~\$11.50 '23e EPS; ~20x 2023 EBITDA	~28.5x ~\$14 2023 Bull Case EPS
LyondellBasell	LYB	\$80.00	\$65	\$100	\$120	\$100	~5-times Bear Case 2023 EBITDA	~6x 2023 EBITDA (refinery only gets 2022/2023)	~6.5x Bull Case 2023 EBITDA
Eastman Chemical Co	EMN	\$73.94	\$60	\$115	\$150	\$115	~10x 2023E Bear Case EPS; \$0 CRT	~9x EBITDA/SOTP & ~13x 2022 EPS + ~\$25 for CRT	~11x Bull 2023 EBITDA SOTP; +\$50 CRT
Huntsman Corp.	HUN	\$26.00	\$24	\$37	\$47	\$37	~8x 2023e Bear Case EBITDA	~6.5x 2023e Base Case EBITDA	~7x 2023e Bull Case EBITDA
Linde PLC	LIN	\$282.46	\$250	\$365	\$430	\$365	~13.5x Bear Case 2023e EBITDA	~17.5x 2023e EBITDA / DCF	DCF value on bull case.
Air Products and Chemicals Inc.	APD	\$237.99	\$215	\$335	\$450	\$335	~12x Bear Case C2022e EBITDA	~16.5x C2022 EBITDA / DCF	DCF value on bull case
Corteva Inc.	CTVA	\$62.95	\$50	\$70	\$85	\$70	~12x 2023e Bear Case EBITDA	~13.5x 2023e Base Case EBITDA + New Cost Saves	~15x Bull Case 2023e EBITDA
Crown Holdings, Inc	CKK	\$83.10	\$67	\$120	\$155	\$120	~8x 2023E Bear Case EBITDA	~10.5x 2023E Base Case EBITDA	~12x 2023E Bull Case EBITDA
Diversey Holdings, Ltd	DSEY	\$4.37	\$6	\$15	\$20	\$15	10x 2023 Bear Case EBITDA of ~\$385 million	~14x 2023 EBITDA of \$460 million	~15x 2023 Bull Case EBITDA of ~\$560 million
Sealed Air Corporation	SEE	\$45.98	\$45	\$75	\$93	\$75	~9.5x 2023E Bear Case EBITDA	~11x 2023E Base Case EBITDA	~12x 2023E Bull Case EBITDA
Equal-weights									
AptarGroup Inc	ATR.N	\$94.56	\$80	\$120	\$160	\$120	~12x Bear Case 2023E EBITDA	~13x Base Case 2023E EBITDA	~15x Bull Case 2023E EBITDA
Archer Daniels Midland	ADM	\$88.84	\$50	\$94	\$135	\$94	~12x Bear Case EPS \$4-4.50	~15x 2022 EPS / ~14.5x 2025 EPS Base \$6-7	~18x 2022 Bull EPS \$7.50 / ~17x Bull EPS Base \$8
Ardagh Metal Packaging S.A.	AMBP.N	\$4.79	\$4.50	\$6.30	\$9.60	\$6.30	~8x 2023e bear case EBITDA	~9x 2023e base case EBITDA	~10x 2023e bull case EBITDA
Avent Corporation	AVNT	\$30.79	\$30	\$50	\$60	\$50	Recession	Execution and Recession Risk Remain Top of Mind	Mix and margin expansion drive multipleexpansion
Axalta Coating Systems Ltd	AXTA	\$22.35	\$19	\$30	\$40	\$30	~8.5x Bear Case 2023e EBITDA	~10.5x Base Case 2023e EBITDA	~12x Bull Case 2023e EBITDA
Ball Corporation	BLL	\$0.15	\$37	\$55	\$77	\$55	~10 2023E Bear Case EBITDA	~12x 2023E Base Case EBITDA	~13.5x 2023E Bull Case EBITDA
Berry Global Group Inc	BERY	\$47.18	\$39	\$61	\$80	\$61	~7x 2023E Bear Case EBITDA	~7x 2023E Base Case EBITDA	~8x 2023E Bull Case EBITDA
Bunge Ltd.	BG	\$90.35	\$50	\$120	\$140	\$120	~10x Bear Case EPS \$5	~11x 2023 EPS / ~14x \$8.50 Baseline EPS	~9x 2023 Bull EPS \$16 / ~11x Bull EPS Base \$12.50
CF Industries	CF	\$107.03	\$45	\$100	\$140	\$100	~10% Bear Case FCF Yield	~8x 2024 EBITDA / 13% FCFY +2 yrs peak FCF	8x normal EBITDA + 4yrs peak cycle FCF
Chemours Co	CC	\$27.41	\$11	\$41	\$55	\$41	2023 Bear Case Sum of the Parts	2023 Sum of the Parts	2023 Bull Case Sum of the Parts
Celanese Corp.	CE	\$93.25	\$70	\$110	\$150	\$110	10x \$7 of EPS	~9 2023 EBITDA based on SOTP	Sum of the Parts - 2024 Bull Case
Dow Inc.	DOW	\$45.92	\$35	\$54	\$65	\$54	~5-times Bear Case 2023 EBITDA	~7.x 2023E EBITDA SOTP, ~15x P/E & ~5% dividend	~6.5x 2024E Bull Case EBITDA
DuPont De Nemours, Inc.	DD	\$53.31	\$40	\$72	\$85	\$72	SOTP: ~9x Bear Case 2023 EBITDA; \$4B PFAS	Sum of the parts: ~10.5x 2023 EBITDA; \$1.36B PFAS	SOTP: ~11.5x Bull Case 2023 EBITDA; <\$1.36B PFAS
Ecolab Inc.	ECL	\$144.22	\$110	\$181	\$200	\$181	~13x 2023e Bear Case EBITDA	~18.5x 2023e EBITDA	~20x 2023e Bull Case EBITDA
FMC Corporation	FMC	\$116.52	\$85	\$125	\$150	\$125	~11.0x 2023e Bear Case EBITDA	~12.5x 2023e EBITDA	~14.0x 2023e Bull Case EBITDA
Israel Chemicals Ltd	ICL	\$8.75	\$7	\$12	\$14	\$12	~8.0x 2024e Bear Case EBITDA	~8.5x 2024e EBITDA +2yrs peak FCF	~8.5x 2024e Bull Case EBITDA +4yrs peak FCF
Mosaic Company	MOS	\$52.00	\$35	\$60	\$80	\$60	7x bear case EBITDA	8x 2024 EBITDA +2 yrs peak FCF	8x 2024 EBITDA +4 yrs peak FCF
Nutrien Ltd	NTR	\$86.58	\$55	\$100	\$145	\$100	~8x 2024e Bear Case EBITDA based on SOTP	~9x 2024e Base Case +2 yrs peak FCF	~9x EBITDA +4 yrs peak FCF
PPG Industries Inc.	PPG	\$112.22	\$100	\$150	\$200	\$150	~12.0x Bear Case EBITDA	~13.5x 2023e EBITDA based on Sum of the Parts	~15x Bull Case 2023e EBITDA
Olin Corp.	OLN	\$48.03	\$35	\$50	\$75	\$50	~6x 2023E Bear Case EBITDA	~6x 2023E EBITDA, ~10x P/E and a ~12% FCF yield	~5.3x 2023E Bull Case EBITDA
Ecovyst Inc.	ECVST.N	\$8.75	\$9.0	\$12.5	\$16.0	\$12.5	~8.5x 2022E Bear Case EBITDA	~9.5x 2022E Base Case EBITDA	~10.5x 2022E Bull Case EBITDA
Tronox Limited	TROX	\$12.77	\$9	\$26	\$38	\$26	~5x 2023 Bear Case EBITDA	~5.6x 2023 Base Case EBITDA	~\$37 of fundamental value plus ~\$1 from Jazan F1
Elements Solutions Inc	ESI	\$16.30	\$16	\$25	\$31	\$25	~10.5x 2023E Bear Case EBITDA	~12.3x 2023E Base Case EBITDA	~13.5x 2023E Bull Case EBITDA
Venator Materials, PLC	VNTR	\$0.73	\$1.15	\$2.20	\$4.35	\$2.20	2023 Bear Case Sum of the Parts	2023 Sum of the Parts	2023 Bull Case Sum of the Parts
Westlake Chemical Corp.	WLK	\$90.50	\$70	\$115	\$140	\$115	~7x 2023E Bear Case EBITDA	~6x 2023E EBITDA, ~10x P/E and a ~12% FCF yield	~6x 2023E Bull Case EBITDA
RPM International Inc.	RPM	\$92.18	\$72	\$97	\$120	\$97	~13.0x F2022 Bear Case EBITDA	~14.0x F2022e Base Case EBITDA	~16x F2023e Bull Case EBITDA
Trinseo S.A.	TSE	\$19.16	\$15	\$20	\$38	\$20	~8x 2023 bear EBITDA, and ~17% FCF yield	~7x 2023e EBITDA, and ~15% FCF yield	~4.5x 2023 bull EBITDA, and ~12% FCF yield
Underweights									
Albemarle Corporation	ALB	\$256.00	\$80	\$145	\$325	\$145	Sum-of-the-parts (10x Lithium multiple)	Sum-of-the-parts	~20x high end of ALB's 2026 EBITDA range
Intrepid Potash	IPI	\$44.13	\$30	\$60	\$90	NA	~8.0x 2024e Bear Case EBITDA	~8.5x 2024e Base Case EBITDA +2yrs peak FCF	~8.5x 2024 Bull Case EBITDA +4yrs peak FCF

Detailed Valuation Summary (Page 1)

	Ticker	MS Rating	MS	Last Price	Market Capitalization	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus	Dividend Yield 2022e	Cons. EV/Sales 2022e
			Price			P/E	P/E	P/E	P/E	EV/EBITDA	EV/EBITDA		
Agriculture & Fertilizers													
Archer Daniels Midland	ADM	Equal-weight	\$94	\$88.84	\$49,800	25.7x	17.7x	12.9x	14.4x	9.9x	10.9x	1.78%	0.6x
Bunge Ltd.	BG	Equal-weight	\$120	\$90.35	\$13,724	13.5x	7.4x	7.1x	7.7x	6.4x	6.6x	2.55%	0.3x
CF Industries	CF	Equal-weight	\$100	\$107.03	\$21,327	89.1x	23.2x	5.9x	7.7x	4.0x	5.1x	1.33%	2.1x
Corteva Inc.	CTVA.K	Overweight	\$70	\$62.95	\$45,236	44.7x	29.4x	24.6x	20.4x	14.7x	13.0x	0.91%	2.6x
FMC Corp.	FMC	Equal-weight	\$125	\$116.52	\$14,677	18.7x	17.1x	15.7x	13.9x	12.8x	11.7x	1.83%	3.2x
Ingredion Inc.	INGR.K	NA	NC	\$83.37	\$5,462	14.0x	12.2x	11.7x	10.6x	7.6x	7.2x	3.19%	1.0x
Intrepid Potash, Inc.	IPI	Underweight	NA	\$44.13	\$601	-24.7x	20.2x	5.5x	8.4x	2.8x	3.9x	0.00%	1.4x
Nutrien Ltd	NTR	Equal-weight	\$100	\$86.58	\$45,921	49.5x	14.2x	5.2x	5.9x	3.9x	4.6x	2.21%	1.4x
The Mosaic Corp.	MOS	Equal-weight	\$60	\$52.00	\$17,954	112.4x	10.0x	4.0x	4.9x	2.9x	3.7x	1.09%	1.0x
Israel Chemicals	ICL	Equal-weight	\$12	\$8.75	\$11,043	46.7x	15.8x	4.7x	6.6x	3.4x	4.4x	8.97%	1.3x
Average					22,574	38.1x	16.7x	9.7x	10.0x	6.9x	7.1x	2.39%	1.6x
Chlor-alkali													
Olin Co.	OLN	Equal-weight	\$50	48.03	\$6,969	NM	5.6x	5.5x	6.7x	3.8x	4.7x	1.67%	1.0x
Westlake Chemical Co.	WLK	Equal-weight	\$115	90.50	\$11,580	43.0x	6.0x	4.5x	7.1x	3.3x	4.5x	1.34%	1.0x
Average					\$9,275	43.0x	5.8x	5.0x	6.9x	3.6x	4.6x	1.50%	1.0x
Diversified Chemicals													
Albemarle	ALB	Underweight	\$145	256.00	\$29,985	63.5x	63.3x	12.1x	9.8x	9.5x	7.6x	0.66%	4.4x
Ashland Inc.	ASH	NC	NC	96.20	\$5,208	37.6x	21.1x	17.0x	15.6x	9.9x	9.5x	1.33%	2.5x
Balchem Corp	BCPC.O	NC	NC	126.91	\$4,076	38.4x	39.0x	35.6x	32.4x	20.4x	18.5x	-	4.7x
Cabot Corp	CBT	NC	NC	64.70	\$3,643	33.2x	13.1x	10.4x	9.3x	6.9x	6.2x	2.30%	1.2x
Celanese Corp.	CE	Equal-weight	\$110	93.25	\$10,104	13.0x	5.1x	5.3x	6.5x	4.9x	5.7x	2.98%	1.4x
DuPont De Nemours, Inc.	DD	Equal-weight	\$72	53.31	\$26,703	16.0x	12.7x	16.1x	14.3x	11.5x	10.7x	2.42%	2.8x
Ecolab Inc.	ECL	Equal-weight	\$181	144.22	\$41,101	35.7x	30.4x	30.5x	25.1x	17.5x	15.5x	1.43%	3.5x
Diversey Holdings	DSEY.O	Overweight	\$15	4.37	\$1,417	8.8x	8.8x	13.0x	8.6x	9.0x	7.7x	0.00%	1.1x
Eastman Chemical Co.	EMN	Overweight	\$115	73.94	\$9,080	12.5x	8.3x	8.4x	8.0x	6.8x	6.8x	4.11%	1.3x
W.R. Grace & Co.	GRA	NC	NC	69.99	\$4,638	26.8x	-	-	-	-	-	-	-
Huntsman Corp.	HUN	Overweight	\$37	26.00	\$5,237	27.7x	7.5x	6.6x	7.4x	4.6x	5.4x	3.19%	0.7x
International Flavors & Fragrances	IFF	Overweight	\$136	87.79	\$22,382	15.7x	15.7x	15.6x	14.0x	13.3x	12.4x	3.48%	2.7x
Kraton Performance Polymers	KRA	NC	NC	46.49	\$1,498	39.0x	18.8x	-	-	-	-	-	-
Ecovyst Inc.	ECVT.N	Equal-weight	\$13	8.75	\$1,196	13.2x	18.1x	10.7x	9.2x	7.1x	6.6x	0.00%	2.3x
Avient Corporation	AVNT.N	Equal-weight	\$50	30.79	\$2,800	18.6x	10.2x	10.8x	11.6x	6.8x	6.6x	2.97%	0.9x
Element Solutions Inc	ESI	Equal-weight	\$25	16.30	\$3,999	17.4x	11.9x	11.2x	10.2x	10.4x	9.8x	1.87%	2.2x
Trinseo	TSE	Equal-weight	\$20	19.16	\$670	10.3x	1.9x	7.9x	5.1x	6.1x	5.4x	6.73%	0.5x
Dow Inc.	DOW	Equal-weight	\$54	45.92	\$32,978	30.4x	5.2x	6.9x	8.6x	4.6x	5.6x	6.14%	0.8x
Average					\$10,589	27.1x	17.1x	13.6x	12.2x	9.3x	8.7x	2.64%	2.1x

E = Morgan Stanley Research Estimate. "-"/NA=Not Available. NC=Not covered by Morgan Stanley Research. NM=Not meaningful

++Stock Rating, price target or estimates for this company have been removed from consideration in this report because, under applicable law and/or Morgan Stanley policy, Morgan Stanley may be precluded from issuing such information with respect to this company at this time

Source: Thomson Reuters, Morgan Stanley Research.

Note: price close as of 10/13/22.

Detailed Valuation Summary (Page 2)

	Ticker	MS Rating	MS Price Target	Last Price	Market Capitalization	Consensus P/E 2020	Consensus P/E 2021e	Consensus P/E 2022e	Consensus P/E 2023e	Consensus EV/EBITDA 2022e	Consensus EV/EBITDA 2023e	Dividend Yield 2022e	Cons. EV/Sales 2022e	
Paints & Coatings														
	Axalta Coating Systems	AXTA.K	Equal-weight	\$30	22.35	4,929	18.9x	13.3x	14.4x	11.4x	10.1x	8.7x	0.00%	1.7x
	H.B. Fuller Inc.	FUL	NC	NC	\$65.15	\$3,473	24.8x	18.8x	15.5x	13.9x	9.8x	9.0x	1.10%	1.4x
	Masco Corp.	MAS	NC	NC	\$48.60	\$10,960	15.8x	13.1x	11.7x	11.2x	8.6x	8.6x	2.15%	1.6x
	PPG Industries	PPG	Equal-weight	\$150	\$112.22	\$26,371	19.7x	16.7x	17.6x	14.6x	13.0x	11.3x	2.12%	1.8x
	RPM International Inc.	RPM	Equal-weight	\$97	\$92.18	\$11,900	31.2x	22.1x	24.7x	20.2x	16.7x	14.0x	1.71%	2.2x
	Sherwin-Williams	SHW	Overweight	\$300	\$205.68	\$53,309	25.4x	25.0x	23.9x	20.0x	17.9x	15.6x	1.14%	2.9x
	Average					\$18,491	22.6x	18.2x	18.0x	15.2x	12.7x	11.2x	1.37%	1.9x
Industrial Biotech														
	Codexis, Inc.	CDXS.O	NC	NC	\$5.06	\$331	-11.0x	-13.2x	-9.5x	-5.2x	-8.4x	-3.7x	0.00%	1.8x
	Gevo Inc.	GEVO.O	NC	NC	\$2.13	\$501	-2.5x	-7.3x	-7.4x	-7.9x	-2.6x	-2.3x	-	17.2x
	Average					\$416	-6.7x	-10.3x	-8.5x	-6.5x	-5.5x	-3.0x	0.00%	9.5x
Industrial Gases														
	Air Products	APD	Overweight	\$335	\$237.99	\$52,786	28.4x	26.4x	23.2x	21.0x	13.7x	12.4x	2.66%	4.7x
	Linde PLC	LIN.N	Overweight	\$145	\$282.46	\$140,768	34.9x	26.6x	23.7x	21.8x	14.2x	13.4x	1.65%	4.6x
	Average					\$96,777	31.7x	26.5x	23.4x	21.4x	13.9x	12.9x	2.16%	4.6x
Petrochemicals														
	The Dow Chemical Co.	DOW	Equal-Weight	\$54	\$45.92	\$32,978	30.4x	5.2x	6.9x	8.6x	4.6x	5.6x	6.14%	0.8x
	LyondellBasell Industries	LYB	Overweight	\$100	\$80.00	\$26,096	16.6x	4.3x	5.4x	6.2x	4.8x	5.5x	8.44%	NA
	Methanex Co.	MEOH.O	NC	NC	\$35.46	\$2,491	NM	5.9x	7.4x	9.6x	4.9x	5.6x	1.70%	1.1x
	Westlake Chemical Co.	WLK	Equal-weight	\$115	\$90.50	\$11,580	43.0x	6.0x	4.5x	7.1x	3.3x	4.5x	1.34%	1.0x
	Average					\$18,287	30.0x	5.4x	6.0x	7.9x	4.4x	5.3x	4.40%	1.0x
Titanium Dioxide														
	Kronos Worldwide Inc.	KRO	NC	NC	\$8.99	\$1,038	17.3x	9.3x	7.9x	12.8x	NC	NC	8.45%	0.5x
	Chemours	CC	Equal-weight	\$41	\$27.41	\$4,252	15.5x	6.7x	5.3x	5.2x	4.6x	4.7x	3.64%	1.0x
	Tronox Inc.	TROX.K	Equal-weight	\$26	\$12.77	\$1,972	22.3x	5.5x	4.3x	4.3x	4.4x	4.4x	4.32%	1.2x
	Venator	VNTR.K	Equal-weight	\$2	\$0.73	\$79	-3.2x	18.3x	4.1x	7.7x	4.9x	5.5x	0.00%	0.4x
	Average					\$1,835	13.0x	10.0x	5.4x	7.5x	4.6x	4.9x	4.10%	0.8x
Paper & Packaging														
	AptarGroup Inc	ATR.N	Equal-weight	\$120	\$94.56	\$6,178	26.1x	24.5x	24.8x	22.1x	10.9x	10.2x	1.62%	2.2x
	Avery Dennison Corp	AVY.N	NA	NA	\$166.34	\$13,516	24.3x	18.6x	16.8x	15.6x	11.4x	10.8x	1.73%	1.8x
	Ball Corporation	BLL	NA	NA	\$48.94	\$15,382	16.7x	14.3x	15.2x	13.6x	11.3x	10.6x	1.69%	1.5x
	Berry Global Group Inc	BERY.K	Equal-weight	\$61	\$47.18	\$5,902	10.5x	8.2x	6.4x	6.0x	6.9x	6.7x	0.00%	1.0x
	Crown Holdings, Inc	CCK	Overweight	\$120	\$83.10	\$10,069	14.6x	11.0x	10.8x	9.6x	8.8x	8.3x	1.01%	1.3x
	Graphic Packaging Holding Co.	GPK.N	NA	NA	\$20.72	\$6,378	18.8x	17.3x	9.5x	8.5x	7.7x	7.2x	1.64%	1.3x
	International Paper Co	IP.N	NA	NA	\$32.78	\$11,867	11.5x	8.0x	7.4x	7.9x	5.2x	5.4x	5.67%	0.8x
	Packaging Corp of America	PKG.N	NA	NA	\$115.79	\$10,854	19.7x	13.3x	10.2x	11.1x	6.5x	6.9x	3.97%	1.4x
	Sealed Air Corporation	SEE	Overweight	\$75	\$45.98	\$6,678	14.9x	12.9x	11.2x	10.6x	8.2x	8.0x	1.77%	1.7x
	Westrock Co	WRK.N	NA	NA	\$32.09	\$8,160	11.9x	9.6x	6.7x	6.7x	4.6x	4.6x	3.09%	0.7x
	Average					\$9,647		14.3x	12.5x	11.7x	8.6x	8.2x	47.39%	1.4x
	Large Cap Average			\$974	\$363,216		175.3x	158.4x	143.2x	104.9x	98.8x	20.38%	20.9x	
	Small/Mid Cap Average			\$1,433	\$209,505		323.7x	215.6x	207.8x	161.7x	158.6x	52.39%	35.3x	
	US Average			\$93	\$71	\$13,055	29.5x	14.7x	11.7x	11.1x	8.2x	7.9x	2.21%	2.1x

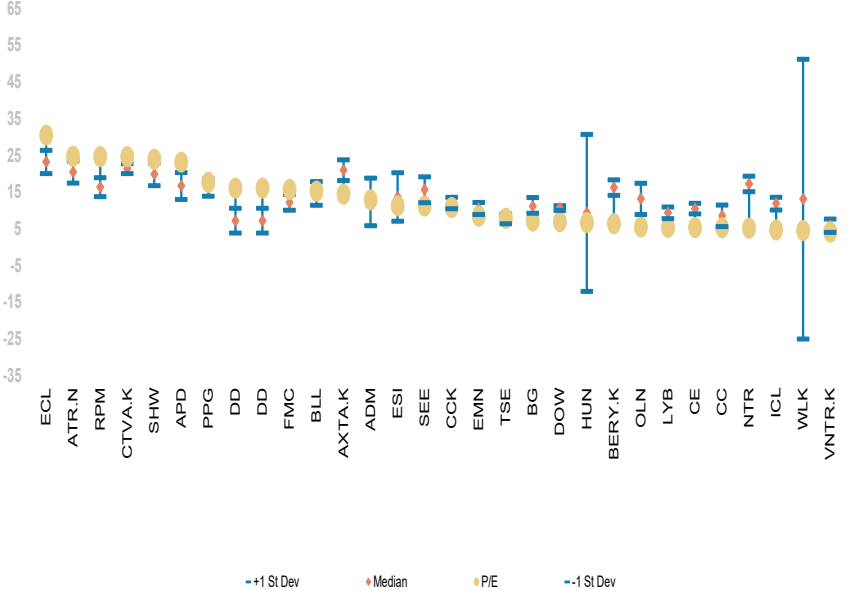
E = Morgan Stanley Research Estimate. *-*/NA=Not Available. NC=Not covered by Morgan Stanley Research. NM=Not meaningful

Source: Thomson Reuters, Morgan Stanley Research

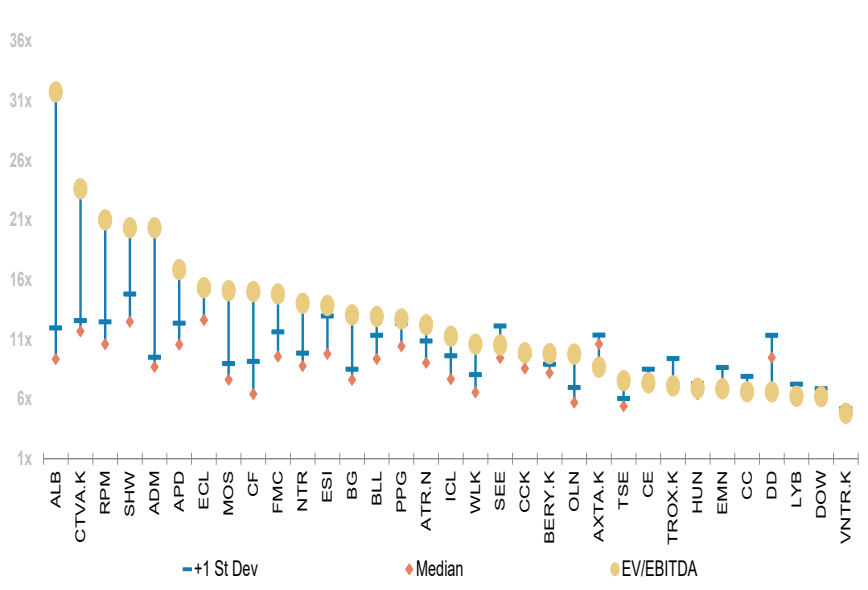
Note: price close as of 10/13/22.

