Capital Goods - Global

Global Industrials Conference 2024: strong H2 required & you might get it in the US

Industry Overview

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Equity
Global
Capital Goods

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Structural vs cyclical, US vs Europe vs China, H2 recovery

71% of 80+ proprietary indicators in BofA's Global Proprietary Signals (see report) are bullish or neutral vs 43% a year ago, which we think makes this year's Global Industrial Conference 19-21st March a particularly timely event. We expect the conference commentary and debate to revolve around capex (and structural growth) vs industrial production (cyclical); the dynamics of a slow Europe, a defiantly robust US and a relatively muted China; inflecting indicators vs slowing fundamentals, and; the hope/promise of a stronger H2. Against this, the high correlation between Industrial Momentum indicator and 12mth fwd P/E (Ex9 inside) suggests scope for valuation to keep pace with the rising indicator. In this note we update sector views from our industrials analysts in the US, Europe and Japan compared to expectations at the beginning of the year.

US: 3 months into the year and still bullish on 2024

Our constructive view on the US capex cycle and preference for capex over industrial production has been playing out year-to-date. 2024/2025 earnings revisions have been largely positive. While 4Q earnings results were mixed, full-year guides were better than expectations, reflecting corporate conviction on short-cycle inflection in 2H24. Investors seem to have a less optimistic attitude, but current valuations suggest some belief in the 2H ramp. The winners (electrification, grid, aero, oil & gas) will continue to "win", while on machinery the story of '24 is if the cycle can find some legs to drive EPS in '25.

Europe: FY guides ahead, but much rides on stronger H2

Much of what we said with the Year Ahead is proving valid, but what has not happened is earnings falling. As a result, V (valuation) is driving share price performance (SXNP +3% rel SXXP ytd) rather than E (earnings), with management commentary and guidance proving more optimistic than we (and consensus) had expected through the FY results. We remain constructive on short cycle exposure given consensus but are wary about trajectory of H2 required to meet FY guidance (automation, low voltage and China).

Asia: Factory Automation bottoming, but all eyes on China

The Factory Automation indicator appears to be bottoming out (seeing levels last seen in late-2022) and the dynamics around inventory, bottoming out of production & semis recovery suggest we could be approaching a turning point in the cycle, supporting our preference for FA exposure into FY24/25. Near term demand is likely to remain sluggish, though, and the National People's Congress yielded limited new policy measures in support of the "around 5%" GDP growth target, though the government work report struck a positive tone (see China Watch 05 March 2024).

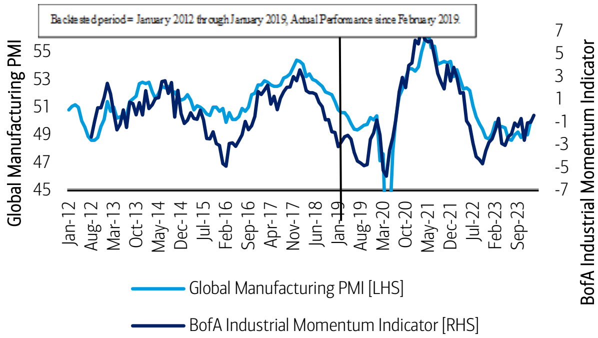
Full agenda: 75+ companies, 650+ investors… it's a biggie

The 2024 Global Industrials Conference is the largest we have had. 19-21st March we host 75+ companies & 650+ investors at the Landmark Hotel, London. Full agenda inside.

Key charts

Exhibit 1: BofA Industrial Momentum Indicator vs Global Manufacturing PMI

BofA Industrial Momentum Indicator typically leads Global Manufacturing PMI



Source: BofA Global Research. **Disclaimer and notes:** see page 3 & appendix

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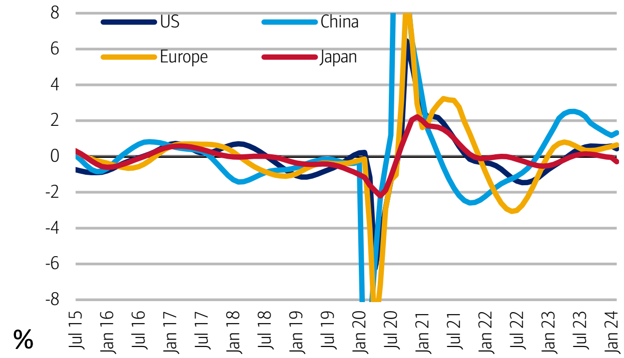
Exhibit 2: Regional OECD Lead Indicators: 6m/6m change = inflection

Europe and China have inflected positively



Source: OECD

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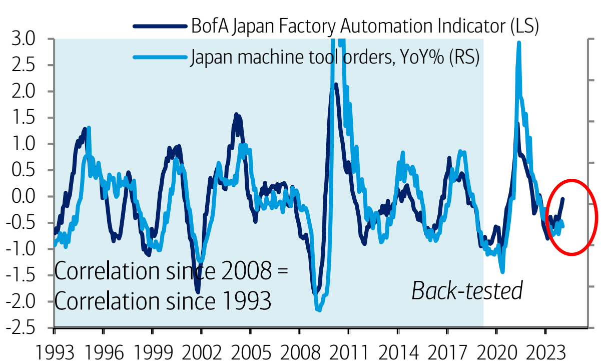
Exhibit 3: BofA Japan FA Indicator vs Japan machine tool orders (YoY%)

The BofA Japan Factory Automation Indicator improved sharply in January



Source: JMTBA, BofA Global Research. **Disclaimer and notes:** see appendix

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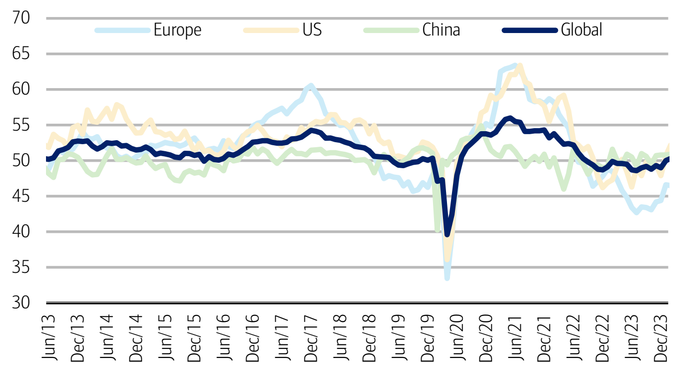
Exhibit 4: Global PMIs, by region (2013-present)

European PMI is lagging well behind US and China PMIs



Source: BofA Global Research, Bloomberg, Refinitiv

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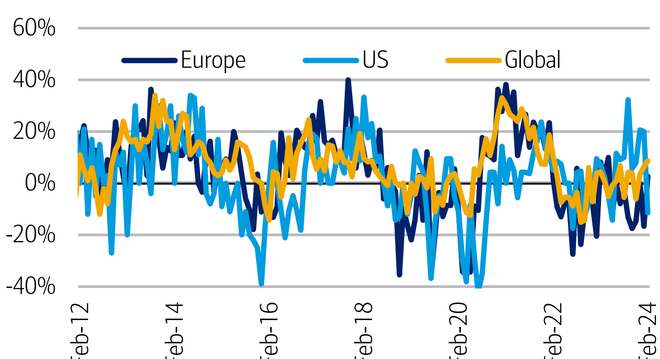
Exhibit 5: Fund manager survey: % saying overweight/(underweight) industrials, by region by month

3% of fund managers said they were overweight European industrials in the latest print, but US positioning is 11% underweight



Source: BofA Regional Fund Manager Survey

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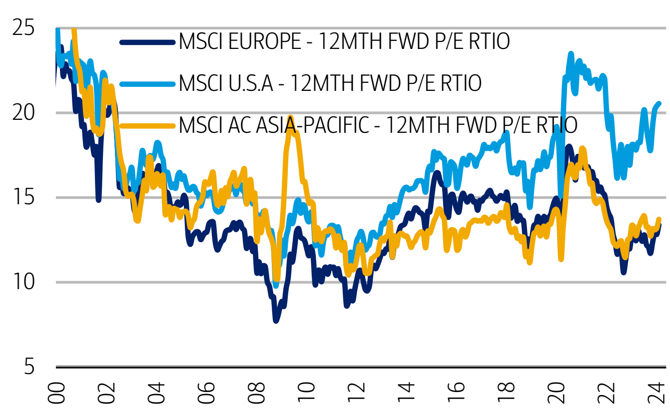
Exhibit 6: 12m fwd. PE: MSCI EU vs MSCI US vs MSCI Asia

US Capital Goods valuation premium has expanded in the last 18mths vs European and Asian peers



Source: BofA Global Research estimates, Refinitiv

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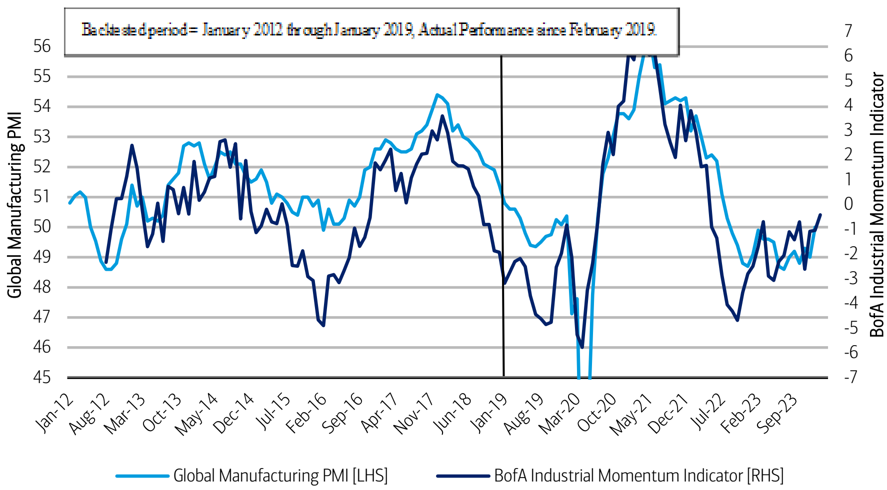
BofA Industrial Momentum Indicator: breaks out of the range: positive signal

The BofA Industrial Momentum Indicator was up in February on a MoM basis, breaking out of this cycle's tight range since mid-2022. The Indicator's upturn is driven by improvements in key inputs from low levels (Fund Manager positioning, profit expectations, BofA Truck Shipper Survey, copper). Why does this matter? The Indicator typically leads Global PMI and industrial revisions. Recall, the Global PMI – an indicator of manufacturing activity – has remained at 50 (neutral) or sub 50 (contraction) for 16 consecutive months. A sustainable upturn in the BofA Industrial Momentum Indicator suggests signs of coming out of a protracted manufacturing malaise in coming months. We worked with our Data Analytics team to create an indicator that is intended to lead Industrial sales revisions, earnings growth, and the Global Manufacturing Purchasing Managers' Index on a two-month basis.