Valuation Summary

P/E



EV/EBITDA



Source: Thomson Reuters, Company Data

Performance Summary

	Relative Performance - Total Return					Relative Performance - Total Return			
	1 month	3 month	YTD	12month		1 month	3 month	YTD	12month
Agriculture & Fertilizers					Industrial Biotech				
Archer Daniels Midland	3.10%	24.48%	33.34%	41.23%	Codexis, Inc.	-32.53%	-58.08%	-83.82%	-81.59%
Bunge Ltd.	-2.01%	6.17%	-1.66%	7.51%	Gevo Inc.	-19.62%	-8.97%	-50.23%	-68.02%
CF Industries	3.82%	33.22%	53.02%	79.73%	Average	-26.08%	-33.53%	-67.03%	-74.80%
Corteva Inc.	-1.35%	22.56%	34.18%	46.71%	Industrial Gases				
FMC Corp.	5.51%	17.05%	7.51%	29.70%	Air Products	-6.09%	7.96%	-20.19%	-15.26%
Ingredion Inc.	0.83%	-1.61%	-11.69%	-10.90%	Linde PLC	-1.43%	5.44%	-17.50%	-7.13%
Intrepid Potash, Inc.	-3.24%	19.82%	3.28%	4.33%	Average	-3.76%	6.70%	-18.84%	-11.20%
Nutrien Ltd	-5.12%	21.11%	17.02%	23.42%	Petrochemicals				
The Mosaic Corp.	-3.53%	19.41%	33.34%	26.85%	The Dow Chemical Co.	-2.44%	-4.81%	-16.13%	-18.02%
Israel Chemicals	-1.13%	0.17%	-3.66%	14.84%	LyondellBasell Industries	1.27%	-3.00%	-5.81%	-10.54%
Average	-0.22%	18.02%	18.70%	27.62%	Methanex Co.	0.48%	4.12%	-9.36%	-27.90%
Chlor-alkali					Westlake Chemical Co.	-1.51%	-0.21%	-6.03%	-6.20%
Olin Co.	-3.50%	3.81%	-15.57%	0.13%	Average	-0.55%	-0.97%	-9.34%	-15.67%
Westlake Chemical Co.	-1.51%	-0.21%	-6.03%	-6.20%	Titanium Dioxide				
Average	-2.50%	1.80%	-10.80%	-3.04%	Kronos Worldwide Inc.	-23.49%	-44.07%	-37.76%	-29.22%
Diversified Chemicals					Chemours	-19.24%	-11.01%	-16.48%	-8.75%
Albemarle	-16.51%	30.35%	10.06%	11.41%	Tronox Inc.	-4.70%	-14.77%	-45.70%	-48.01%
Ashland Inc.	-6.23%	-0.94%	-9.78%	1.63%	Venator	-52.29%	-56.02%	-71.26%	-75.42%
Balchem Corp	-2.03%	-0.98%	-24.73%	-16.65%	Average	-24.93%	-31.47%	-42.80%	-40.35%
Cabot Corp	-12.03%	2.64%	16.86%	25.11%	Paper & Packaging				
Celanese Corp.	-13.65%	-12.11%	-43.65%	-41.56%	AptarGroup Inc	-8.71%	-4.42%	-21.99%	-25.14%
DuPont De Nemours, Inc.	-4.48%	0.21%	-33.04%	-24.28%	Avery Dennison Corp				
Ecolab Inc.	-12.12%	-5.87%	-37.92%	-33.46%	Ball Corporation	-14.75%	-26.31%	-48.72%	-46.24%
Diversey Holdings	-28.36%	-29.74%	-67.17%	-73.50%	Berry Global Group Inc	-11.71%	-10.42%	-36.05%	-23.52%
Eastman Chemical Co.	-9.96%	-13.77%	-37.35%	-28.94%	Crown Holdings, Inc	-14.52%	-4.64%	-24.40%	-19.93%
W.R. Grace & Co.					Graphic Packaging Holding Co.	-8.72%	1.21%	7.42%	6.78%
Huntsman Corp.	-1.33%	-8.00%	-23.92%	-16.20%	International Paper Co	-17.39%	-20.73%	-28.12%	-38.92%
International Flavors & Fragrances	-18.02%	-21.78%	-40.48%	-39.21%	Packaging Corp of America	-11.35%	-13.56%	-12.70%	-13.90%
Kraton Performance Polymers			0.37%	1.95%	Sealed Air Corporation	-9.68%	-17.99%	-31.16%	-17.74%
Ecovyst Inc.	-2.13%	-6.62%	-14.55%	-26.16%	Westrock Co	-16.39%	-17.10%	-26.48%	-33.53%
Avient Corporation	-20.19%	-20.78%	-44.03%	-36.65%	Average	-12.59%	-13.20%	-24.82%	-21.93%
Element Solutions Inc	-11.99%	-6.56%	-32.11%	-26.51%	Large Cap Average	-7.42%	3.91%	-12.88%	-11.59%
Trinseo	-21.26%	-50.48%	-62.07%	-64.20%	Small/Mid Cap Average	-7.77%	-1.02%	-15.51%	-9.83%
Dow Inc.	-2.44%	-4.81%	-16.13%	-18.02%	US Average	-6.55%	0.39%	-13.63%	-7.01%
Average	-11.88%	-9.96%	-26.66%	-23.81%	S&P 500	-7.00%	-3.18%	-23.00%	-17.31%
Paints & Coatings					S&P Chemical 1500	-5.80%	1.60%	-20.61%	-13.86%
Axalta Coating Systems	-10.38%	-2.66%	-32.52%	-28.20%					
H.B. Fuller Inc.	3.79%	11.22%	-18.90%	-1.50%					
Masco Corp.	-0.08%	-7.95%	-29.74%	-15.44%					
PPG Industries	-6.61%	-1.81%	-34.04%	-28.15%					
RPM International Inc.	0.08%	13.01%	-7.46%	13.38%					
Sherwin-Williams	-8.93%	-15.65%	-41.19%	-29.01%					
Average	-3.69%	-0.64%	-27.31%	-14.82%					

Global Chemicals Sector Valuation (Page 1)

	Recommendation	Price Target	Current Price (LC)	Market Cap	EV/Sales 2022e	EV/Sales 2023e	EV/EBITDA 2022e	EV/EBITDA 2023e	EV/EBIT 2022e	EV/EBIT 2023e	EV/NOA 2022e	EV/NOA 2023e	P/E 2022e	P/E 2023e
Agrochemicals														
CF Industries	Equal-Weight	\$100	\$107	€ 22,766	2.1x	2.8x	3.9x	5.7x	4.0x	6.2x	3.0x	3.3x	5.7x	7.7x
Corteva Inc.	Overweight	\$70	\$63	€ 46,499	2.4x	NA	14.0x	11.6x	16.9x	13.6x	1.9x	1.9x	24.7x	NA
Intrepid Potash	Underweight	NA	\$44	€ 615	1.4x	1.4x	2.6x	2.9x	3.4x	4.1x	0.8x	0.7x	5.3x	7.2x
ICL Group Ltd	Equal-Weight	\$12	\$9	€ 11,538	1.4x	1.5x	3.5x	4.4x	4.0x	5.3x	1.6x	1.5x	4.7x	7.3x
K+S AG	Equal-Weight	€21	€21	€ 3,973	0.8x	0.9x	1.7x	2.8x	2.1x	3.8x	0.7x	0.7x	2.6x	4.9x
OCI NV	Equal-Weight	€36	€43	€ 9,055	1.1x	1.5x	2.6x	4.1x	3.1x	5.5x	2.0x	2.1x	5.8x	15.3x
Mosaic Company	Equal-Weight	\$60	\$52	€ 18,891	1.0x	1.2x	2.8x	3.5x	3.2x	4.2x	1.3x	1.3x	3.8x	4.5x
FMC Corporation	Equal-Weight	\$125	\$117	€ 15,078	3.1x	2.9x	12.4x	11.5x	14.2x	13.0x	3.1x	3.0x	15.8x	14.4x
Fertiglobe PLC	Equal-Weight	AED 5	AED 5	€ 12,284	2.3x	3.4x	4.4x	7.0x	4.8x	8.2x	4.3x	4.6x	8.4x	14.1x
Yara International ASA	Equal-Weight	NOK490	NOK416	€ 10,193	0.5x	0.5x	2.3x	2.9x	3.0x	4.0x	0.9x	0.9x	3.9x	5.3x
Average					1.5x	1.6x	4.1x	4.9x	4.8x	6.0x	1.8x	1.8x	6.8x	8.0x
Coatings														
Akzo Nobel	Overweight	€91	€60	€ 10,745	1.2x	1.2x	10.6x	7.8x	15.1x	10.1x	1.9x	1.9x	17.6x	11.2x
Sherwin-Williams Co.	Overweight	\$300	\$206	€ 55,248	2.9x	2.7x	18.1x	14.4x	19.6x	15.4x	5.0x	5.0x	24.2x	18.0x
PPG Industries Inc.	Equal-Weight	\$150	\$112	€ 27,079	1.9x	1.8x	13.1x	11.5x	17.0x	14.4x	2.5x	2.5x	17.4x	14.3x
RPM International Inc.	Equal-Weight	\$97	\$92	€ 12,323	2.0x	2.0x	15.3x	14.7x	18.4x	17.6x	3.2x	3.1x	22.3x	21.4x
Axalta Coating Systems Ltd	Equal-Weight	\$30	\$22	€ 5,295	1.7x	1.6x	10.2x	9.1x	14.7x	12.4x	1.8x	1.8x	14.9x	11.9x
Kansai Paint	Overweight	JPY 2,300	JPY 2,054	€ 3,988	1.1x	1.1x	9.9x	8.4x	14.0x	11.0x	1.7x	1.7x	21.3x	18.5x
Nippon Paint Holdings	Equal-Weight	JPY 1,000	JPY 927	€ 15,325	2.0x	1.8x	17.1x	14.5x	22.5x	17.9x	2.2x	2.1x	28.0x	22.7x
Average					1.9x	1.9x	13.5x	11.5x	17.0x	14.0x	2.9x	2.8x	19.3x	15.4x
Diversified Industrials														
BASF	Equal-Weight	€57	€43	€ 39,462	0.7x	0.8x	5.6x	6.4x	8.8x	11.5x	1.2x	1.2x	6.5x	8.3x
Braskem S.A.	++	++	\$38	€ 5,856	0.7x	0.6x	4.3x	4.3x	5.5x	5.8x	1.4x	1.3x	4.9x	6.5x
DuPont De Nemours Inc.	Equal-Weight	\$72	\$53	€ 27,313	2.8x	2.7x	11.2x	10.7x	13.4x	12.7x	1.0x	1.1x	16.0x	13.8x
LG Chem	Overweight	KRW790000	KRW575000	€ 28,757	0.8x	0.8x	6.4x	6.4x	12.4x	13.5x	1.2x	1.1x	16.8x	16.4x
LyondellBasell Industries N.V.	Overweight	\$100	\$80	€ 26,934	0.6x	1.0x	4.2x	5.9x	5.1x	7.9x	1.8x	1.7x	5.5x	8.4x
PTT Global Chemicals	Overweight	THB62	THB41	€ 4,996	0.5x	0.5x	8.1x	6.3x	17.8x	12.5x	0.9x	0.8x	8.8x	6.6x
Reliance Industries	Overweight	INR3085	INR2383	€ 200,692	1.8x	1.7x	9.8x	7.9x	13.3x	10.2x	1.8x	1.7x	22.1x	19.0x
Borouge PLC	Equal-Weight	SAR3	SAR3	€ 274	0.6x	0.5x	1.4x	1.3x	1.8x	1.8x	0.5x	0.4x	15.5x	16.6x
Shin-Etsu Chemical	Overweight	JPY21500	JPY14860	€ 43,162	1.7x	1.6x	3.9x	3.8x	4.7x	4.8x	2.0x	1.8x	8.9x	9.6x
Givaudan SA	Overweight	SAR3400	SAR2782	€ 26,664	4.3x	4.0x	19.8x	17.7x	26.4x	22.7x	3.6x	3.6x	31.1x	24.6x
Kerry Group PLC	Overweight	SAR 122	SAR 87	€ 15,404	2.0x	1.9x	13.9x	12.3x	18.3x	16.2x	2.1x	2.0x	20.4x	17.6x
Average					1.5x	1.5x	8.0x	7.6x	11.6x	10.9x	1.6x	1.5x	14.2x	13.4x
Industrial Gases														
Elkem ASA	Overweight	€50	€36	€ 1,987	0.5x	0.6x	1.7x	2.8x	2.0x	3.7x	0.8x	0.8x	2.5x	4.6x
Air Liquide	Equal-Weight	€133	€118	€ 1,909	2.4x	2.3x	9.7x	9.1x	14.7x	13.8x	2.0x	1.9x	19.6x	18.7x
Air Products and Chemicals Inc.	Overweight	€335	€238	€ 54,146	4.8x	4.8x	13.7x	13.5x	20.2x	19.6x	3.4x	3.0x	22.9x	21.4x
Linde PLC	Overweight	\$365	\$282	€ 145,033	4.8x	4.9x	15.0x	14.6x	20.6x	19.9x	2.7x	2.7x	24.0x	22.4x
Nutrien Ltd	Equal-Weight	€100	€87	ND	0.8x	0.9x	2.2x	2.7x	2.5x	3.2x	0.9x	0.8x	5.2x	6.0x
Sasol Ltd	Equal-Weight	\$37000	\$31657	€ 11,425	1.0x	0.8x	3.7x	2.8x	4.2x	3.3x	1.1x	0.9x	5.7x	4.0x
Average					4.0x	4.0x	12.8x	12.4x	18.5x	17.7x	2.7x	2.5x	22.2x	20.8x

E = Morgan Stanley Research Estimate. "-"=Not Available. NC=Not covered by Morgan Stanley Research. NM=Not meaningful

++Stock Rating, price target or estimates for this company have been removed from consideration in this report because, under applicable law and/or Morgan Stanley policy, Morgan Stanley may be precluded from issuing such information with respect to this company at this time

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Global Chemicals Sector Valuation (Page 2)

	Recommendation	Price Target	Current Price (LC)	Market Cap	EV/Sales 2022e	EV/Sales 2023e	EV/EBITDA 2022e	EV/EBITDA 2023e	EV/EBIT 2022e	EV/EBIT 2023e	EV/NOA 2022e	EV/NOA 2023e	P/E 2022e	P/E 2023e
Specialty Chemicals														
Albemarle Corporation	Underweight	\$145	\$256	€ 30,788	4.3x	4.8x	9.4x	13.1x	10.3x	15.2x	3.5x	3.1x	12.6x	19.9x
Arkema S.A.	Underweight	€88	€75	€ 5,749	0.7x	0.8x	3.6x	5.1x	4.9x	8.6x	0.9x	0.8x	5.0x	9.5x
BASF	Equal-Weight	€57	€43	€ 39,462	0.7x	0.8x	5.6x	6.4x	8.8x	11.5x	1.2x	1.2x	6.5x	8.3x
Braskem S.A.	++	++	BRL 38	€ 5,856	0.7x	0.6x	4.3x	4.3x	5.5x	5.8x	1.4x	1.3x	4.9x	6.5x
Celanese Corp.	Equal-Weight	\$110	\$93	€ 10,375	1.5x	1.8x	5.4x	7.4x	6.3x	9.2x	1.6x	1.7x	5.2x	7.8x
Chemours Co	Equal-Weight	\$41	\$27	€ 4,838	1.0x	0.9x	4.5x	4.2x	5.5x	5.1x	1.9x	1.8x	4.9x	4.4x
Clariant AG	Equal-Weight	CHF19	CHF16	€ 5,568	1.2x	1.2x	7.2x	6.6x	11.9x	10.1x	1.6x	1.5x	15.3x	13.0x
Covestro AG	Overweight	€45	€34	€ 6,498	0.5x	0.6x	5.5x	7.8x	11.6x	29.8x	0.9x	0.9x	13.1x	52.7x
Dow Inc.	Equal-Weight	\$54	\$46	€ 33,962	0.8x	1.0x	4.9x	6.9x	6.8x	11.7x	1.5x	1.5x	6.9x	13.1x
DuPont De Nemours Inc.	Equal-Weight	\$72	\$53	€ 27,313	2.8x	2.7x	11.2x	10.7x	13.4x	12.7x	1.0x	1.1x	16.0x	13.8x
DSM	Equal-Weight	€149	€116	€ 19,532	1.9x	1.8x	10.5x	10.3x	16.3x	15.5x	1.7x	1.7x	20.4x	19.7x
Eastman Chemical Co	Overweight	\$115	\$74	€ 9,901	1.5x	1.6x	7.7x	8.2x	10.2x	11.3x	1.5x	1.5x	8.7x	9.2x
Ecolab Inc.	Equal-Weight	\$181	\$144	€ 41,907	3.5x	3.3x	18.0x	15.8x	27.2x	22.8x	3.1x	3.0x	30.2x	24.8x
Elkem ASA	Overweight	NOK50	NOK36	€ 1,987	0.5x	0.6x	1.7x	2.8x	2.0x	3.7x	0.8x	0.8x	2.5x	4.6x
Evonik Industries AG	Equal-Weight	€25	€17	€ 8,115	0.7x	0.8x	5.0x	5.6x	8.7x	11.0x	0.8x	0.8x	7.5x	9.9x
Huntsman Corp	Overweight	\$37	\$26	€ 5,409	0.8x	0.8x	4.6x	5.1x	5.7x	6.3x	1.2x	1.2x	7.1x	7.3x
Johnson Matthey	Equal-Weight	GBp2000	GBp1815	€ 3,976	1.2x	1.0x	6.2x	5.9x	8.4x	8.0x	1.5x	1.4x	10.2x	9.2x
LANXESS	Equal-Weight	€41	€34	€ 2,930	0.9x	0.9x	7.5x	7.2x	17.5x	17.6x	1.0x	1.0x	6.6x	7.5x
Olin Corp.	Equal-Weight	\$50	\$48	€ 7,292	1.1x	1.2x	4.1x	5.6x	5.5x	8.8x	1.8x	1.9x	5.8x	10.2x
Sasol Ltd	Equal-Weight	ZAR 37,000	ZAR 31,657	€ 11,425	1.0x	0.8x	3.7x	2.8x	4.2x	3.3x	1.1x	0.9x	5.7x	4.0x
Sika AG	Overweight	CHF303	CHF208	€ 32,566	3.2x	3.0x	16.3x	14.7x	20.4x	18.1x	4.5x	4.2x	27.6x	24.3x
Solvay	++	++	€86	€ 8,950	0.9x	0.9x	3.8x	4.4x	5.5x	7.3x	0.9x	0.9x	7.3x	10.6x
Synthomer PLC	Equal-Weight	GBp220	GBp91	€ 450	0.5x	0.5x	4.8x	4.5x	6.9x	6.7x	0.6x	0.6x	3.4x	3.6x
Trinseo S.A.	Equal-Weight	\$20	\$19	€ 974	0.6x	0.6x	7.4x	7.1x	16.5x	15.4x	1.1x	1.1x	15.9x	10.8x
Tronox Holdings Plc-Class A	Equal-Weight	\$26	\$13	€ 2,083	1.1x	0.9x	3.9x	3.5x	5.2x	4.8x	0.9x	0.8x	3.9x	3.5x
Umicore SA	Equal-Weight	€32	€31	€ 7,480	2.2x	2.3x	7.7x	9.3x	10.1x	13.8x	1.8x	1.8x	12.9x	18.2x
Venator Materials PLC	Equal-Weight	\$2	\$1	€ 82	0.3x	0.3x	3.6x	3.3x	7.8x	6.4x	0.6x	0.5x	3.2x	2.3x
Victrex	Equal-Weight	GBp1900	GBp1576	€ 1,558	4.5x	4.1x	12.2x	11.0x	15.1x	13.7x	3.1x	2.8x	17.1x	15.5x
Wacker Chemie	Equal-Weight	€150	€105	€ 5,204	0.6x	0.7x	2.3x	3.9x	2.9x	5.7x	0.9x	0.8x	4.2x	9.0x
Westlake Corp	Equal-Weight	\$115	\$91	€ 11,928	0.9x	1.0x	3.2x	3.8x	4.1x	5.5x	1.1x	1.0x	4.4x	7.2x
Average					1.4x	1.4x	6.4x	6.7x	9.3x	10.5x	1.5x	1.4x	10.2x	12.2x
Consumer Chemicals														
Croda	Overweight	GBp8100	GBp6362	€ 10,018	4.5x	4.8x	14.1x	15.3x	17.2x	18.8x	3.7x	3.7x	23.8x	25.8x
Givaudan SA	Overweight	CHF3400	CHF2782	€ 26,664	4.3x	4.0x	19.8x	17.7x	26.4x	22.7x	3.6x	3.6x	31.1x	24.6x
Symrise AG	Underweight	€91	€94	€ 13,173	3.4x	3.2x	16.1x	15.1x	22.8x	21.4x	2.8x	2.8x	30.4x	28.8x
Average					3.2x	3.1x	14.6x	13.7x	20.7x	18.6x	2.6x	2.6x	24.1x	22.0x
Weighted Total Averages					1.6x	1.7x	7.4x	7.9x	9.7x	10.9x	1.73x	1.69x	10.2x	10.9x

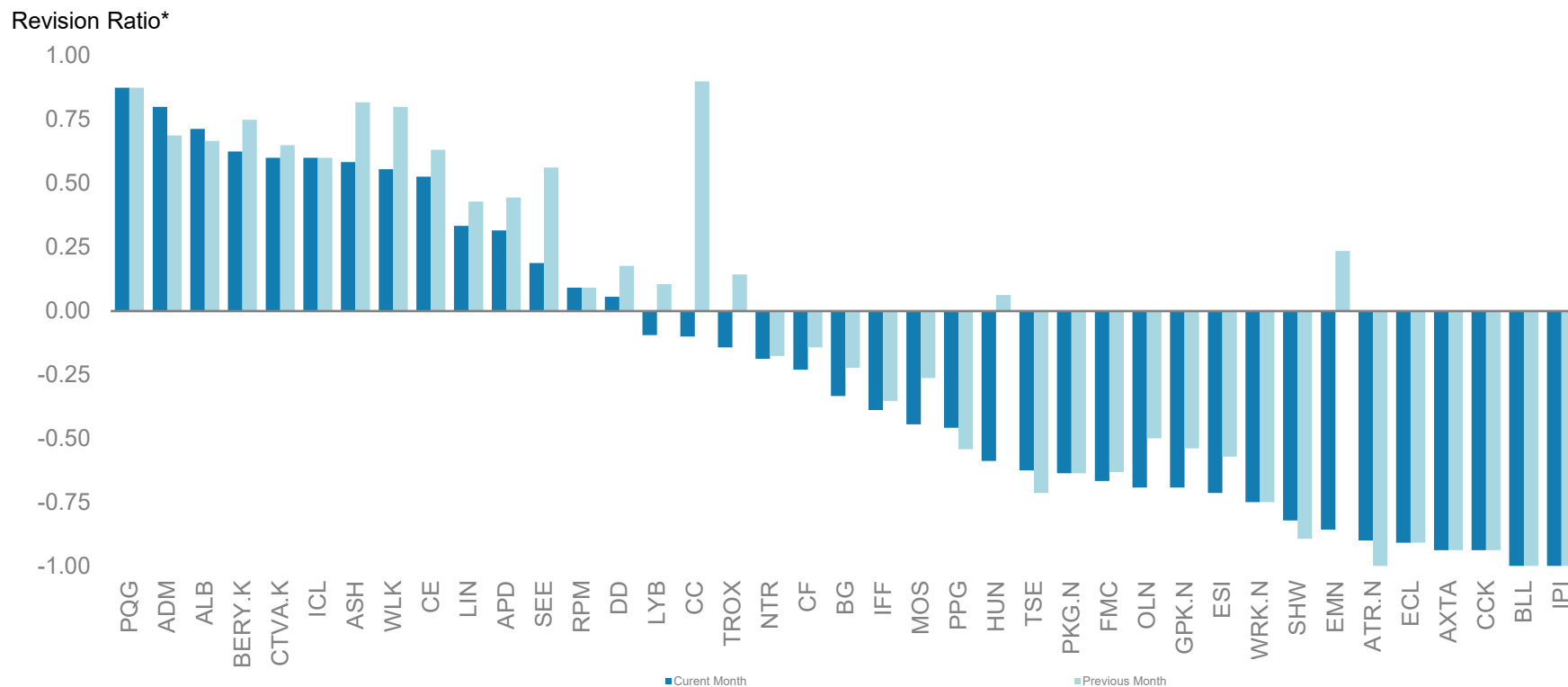
E = Morgan Stanley Research Estimate. "-" / NA = Not Available. NC = Not covered by Morgan Stanley Research. NM = Not meaningful

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Earnings Revisions Trends

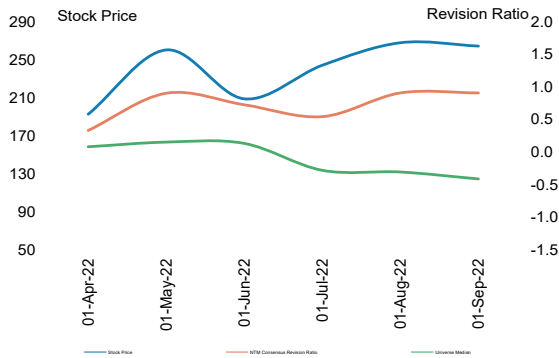


*The Revision Ratio is the ratio of the number of Analysts revising estimates up/down divided by total number of revisions and oscillates between -1 and 1. It is calculated by the following equation: (# of estimates revised up - # of estimates revised down)/total # of revisions.

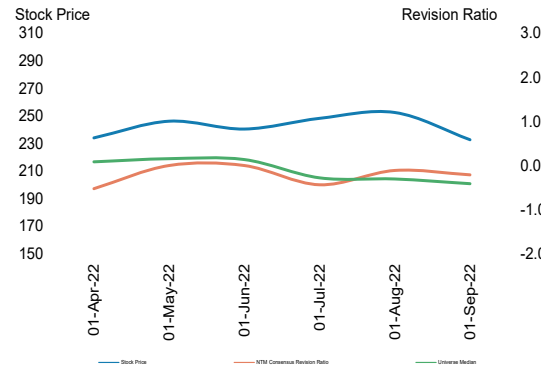
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Earnings Revisions Trends

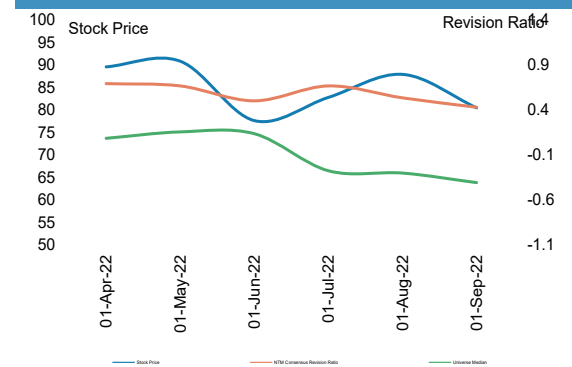
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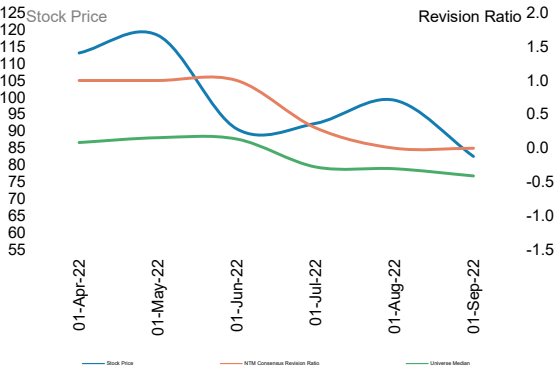
Air Products



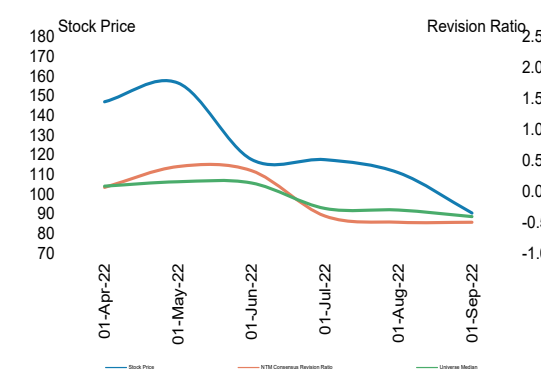
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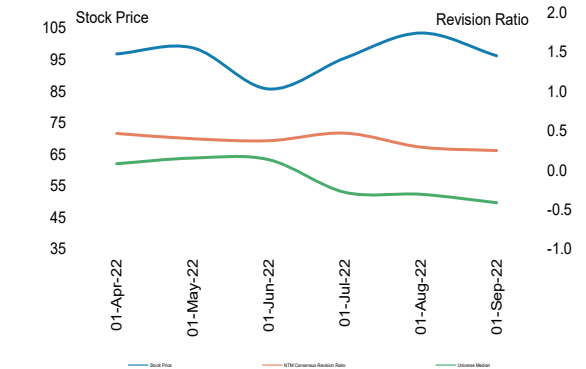
Bunge