Exhibit 7: BofA Industrial Momentum Indicator vs Global Manufacturing PMI
Bottoms in the BofA Industrial Momentum Indicator lead bottoms in Global Manufacturing PMI



Source: BofA Global Research, Backtested period = January 2012 through January 2019, Actual Performance since February 2019. This performance is back-tested and does not represent the actual performance of any account or fund. Back-tested performance depicts the theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein. Disclaimer: The indicator identified as BofA Industrial Momentum Indicator above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purposes, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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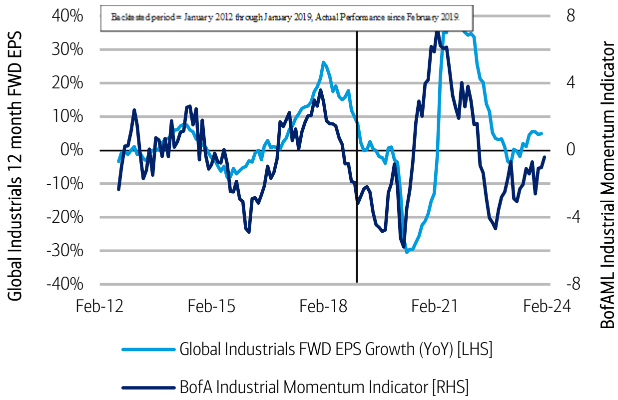
Exhibit 8: BofA Industrial Momentum Indicator versus Global Industrials Forward EPS Growth

BofA Industrial Momentum Indicator typically leads Industrial EPS growth



Source: BofA Global Research, Backtested period = January 2012 through January 2019, Actual Performance since February 2019. This performance is back-tested and does not represent the actual performance of any account or fund. Back-tested performance depicts the theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein. Disclaimer: The indicator identified as BofA Industrial Momentum Indicator above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purposes, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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Exhibit 9: BofA Industrial Momentum Indicator versus Global Industrials Forward PE

BofA Industrial Momentum Indicator typically leads Industrials multiple

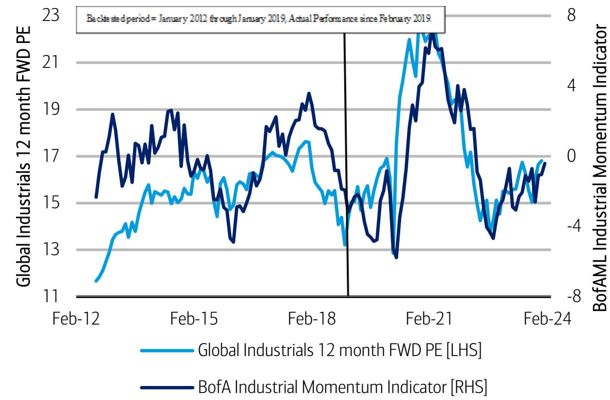

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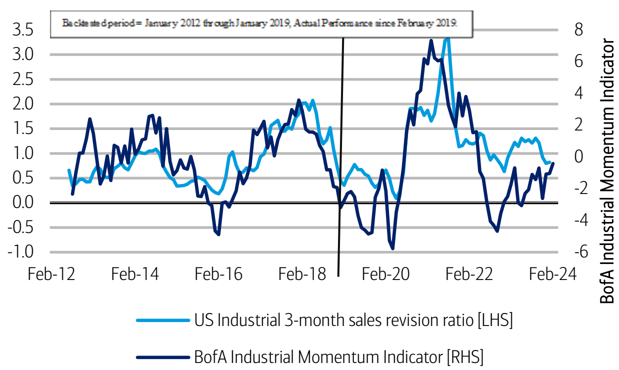
Exhibit 10: BofA Industrial Momentum Indicator versus US Industrials Sales Revision Ratio (3 months)

BofA Industrial Momentum Indicator typically leads US Industrial Sales Revisions



Source: BofA Global Research, Backtested period = January 2012 through January 2019, Actual Performance since February 2019. This performance is back-tested and does not represent the actual performance of any account or fund. Back-tested performance depicts the theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein. Disclaimer: The indicator identified as BofA Industrial Momentum Indicator above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purposes, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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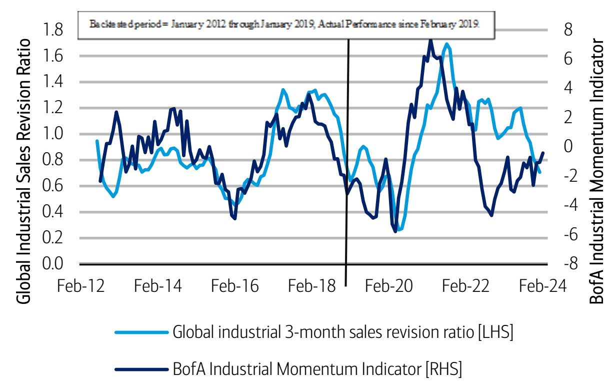
Exhibit 11: BofA Industrial Momentum Indicator versus Global Industrials Sales Revision Ratio (3 months)

BofA Industrial Momentum Indicator typically leads Global Industrial Sales Revisions



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Key end market views & debates

We summarise our views on the main end market and highlight the key debates for the conference.

Aerospace: Supply chain continues to improve though challenges remain, but delivery growth expected to be in mid-teens 2024/25 for Airbus/Boeing, with strong aftermarket growth in both years. **Debate likely to focus** on build rates and production ramp.

Automotive: BofA has recently cut estimates of EV penetration, and though US production rates are expected to be strong in 2024, global growth is forecast to be zero. **Debate likely to focus** on delays to EV factory build out and impact on automation/ equipment demand, strength of recovery in US production.

Construction: Regional trends are mixed, though weak residential newbuild markets in Europe/China are well understood. Non-residential markets remain more robust, though signs of weakness are showing in Commercial Real Estate Key US institutional market remains strong. **Debate likely to focus** on recovery trends in US residential, resilience of energy efficiency themes (esp. HVAC and heat pumps), pricing & dynamics in renovation/refurbishment.

Datacenter: Demand remains strong in one of the highest profile industrial end markets given requirements and growth of Artificial Intelligence. **Debate likely to focus** on dynamics of supply chain, permitting & development of power/cooling intensity.

Industrial automation: One of the main beneficiaries of supply chain disruption but now seeing significant “normalisation” of demand. Indicators are inflecting. **Debate likely to focus** on timing & trajectory of recovery, destocking and pricing, especially in US and China.

Mining: BofAE capex growth continues to be tempered and near-term trends are conflicting. Long term story for metal demand offset by near term risk to order momentum for equipment; productivity solutions (e.g. automation may fare better). **Debate likely to focus** on order trends, pricing, automation and electrification demand.

Oil & Gas: Process capex outlook remains constructive with BofAE chemicals and oil & gas capex growth revised up over recent months. **Debate likely to focus** on shift from expansion to productivity, timing of mega-projects and regional dynamics.

Renewables: Positive outlook for demand given US Inflation Reduction Act, re-setting of offshore economics (esp pricing/contract structure in the US) and the outlook for European offshore auctions. **Debate likely to focus** on pricing, operational execution, timing of orders (esp EU offshore) and competition.

Semis: BofAE capex revisions rising and we appear to be past the trough with recent results showing order intake beating expectations in the supply chain. **Debate likely to focus** on timing & trajectory of recovery, dynamics of competition and impact of AI.

Truck: We believe production declines considerably in Europe (15-20%) and N America (12%) in 2024, offset by growth in China, before recovery in 2025. **Debate likely to focus** on order trends and pricing.

Utilities: For the first time in many years, grid infrastructure & investment is strong and well underpinned (both high and medium voltage). Demand for gas turbines is also high. **Debate likely to focus** on supply chain constraints, demand dynamics & permitting and competitive landscape.

Europe: better guides, despite macro

We were cautious at the beginning of the year given the strength of the sector performance in 2023 (SXNP was +9% rel SXXP), but the sector has pushed on since January with another +3% relative to SXXP. We note with interest the divergence in investor positioning in the latest Fund Manager Survey data; European industrials are 3% overweight, Global positioning is 9% overweight in Industrials, but US industrials are a 11% underweight. There is a 2-3x turn (2025E EV/EBITA) discount that the European industrials trade on relative to their US peers for similar end market exposures. This discount is not new, but if global investors are optimistic, as indicated by the 9% overweight, they may be tempted by “cheaper” European industrials vs US.

So, where are we now?