Celanese



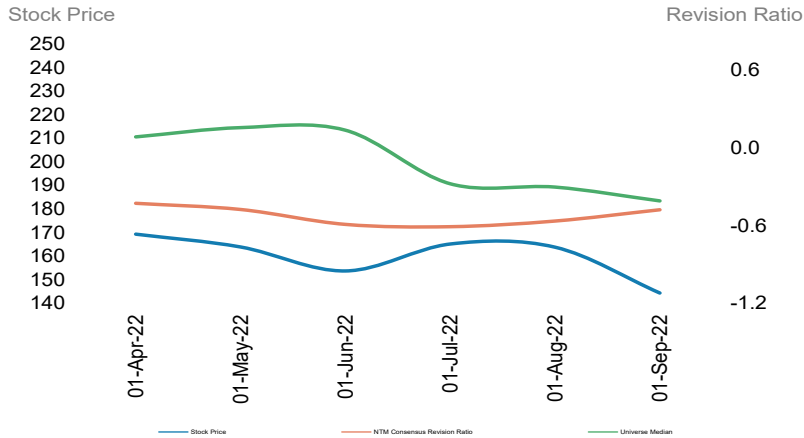
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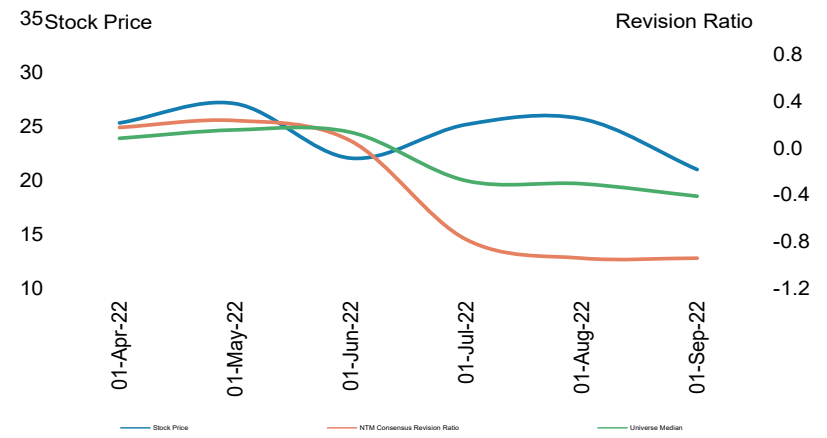
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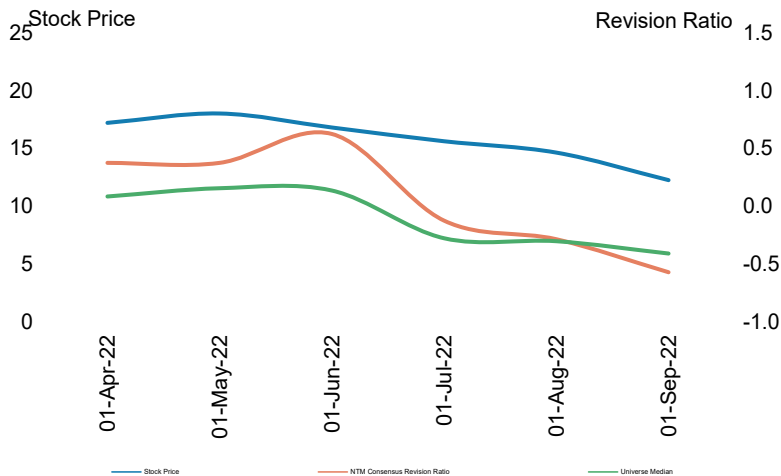
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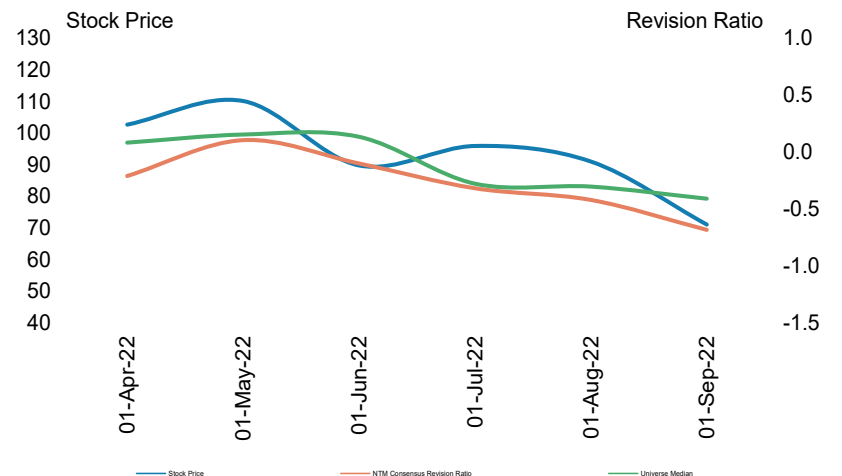
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Tronox

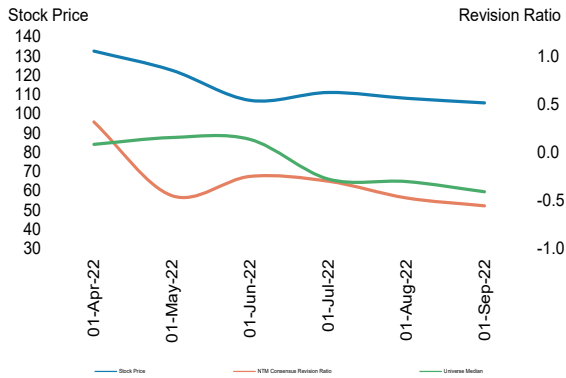


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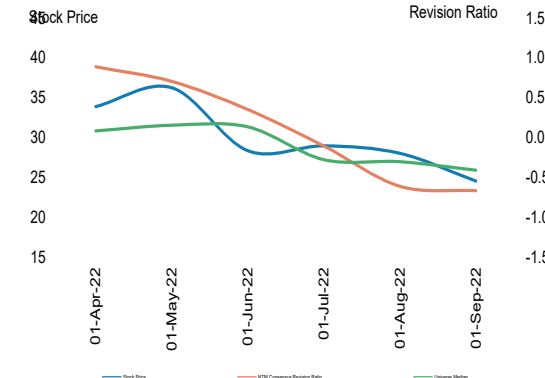


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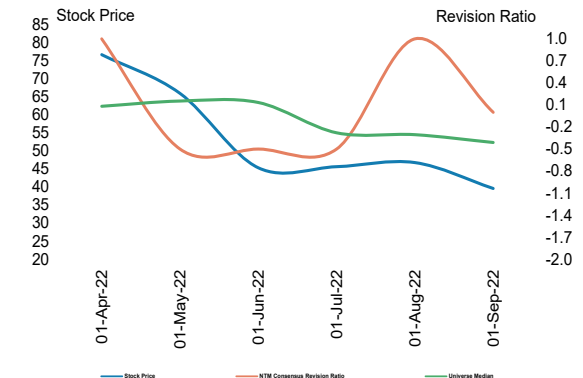
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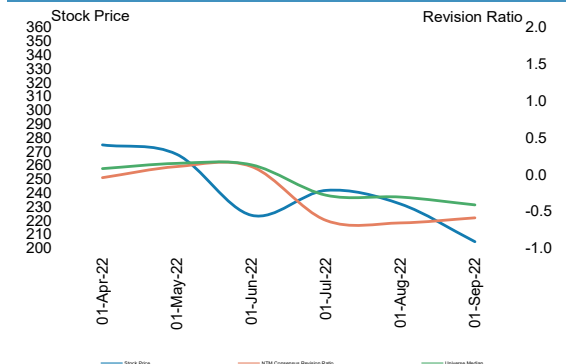
Huntsman



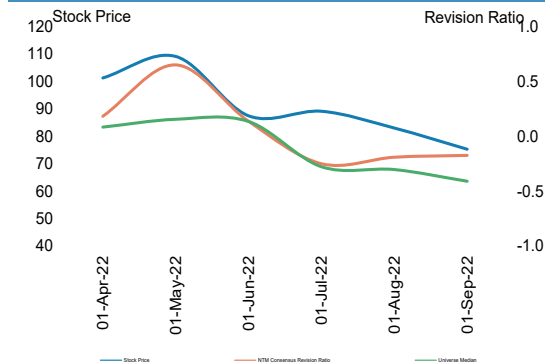
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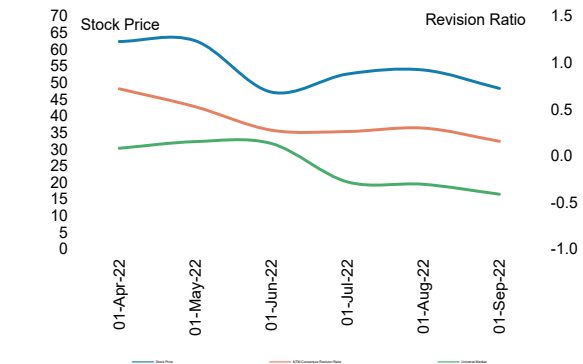
Sherwin - Williams



LyondellBasell



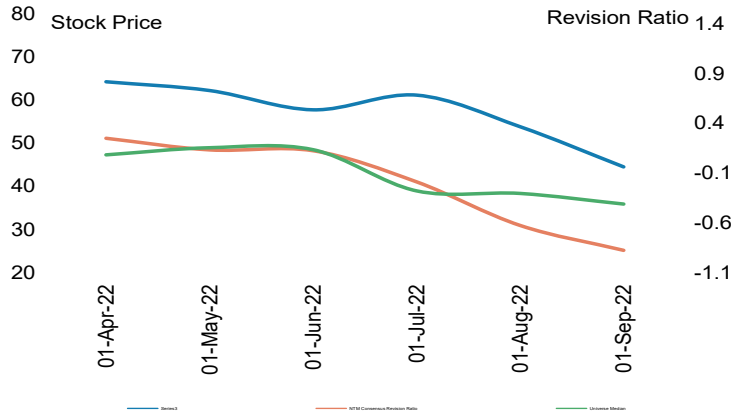
Mosaic Corp



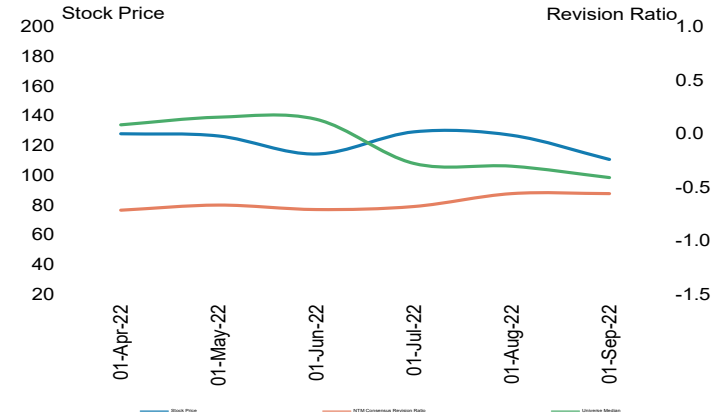
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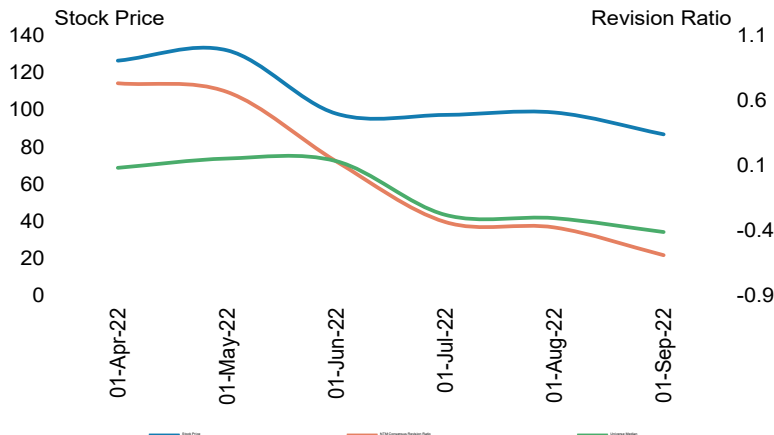
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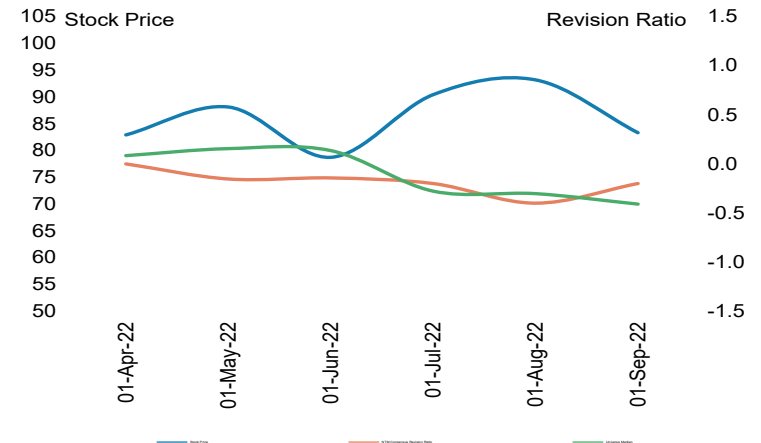
PPG



Westlake

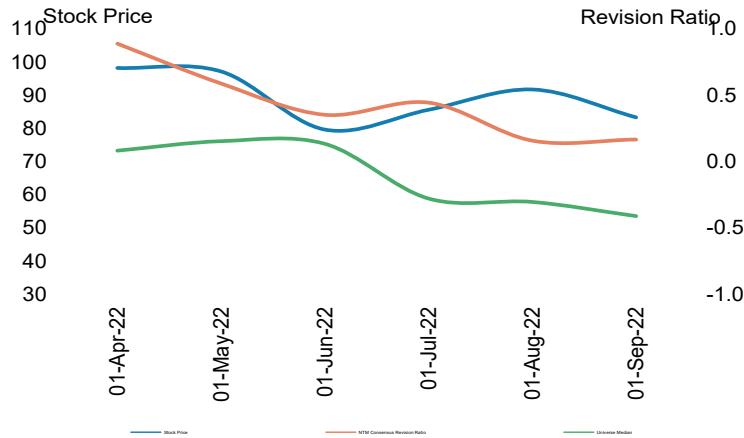


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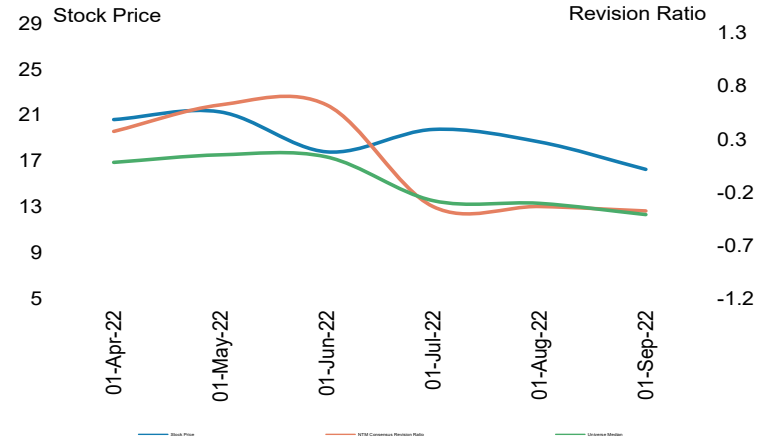


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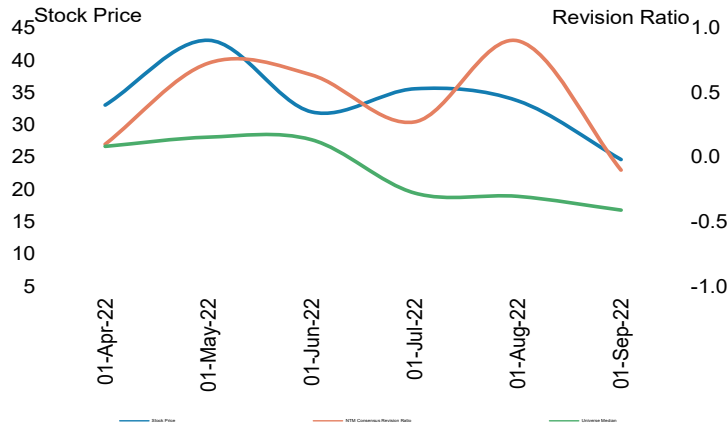
Nutrien



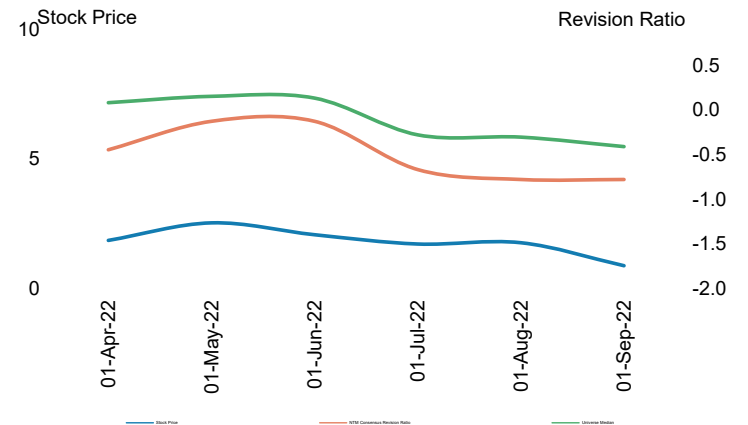
Element Solutions Inc



Chemours



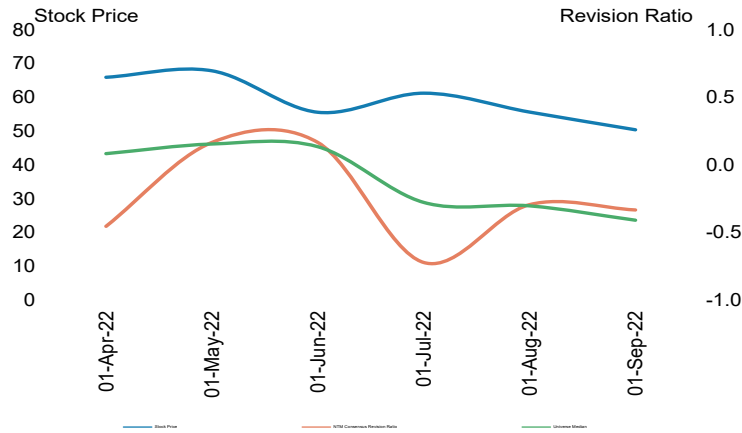
Venator materials



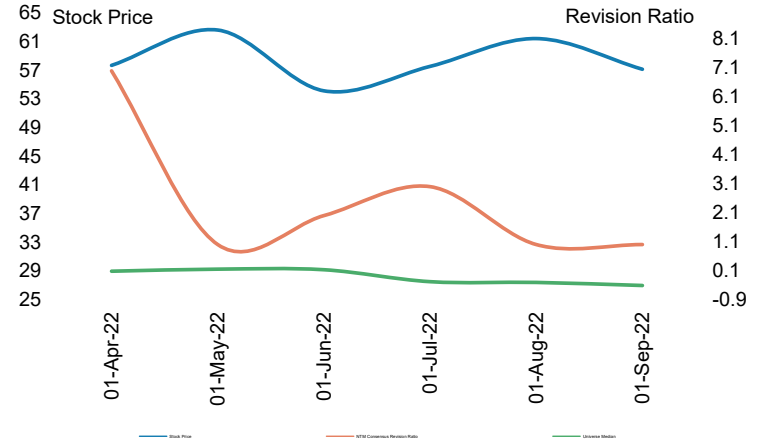
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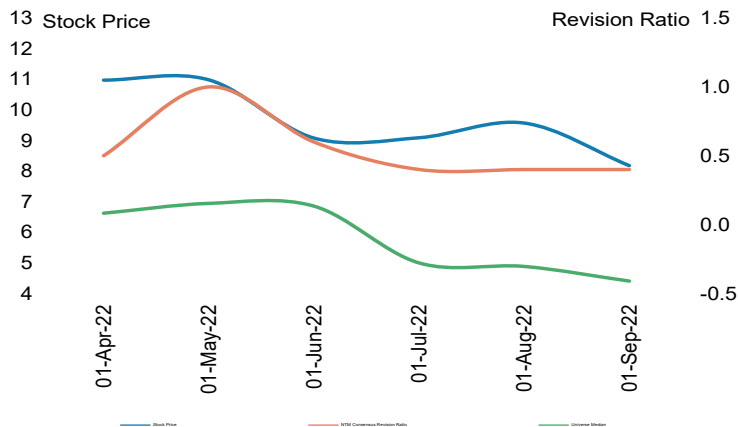
DuPont



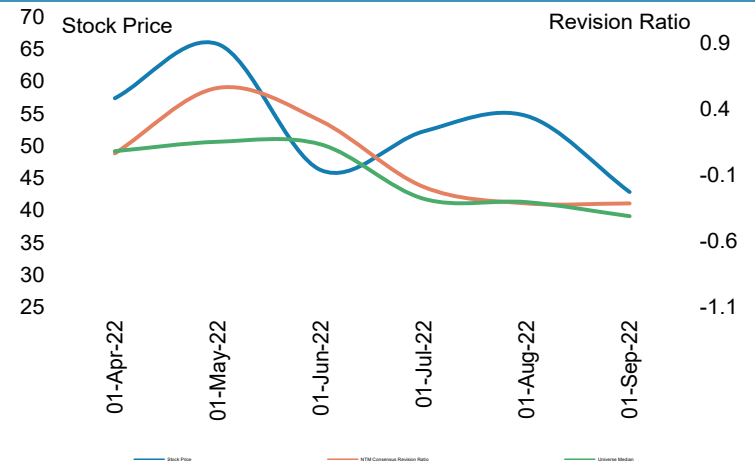
Corteva Inc.



ICL Group



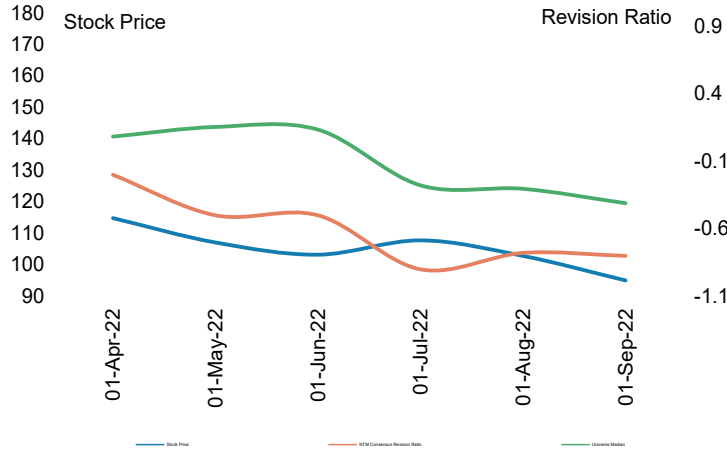
Olin



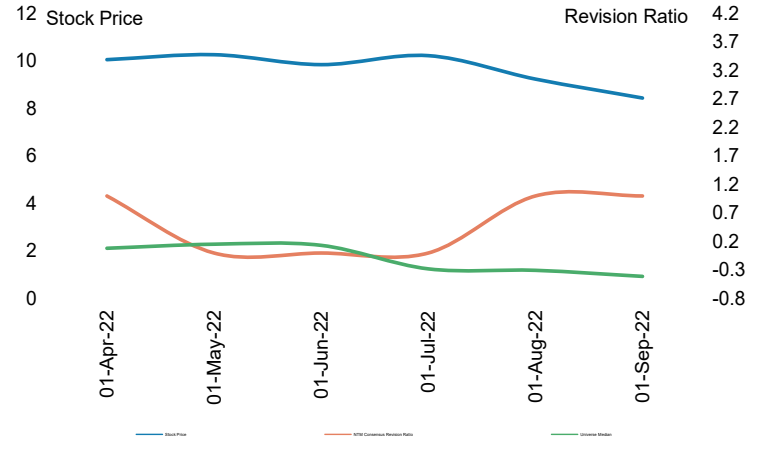
Source: Thomson Reuters, Morgan Stanley Research

Earnings Revisions Trends

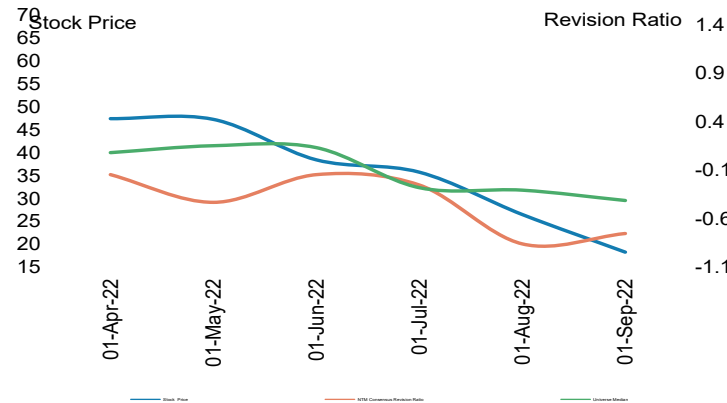
Aptar Group Inc.



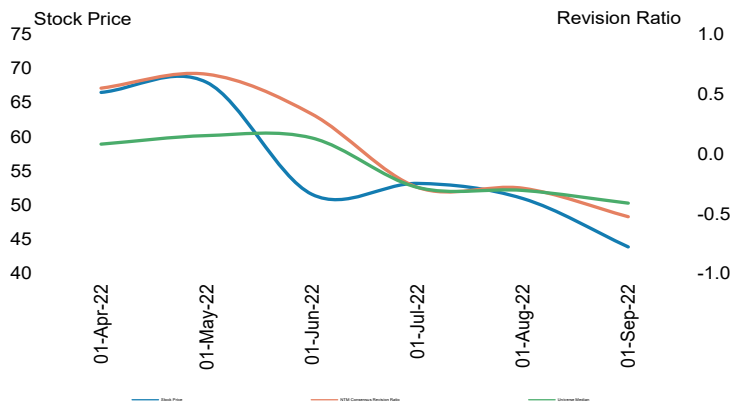
PQ Group



Trinseo



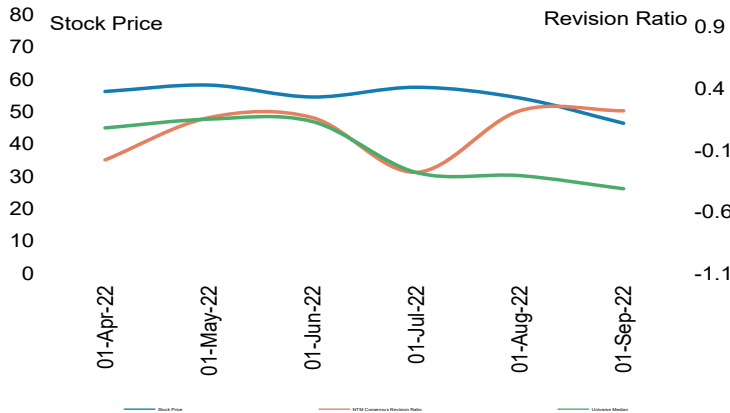
Dow Inc.



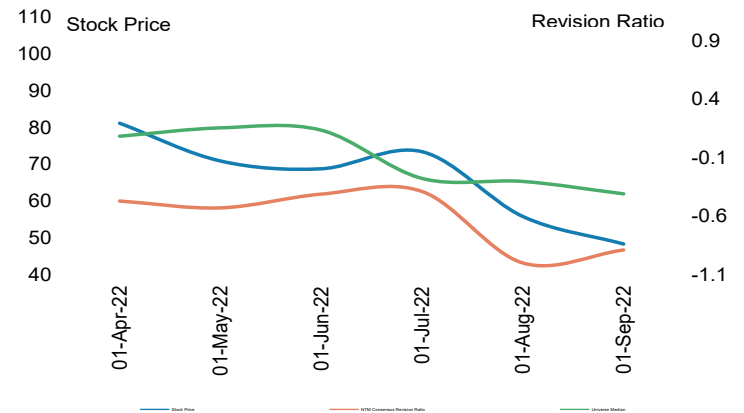
Source: Thomson Reuters, Morgan Stanley Research

Earnings Revisions Trends

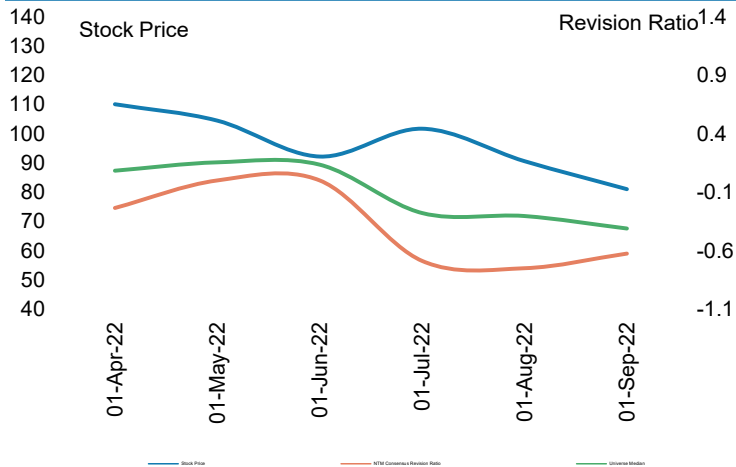
Berry Global



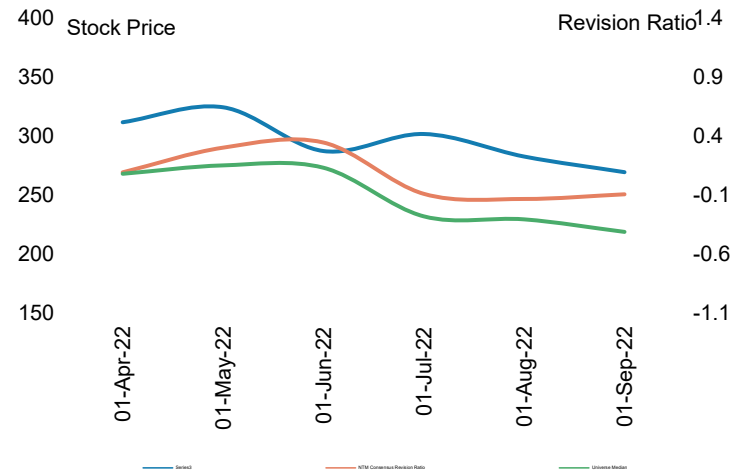
Ball Corp



Crown Holdings Inc.



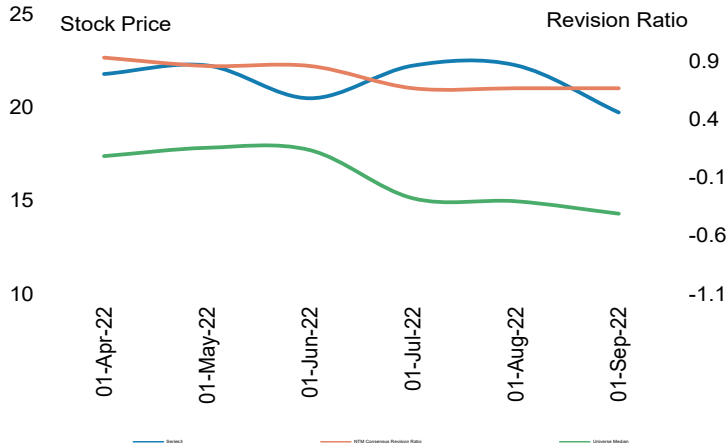
Linde PLC.



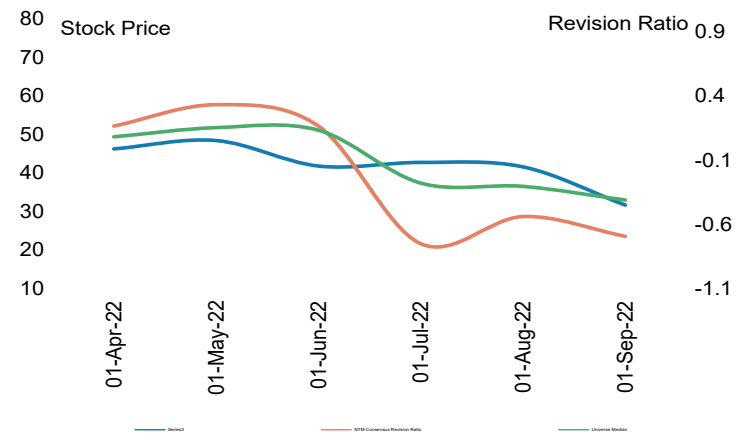
Source: Thomson Reuters, Morgan Stanley Research

Earnings Revisions Trends

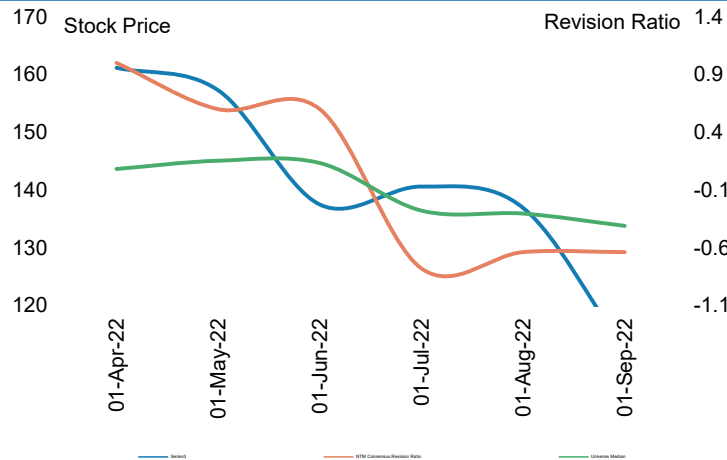
Graphic Packaging Holding Co.



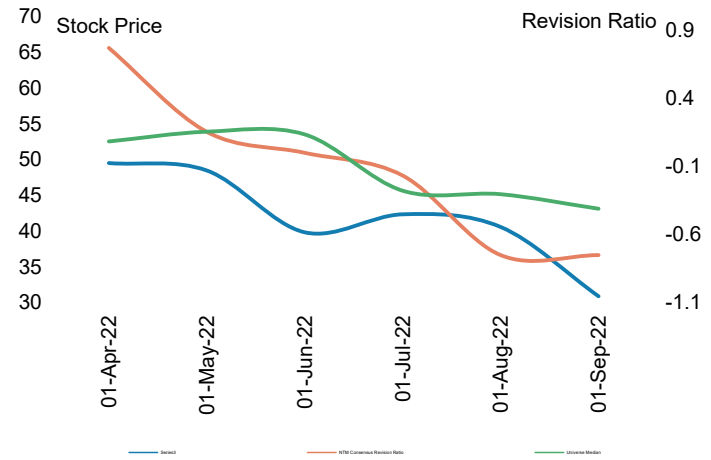
International Paper Co.



Packaging Corp of America



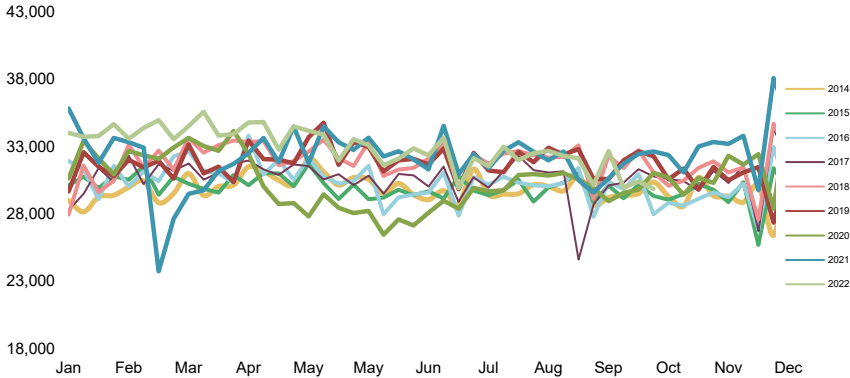
Westrock Inc.



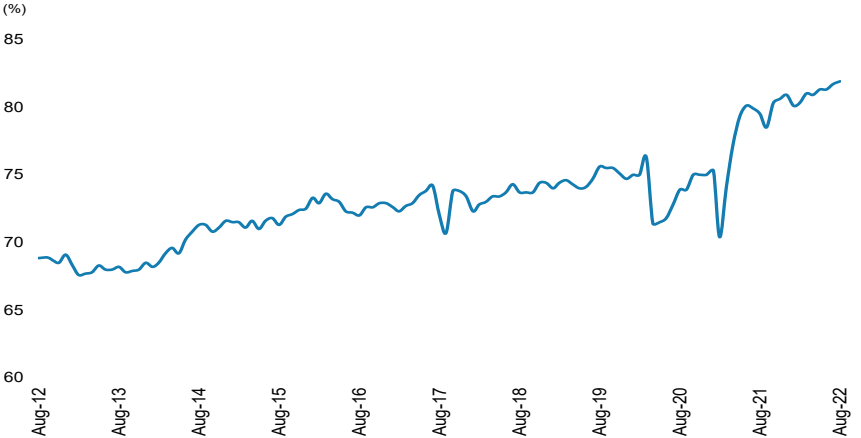
Source: Thomson Reuters, Morgan Stanley Research

Chemicals Trends

Class 1 Chemicals Carloads



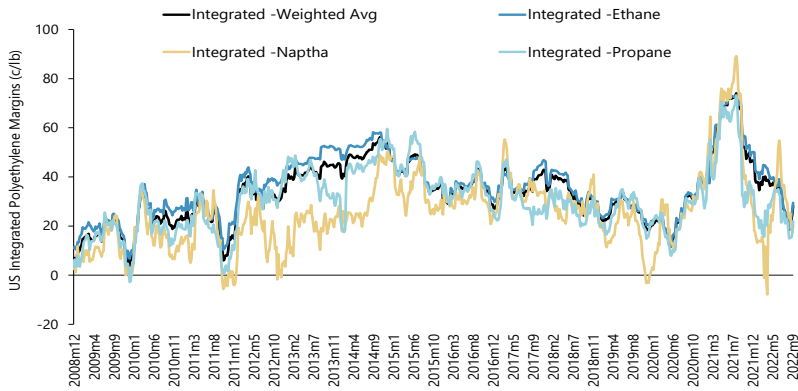
Chemicals Capacity Utilization



Source: American Railcar Association, Morgan Stanley Research

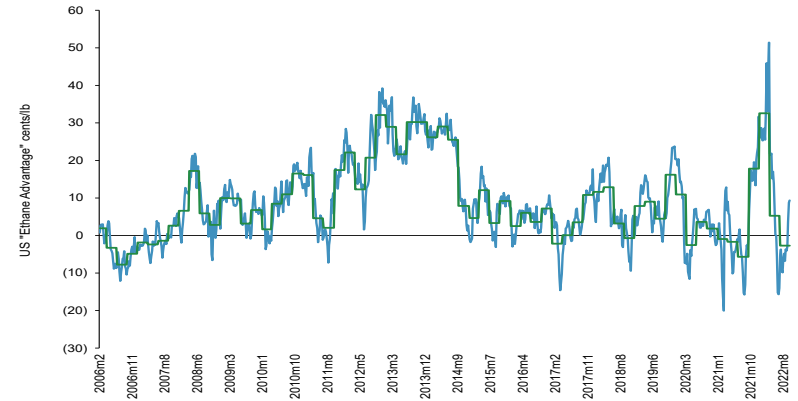
Petrochemical Margins, Prices, and Figures

US Integrated Margins



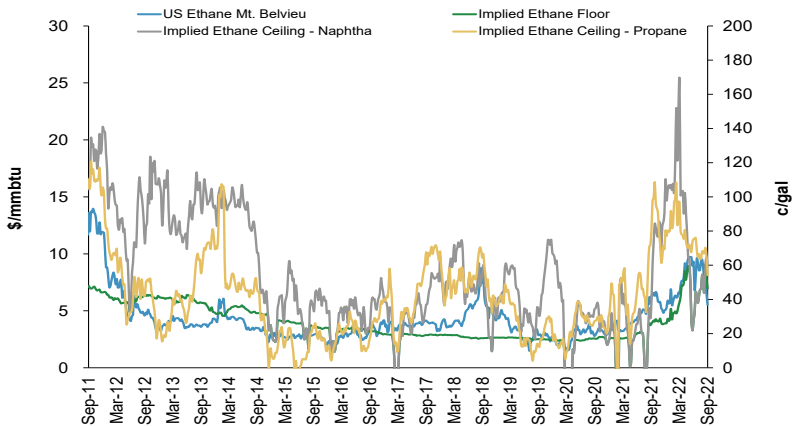
Source: Chemical Market Analytics, Datastream, Bloomberg, Morgan Stanley Research

Ethane Advantage



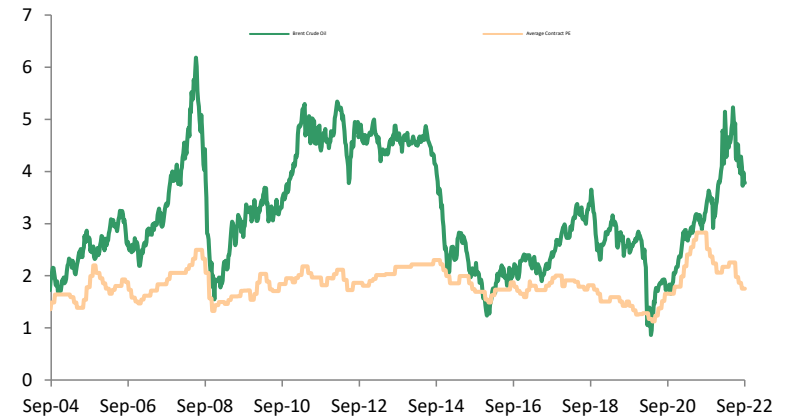
Source: Chemical Market Analytics, Morgan Stanley Research

Ethane Prices



Source: Chemical Market Analytics, Datastream, Bloomberg, Morgan Stanley Research

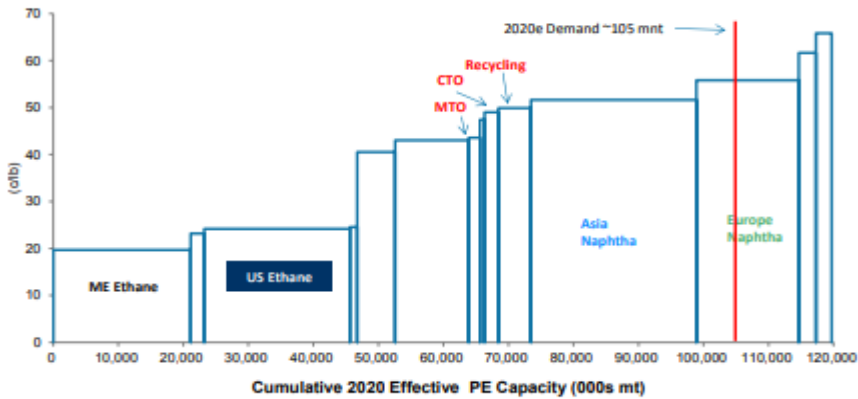
PE Price Relative To Brent



Source: Bloomberg, Chemical Market Analytics, Morgan Stanley Research

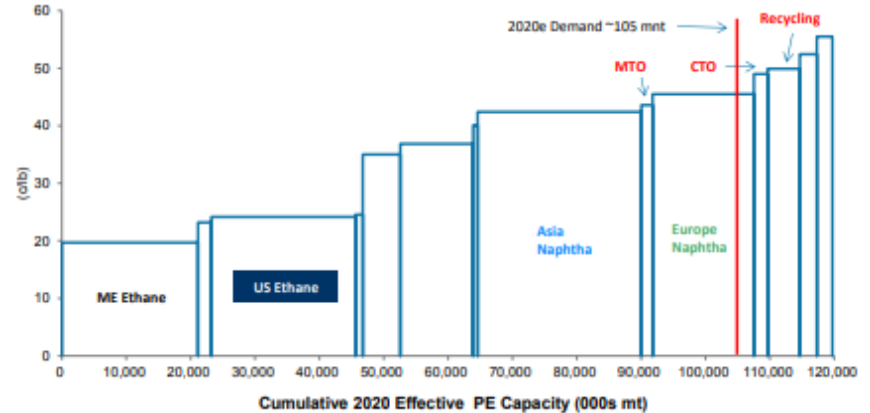
Polyethylene Global Cost Curve at Various Brent Scenarios

Polyethylene Global Cost Curve - \$75/Bbl Brent



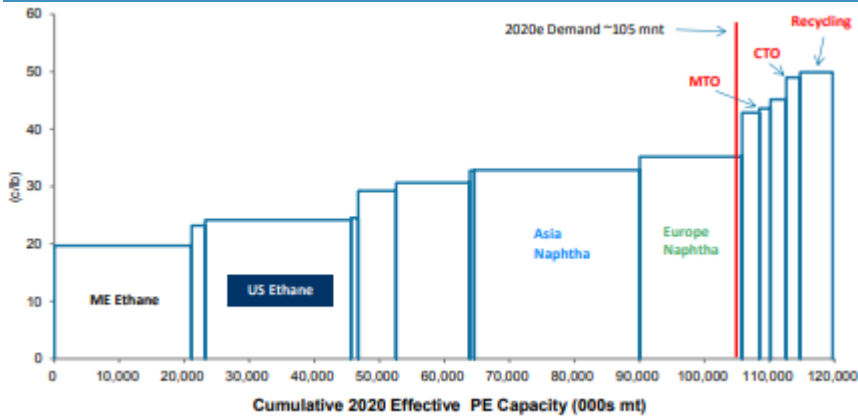
Source: Chemical Market Analytics, Company Data, Morgan Stanley Research

Polyethylene Global Cost Curve - \$60/Bbl Brent



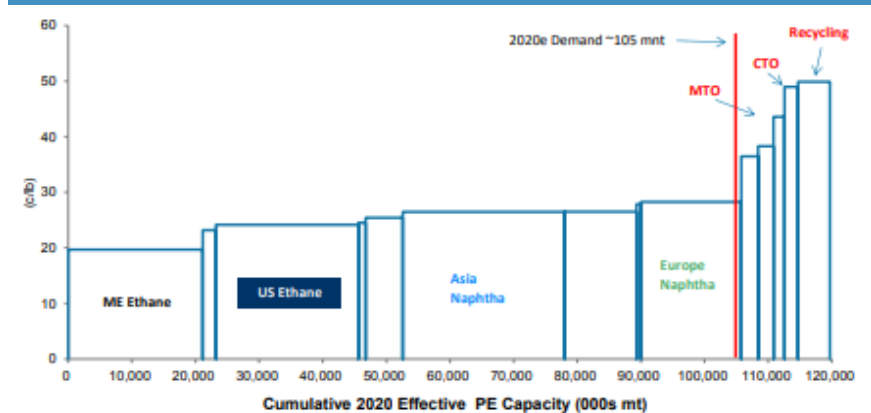
Source: Chemical Market Analytics, Company Data, Morgan Stanley Research

Ethylene Global Cost Curve - \$45/Bbl Brent



Source: Chemical Market Analytics, Company Data, Morgan Stanley Research

Ethylene Global Cost Curve - \$35/Bbl Brent

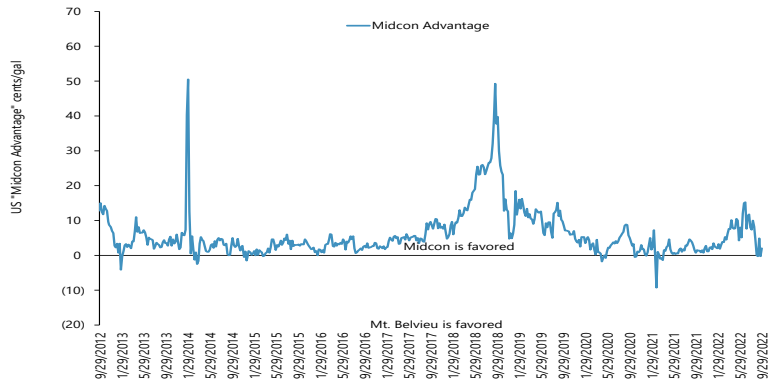


Source: Chemical Market Analytics, Company Data, Morgan Stanley Research

Note – we adjust for 7% downtime

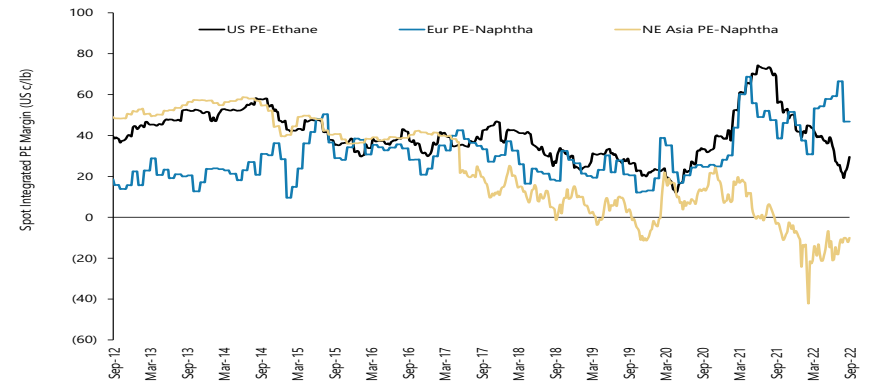
Petrochemical Margins, Prices, and Figures

US Midcon Advantage



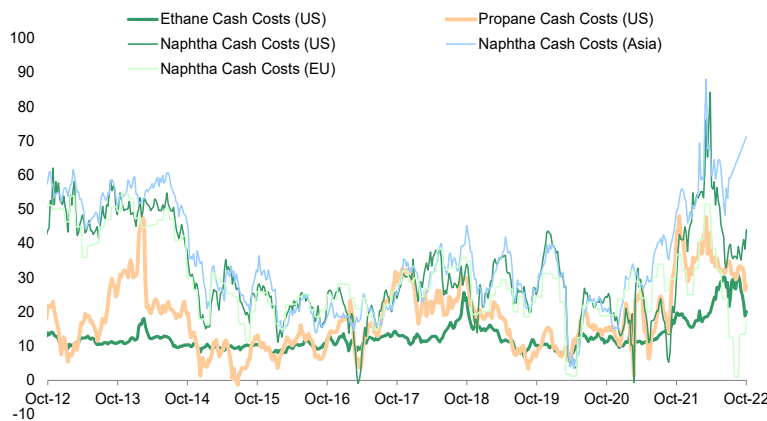
Source: Bloomberg, Morgan Stanley Research

Spot Integrated PE Margins



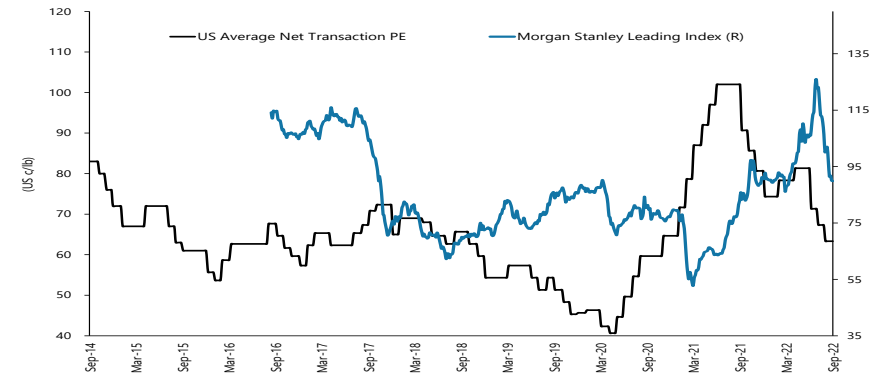
Source: Chemical Market Analytics, Morgan Stanley Research

Ethylene Cash Costs



Source: Chemical Market Analytics, Morgan Stanley Research

MS Leading Indicator

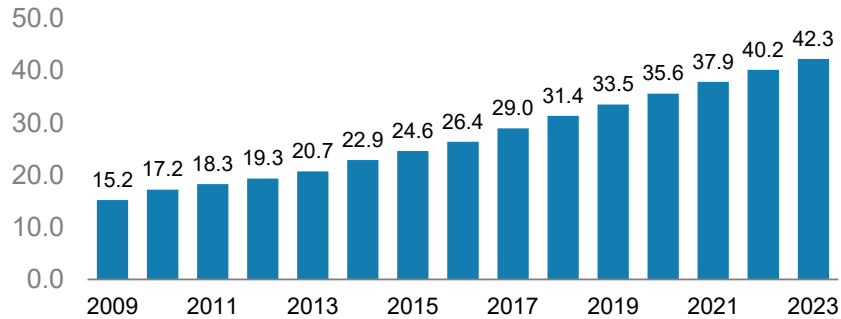


Source: Chemical Market Analytics, Morgan Stanley Research

Petrochemical Margins, Prices, and Figures

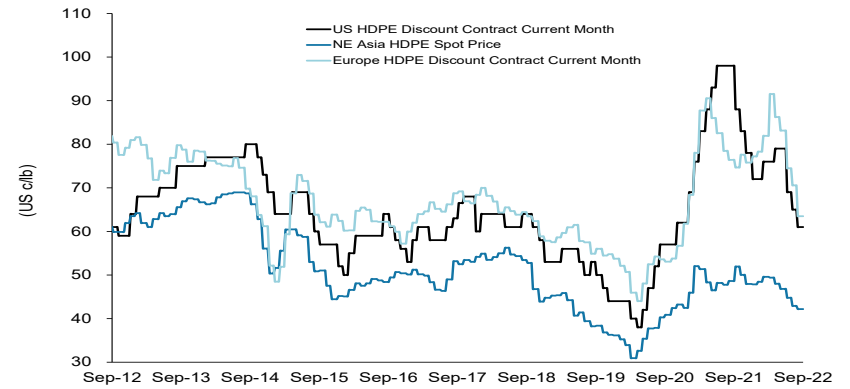
Chinese PE Demand

China PE Demand (Million mt)



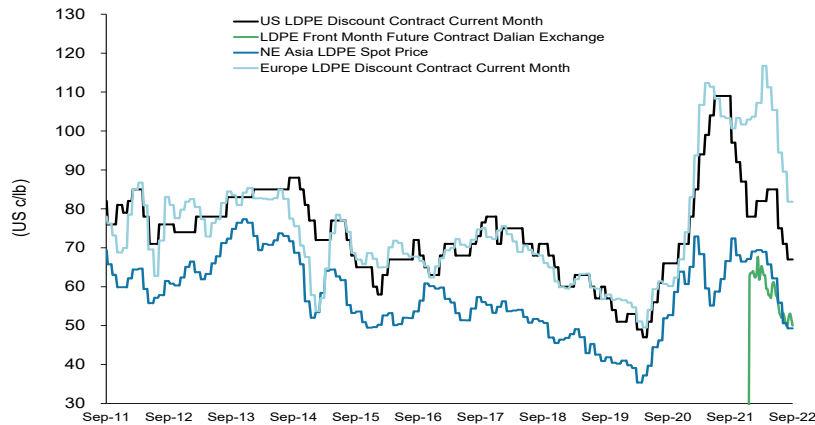
Source: CPCIA, Morgan Stanley Research estimates

HDPE prices



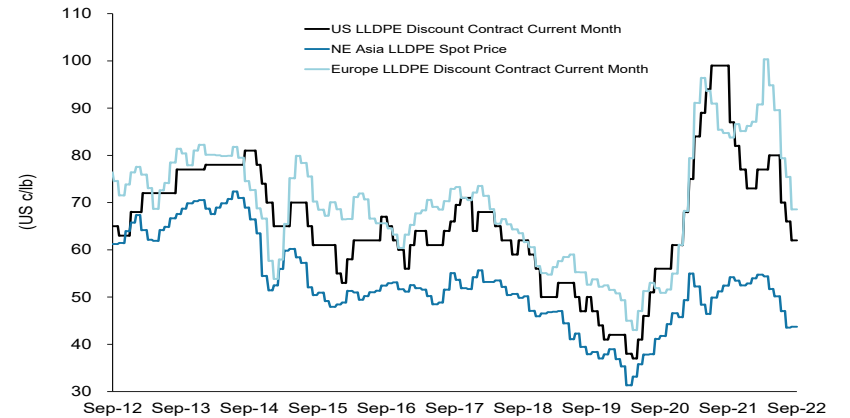
Source: Chemical Market Analytics, Morgan Stanley Research