Much of what we said with the Year Ahead is proving valid, but what has not happened is earnings falling. As a result, V (valuation) is driving share price performance rather than E (earnings), with management commentary and guidance proving more optimistic than we (and consensus) had expected through the FY results. Earnings momentum in late cycle end markets has been stronger for longer, with demand in grid infrastructure, datacenters, oil & gas staying strong and expectations around shorter cycle end market deterioration moving too fast (e.g. truck, industrial production). Some “structural” growth trends are proving more cyclical, e.g. heat pumps, mining equipment, and there are signs that European governments are struggling to balance budgets despite a commitment to energy transition, which could weigh on construction demand in the near term.

PMIs are recovering, as expected, though OECD Lead Indicators are mixed suggesting sentiment is improving, but fundamentals are (as ever) slow to follow. Signs that H1’24 is likely to be weak against tough comparatives are becoming more socialised in company commentary and investor expectations, with eyes turning to an acceleration in H2 and solid run-rates in growth/earnings into 2025.

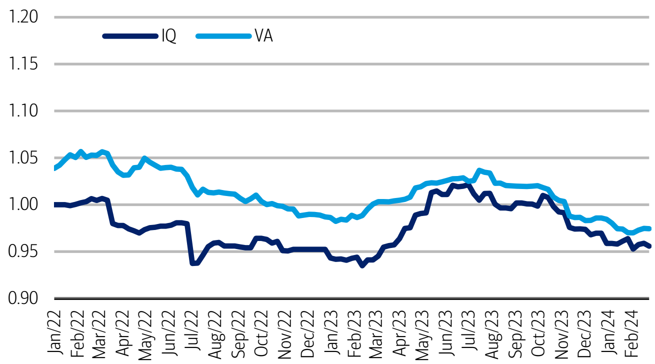
We think investors already expect:

- slowing construction markets; weak in Europe with a stronger H2 and building momentum in US residential demand;
- weak truck markets, albeit stronger H1, weaker H2 with a stronger US market vs Europe;
- weak industrial automation markets in H1, with recovery in H2 helped by China normalising and easy comparatives;
- improving industrial production through the year (supported by PMIs improving);
- strong infrastructure markets (datacentre, high and medium voltage);
- solid oil & gas markets and process industries (including mining);
- recovering demand in wind, with half an eye on the rhetoric during, and possible outcome of, the US election.

Negotiating this soft landing would suggest consensus expectations of double-digit earnings growth in 2025 are achievable, against which European Capital Goods are now trading on 12x 2025E EV/EBITA vs 11.5x in January. The SXNP is +4% relative to the SXXP ytd, but if 2024 earnings already reflect the above and therefore limited risk of downward revisions, with the prospect of double-digit earnings growth in 2025 we think that multiple can be maintained.

Exhibit 12: 2024 Operating profit – BofA vs VA, indexed

BofA estimates for 2024 op. profit have fallen 5% vs Jan'22



Source: BofA Global Research estimates, Visible Alpha

Vs our October note, the sample now excludes ENR

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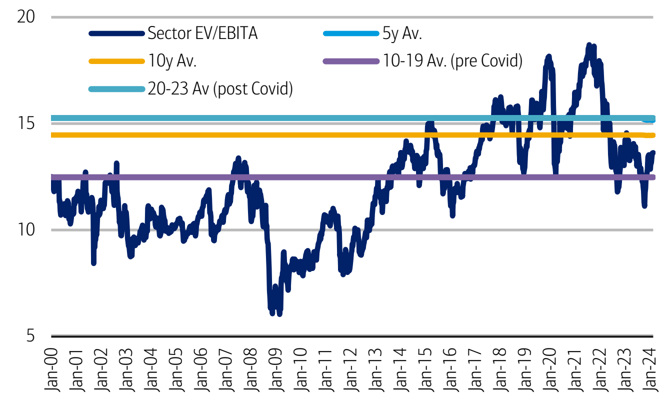
Exhibit 13: Sector 12mth FWD EV/EBITA

The sector valuation is in line with the 10y average



Source: BofA Global Research estimates

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Where are the downside risks?

We remain cautious on residential construction markets, particularly with renovation and refurbishment demand cited as deteriorating by more companies in Q4 vs Q3. We also think weakness in H1 from tough comparatives in energy efficiency product lines (e.g. heat pumps, solar, EV charging etc) could surprise to the downside. We remain cautious on the evolution of mining capex for the equipment suppliers we cover, noting investors remain focused on the very longer term (e.g. copper deficit). There is also a considerable amount of expectation around what China does in terms of stimulus, with hopes for a recovery in H2 in a number of end markets likely dependent on this, not least of which are construction and automation.

We review the key themes we started the year with and measure where we think we are now:

Theme #1: Softly, softly… threading the economic needle

What we said in January: *US soft landing priced in. China recovery a question mark. Europe slower YoY. Downside risk: US falls harder & China recovery delayed again. Upside risk: China recovery helps Europe soft landing, US reaccelerates & is best exposure for 2024 given stimulus.*

Where are we now?

US: fast in 2024, slower in 2025. Michael Gapen, Head of US Economics Research, has upgraded our growth forecast for the US (see report) and we are now above consensus for growth. Specifically, we revise our US outlook in the direction of faster growth in 2024 (2.1% 4Q/4Q from 1.2%) and slower growth in 2025 (1.8% from 2.0%). We expect a lower peak unemployment rate of 4.1%, but slower disinflation (to 2.6% and 2.3% for core PCE inflation in 2024 and 2025, respectively). Previously we expected growth to slow below trend before re-accelerating. We now think growth will be more front-loaded. Our revisions continue to emphasize improvement in the economy driven by supply-side factors, particularly the rebound in the labor force. Our revisions do not alter our outlook for monetary policy. We expect the Fed to start a gradual cutting cycle in June owing to progress in reducing inflation. By the end of 2025, we expect the target fed funds rate to be reduced to 3.5-3.75% (75p in cuts this year and 100bp of cuts next year). Tapering of runoff should begin in May, with quantitative tightening (QT) ceasing around the end of the year.

China: Growth target in line with expectations. Our colleagues in China Economic research had the following key takeaways (see report) from the recent National People's Congress: (1) the 2024 growth target ("around 5%") is in line with our and market expectations, signaling continued policy support to prop up growth; (2) fiscal policy turns out to be slightly less aggressive than we expected, though largely in line with the market consensus; (3) monetary policy stance remains largely unchanged, with continued emphasis on FX stability; (4) the government is likely to place a bigger focus on policy coordination and avoid introducing accidentally pro-cyclical policy this year.

Policymakers set the 2024 growth target at "around 5%", in line with our and market expectations. They also admit that it won't be low hanging fruit. With a higher comparison base of GDP from last year, achieving such a target would require sequential growth momentum to improve modestly in the coming quarters. It implies if demand strength falls short of expectation, more policy easing measures would be needed to ensure the goal is reached.

Europe: No change in speed, either rate cuts or GDP growth. Our European economics research colleagues have not changed their expectations (see report) since January for the ECB to start rate cuts in June, or GDP growth in the Eurozone of 0.4% in 2024 and 1.1% in 2025. They continue to be of the view that the region gradually returns to trend growth after five years of stagnation.

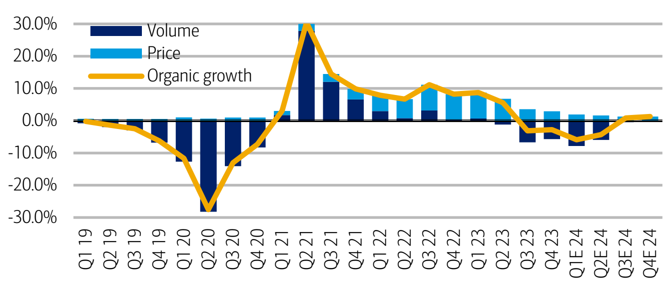
Theme #2: Pricing: who holds the power?

What we said in January: *Pricing tailwinds slowing from HSD (H2'22) to 1-2% ('24E). Material costs mixed & wages higher in '24E. Red Sea tensions raise spectre of rising logistics costs & supply disruption again, albeit not a COVID repeat. Focus on names with proven pricing power.*

Where are we now?

Much of the commentary around FY results cited "normalisation" in the pricing environment. For most companies this means balancing raw material cost inflation and means pricing of 1-2%. We are seeing indications of deflation in raw material-linked products (cable, conduits etc) but the broad conclusion would be consistent with what we expected; tailwinds from pricing are diminishing. The prevailing concern remains the extent to which companies over-earned during the high-inflation environment, but so far the only indications of outright deflation have come from China. Supply chains appear back to normal and Red Sea tensions have been barely referenced.

Exhibit 14: Volume and price contribution to organic growth
Volume drove growth in '21, but price has been the driver since with volumes turning negative in Q3'23



Source: BofA Global Research estimates, company report

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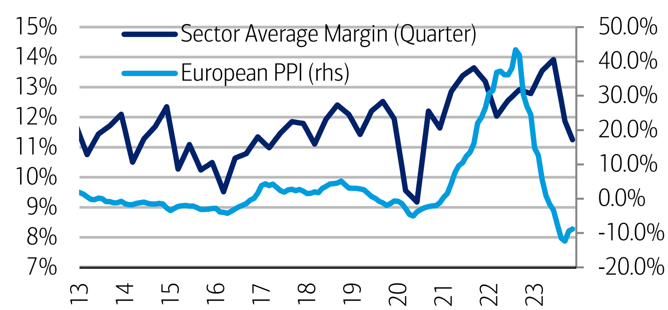
Exhibit 15: Sector average EBIT margin vs European PPI (YoY, rhs)
We see sector average margin track European PPI



Source: BofA Global Research, Refinitiv

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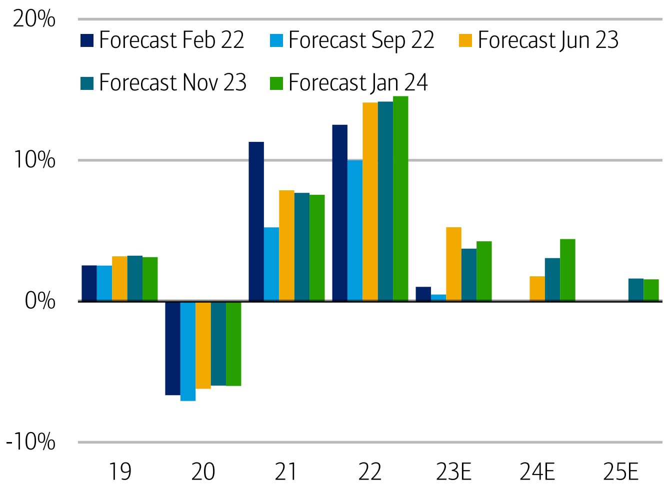
Theme #3: Structural vs cyclical: capex under threat

What we said in January: *Financing availability & cost an issue, though rates likely falling. Risk is elections & legislation reversal. Capex surveys suggest diminishing appetite to grow capex budgets & few sectors still growing. Auto slows, semi/renewables accelerate, mining plateauing.*

Where are we now?