LDPE prices



Source: Chemical Market Analytics, Bloomberg, Morgan Stanley Research

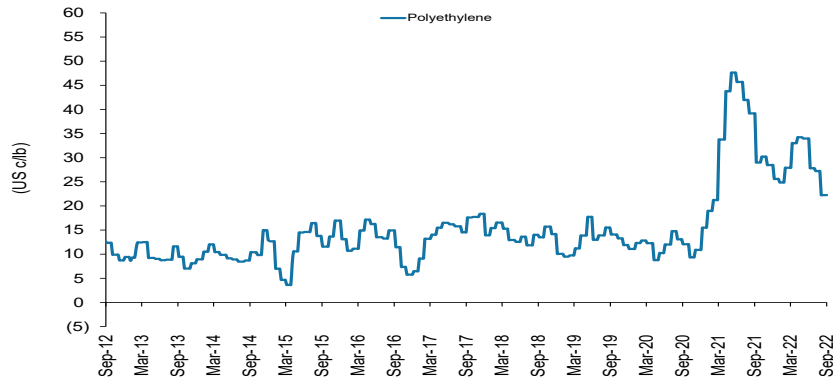
LLDPE prices



Source: Chemical Market Analytics, Morgan Stanley Research

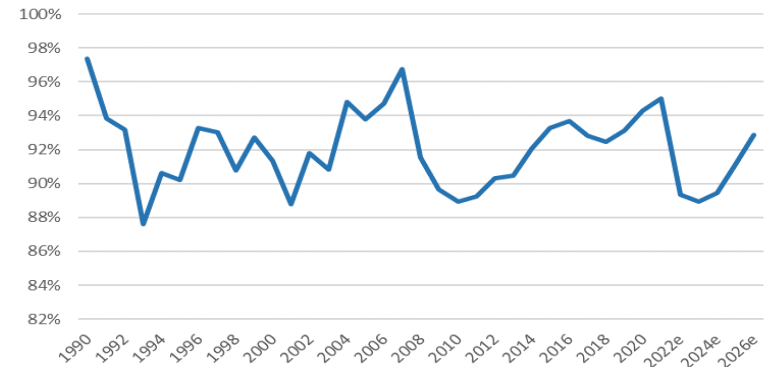
Petrochemical Margins, Prices, and Figures

US/EU PE premiums to Asia



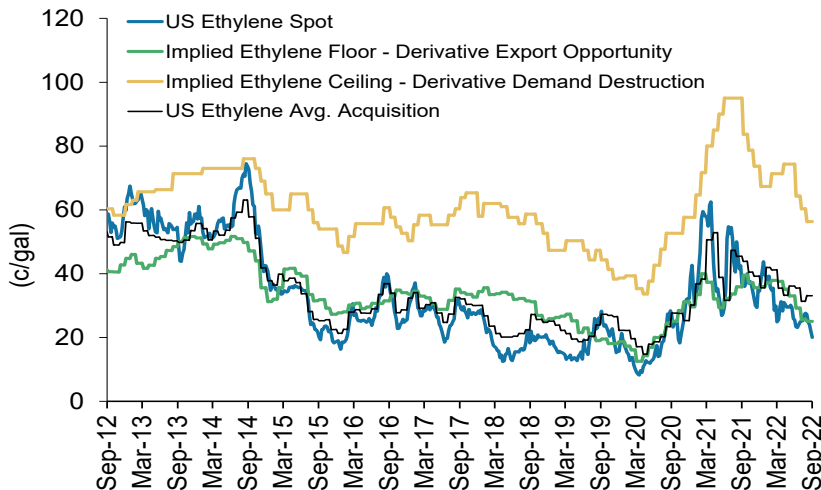
Source: Company Data, Morgan Stanley Research

PE Effective Utilization Rates (including outages)



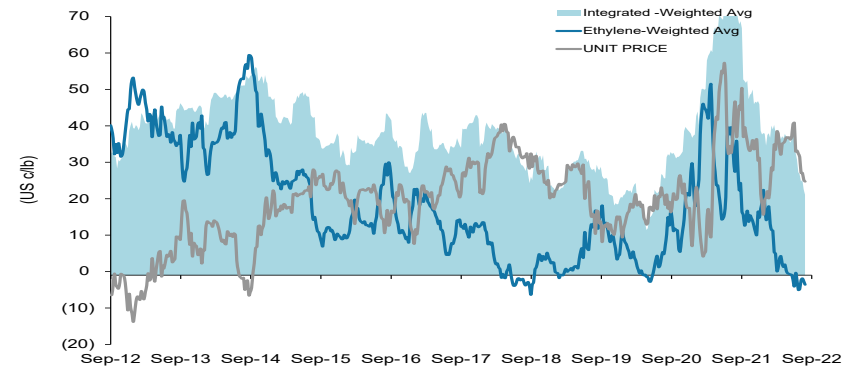
Source: Chemical Market Analytics, Morgan Stanley Research
Note: Assumes outage run rate of 7% (planned and unplanned)

US Ethylene Spot Price



Source: Company Data, Morgan Stanley Research

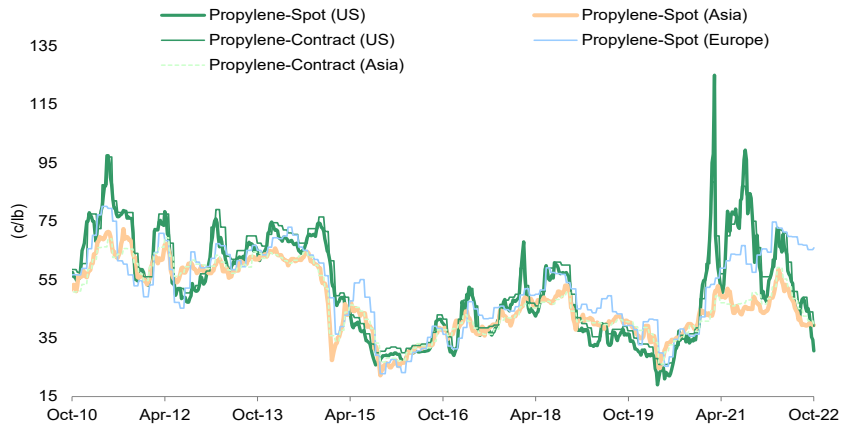
US Ethylene Margins



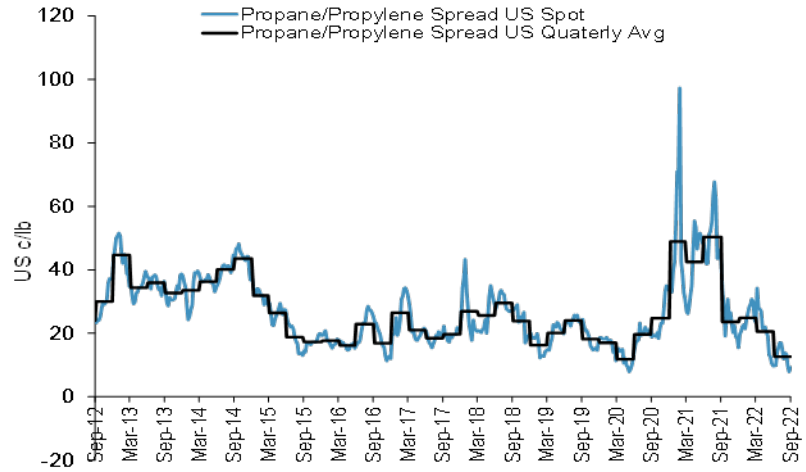
Source: Company Data, Morgan Stanley Research

Petrochemical Margins, Prices, and Figures

US Propylene Prices

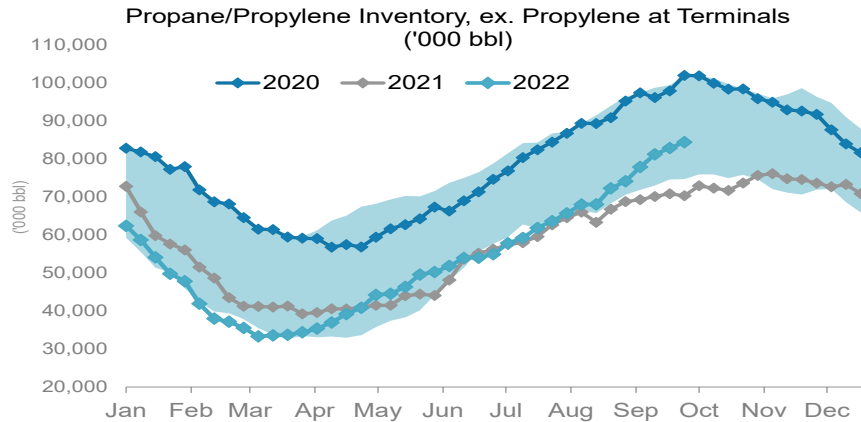


US Propane To Propylene Spread



Source: Chemical Market Analytics, Morgan Stanley Research

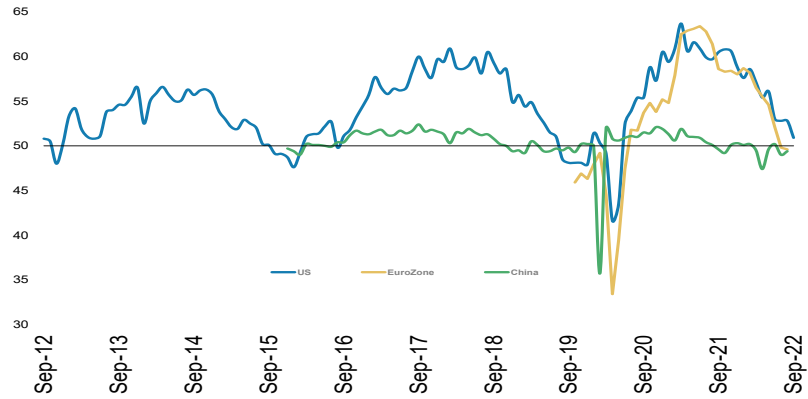
Propane Inventory



Source: EIA, Morgan Stanley Research

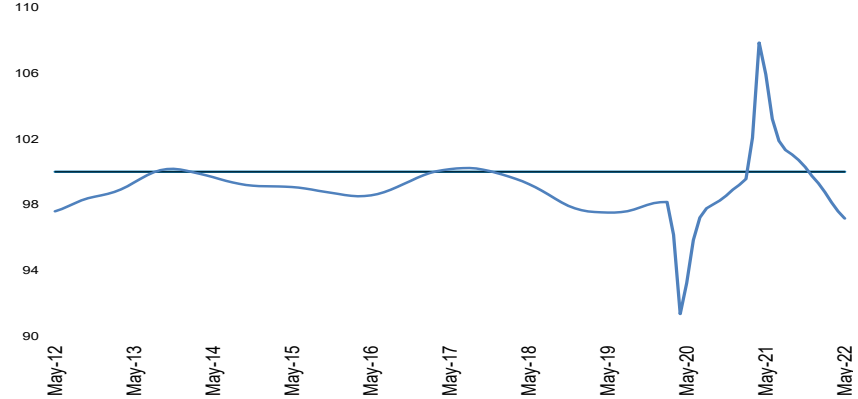
Composite Leading Indicators

Global PMI



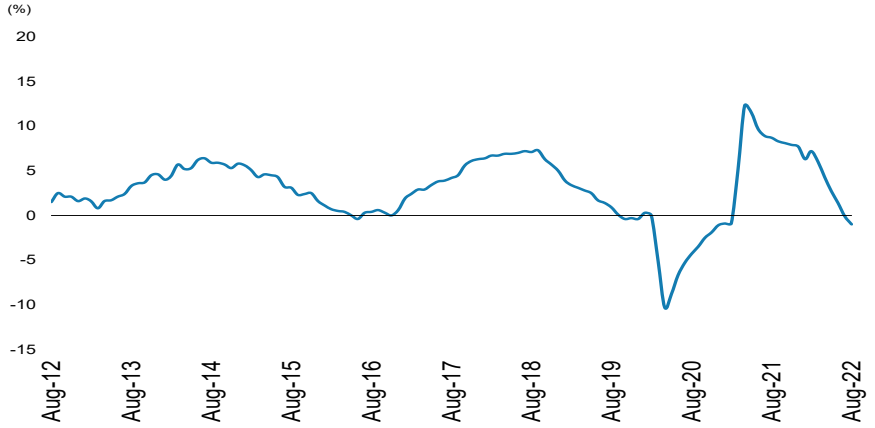
Source: Bloomberg, Morgan Stanley Research

OECD Total CLI



Source: Bloomberg, Morgan Stanley Research

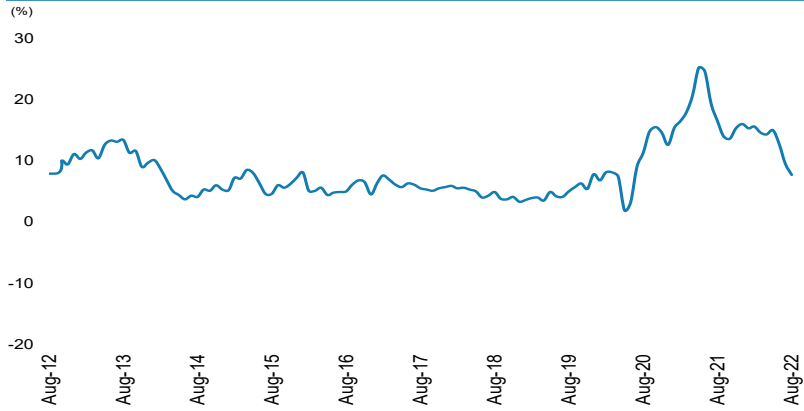
US Conference Board LEI



Source: Bloomberg, Morgan Stanley Research

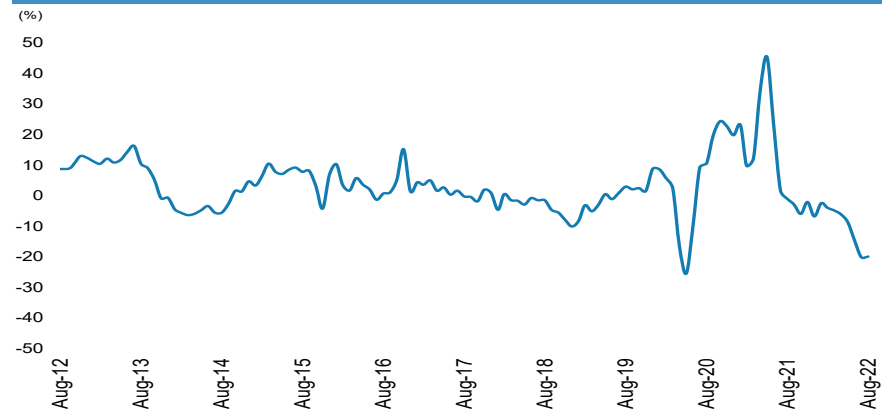
Housing & Construction Trends

Median Home Price YoY % Change



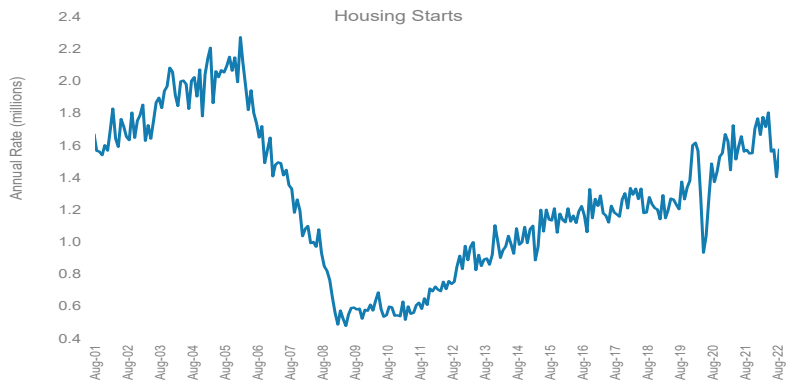
Source: Bloomberg, Morgan Stanley Research

Existing Home Sales YoY % Change



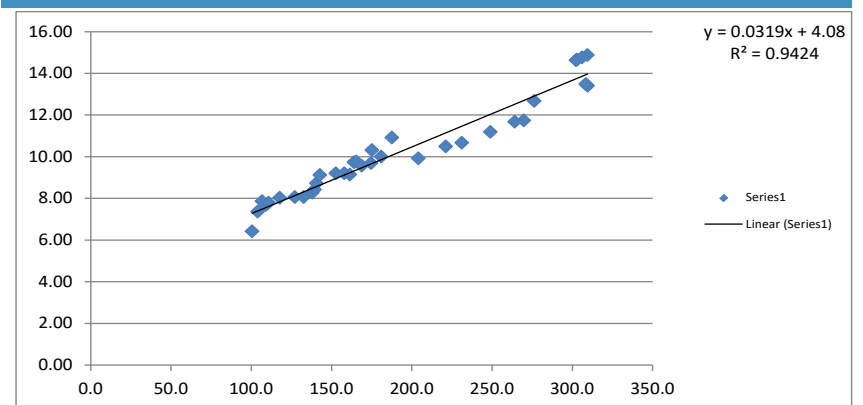
Source: Bloomberg, Morgan Stanley Research

Housing Starts



Source: Haver, Morgan Stanley Research

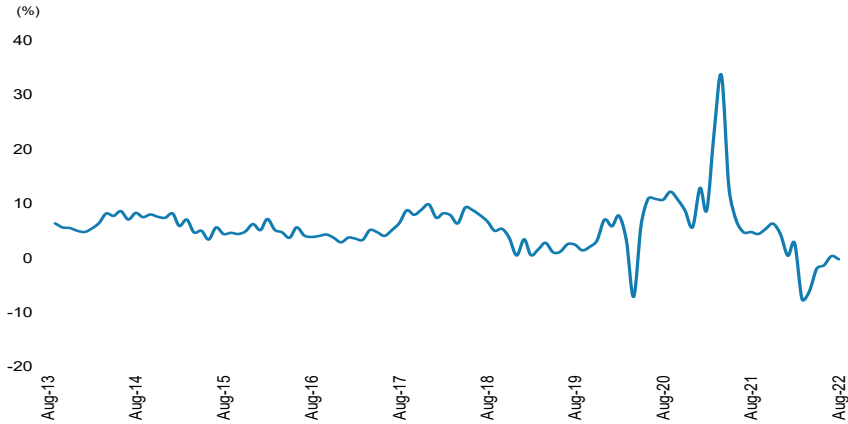
Existing Home Sales & Architectural Coatings (Gal.) Correlation



Source: Haver, Morgan Stanley Research

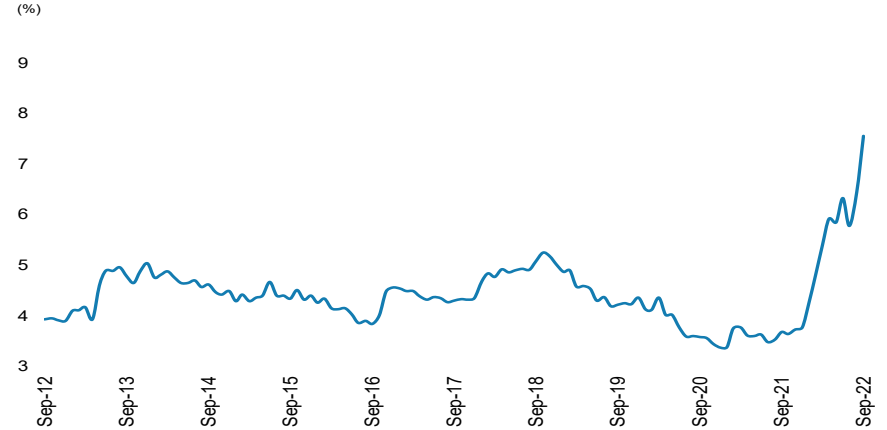
Housing & Construction Trends

Home Improvement Sales YoY Change



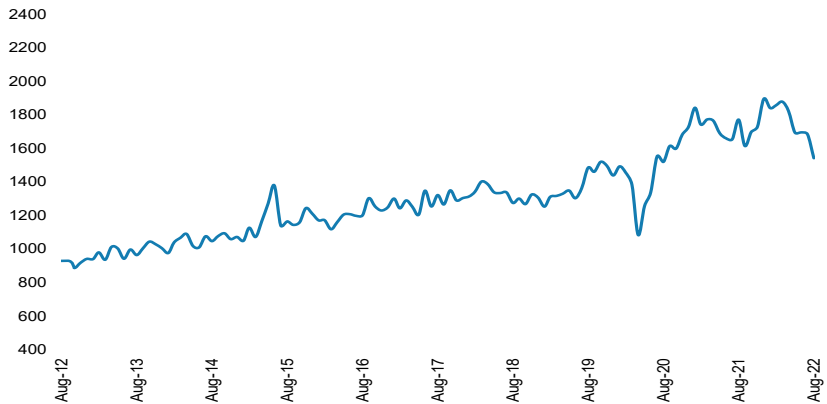
Source: Bloomberg, Morgan Stanley Research

30 Year Mortgage Rate



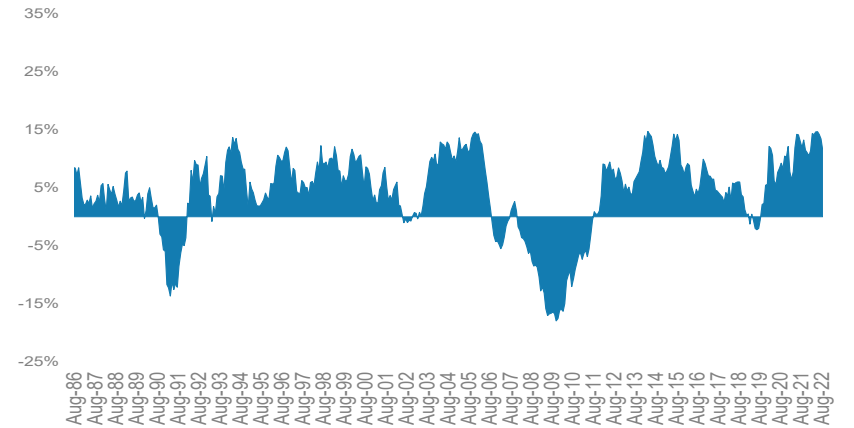
Source: Bloomberg, Morgan Stanley Research

Housing Permits Issued



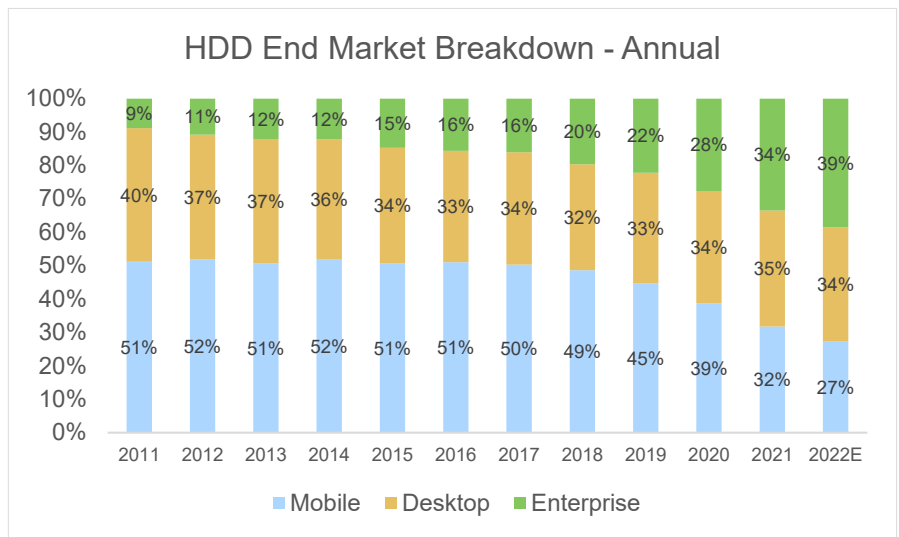
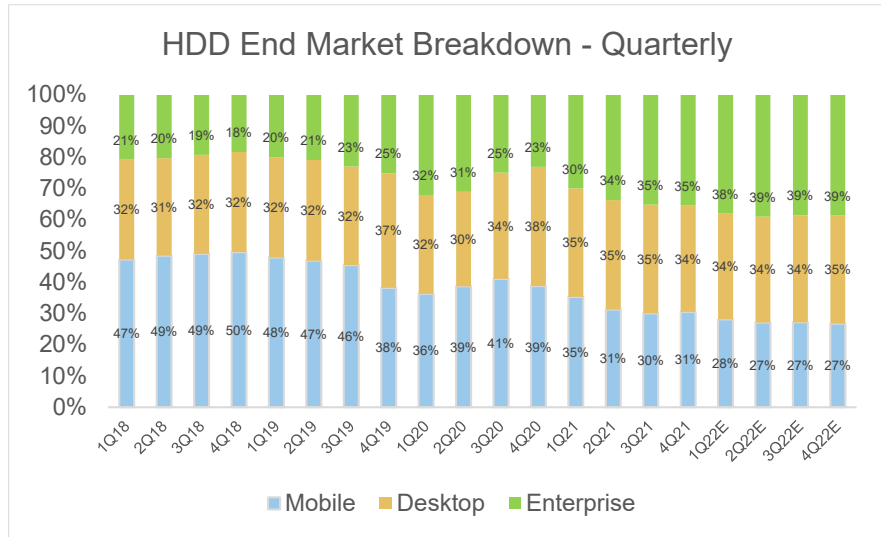
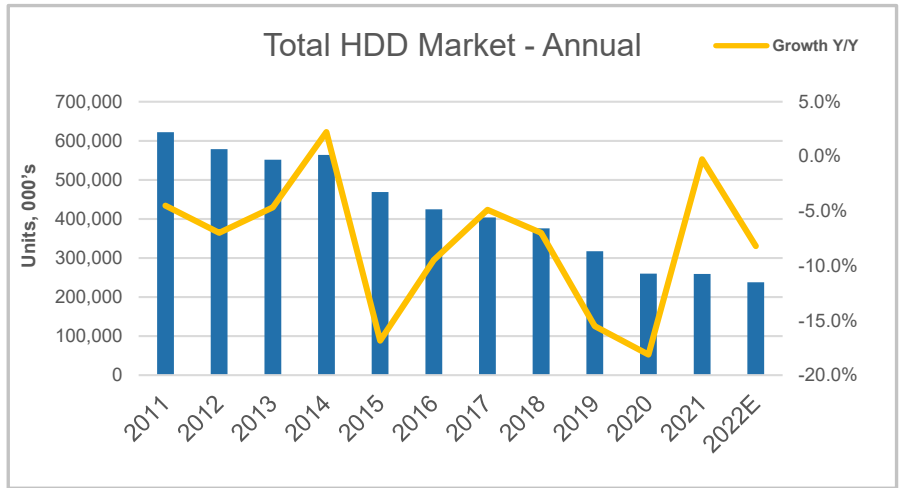
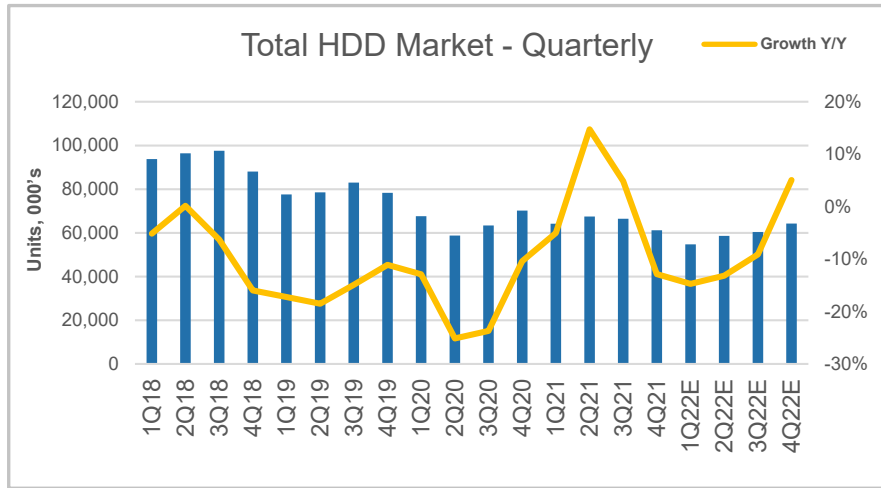
Source: Haver, Morgan Stanley Research

Construction Spending



Source: Haver, Morgan Stanley Research

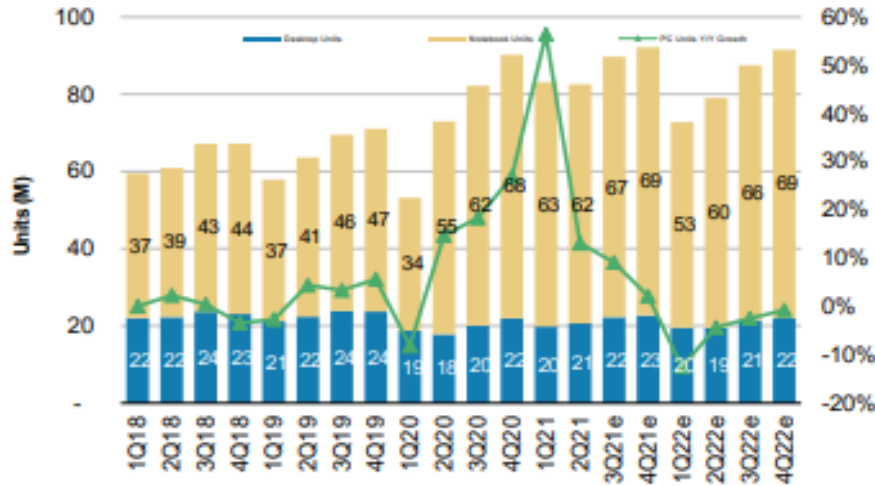
Electronics Trends: Hard Disk Market Data



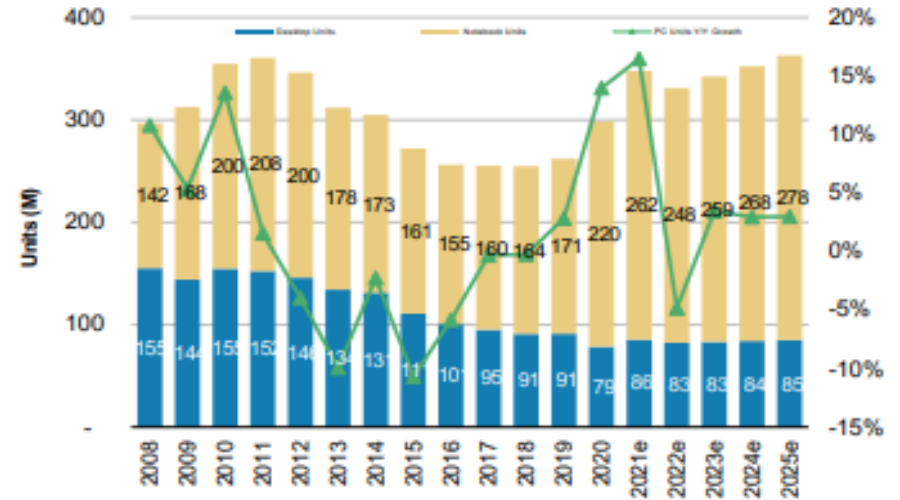
e = Morgan Stanley Research estimates
 Source: Company Data, Morgan Stanley Research

Electronics Trends: PC and Tablet

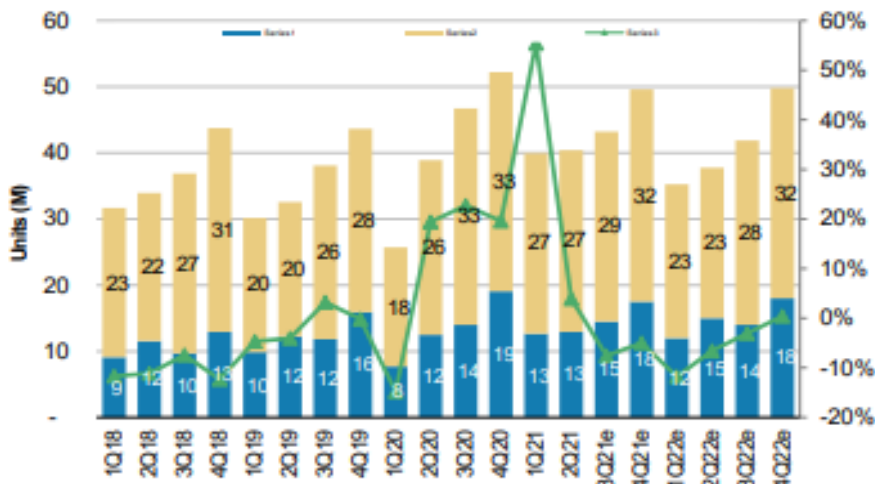
Desktop and Notebook Market Quarterly



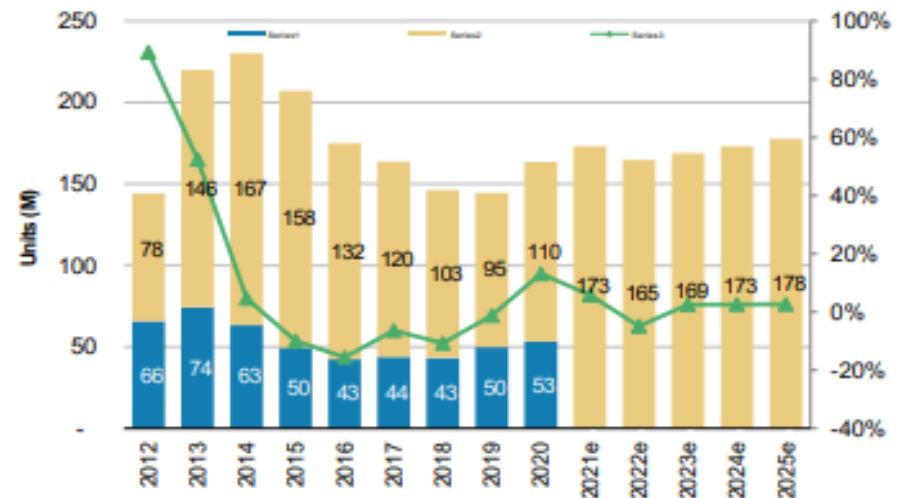
Desktop and Notebook Market Annual



Tablet Market Quarterly



Tablet Market Annual



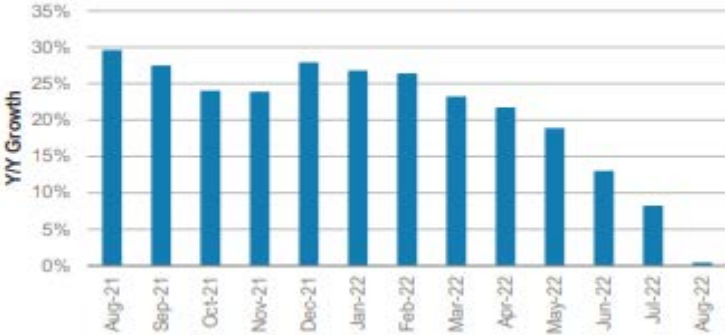
e = Morgan Stanley Research estimates
Source: Company Data, Morgan Stanley Research

Electronics Trends: Semiconductors

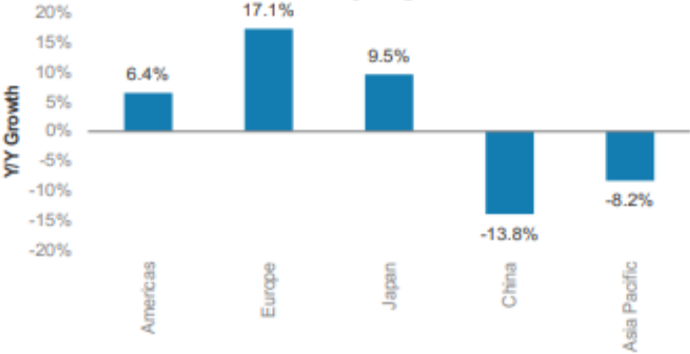
Global Semiconductors Sales



Global Semiconductors Sales



August 2022 Semiconductor Sales by Region



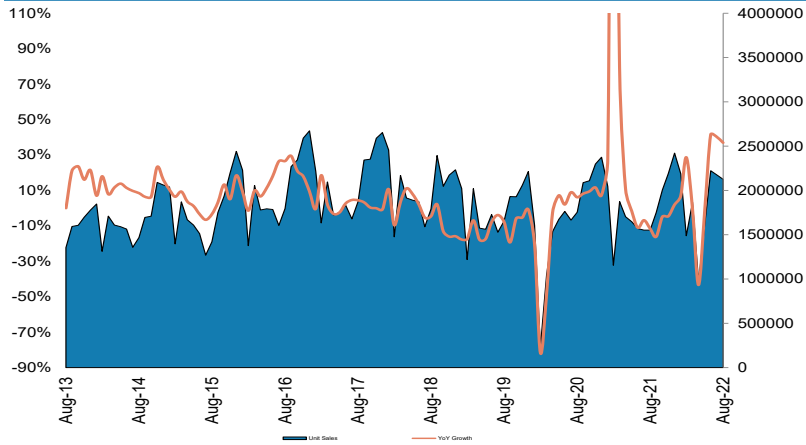
NAND Sales (\$US Bn)



e = Morgan Stanley Research estimates
 Source: Bloomberg, SIA, Morgan Stanley Research

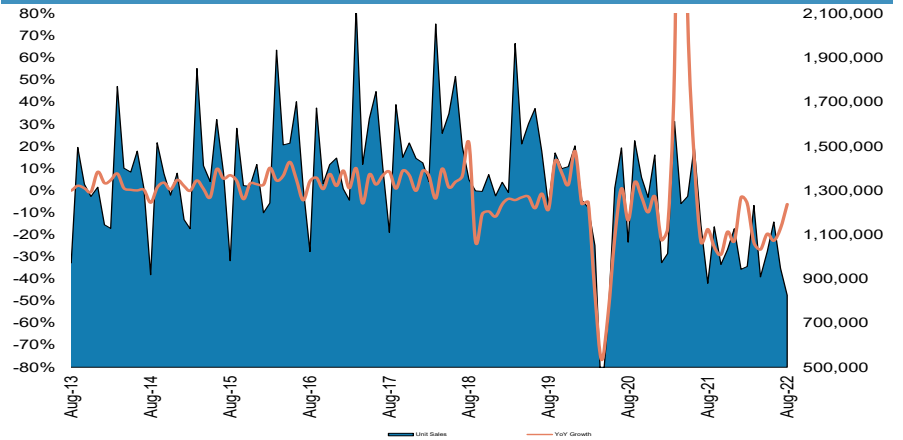
Automotive Trends: Car & Light Truck Sales

China Monthly Sales



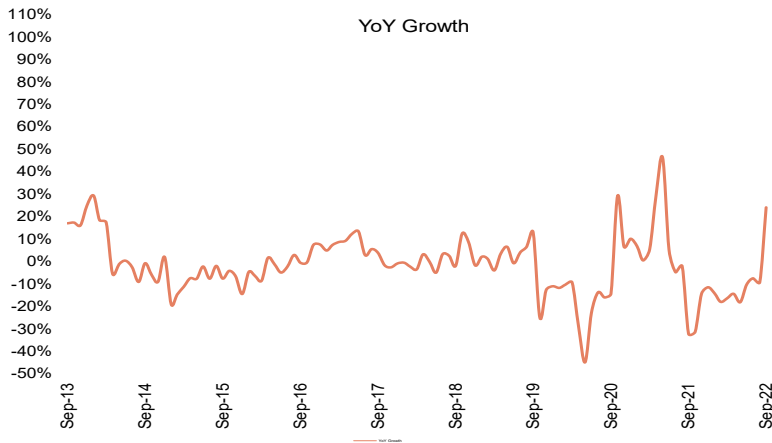
Source: China Auto Market, Morgan Stanley Research

Europe Monthly Sales



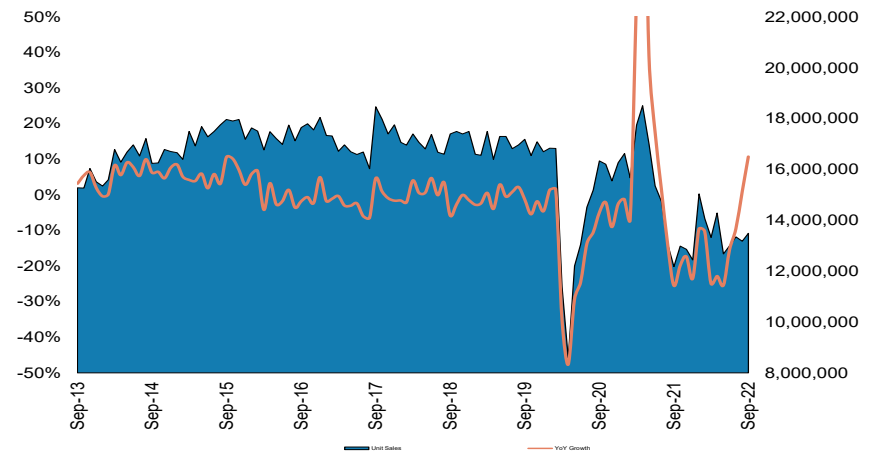
Source: ACEA, Morgan Stanley Research

Japan Monthly Sales



Source: JAMA, Morgan Stanley Research

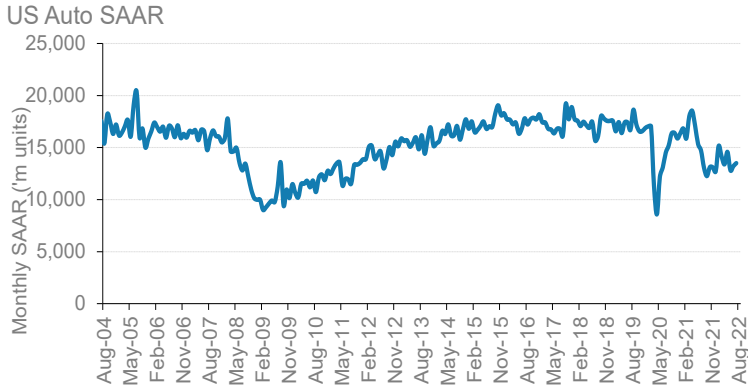
US Monthly Sales



Source: Autodata, Morgan Stanley Research

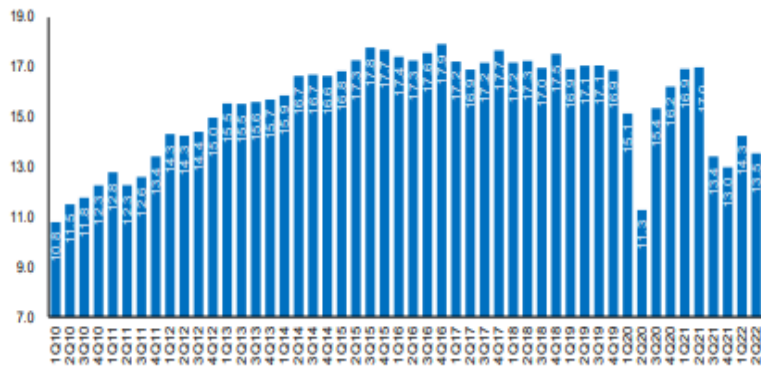
Automotive Trends

Long-Term US Auto Sales SAAR



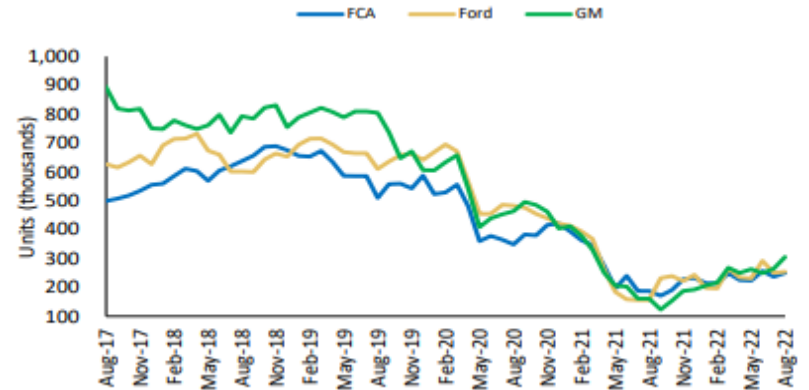
Source: Autodata, Morgan Stanley Research

New Vehicle SAAR by Quarter



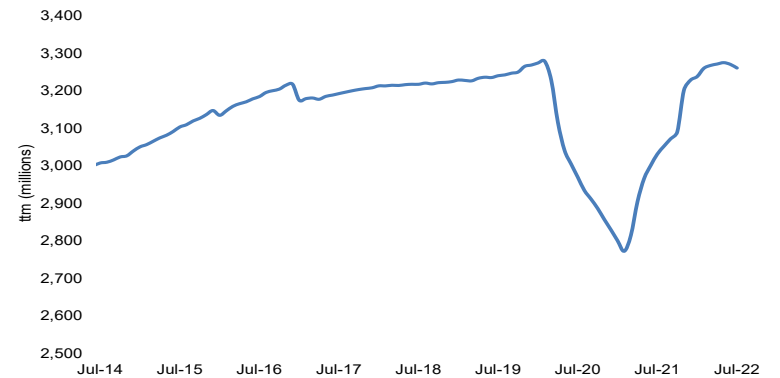
Source: Autodata, Morgan Stanley Research

Detroit 3 Days of Supply



Source: Autodata, Morgan Stanley Research

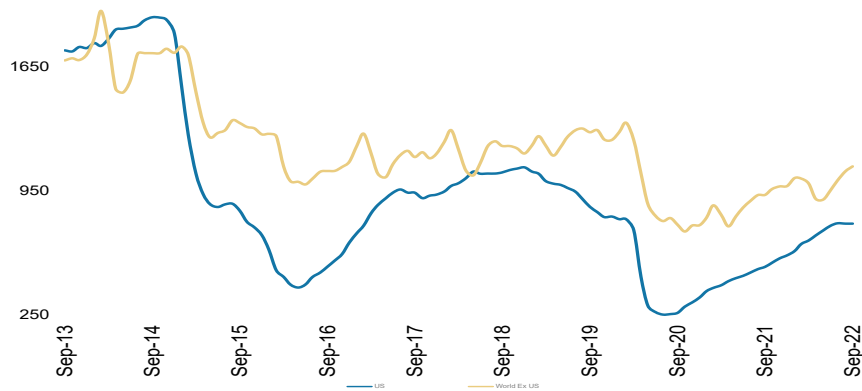
Miles Driven (US)



Source: Department of Transportation, Morgan Stanley Research

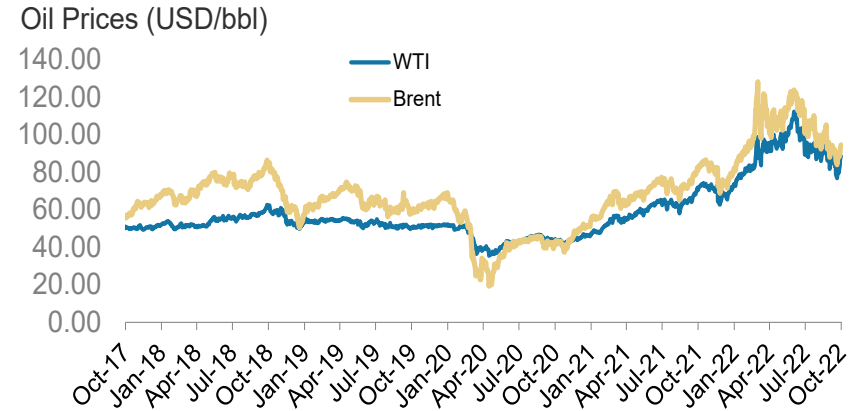
Oil & Gas Trends

Rotary Rig Count



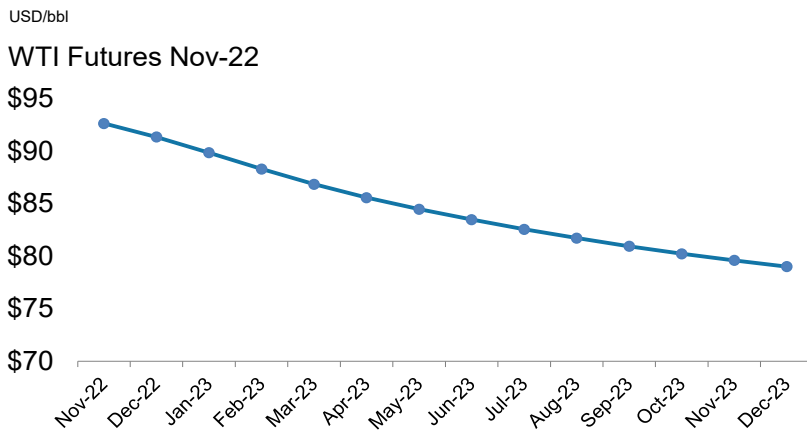
Source: Baker-Hughes Rotary Rig Count

Crude Oil Front Month Price



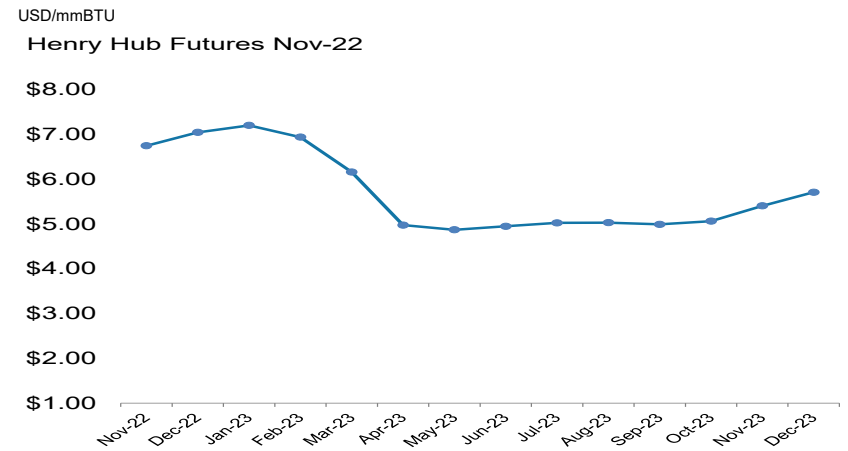
Source: NYMEX, Bloomberg

WTI Crude Oil Forward Curve



Source: NYMEX, Bloomberg

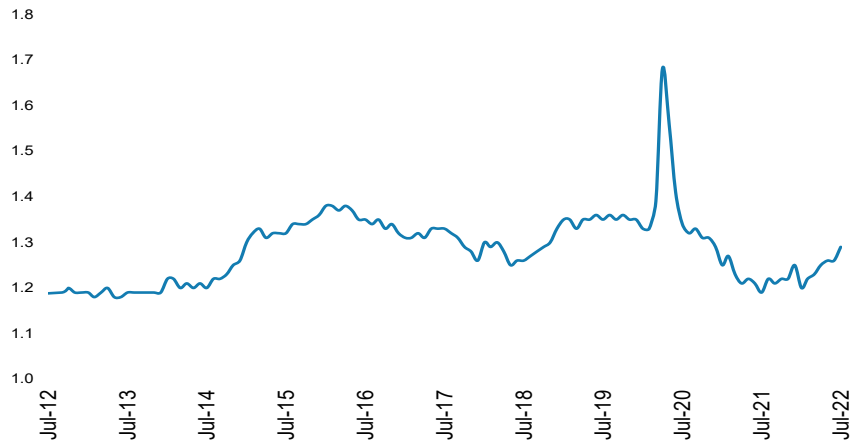
Natural Gas Forward Curve



Source: NYMEX, Bloomberg

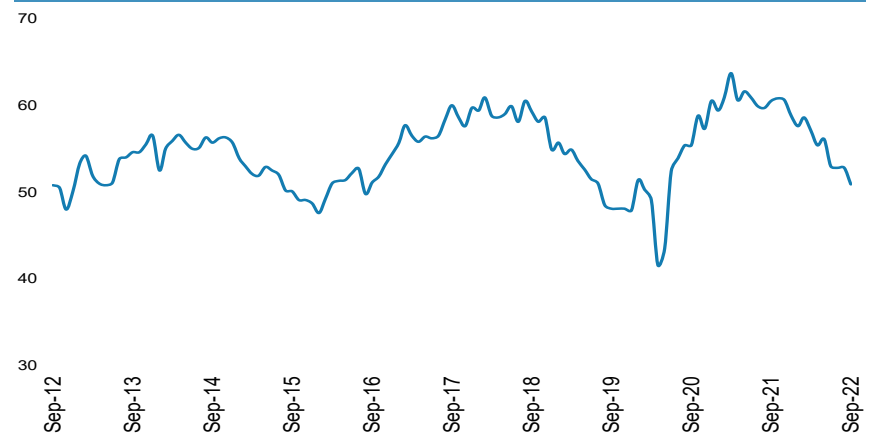
Industrials Trends

Inventories/Sales: Durable Goods Wholesalers



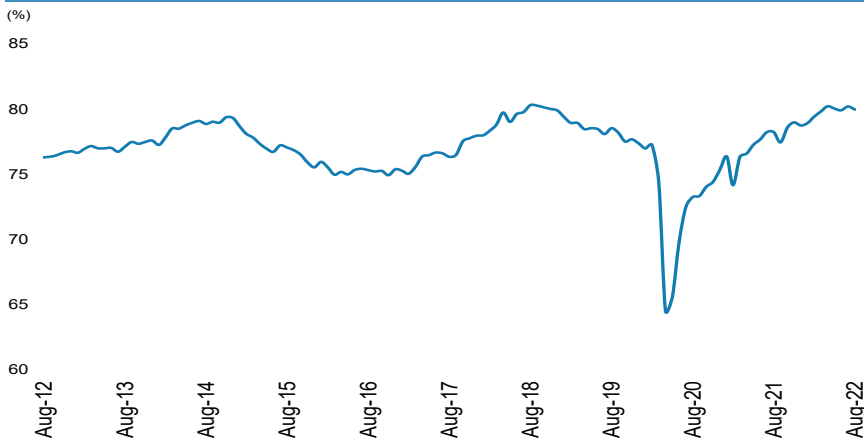
Source: Census, Morgan Stanley Research

ISM Index



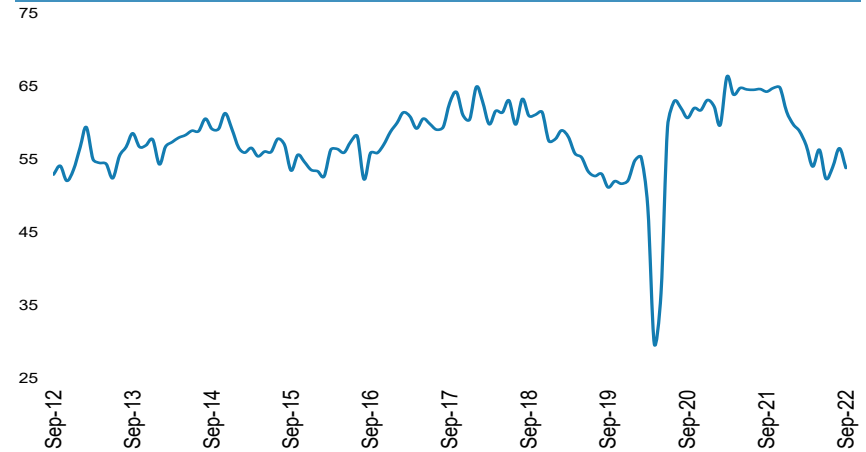
Source: ISM, Census, Morgan Stanley Research