Capex budgets do appear to be slowing. Auto capex related to EV capacity is coming under pressure, and mining equipment orders are falling suggesting that mining capex is not being directed to heavy equipment. Oil & gas capex growth remains solid, while capex in grid (high and medium voltage), utilities (both conventional and renewables) and datacentres remains very strong. Investment decisions do seem to be taking longer, but companies talk to solid pipelines and the support of government stimulus.

Exhibit 16: 2023E & 2024E capex growth forecast evolution
We expect capex to increase by c4.0% in 2023 and 2024



Source: BofA Global Research estimates

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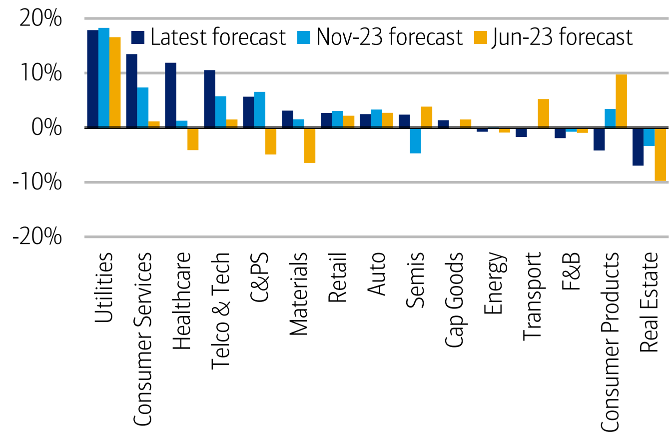
Exhibit 17: Capex growth 2024E, by sector, ranked from highest to lowest capex growth % per latest estimates
Utilities capex expected to grow strongly for a second consecutive year in 2024



Source: BofA Global Research estimates

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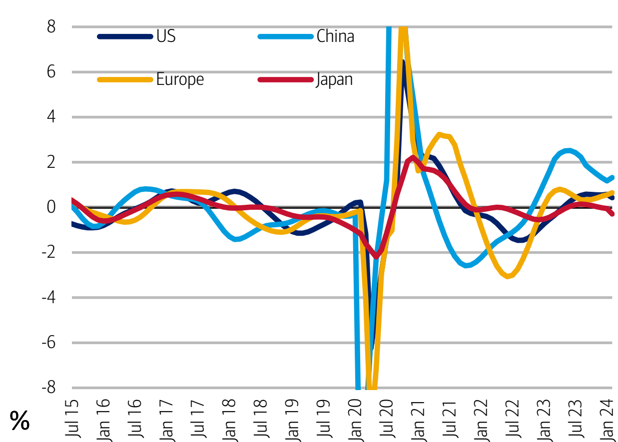
Theme #4: Short cycle: estimates reflect weak volumes

What we said in January: *PMIs weak now but will likely bounce in H1. OECD Lead Indicators rolling everywhere (6m/6m). Consensus has corrected on truck/auto/semis/gen industrial volumes, but industrial automation likely weak H1. H2 recovery conditional on China improvement.*

Where are we now?

Q4 proved stronger than the market expected, with margins holding up and guidance ahead of expectations. Business models appear more resilient than feared though guidance requires a strong H2 across multiple short cycle end markets (automation, auto, low voltage) with the difference being truck production where H1 likely continues the strength of 2023 and the visibility on H2 is limited at this stage. China continues to be weak and destocking remains a concern across regions. That said, PMIs are indeed picking up as expected, though OECD LI momentum remains mixed.

Exhibit 18: Regional OECD Lead Indicators: 6m/6m change = inflection
OECD LI momentum is mixed, but Europe & China have inflected positively



Source: OECD

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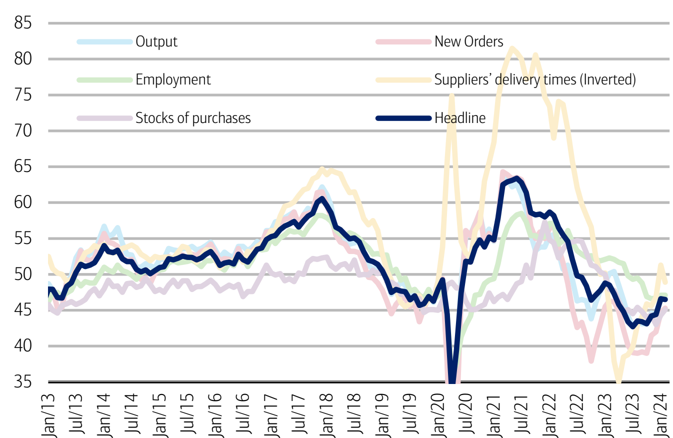
Exhibit 19: European PMI's, by component (2013-present)
The PMI appears to have troughed, with recent improvement seen



Source: BofA Global Research, Bloomberg. High scores on "Suppliers; delivery times" supports PMI scores, and implies a long period of time to deliver

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Theme #5: Construction: sentiment +ve, numbers -ve

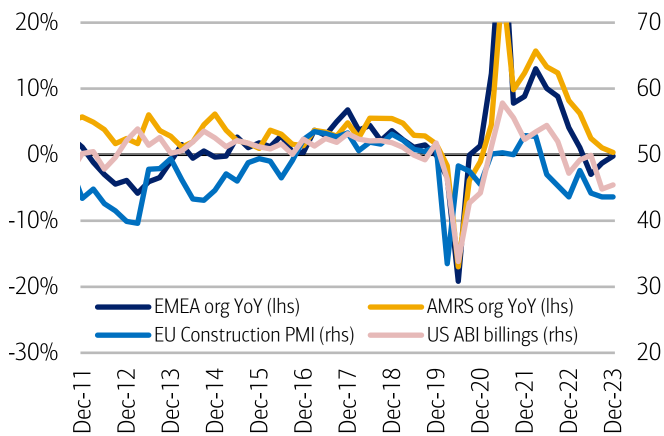
What we said in January: *Residential newbuild already weak, renovation demand falling. Non-residential mixed: office/retail tough, factory mixed, infrastructure/datacenter strong. With peak rates notionally behind us, the debate could shift quickly to 2025 and recovery.*

Where are we now?

More companies are talking about deterioration in demand for renovation and refurbishment, while new build markets remain weak. That said, investors are looking through the likely weakness in H1 to a stronger H2, while in the meantime infrastructure demand remains robust. European companies cited improving signs in US residential markets, while US commercial real estate markets deteriorated in Q4 and the outlook remains mixed. China recovery yet to appear, and data suggests unlikely in 2024. Strength of non-resi vs resi shows up most obviously in medium voltage vs low voltage exposure.

Exhibit 20: EU and US construction indicators, vs. EMEA and Americas construction supply chain organic growth YoY

PMI or ABI below 50 indicates MoM contraction. Construction markets look weaker in Europe than in the US



Source: Bloomberg, American Institute of Architects, BofA Global Research estimates, company reports

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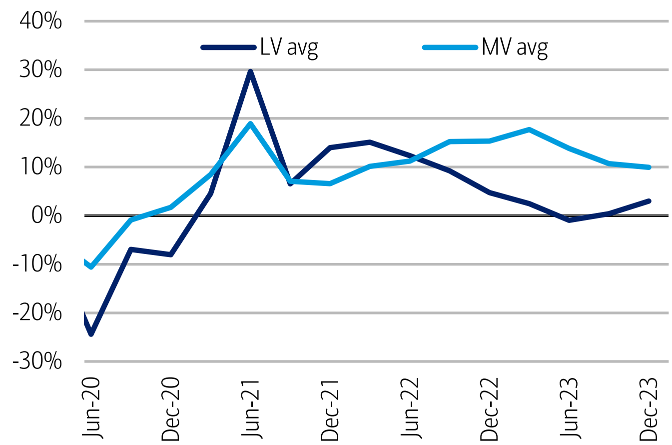
Exhibit 21: Medium voltage supply chain growth vs low voltage

The benefit of having MV equipment in the portfolio is clear compared to the demand trends in Low Voltage



Source: BofA Global Research estimates, company report

Medium Voltage: Siemens Smart Infra, Schneider Energy Mgmt, ABB Electrification, Eaton Electrification. Low Voltage: Legrand, Rexel, Hubbel Electrical Solutions

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Theme #6: Energy transition: grid is good, wind picking up

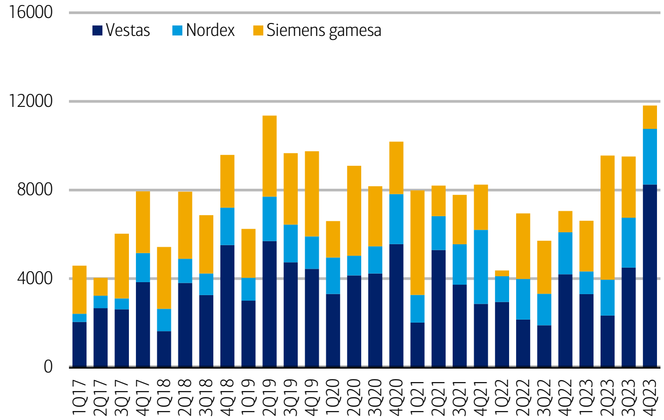
What we said in January: *Grid is strong, US wind improving but complexity of implementation is weighing on heat pumps, EVs, Europe wind & solar. Rising risks to govt. support (Germany; US election).*

Where are we now?