Total Manufacturing Capacity Utilization



Source: Census, Morgan Stanley Research

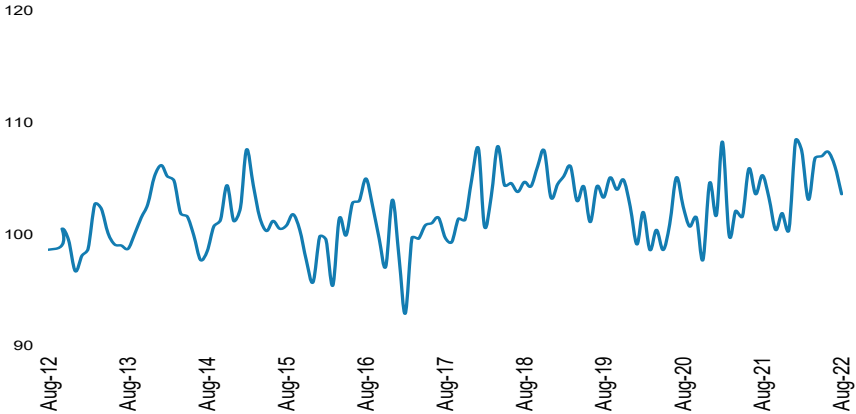
ISM New Orders



Source: ISM, Census, Morgan Stanley Research

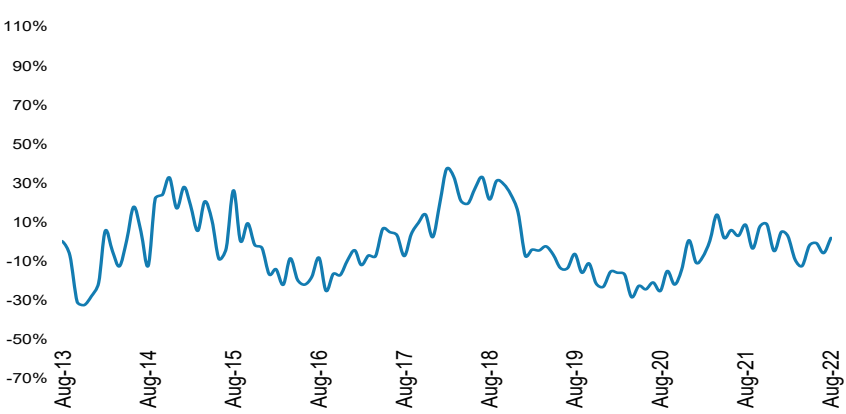
Utilities Trends

Utilities Industrial Production



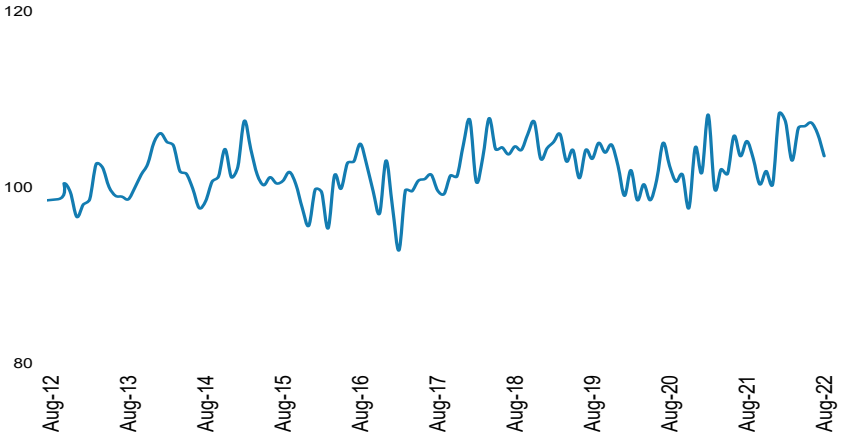
Source: Federal Reserve, Morgan Stanley Research

Generator/Turbine New Orders: YoY Change



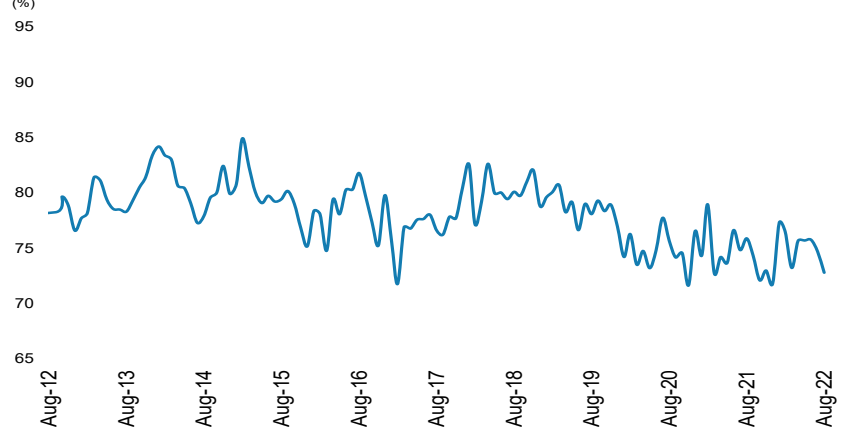
Source: US Department of Commerce, Morgan Stanley Research

US Electricity Net Consumption (Billion Kilowatt hours)



Source: US Energy Information Administration, Morgan Stanley Research

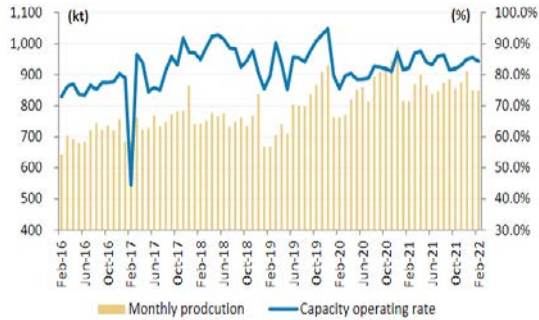
Utilities Capacity Utilization



Source: US Department of Commerce, Morgan Stanley Research

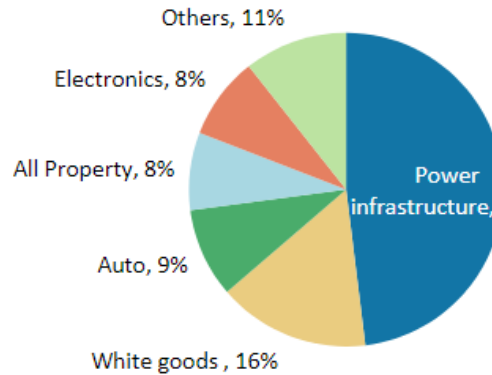
Metals Trends

China Copper Production



Source: Baichuan, Morgan Stanley Research

China Copper Demand Drivers

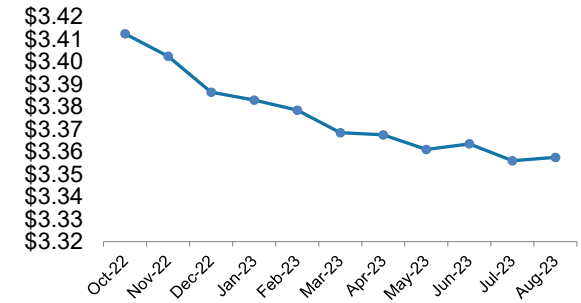


Source: Anitaike, Morgan Stanley Research

Copper Forward Curve

USD/metric ton. EUR/metric ton

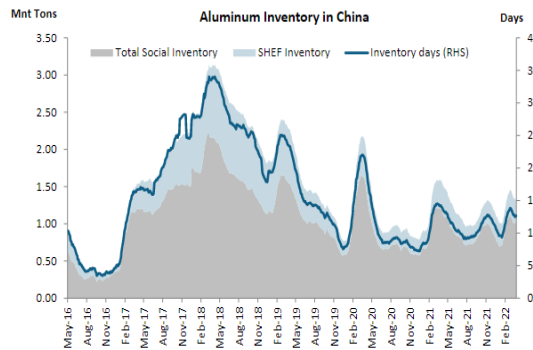
Copper Futures Oct-22



Source: LME, Bloomberg

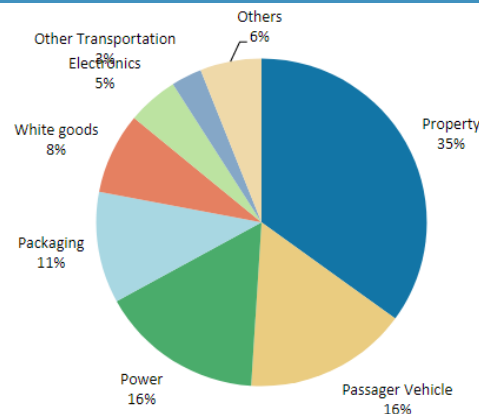
Months

China Aluminum Inventory



Source: Wind, CEIC, Morgan Stanley Research

China Aluminum Demand Drivers

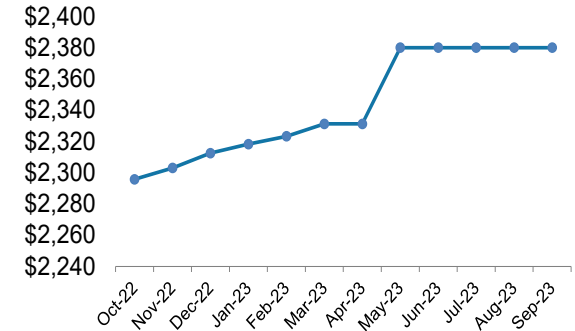


Source: Anitaike, Morgan Stanley Research

Aluminum Forward Curve

USD/metric ton. EUR/metric ton

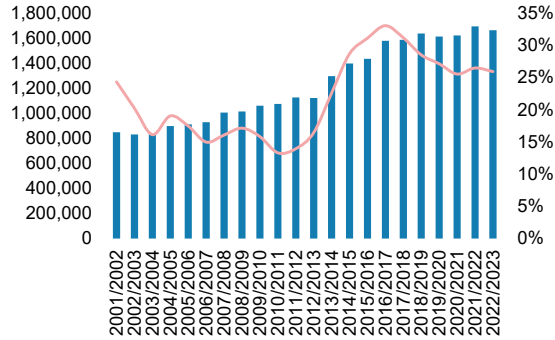
Aluminium Futures Oct-22



Source: LME, Bloomberg

Agricultural Commodity Trends

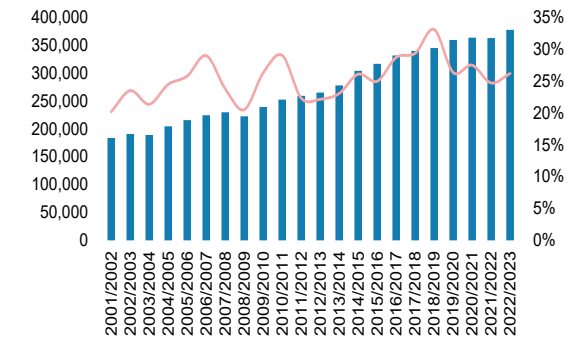
Global Corn Tightness (stocks/use) and Consumption (metric ton)



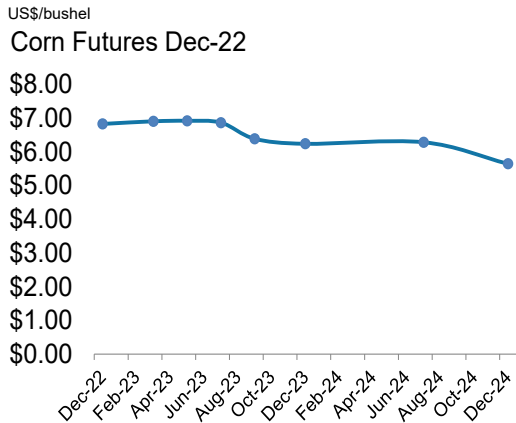
Global Wheat Tightness (stocks/use) and Consumption (metric ton)



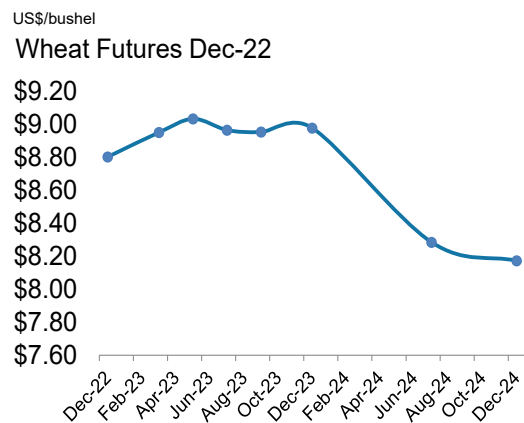
Global Soybean Tightness (stocks/use) and Consumption (metric ton)



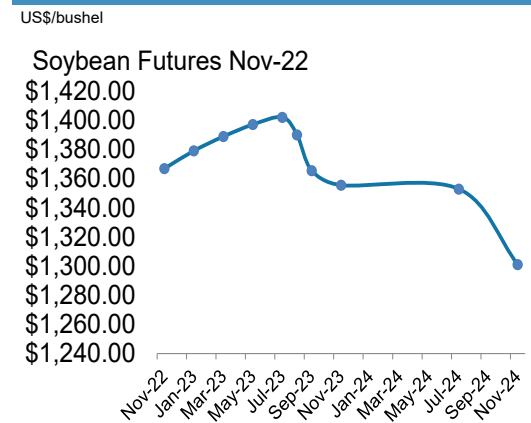
Corn Forward Curve



Wheat Forward Curve



Soybean Forward Curve



Source: CBOT, USDA, Morgan Stanley Research

Agricultural Trends: Corn Farmer P&L

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	SPOT
Gross Value Of Production																
Primary Product, Grain	586.0	964.8	654.9	850.2	847.1	654.8	679.7	685.8	732.3	654.4	580.8	955.9	1263.3	1119.4	1023.8	1128.2
Secondary Product, Silage	0.9	1.2	1.3	1.4	1.4	1.4	1.9	2.0	2.3	2.4	2.1	2.3	3.2	2.7	2.4	2.8
Total, Gross Value Of Production	586.9	966.0	656.2	851.5	848.4	656.2	681.5	687.8	734.5	656.7	582.9	958.2	1266.4	1122.1	1026.2	1131.0
Operating Costs																
Seed	81.6	84.4	92.0	97.6	101.0	101.6	98.4	97.1	96.0	93.5	91.8	91.4	97.0	98.0	98.9	91.4
Fertilizer	101.8	135.3	151.0	139.3	115.4	119.5	96.7	79.9	84.6	97.2	80.3	101.6	206.2	177.1	113.7	209.3
Chemicals	26.3	26.4	27.5	28.6	29.2	28.0	35.7	34.8	34.0	34.0	32.6	31.5	32.9	33.2	33.6	31.5
Custom Services	16.4	16.8	17.1	17.8	18.2	19.0	22.7	22.1	22.5	22.7	22.9	23.5	24.2	24.9	25.7	23.5
Fuel, Lube, And Electricity	25.8	32.4	30.6	32.3	32.8	21.3	24.1	27.2	30.7	32.4	27.2	27.0	30.7	29.1	28.4	27.0
Repairs	24.0	24.8	25.5	25.8	26.2	26.2	32.2	32.8	33.9	35.1	35.6	38.0	39.4	41.0	42.6	38.0
Purchased Irrigation Water	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Interest On Operating Capital	0.3	0.2	0.2	0.2	0.1	0.3	0.8	1.7	3.4	3.5	0.7	0.1	0.1	0.1	0.1	0.1
Hired Labor	3.0	2.9	3.0	3.1	3.2	3.3	4.5	4.6	4.9	5.3	5.3	5.6	6.0	6.3	6.6	5.6
Total, Operating Costs	279.1	323.2	347.1	344.7	326.3	319.3	315.2	300.3	310.2	323.9	296.8	318.9	436.8	410.0	350.0	426.6
Allocated Overhead																
Opportunity Cost Of Unpaid Labor	22.5	22.8	23.7	24.4	24.8	25.6	25.8	26.4	28.1	29.7	31.0	32.3	33.3	34.3	35.4	32.3
Capital Recovery Of Machinery And Equipment	84.4	89.6	94.1	96.9	100.2	102.6	118.0	120.3	122.7	127.4	126.1	134.6	140.0	145.5	151.3	134.6
Opportunity Cost Of Land	127.3	138.2	154.9	167.7	175.6	179.2	160.4	158.7	160.7	159.4	161.9	163.4	163.4	163.4	163.4	163.4
Taxes And Insurance	8.5	8.9	9.0	9.2	9.3	11.0	11.6	12.0	12.2	12.7	13.2	13.5	14.1	14.6	15.2	13.5
General Farm Overhead	18.1	18.7	19.3	19.5	19.9	19.8	17.7	18.0	18.7	19.3	19.6	20.9	21.5	22.1	22.8	20.9
Total, Allocated Overhead	260.8	278.2	301.0	317.7	329.7	338.3	333.4	335.4	342.4	348.4	351.8	364.8	372.3	380.0	388.1	364.8
Costs Listed																
Total, Costs Listed	540.0	601.4	648.1	662.4	656.0	657.5	648.7	635.8	652.7	672.4	648.6	683.8	809.1	790.0	738.1	791.5
Net Value																
Value Of Production Less Total Costs Listed	46.9	364.6	8.1	189.1	192.5	-1.3	32.9	52.1	81.9	-15.6	-65.7	274.5	457.4	332.1	288.2	339.5
Prospective Cash Margins (\$/ac)	307.8	642.8	309.1	506.9	522.2	336.9	366.3	387.5	424.3	332.8	286.1	639.3	829.7	712.2	676.3	704.3
Supporting Information																
Yield (Bushels Per Planted Acre)	152.6	146.8	123.1	158.1	171.0	168.4	174.6	176.6	176.4	167.5	171.4	177.0	172.5	179.3	181.2	172.5
Price (Dollars Per Bushel At Planting)	\$3.84	\$6.57	\$5.32	\$5.38	\$4.95	\$3.89	\$3.89	\$3.88	\$4.15	\$3.91	\$3.39	\$5.40	\$7.32	\$6.24	\$5.65	\$6.54
Enterprise Size (Planted Acres)	280	280	280	280	280	280	278	278	278	278	278	278	278	278	278	278
Production Practices																
Dryland (Percent Of Acres)	89%	89%	89%	89%	89%	89%	89%	89%	89%	88%	88%	89%	89%	89%	89%	89%
Irrigated (Percent Of Acres)	11%	11%	11%	11%	11%	11%	11%	11%	11%	12%	12%	11%	11%	11%	11%	11%

Agricultural Trends: USDA Balance Sheet

Corn Balance Sheet (post August 12 WASDE)

Millions of Bushels (bu) and Acres	July 2022			August 2022			2021/22-E vs. Jul-22		2022/23-E vs. Jul-22	
	2020/21	2021/22-E	2022/23-E	2020/21	2021/22-E	2022/23-E	bu	%	bu	%
U.S. Corn Balance Sheet										
Area Planted	90.7	93.4	89.9	90.7	93.4	89.8	0.0	0.0%	-3.1	-0.1%
Area Harvested	82.3	85.4	81.9	82.3	85.4	81.8	0.0	0.0%	-3.1	-0.1%
Harvest Ratio	90.7%	91.4%	91.1%	90.7%	91.4%	91.1%				
Yield per Harvested Acre	171.4	177.0	177.0	171.4	177.0	175.4	0.0	0.0%	-1.6	-0.9%
Beginning Stocks	1,919	1,235	1,510	1,919	1,235	1,530	0.0	0.0%	20.0	1.3%
Production	14,111	15,115	14,925	14,111	15,115	14,359	0.0	0.0%	-146.0	-1.0%
Imports	24	25	25	24	25	25	0.0	0.0%	0.0	0.0%
Supply, Total	16,955	16,375	16,040	16,955	16,375	15,913	0.0	0.0%	-127.0	-0.8%
Feed and Residual	5,597	5,600	5,350	5,603	5,600	5,325	0.0	0.0%	-25.0	-0.5%
Food, Seed & Industrial 2/	6,471	6,815	6,820	6,471	6,795	6,825	-20.0	-0.3%	5.0	0.1%
Ethanol & byproducts 3/	5,033	5,375	5,375	5,033	5,350	5,375	-25.0	-0.5%	0.0	0.0%
Domestic, Total	12,968	12,415	12,170	12,974	12,395	12,150	-28.0	-0.2%	-28.0	-0.2%
Exports	2,753	2,450	2,400	2,747	2,450	2,375	0.0	0.0%	-25.0	-1.0%
Use, Total	14,821	14,865	14,570	14,821	14,845	14,525	-29.0	-0.1%	-45.0	-0.3%
Ending Stocks	1,235	1,510	1,470	1,235	1,530	1,388	20.0	1.3%	-82.0	-5.6%
Avg. Farm Price (\$/bu)	\$4.53	\$5.95	\$6.65	\$4.53	\$5.95	\$6.65	\$0.00	0.0%	\$0.00	0.0%
Stocks-to-Use Ratio (Total)	8.3%	10.2%	10.1%	8.3%	10.3%	9.6%	0.1%		-0.5%	

Soybean Balance Sheet (post August 12 WASDE)

Millions of Bushels (bu) and Acres	July 2022			August 2022			2021/22-E vs. Jul-22		2022/23-E vs. Jul-22	
	2020/21	2021/22-E	2022/23-E	2020/21	2021/22-E	2022/23-E	bu	%	bu	%
U.S. Soybean Balance Sheet										
Area Planted	83.4	87.2	88.3	83.4	87.2	88.0	0.0	0.0%	-0.3	-0.3%
Area Harvested	82.6	86.3	87.5	82.6	86.3	87.2	0.0	0.0%	-0.3	-0.3%
Harvest Ratio	99.0%	99.0%	99.1%	99.0%	99.0%	99.1%				
Yield per Harvested Acre	51	51.4	51.5	51.0	51.4	51.9	0.0	0.0%	0.4	0.8%
Beginning Stocks	525	257	215	525	257	225	0.0	0.0%	10.0	4.7%
Production	4,216	4,435	4,505	4,216	4,435	4,531	0.0	0.0%	26.0	0.6%
Imports	20	15	15	20	15	15	0.0	0.0%	0.0	0.0%
Supply, Total	4,761	4,707	4,735	4,761	4,707	4,771	0.0	0.0%	36.0	0.8%
Crushings	2,141	2,205	2,245	2,141	2,205	2,245	0.0	0.0%	0.0	0.0%
Exports	2,261	2,170	2,135	2,266	2,160	2,155	-10.0	-0.5%	20.0	0.9%
Seed	101	103	102	101	102	102	-1.0	-1.0%	0.0	0.0%
Residual	1	15	23	-4	15	24	0.0	0.0%	1.0	4.3%
Use, Total	4,504	4,492	4,505	4,504	4,482	4,526	-10.0	-0.2%	21.0	0.5%
Ending Stocks	257	215	230	257	225	245	10.0	4.7%	15.0	6.5%
Avg. Farm Price (\$/bu)	\$10.80	\$13.35	\$14.40	\$10.80	\$13.30	\$14.35	0.0	-0.4%	-\$0.05	-0.3%
Stocks-to-Use Ratio (Total)	5.7%	4.8%	5.1%	5.7%	5.0%	5.4%	0.2%		0.3%	

Wheat Balance Sheet (post August 12 WASDE)

Millions of Bushels (bu) and Acres	July 2022			August 2022			2021/22-E vs. Jul-22		2022/23-E vs. Jul-22	
	2020/21	2021/22-E	2022/23-E	2020/21	2021/22-E	2022/23-E	bu	%	bu	%
U.S. Wheat Balance Sheet										
Area Planted	44.5	44.7	47.1	44.5	44.7	47.0	0.0	0.0%	-0.1	-0.2%
Area Harvested	36.8	37.2	37.6	36.8	37.2	37.5	0.0	0.0%	-0.1	-0.3%
Harvest Ratio	82.7%	79.7%	79.8%	82.7%	79.7%	79.8%				
Yield per Harvested Acre	49.7	44.3	47.3	49.7	44.3	47.5	0.0	0.0%	0.2	0.4%
Beginning Stocks	1,528	945	980	1,528	945	980	0.0	0.0%	0.0	0.0%
Production	1,828	1,696	1,781	1,828	1,696	1,763	0.0	0.0%	-2.0	-0.1%
Imports	130	85	130	130	85	130	0.0	0.0%	0.0	0.0%
Supply, Total	2,897	2,598	2,591	2,898	2,598	2,593	0.0	0.0%	-2.0	-0.1%
Food	901	962	964	901	972	970	10.0	1.0%	6.0	0.6%
Seed	64	60	68	64	60	68	0.0	0.0%	0.0	0.0%
Feed and Residual	85	130	85	87	84	85	-3.0	-3.0%	0.0	0.0%
Domestic, Total	1,128	1,122	1,112	1,128	1,128	1,128	0.0	0.0%	0.0	0.0%
Exports	994	894	890	994	890	895	-4.0	-0.2%	35.0	3.1%
Use, Total	2,117	1,998	1,912	2,117	1,928	1,943	9.0	0.2%	31.0	1.6%
Ending Stocks	840	668	639	840	668	610	0.0	0.0%	-59.0	-8.9%
Avg. Farm Price (\$/bu)	\$5.05	\$7.63	\$10.90	\$5.05	\$7.63	\$9.25	0.0	0.0%	-\$1.25	-11.9%
Stocks-to-Use Ratio	49.8%	34.3%	33.4%	49.8%	34.3%	31.4%	0.9%		-0.9%	

Source: USDA, Morgan Stanley Research

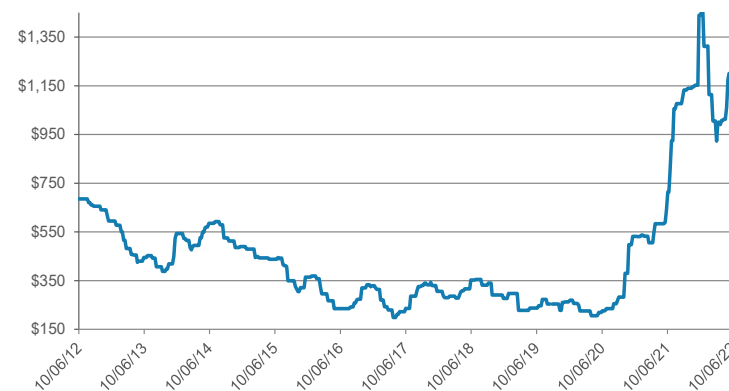
Fertilizer Prices, Margins and Trade

Average Fertilizer Farm Price

Year	Month	Ammonia	Nitrogen Solutions (30%)	Urea	DAP	Potash
2000	Apr.	227	131	200	240	165
2001	Apr.	399	189	280	244	170
2002	Apr.	250	127	191	227	164
2003	Apr.	373	161	261	250	165
2004	Apr.	379	178	276	276	181
2005	Apr.	416	215	332	303	245
2006	Apr.	521	232	362	337	273
2007	Apr.	523	277	453	442	280
2008	Apr.	755	401	552	850	561
2009	Mar.	680	320	486	638	853
2010	Mar.	499	283	448	508	511
2011	Mar.	749	351	526	703	601
2012	Mar.	785	403	644	675	665
2013	Mar.	847	410	592	640	595
2014	Mar.	851	359	571	611	601

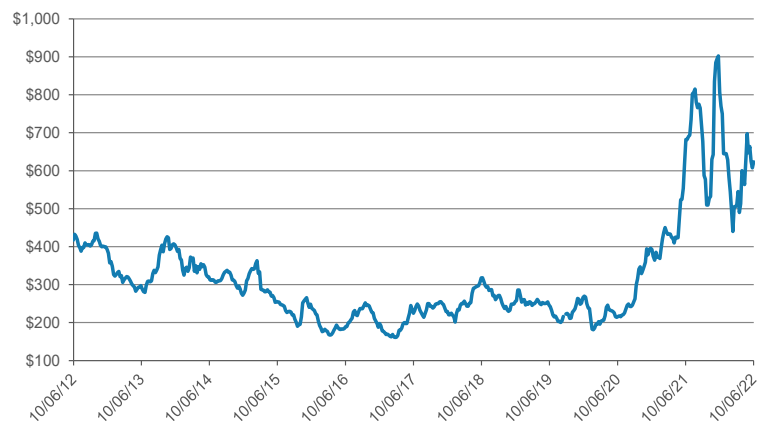
Source: USDA, Morgan Stanley Research

Ammonia (Per Ton)



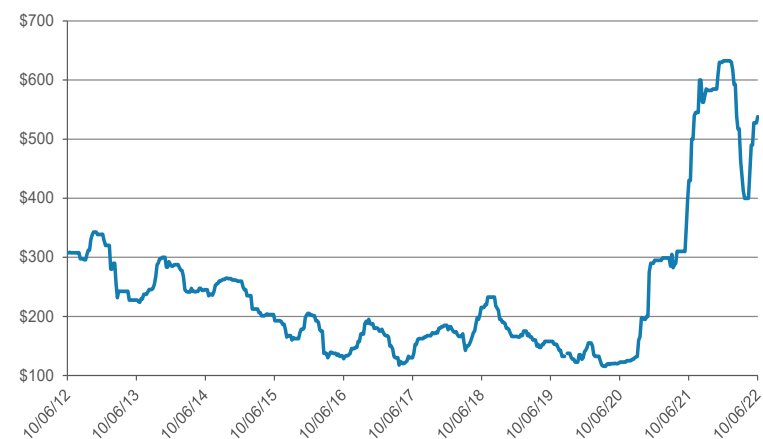
Source: Green Markets, Morgan Stanley Research