Trends remain as they appeared in January; heat pumps, solar, EVs are where demand is falling, while wind and grid remain strong. Investor feedback suggests growing concern around headline risk and rhetoric during the US election even if ultimately government support remains unchanged. In Europe, indications continue to suggest governments are struggling to afford support (e.g. France cut support for energy efficiency in renovation in January).

Exhibit 22: Wind Orders (MW) by quarter

We have seen strong positive momentum in total wind orders since Q1 2023



Source: BofA Global Research estimates, company report

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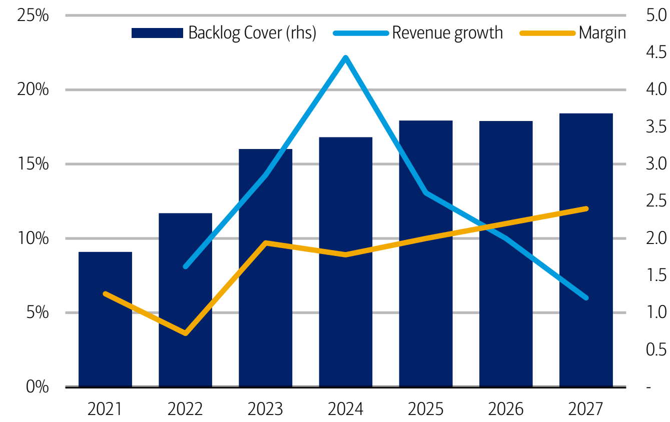
Exhibit 23: Siemens Energy Grid Tech orderbook development

Strong grid demand has meant backlogs have grown, creating multi-year revenue and margin growth opportunities



Source: BofA Global Research estimates, company report

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US: constructive outlooks; 2H24-weighted

In our Year Ahead (published December 13), we highlighted conviction in the US manufacturing capex cycle and secular tailwinds of sectors, underpinned by rising Federal spending. We preferred capex over production in 2024 as reshoring continues, stimulus grows, and mega-projects move forward. We identified seven markets (aerospace, autos, cement, electrical, industrial machinery, pharma, and semis) that drove virtually all the volume growth.

So far, our sector is up +11.2% year-to-date (as of market close on 3/8) versus the S&P up + 7.4% year-to-date. This has largely been reflected by positive earnings revisions rather than multiple expansion. 2024 guides were better than expectations but weighted towards 2H. We are modelling 56% of earnings in 2H24, which is the most 2H-weighted earnings cadence since 2020.

Winners continue to win, debate on short-cycle inflection

Our constructive view on the US capex cycle and preference for capex over industrial production has been playing out year-to-date. 2024/2025 earnings revisions have been positive. While 4Q earnings results were mixed, full-year guides were better than expectations, reflecting corporate conviction on short-cycle inflection in 2H24. Investors seem to have a less optimistic attitude, but current valuations suggest some belief in the 2H ramp.

The winners (electrification, grid, aerospace, oil & gas) continue to "win" and short-cycle continues to be weak. The key debate surrounds short-cycle inflection and the pace of destock. We are seeing signs that short-cycle is bottoming and set to inflect. This includes bottoming PMIs, improving q/q trends in our short-cycle survey, and corporate commentary on destock.

It is relatively rare for the PMI to remain below 50 for more than three consecutive months without the US falling into a recession. In the past 65 years, it has happened just six times. So far, PMIs have been below 50 for 15 consecutive months (since Nov 2022). This would be the longest ever <50 period without a recession ever.

Theme #1: Focus on capex and winning end markets

In our Year Ahead, we estimate inflation-adjusted US manufacturing capex in 2023 to be ~7% above 2019. This compares to industrial production (a measure of volume output) at 0.1% above 2019. We see capex again outpacing production in 2024 as reshoring continues, stimulus grows, and megaprojects move forward. We identify the seven end markets (aerospace, autos, cement, electrical, industrial machinery, pharma, and semis) that have driven virtually all the volume growth. We argue secular themes should again fuel growth in these end markets in 2024.

US industrial policy is old and new

232 years ago, US Secretary of the Treasury Alexander Hamilton presented a report on manufacturing to Congress[1]. It argued for infrastructure improvements, direct support of "infant manufacturers", and domestic supply chains for defense industries. Sound familiar?

In an October 2022 speech Brian Deese, the Director of the National Economic Council, argued the "animating vision" of the Biden Administration is "a modern American industrial strategy." He outlined the need for public investment in transportation infrastructure, support for the emerging clean energy industry, and using grants, tax incentives, and export controls to improve national security.

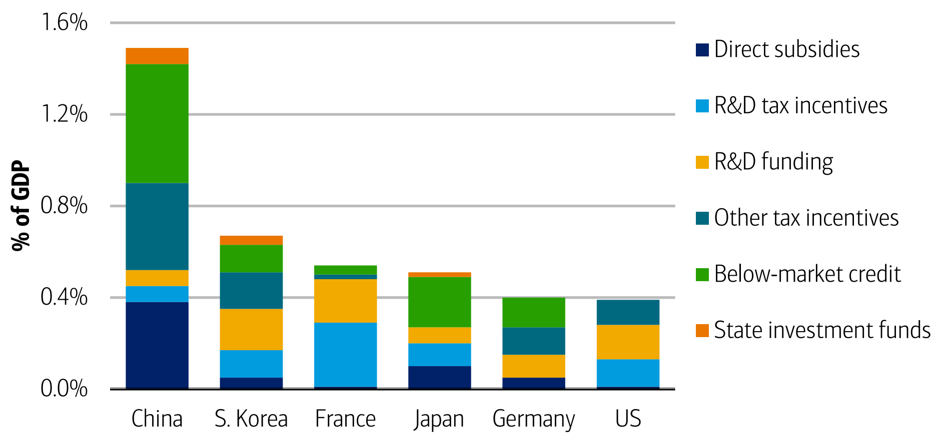
[1] Hamilton, A (1791). *Final Version of the Report on the Subject of Manufactures*. National Archives.

US was a laggard on industrial policy spending

The US was objectively a laggard on industrial policy. This is the key takeaway from a report[2] by the Center for Strategic & International Studies (CSIS), a bipartisan policy research organization. In 2019, the US spend 0.39% of GDP on industrial policy. This was closer to Brazil (0.33%) than France (0.55%). In contrast, China spent 1.48% of GDP on industrial policy across both emerging (e.g., semiconductors, electric vehicles) and traditional (e.g., aluminum production) sectors.

This data comes from 2019. Where does the US stand today? We estimate the combined impact of the manufacturing-focused parts of the Infrastructure Investment & Jobs Act (IIJA), Inflation Reduction Act (IRA), and CHIPS Act would increase this US industrial policy spending to ~0.80% of GDP. This uses the average annual spending over 2022-31 versus current nominal US GDP.

Exhibit 24: Industrial policy spending as a % of GDP (2019)
The US historically spent less on industrial policy versus peers



Source: Center for Strategic & International Studies, BofA Global Research

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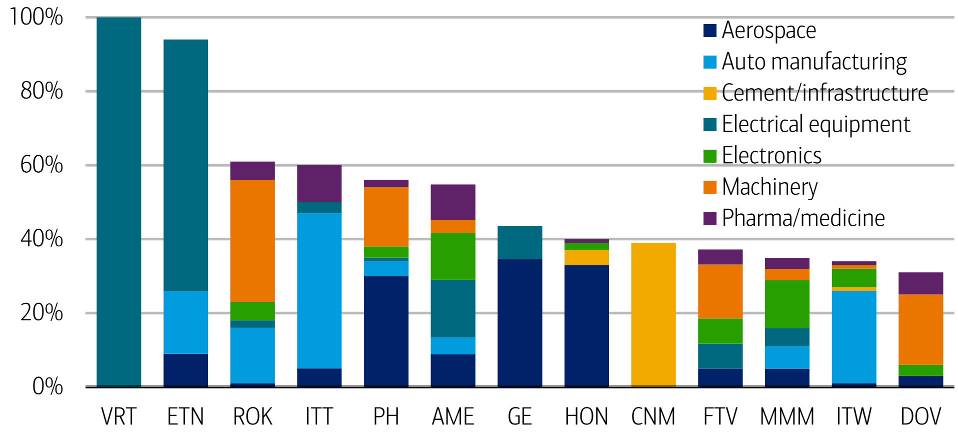
The (manufacturing) magnificent seven

Industrial policy, by definition, is government action aimed at "priority" industries. We see evidence that this is exactly what is emerging out of US manufacturing economic data. The US manufacturing recovery to-date has not been broad-based. We identify seven sectors which have generated most of the volume and employment growth since the 2020 recession. The "magnificent seven" are aerospace, autos, cement, electrical equipment, industrial machinery, pharma, and semiconductor manufacturers.

Given the secular drivers behind these seven sectors, we argue revenue growth in 2024 will reflect companies' exposure to these markets.

[2] DiPippo, G., Mazzocco, I., and Kennedy, S. (2022) *Red Ink: Estimating Chinese Industrial Policy Spending in Comparative Perspective.* Center for Strategic & International Studies.

Exhibit 25: Revenue mix by selected end markets (2023E)
Stocks in our coverage with high exposures to fastest-growing areas of US manufacturing



Source: BofA Global Research, company filings

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Volumes still below 2019 levels in many areas

Only seven (of 19) US manufacturing sectors have industrial production above the prior economic peak (Feb 2020). Industrial production is a measure of output quantities (i.e., excludes inflation/pricing).

Exhibit 26: US industrial production current cycle versus prior business cycle
Winners so far: Aero, Electronics, Pharma, Cement, Electrical, Autos and Machinery

	2/20-10/23 CAGR	12/07-2/20 CAGR
Aerospace and other transportation eq.	3.6%	-1.7%
Computer and electronic product	2.1%	3.4%
Chemical	2.0%	-2.0%
Nonmetallic mineral product (e.g., cement)	1.5%	-1.3%
Electrical eq., appliance, and component	0.8%	-1.3%
Motor vehicles and parts (note)	0.6%	2.0%
Machinery	0.5%	-1.2%
Total manufacturing	**0.1%**	**-0.5%**
Petroleum and coal products	-0.3%	-0.2%
Fabricated metal product	-0.4%	-1.3%
Primary metal	-0.5%	-1.6%
Wood product	-0.5%	-1.1%
Food, beverage, and tobacco	-0.7%	0.4%
Apparel and leather goods	-0.9%	-6.1%
Plastics and rubber products	-1.5%	-0.3%
Paper	-3.4%	-1.2%
Textiles and products	-3.4%	-3.2%
Other manufacturing	-3.8%	-4.8%
Furniture and related product	-4.8%	-2.5%
Printing and related support activities	-4.9%	-2.3%

Source: US Federal Reserve, BofA Global Research
Note: Motor vehicles calculated Feb. 2020 to August 2023 (e.g., before the United Auto Workers strike began in Sept.)

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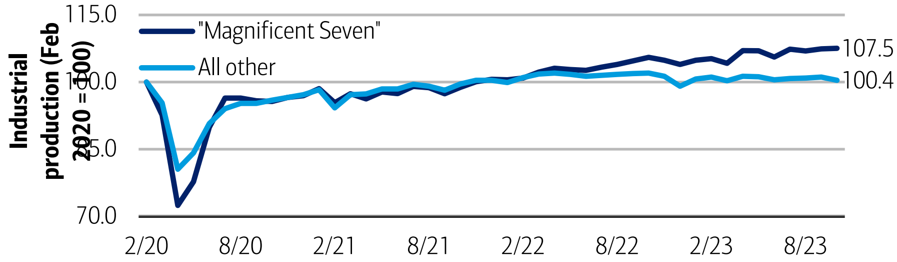
We can dive into even narrower sub-industries. We find that aerospace, autos, cement, electrical equipment, industrial machinery, pharma, and semiconductor manufacturers are responsible for nearly all of US manufacturing volume and employment growth since Feb 2020.

Exhibit 27: US manufacturing industrial production (Feb 2020 = 100)
Seven sub-sectors have been responsible for the majority of US manufacturing volume growth



Source: US Federal Reserve, BofA Global Research
Note: Motor vehicles as of August 2023 (e.g., before the United Auto Workers strike began in Sept.)

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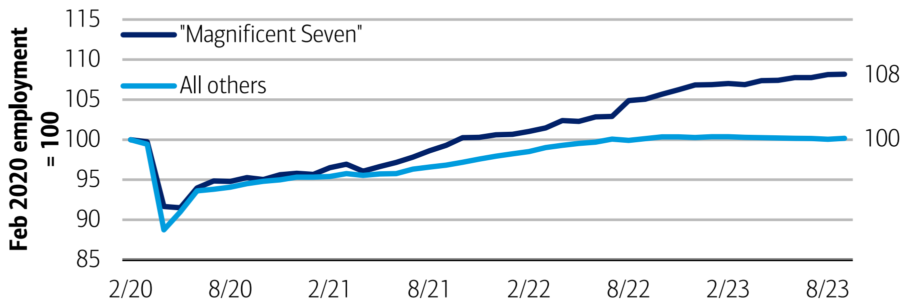
These areas are responsible for 24% of US industrial production and 20% of US manufacturing employment. The other 75-80% of industries have been relatively flat since returning to pre-COVID levels of employment and output.

Exhibit 28: US manufacturing employment levels for selected sub-industries
Seven sub-sectors have been responsible for the majority of US manufacturing employment growth



Source: Bureau of Labor Statistics, BofA Global Research

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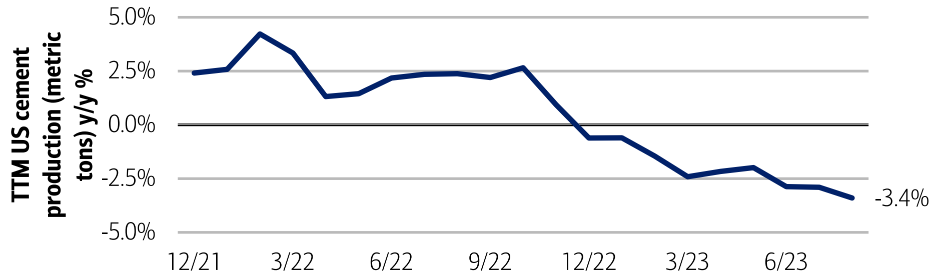
We can tie thematic growth stories into each one of these seven sub-industries. US Federal infrastructure funds fueling growth in cement manufacturing. Reshoring driving industrial machinery manufacturing. A post-COVID focus on US pharmaceutical manufacturing. The investment in electric vehicles requiring new production lines and battery manufacturing plants. A commercial aerospace cycle hyper-charged by COVID-era production declines. An US industrial policy shifting to support domestic chip manufacturing.

A closer look at the Magnificent Seven

- **Aerospace:** Based on BofA analysts forecasts, commercial aircraft deliveries from Airbus and Boeing are expected to grow 17% y/y in 2024 and 16% y/y in 2025. Aftermarket volumes are expected to grow at a mid- to high-single digit CAGR through 2025.
- **Autos:** The BofA Global Autos team forecasts US auto production to rise 10% y/y in 2024, aided by the impact of US strikes. Global auto production is more muted (0% y/y). Capital equipment orders should be supported by EV battery plants, many of which broke ground in 2H22/1H23.
- **Cement:** US cement production volume (in metric tons) grew 4.3% in 2021 and 2.4% in 2022. However, lower residential construction spending is expected to drag volumes down (2.9)% y/y in 2023. The Portland Cement Association, a policy group for US cement manufacturers, forecasts 1.4% y/y volume growth in 2024 and 3.2% in 2025. US Federal stimulus spending is expected to add 9mn metric tons of demand annually through 2026, or ~8% to total US cement consumption. Reshoring activity (including manufacturing & infrastructure) is expected to add over 1mn metric tons in 2024, or ~1pt to total US cement consumption.

Exhibit 29: US cement production volumes hurt by weaker residential construction
Federal stimulus spending expected to add ~8% to US cement consumption through 2026



Source: US Geological Survey, BofA Global Research

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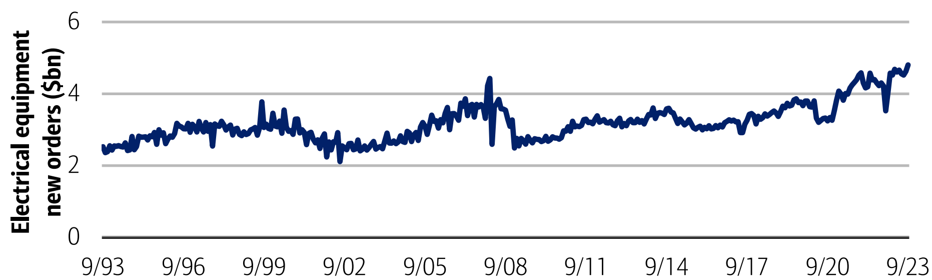
- **Electrical equipment:** We see the combination of grid investment, data center growth, and US mega projects across multiple industries supporting continued volume growth. Despite being above prior peak levels, US electrical equipment orders were rising at a double-digit pace in September (latest data).

Exhibit 30: Electrical equipment orders (monthly, seasonally adjusted)
Electrical equipment orders were up 12% y/y in September



Source: US Census Bureau, BofA Global Research

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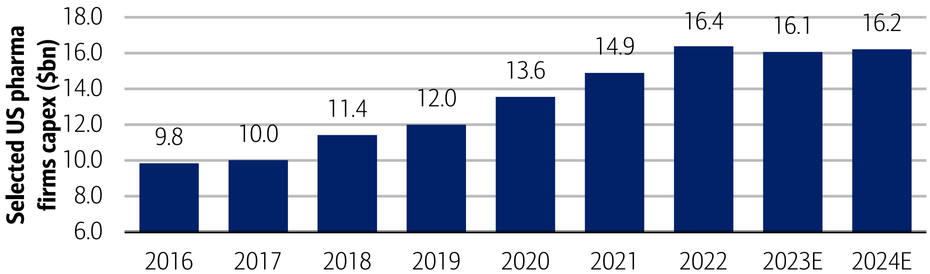
- **Industrial equipment:** This category includes a broad swath of capital goods – machinery for the manufacturing of other goods. The largest area is semiconductors/electronics (26%), but the category includes a swath of specialized equipment for chemicals, metal working, plastics, and paper. Given the broad nature of the products, it is hard to tie the employment and output trends to a specific theme. However, reshoring and reindustrialization seem a likely source of demand for these diversified capital goods companies.