Urea (Per Ton)



Source: Green Markets, Morgan Stanley Research

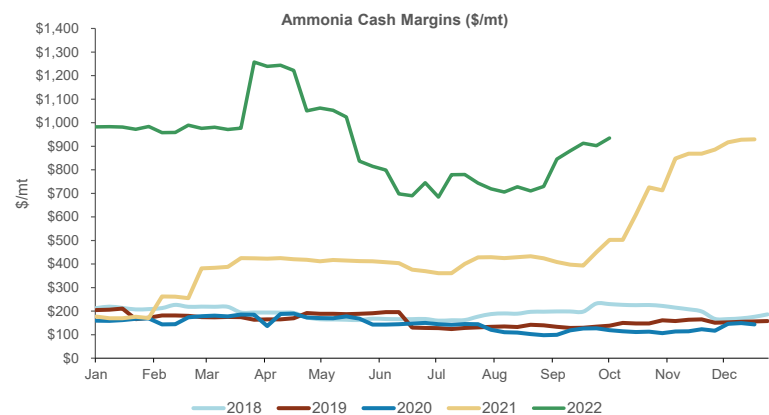
UAN (Per Ton)



Source: Green Markets, Morgan Stanley Research

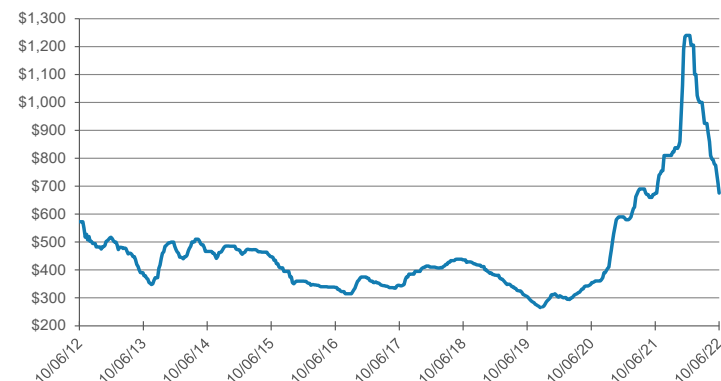
Fertilizer Prices, Margins and Trade

Ammonia Cash Margin (per ton)



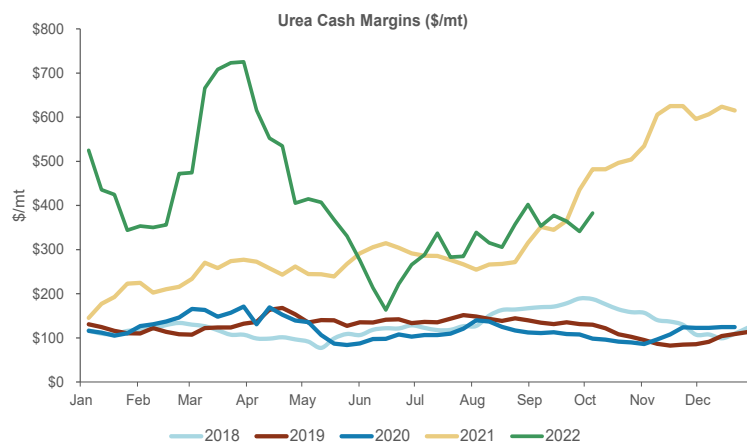
Source: Bloomberg, NYMEX, Green Markets, Morgan Stanley Research

DAP (per ton)



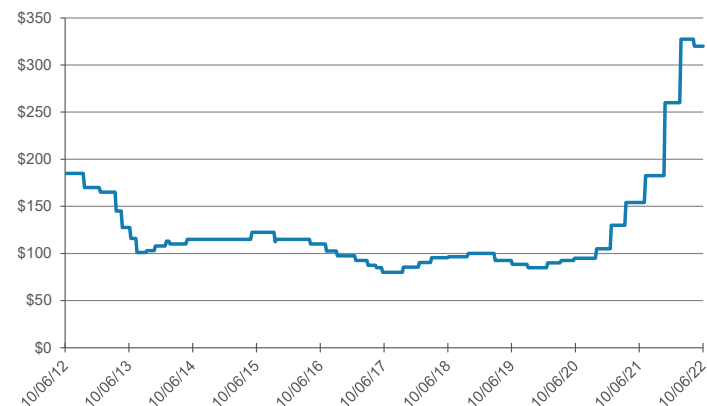
Source: Green Markets, Morgan Stanley Research

Urea Cash Margin (per ton)



Source: Bloomberg, NYMEX, Green Markets, Morgan Stanley Research

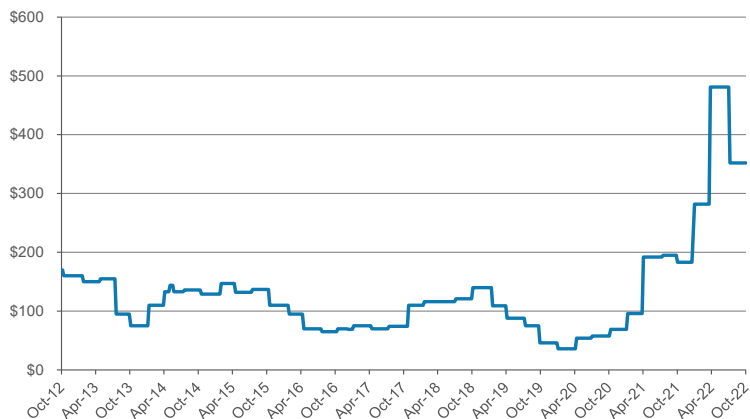
Phosphate Rock (per ton)



Source: Green Markets, Morgan Stanley Research

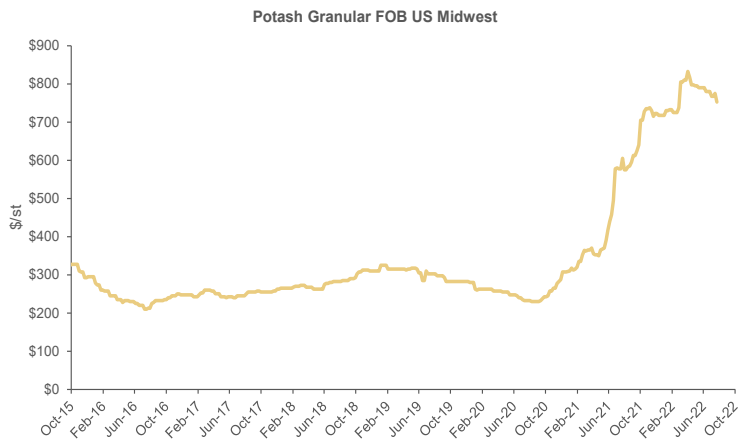
Fertilizer Prices, Margins and Trade

Sulfur (per long ton)



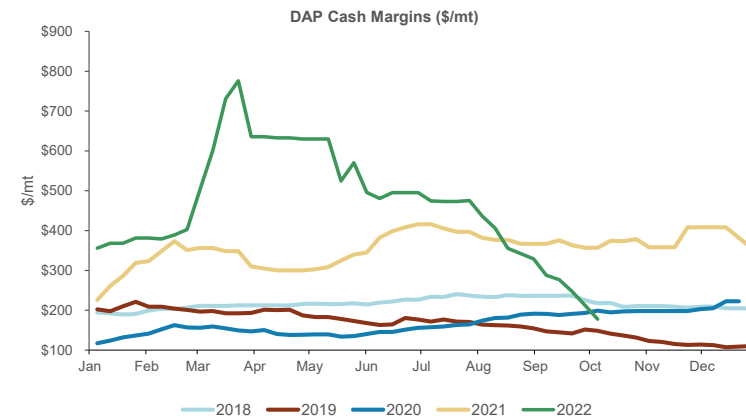
Source: Green Markets, Morgan Stanley Research

Potash



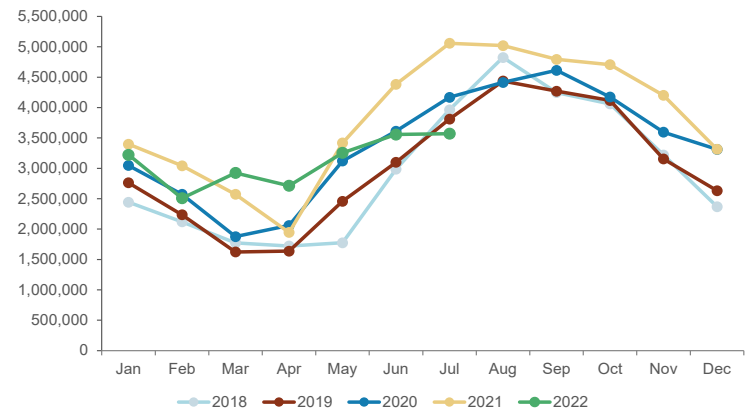
Source: Green Markets, Morgan Stanley Research

DAP Cash Margins (per ton)



Source: Bloomberg, NYMEX, Green Markets, Morgan Stanley Research

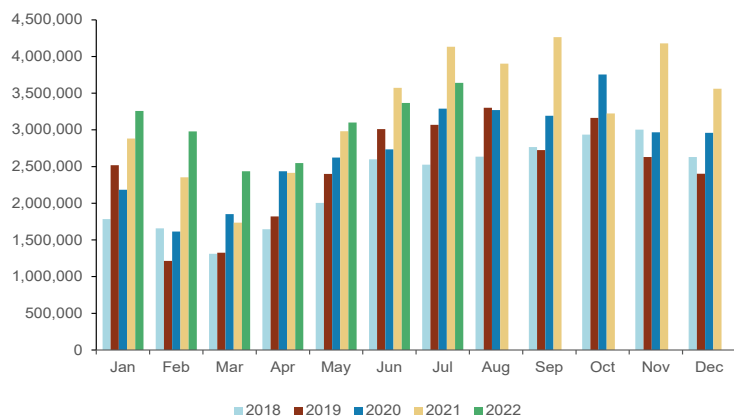
Brazil Retail Fertilizer Consumption



Source: ANDA, Morgan Stanley Research

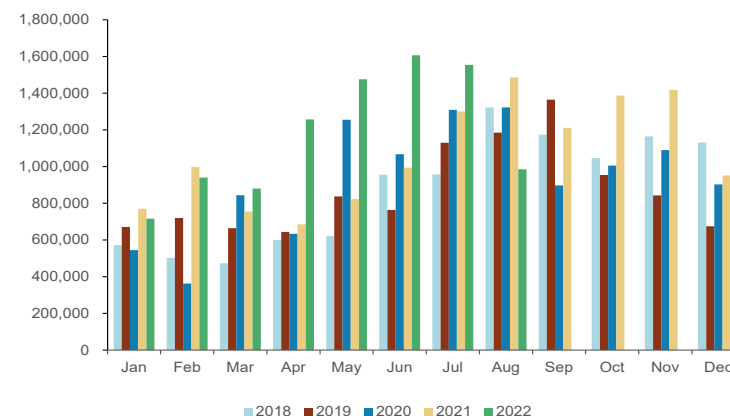
Fertilizer Prices, Margins and Trade

Brazil Fertilizer Imports



Source: ANDA, Morgan Stanley Research

Brazil Potash Imports



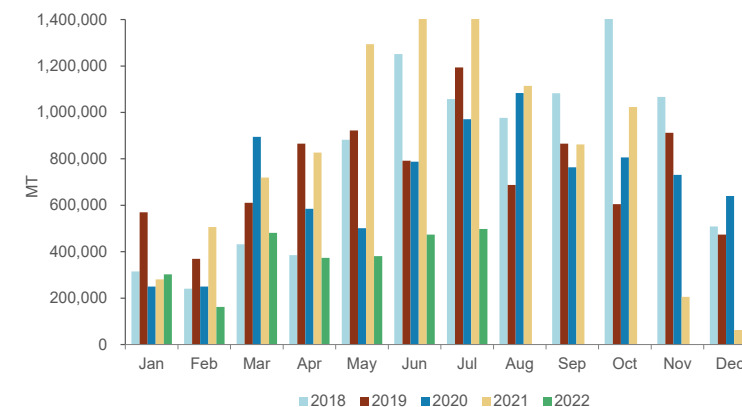
Source: Company data, Morgan Stanley Research

Change in Brazilian Fertilizer Inventories

	July
Production	606,932
Imports	3,641,774
Supply	4,248,706
Consumption	3,571,141
Demand	3,571,141
Change in Inventories (2022)	677,565

Source: ANDA, Morgan Stanley Research

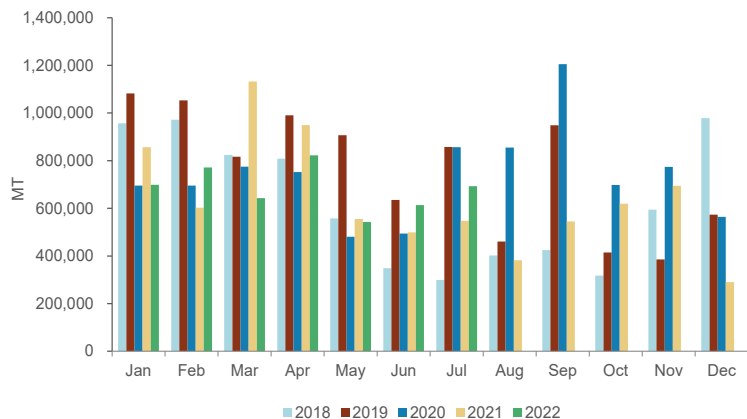
China DAP & MAP Exports



Source: China Customs, Morgan Stanley Research

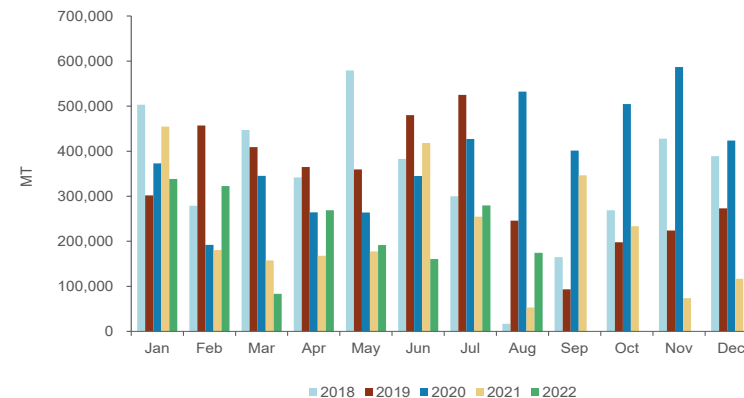
Fertilizer Prices, Margins and Trade

Chinese Potash Imports



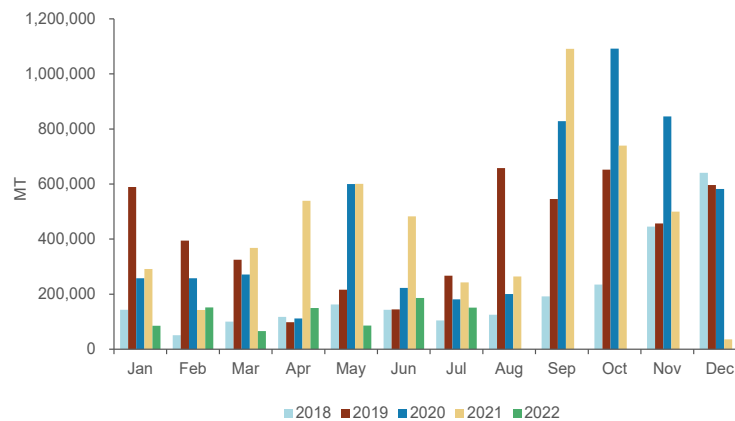
Source: China Customs, Morgan Stanley Research

Indian Potash Imports



Source: Company data, Morgan Stanley Research

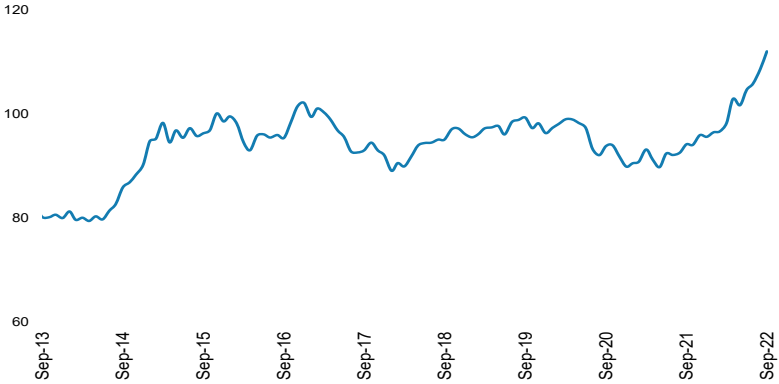
Chinese Urea Exports



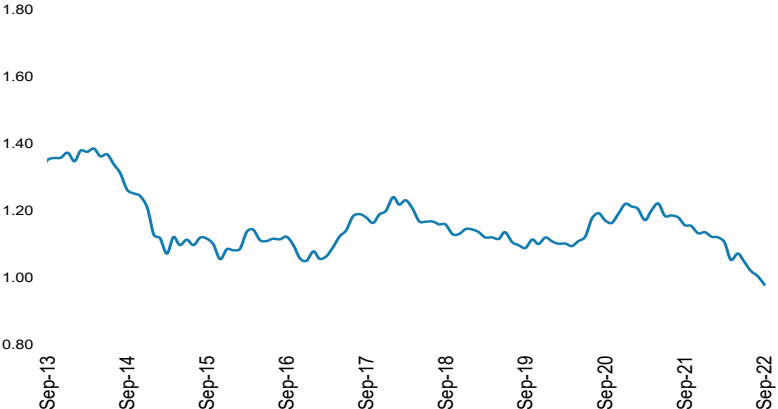
Source: Company data, Morgan Stanley Research

Currency Trends

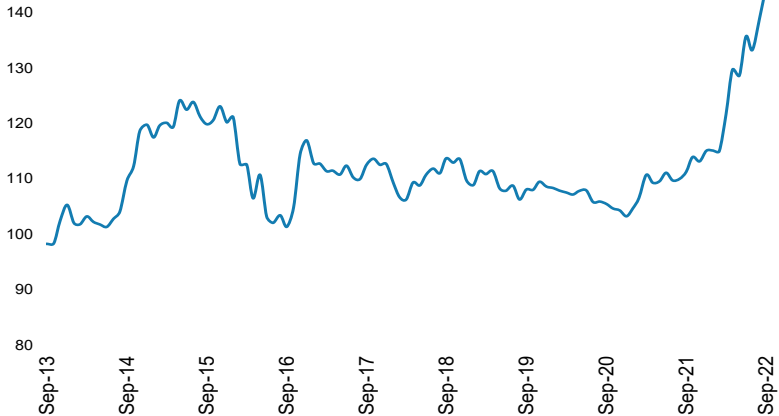
Dollar Weighted Index



EUR/USD



JPY/USD



Source: Bloomberg, Company Data, Morgan Stanley Research

Notable M&A Trends

Recently Announced Transactions					
Date Announced	Target	Buyer	Seller Parent	Total Value (\$M)	Total Value (\$M)
10/11/2022	Ilijin Materials Co Ltd	Lotte Chemical Corp		1281	Pending
9/29/2022	Vital Thin Film Materials Guangdong Co Ltd	Multiple Buyers		626	Completed
8/17/2022	Atotech Deutschland GmbH & Co KG	MKS Instruments Inc		4476	Completed
8/12/2022	Distribution business/Avient Corp	HIG Capital LLC	Avient Corp	950	Completed
8/10/2022	Misr Fertilizers Production Co SAE	Saudi Egyptian Investment & Finance Co		1300	Proposed
8/9/2022	Textile Effects Division/Huntsman Corp	Archroma Management GmbH	Huntsman Corp	718	Pending
8/1/2022	Lubricants business/Valvoline Inc	Saudi Arabian Oil Co	Valvoline Inc	2650	Pending
7/29/2022	ong Ruifu Lithium Co Ltd,Xinjiang Dongli Mining Industry Investment	Shanghai Topcare Medical Services Co Ltd	an Ruifu Mining Co Ltd,Jinan Junhua New E	571	Pending
7/28/2022	Shanghai Secco Petrochemical Co Ltd	INEOS Ltd	China Petroleum & Chemical Corp	1559	Pending
7/22/2022	Shanxi Jinliu Energy Co Ltd	Multiple Buyers		1481	Completed
7/11/2022	LitheA Inc	Ganfeng Lithium Group Co Ltd	Pluspetrol SA	962	Completed
6/8/2022	PI Advanced Materials Co Ltd	Baring Private Equity Asia Ltd	Glenwood Private Equity Co Ltd	996	Pending
6/3/2022	Nitrogen unit/OMV AG	Agrofert AS	OMV AG	869	Pending
5/31/2022	Firmenich International SA	Koninklijke DSM NV		12986	Pending
5/31/2022	Engineering Materials & Dyneema businesses/Koninkl	Advent International Corp,LANXESS AG	Koninklijke DSM NV	4132	Pending
5/26/2022	instar Natural Gas Co,Norstar Pipeline Co Inc,Cook Inlet Natural Gas	TriSummit Utilities Inc	AltaGas Ltd	782	Pending
5/17/2022	Perstorp Holding AB	Petronas Chemicals Group Bhd	PAI Partners SAS	2489	Completed
4/21/2022	Cracker plant/Louisiana	Potential Buyer	NOVA Chemicals Corp	2000	Proposed
4/20/2022	DSM Protective Materials business	Avient Corp	Koninklijke DSM NV	1485	Completed
4/11/2022	Coil coating business/Cornerstone Building Brands	BlueScope Steel Ltd	Cornerstone Building Brands Inc	500	Completed
3/7/2022	Precoat Metals Inc	AZZ Inc	Sequa Corp	1283	Completed
3/3/2022	UPL Ltd	Potential Buyer		7180	Proposed
2/23/2022	Ruili Integrated Circuit Co Ltd	Multiple Buyers		5226	Completed
2/23/2022	Scalapay Srl	Multiple Buyers		524	Completed
2/18/2022	Mobility & materials arm/DuPont de Nemours Inc	Celanese Corp	DuPont de Nemours Inc	11000	Pending
2/17/2022	Personal Care Components business/Mondi plc	Nitto Denko Corp	Mondi PLC	699	Completed
2/17/2022	nia GmbH,Mondi China Film Technology Co Ltd,Personal Care Comp	Nitto Denko Corp	Mondi PLC	699	Completed
2/1/2022	Octal Holding & Co Saoc	Alpek SAB de CV		620	Completed
1/28/2022	Ecovyst Inc	Potential Buyer		810	Proposed
1/26/2022	High temperature solutions business/Imerys SA	Platinum Equity LLC	Imerys SA	1050	Proposed
1/25/2022	Hccholdings Corp	Heimdall Private Equity Co Ltd	Hanwha Solutions Corp	565	Completed
1/6/2022	Standard Energy Tech Co Ltd	Lotte Chemical Corp	Wisepower Co Ltd	539	Completed
12/23/2021	Inner Mongolia Boyuan Yingen Mining Co Ltd	Inner Mongolia Yuan Xing Energy Co Ltd		585	Completed
12/22/2021	Performance Technologies & Industrial Chemicals bu	Cargill Inc	Croda International PLC	1037	Completed
12/21/2021	Birla Carbon India Pvt Ltd	Private Investor		750	Completed
12/20/2021	Hexion Holdings Corp	American Securities LLC		3141	Completed
12/17/2021	Altadia	Carlyle Group Inc/The	Lone Star Global Acquisitions Ltd	2141	Pending
12/14/2021	Zangge Mining Co Ltd	Multiple Buyers	; Industrial Co Ltd,Tibet Zangge Venture Ca	890	Completed
12/6/2021	GCP Applied Technologies Inc	Cie de Saint-Gobain		2222	Completed
11/26/2021	Ginko International Co Ltd	Multiple Buyers		1187	Completed
11/24/2021	Global epoxy business/Hexion Inc	Westlake Corp	Hexion Holdings Corp	1200	Completed

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(as of September 30, 2022)

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STOCK RATING CATEGORY	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)			OTHER MATERIAL INVESTMENT SERVICES CLIENTS (MISC)	
	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY	COUNT	% OF TOTAL OTHER MISC
Overweight/Buy	1342	38%	295	41%	22%	590	39%
Equal-weight/Hold	1582	45%	335	47%	21%	702	46%
Not-Rated/Hold	0	0%	0	0%	0%	0	0%
Underweight/Sell	610	17%	84	12%	14%	219	14%
TOTAL	3,534		714			1511	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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INDUSTRY COVERAGE: Agricultural Products

COMPANY (TICKER)	RATING (AS OF)	PRICE* (10/13/2022)
Vincent Andrews		
Archer Daniels Midland (ADMN)	E (07/12/2012)	\$88.84
Bunge Ltd. (BG.N)	E (03/19/2009)	\$90.35

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Paper & Packaging

COMPANY (TICKER)	RATING (AS OF)	PRICE* (10/13/2022)
Angel Castillo		
AptarGroup Inc. (ATR.N)	E (02/26/2020)	\$94.56
Ardagh Metal Packaging S.A. (AMB.P.N)	E (05/19/2022)	\$4.79
Ball Corporation (BALL.N)	E (01/20/2022)	\$48.94
Berry Global Group Inc (BERY.N)	E (01/16/2019)	\$47.18
Crown Holdings, Inc. (CCK.N)	O (12/15/2020)	\$83.10
Sealed Air Corporation (SEE.N)	O (01/20/2022)	\$45.98

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Chemicals

COMPANY (TICKER)	RATING (AS OF)	PRICE* (10/13/2022)
Angel Castillo		
Avient Corporation (AVNT.N)	E (12/14/2020)	\$30.79
Ecovyst Inc. (ECVT.N)	E (05/04/2021)	\$8.75
Element Solutions Inc (ESLN)	E (10/01/2021)	\$16.30
Huntsman Corp (HUN.N)	O (09/29/2020)	\$26.00
Olin Corp. (OLN.N)	E (03/03/2021)	\$48.03
Trinseo S.A. (TSE.N)	E (05/26/2021)	\$19.16
Westlake Corp (WLK.N)	E (01/09/2018)	\$90.50

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International Flavors & Fragrances (IFF.N)	O (04/11/2021)	\$87.79
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Vincent Andrews

Air Products and Chemicals Inc. (APD.N)	O (02/09/2020)	\$237.99
Albemarle Corporation (ALB.N)	U (02/26/2018)	\$256.00
Avalta Coating Systems Ltd (AXTAN)	E (12/09/2015)	\$22.35
Celanese Corp. (CE.N)	E (10/08/2012)	\$93.25
CF Industries (CF.N)	E (05/25/2016)	\$107.03
Chemours Co (CC.N)	E (01/30/2018)	\$27.41
Corteva Inc. (CTVAN)	O (12/14/2020)	\$62.95
Diversey Holdings, Ltd. (DSEY.O)	O (04/19/2021)	\$4.37
Dow Inc. (DOW.N)	E (12/01/2019)	\$45.92
DuPont De Nemours Inc. (DD.N)	E (05/26/2021)	\$53.31
Eastman Chemical Co (EMN.N)	O (01/17/2019)	\$73.94
Ecolab Inc. (ECL.N)	E (08/15/2017)	\$144.22
FMC Corporation (FMC.N)	E (05/20/2019)	\$116.52
ICL Group Ltd (ICL.N)	E (11/03/2014)	\$8.75
Intrepid Potash (IPL.N)	U (10/03/2013)	\$44.13
Linde PLC (LIN.N)	O (02/09/2020)	\$282.46
LyondellBasell Industries N.V. (LYB.N)	O (12/01/2019)	\$80.00
Mosaic Company (MOS.N)	E (03/16/2016)	\$52.00
Nutrien Ltd (NTR.N)	E (12/11/2018)	\$86.58
PPG Industries Inc. (PPG.N)	E (11/01/2019)	\$112.22
RPM International Inc. (RPMN)	E (12/14/2020)	\$92.18
Sherwin-Williams Co. (SHW.N)	O (03/19/2014)	\$205.68
Tronox Holdings Plc-Class A (TROX.N)	E (01/30/2018)	\$12.77
Venator Materials PLC (VNTR.N)	E (01/30/2018)	\$0.73

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