- **Pharma:** The COVID-19 pandemic exposed how dependent the US has become on foreign pharma production. According to data from the Bureau of Economic Analysis, pharma imports as a percentage of US consumption rose from 57% in 2010 to 66% in 2022. In September 2022, Pres. Biden announced a $2bn investment to strengthen US pharma supply chains.

  Generic production is unlikely to be brought back to the US. However, higher-margin pharma production (e.g., biologicals, cell and gene therapy) have seen US capacity additions.

Exhibit 31: US publicly traded pharma firms' capex spending is ~1/3rd higher than pre-COVID levels
Capex spending is forecast to remain elevated in 2024E



Source: Company filings, BofA Global Research
Note: Historical and consensus capex total for LLY, JNJ, MRK, PFE, BMY, ZTS, VTRS, JASS, CTLT, and PRGO.

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Revenue mix for selected sectors

Exhibit 32: Revenue mix by selected end markets (2023E)
Stocks in our coverage with high exposures to fastest-growing areas of US manufacturing

End Market	VRT	ETN	ROK	ITT	PH	AME	GE	HON	CNM	FTV	MMM	ITW	DOV
Aerospace	0%	9%	1%	5%	30%	9%	35%	33%	0%	5%	5%	1%	3%
Auto manufacturing	0%	17%	15%	42%	4%	5%	0%	0%	0%	0%	6%	25%	0%
Cement/infrastructure	0%	0%	0%	0%	0%	0%	0%	4%	39%	0%	0%	1%	0%
Electrical equipment	100%	68%	2%	3%	1%	16%	9%	0%	0%	7%	5%	0%	0%
Electronics	0%	0%	5%	0%	3%	13%	0%	2%	0%	7%	13%	5%	3%
Machinery	0%	0%	33%	0%	16%	4%	0%	0%	0%	15%	3%	1%	19%
Pharma/medicine	0%	0%	5%	10%	2%	10%	0%	1%	0%	4%	3%	1%	6%
"Magnificent Seven" mix	**100%**	**94%**	**61%**	**60%**	**56%**	**55%**	**44%**	**40%**	**39%**	**37%**	**35%**	**34%**	**31%**

Source: BofA Global Research, company filings Note: VRT = Vertiv, ETN = Eaton Corp, ROK = Rockwell, ITT = ITT Inc, PH = Parker Hannifin, AME = AMETEK, GE = General Electric, HON = Honeywell, CNM = Core & Main, FTV = Fortive, MMM = 3M, ITW = Illinois Tool Works, DOV = Dover Corp

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A note on consumer exposure – possible drag in 2024

Why consumer spend matters… 27% of US manufacturing

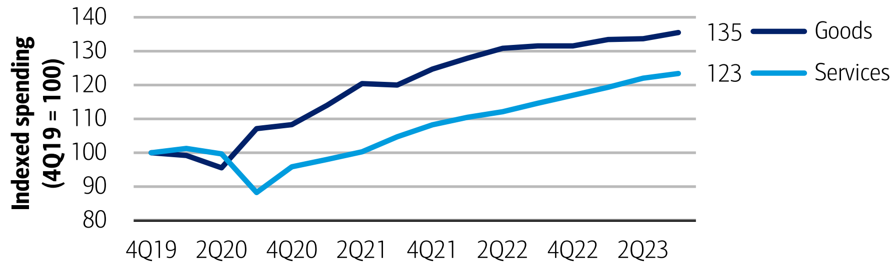
Across our coverage, indirect exposure to US consumer goods is meaningful (e.g., selling capital equipment or components to consumer goods manufacturers). Consumer goods generate 27% of US manufacturing value add, according to the US Federal Reserve.

Our coverage also has some direct exposure to consumer spending. Examples would include Pentair (~30% residential replacement), Trane (~20% residential replacement), Carrier (16% residential replacement), Allegion (12% residential replacement), and 3M (~9% consumer ex-new home construction).

US consumers still rebalancing back to services

Over 2017-19, goods made up 32% of consumer spending. During COVID, US consumers shifted spending to goods versus services. Good spending peaked in 2Q21 at 35% but have drifted down to 33% in 3Q23. "Revenge spending" on services is a popular narrative in the press. However, the hard data shows consumers have still not fully rebalanced back towards services.

Exhibit 33: Consumer spending still rebalancing back to services
Services spending is still lagging compared to goods



Source: Bureau of Economic Analysis, BofA Global Research

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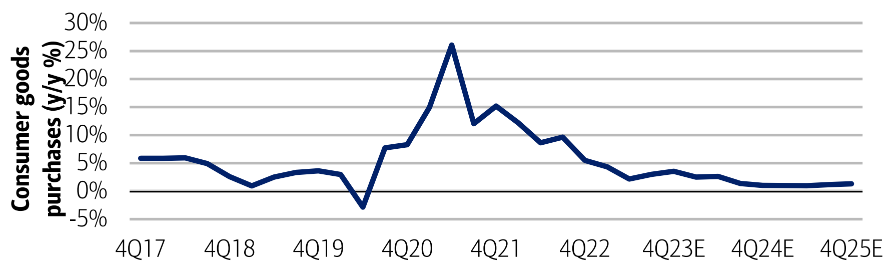
Rebalancing suggests deceleration in 2024

We use the BofA economics team's forecast for nominal consumer spending (+4.1% y/y in 2024E and +3.4% y/y in 2025E). We then assume US consumer spending rebalances back to the historical 32% mix by 4Q25E. These assumptions drive 1.9% y/y goods spending in 2024E and a 1.1% growth in 2025E. While still positive, this would be a deceleration from 3.3% y/y in 2023E.

Exhibit 34: US consumer goods purchases (nominal $s, y/y %)
Rebalancing a potential drag on consumer goods spending over 2024E-25E



Source: Bureau of Economic Analysis, BofA Global Research

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So where are we now?

The best performing stocks in our coverage year-to-date are Vertiv (VRT; +44%), General Electric (GE; +32%), Vontier (VNT; +26%), Eaton (ETN; +24%), and Core & Main (CNM; +23%). This compares to the S&P up +7.4% and our coverage on average up +11.5%. VRT and ETN are the names in our coverage with the most exposure to the selected end markets (largely electrical).

The worst performing multi-industrials are 3M (MMM; down 14%), Rockwell (ROK; down 5%), Honeywell (HON; down 4%), Illinois Tool Works (ITW; flat), and Carrier (CARR; +1%). We note that ROK has company-specific issues despite its relatively high exposure to faster-growing markets. CARR does not have exposure to the above end markets. MMM and ITW have relatively low exposure to these end markets. HON's exposure is largely in Aerospace, where the growth outlook is strong; the underperformance is largely also company-specific.

Theme #2: Stimulus continues

We estimate that only ~20% of Federal stimulus funds have been spent across four major pieces of legislation.

- **IIJA: 18% spent.** The Infrastructure Investment and Jobs Act (IIJA; passed Nov 2021) provided $1.2tn to improve infrastructure. The White House in May 2021) provided $1.2tn to improve infrastructure. The White House in May announced $220bn in allocations to fund over 32,000 projects. A further $428bn has been allocated to states, with spending varying by state. In aggregate, we estimate 18% of funding has been spent through October.

- **IRA: 4% spent.** The Inflation Reduction Act (IRA; passed Aug 2022) authorized ~$400bn in direct investment to clean energy. While finalized numbers for the IRA have not been totaled, the Congressional Budget Office estimates that only 4% will be spend through September.
- **ESSER: 54% spent.** ESSER (Elementary and Secondary School Emergency Relief Fund) has had three iterations totaling $190bn. Each iteration of ESSER funding had the amounts allocated to the states soon after the funding was authorized. According to research from FutureEd, a thinktank at Georgetown University, approximately ~54% of the funding has been spent. The last round (ESSER III) of funding expires in September 2024.
- **CHIPS Act: 1% spent.** The CHIPS and Science Act (passed Aug. 2022) authorized ~$33bn in direct funding for domestic chip production and $22bn in manufacturing in investment tax credits for semi equipment. Only ~1% of funding from the CHIPS Act has been distributed as of October 2023. Companies have recently put in applications for funding, which we expect to be distributed starting in 2024. Micron (August), Global Foundries (September), Intel (October) have applied for CHIPS Act funding.

How much has been spent and impact on capex

US manufacturing capex grew at a 2.9% CAGR over the last economic cycle (2008-2019), per the Bureau of Economic Analysis. We forecast manufacturing capex to grow at a ~8% CAGR over 2019-25E. In 2022, manufacturing capex grew 10.6% y/y. We estimate that stimulus-related spending drove ~1pt of this growth.

Exhibit 35: US manufacturing capex trends by category (1980-2019)
Growth over economic cycles has slowed from mid-single digit to low-single digit

CAGRs	1980-1990	1990-2001	2001-2007	2007-2019
Structures	1.5%	4.4%	-0.6%	1.2%
Intellectual property	8.7%	7.7%	4.3%	3.5%
Equipment	4.5%	3.3%	3.6%	1.0%
Total	**5.6%**	**5.4%**	**3.6%**	**2.5%**

Source: Bureau of Economic Analysis, BofA Global Research

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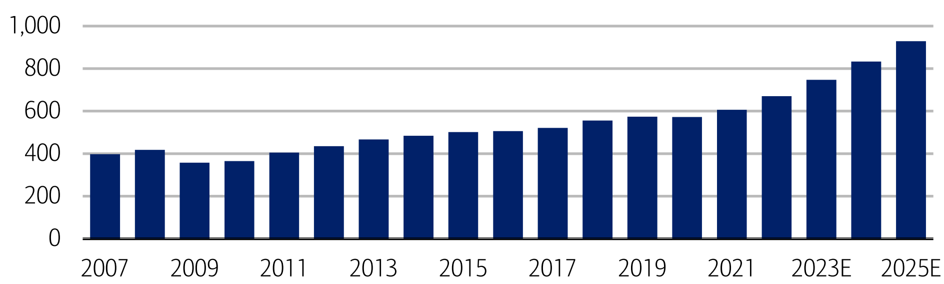
We forecast 11% y/y growth in US manufacturing capex in both 2023E and 2024E. With stimulus-related spending outlays ramping in 2023 and 2024, we expect the stimulus-driven contribution to increase to ~1.5pts in 2023E and 2024E.

Exhibit 36: US manufacturing capex ($bn)
US manufacturing capex is estimated to be $747bn in 2023



Source: Bureau of Economic Analysis, BofA Global Research

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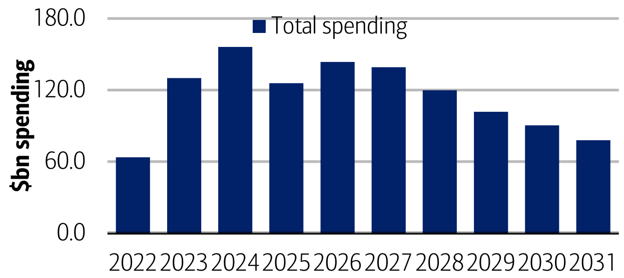
What happens to stimulus if the Republicans win in ’24?

We present a scenario analysis for federal stimulus if the Republicans achieve a Senate majority and win the 2024 presidential election. We are not assessing a likelihood of such an event.

We look at provisions from the Limit, Save, Grow Act (a Republican debt ceiling bill from '23), the Fiscal Responsibility Act of 2023 (the debt ceiling legislation), various US House appropriation bills, the US House Republican controlled Budget Committee's Reverse the Curse Resolution, and Project 2025 (a political framework of the Heritage Foundation, a leading conservative think tank). We assume all proposed stimulus cuts were enacted for our scenario analysis.

Of the $1.9tn designated from the CHIPS Act, ESSER, IIJA, and IRA, we see ~$0.5tn at risk (~26% of total). This number includes the estimated impact of IRA tax credits. Excluding the tax credits, the cuts amount to 14% of total.

Exhibit 37: Our current estimates for total spending
~$120+bn of stimulus in 2024-28



Source: Congressional Budget Office, BofA Global Research estimates

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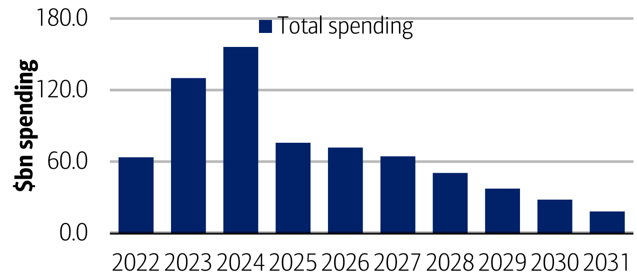
Exhibit 38: Potential spending as part of the "Republican win" scenario
Peak stimulus spend would be in 2024



Source: Congressional Budget Office, BofA Global Research estimates

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- **CHIPS Act: 0% cut.** Support for US semiconductors has bipartisan support. We view the semiconductor sector as the single most important driver of the US manufacturing reshoring. CHIPS Act spending has not been targeted by any proposals.

- **ESSER: 1% cut.** The Limit, Save, Grow Act aimed to retract the unobligated balances of funding made available from the American Rescue Plan (the legislation that funded ESSER III). In the enacted legislation only $391mn was rescinded, or less than 1% of total.

- **IIJA: 11% cut.** The US House Budget Committee seeks to eliminate $25bn from the IIJA. Project 2025, a conservative thinktank framework, would reduce funding by a further $102bn. The proposed cuts are focused on "green" initiatives over more traditional infrastructure spending. In total, these proposed cuts would amount to 11% of total.

- **IRA: 76% cut.** The Limit, Save, Grow Act targeted $76.5bn in IRA funding (out of $400bn total) and all green tax credit provisions. Published appropriations bills sought to cut an additional $22.4bn. Three of the pieces of policy that targeted the IRA aimed to cut funding relating to the IRS (internal Revenue Service). Additionally, the Limit, Save, Grow Act aimed to cut funds related to the High Efficiency Electric Homes Rebate and zero building energy code adoption (see report). House appropriation bills seek to claw back unobligated IRA funds related to the EPA (Environmental Protection Agency), energy, agriculture, and IRS. In total, these proposed cuts would amount to 76% of total.

Moving forward the stimulus peak to 2024

Currently we forecast stimulus spend to peak in '26. In our "Republican win" scenario analysis, 2024 would be the peak for stimulus contribution. This assumes all proposed legislation is passed in the first 100 days.

Exhibit 39: Potential changes to federal stimulus
Only 23% of stimulus is likely to be affected by a change in leadership post-2024 elections

($bn)	CHIPS	IIJA	IRA	ESSER	IRA tax credits	Total
Current government estimates	$55	$1,200	$213	$190	$265	$1,923
-Limit, Save, Grow Act			$(76)	$(1)	$(265)	$(343)
-Reverse the Curse		$(25)				$(25)
-Project 2025		$(102)				$(102)
-Appropriations			$(22)			$(22)
Remaining stimulus	$55	$1,073	$114	$189	$0	$1,431
% change	*0%*	*-11%*	*-46%*	*0%*	*-100%*	*-26%*
Note: Fiscal Responsibility Act			*($1)*	*($0)*		

Source: Federal legislation, Congressional Budget Office, Project 2025

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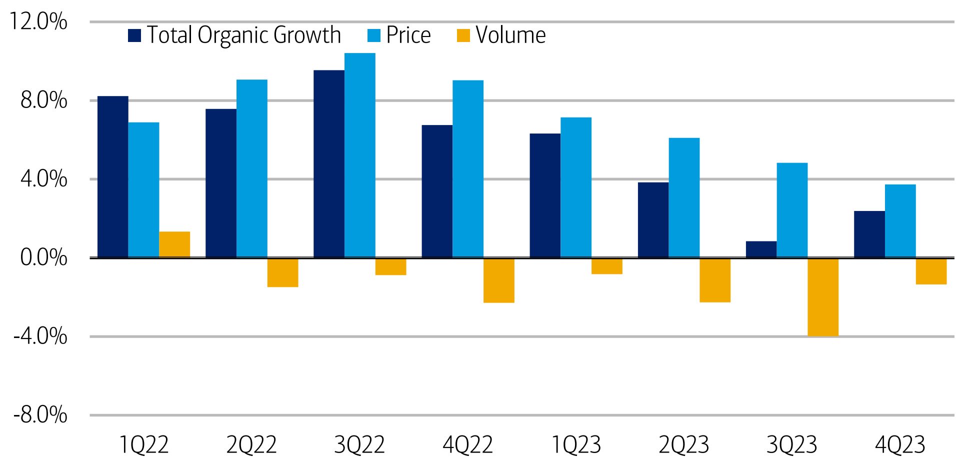
So where are we now?

We have no change in our framework for stimulus. On the margin, it seems that the Inflation Reduction Act (IRA) funding is moving along slowly, in line with a more conservative view from Emerson (EMR).

Theme #3: Rational reasons for volume growth

We look at organic growth vs. price vs. volume growth forecasts for a subset of companies in our coverage that disclose price. We forecast volumes re-accelerating in to +2.1% y/y growth 2024E from (0.4)% y/y decline in 2023E. We forecast pricing taking a step down in 2024E (from +5.6% y/y in 2023E to +2.4% y/y) as most companies return to a more "normalized" pricing environment. Some companies not included in the below analysis (e.g., ETN) have stated an expectation for more volume than price contribution to growth next year.

Exhibit 40: BofA estimates for total organic growth vs. price vs. volume
We forecast volumes re-accelerating to +2.1% y/y growth in 2024E from (1)% y/y decline in 2023E



Source: BofA Global Research
We use an average of ALLE, AME, CARR, DOV, EMR, FTV, HON, MMM, PNR, TT, VNT, VRT

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Volume growth driven by easing comps, supply chain

We forecast volume acceleration largely driven by easier comps in residential (e.g., 2023 saw negative volume growth for Pentair (PNR), MMM, Allegion (ALLE), and HVAC names), particularly as these companies lap destocking. 2024 growth guidance implies positive volumes for PNR, Carrier (CARR), Trane Technologies (TT), and ALLE, for example.

We also think there should be secular improvement in volumes for Aerospace (e.g., HON) and Electrical (e.g., VRT) as supply chains sequentially unlock. We do not underwrite a material uptick in volumes from mega-projects as we believe this will be more of a 2025 story for P&L.

A more normalized pricing environment

We forecast a moderation in pricing next year. Our companies are largely price/cost positive following the period of supply chain-driven inflation. The BofA commodity strategist forecasts steel down (1.6)% y/y and copper +2.2% y/y. Steel is the largest and most common input for our companies behind wages. We expect companies will see continued gross margin uplift but will not be able to push through the same extent of price increases as previously. Continued labor inflation supports 2-3% price increases in 2024. Some management teams (e.g., Honeywell) believe 2-3% price going forward is reasonable.

So where are we now? Consistent with our forecast

Our companies have largely guided towards normalized pricing environments. Our pricing estimate of +2.4% y/y for companies that disclose price is in line with our estimate prior to 2024 growth guidance. Further, our forecast for volume re-acceleration to low-single digit growth and corporate commentary is consistent with an inflection in volumes, as they accelerate in 2H24.

Theme #4: US fixed asset investment leadership

We believe global capex growth outpaced global GDP in 2022 and we expect it to re-accelerate in 2023 and likely going forward. We have seen a long trend of outgrowth largely driven by China beginning in the mid-2000's. We believe this trend is likely to transition to the US being the largest driver of capex.

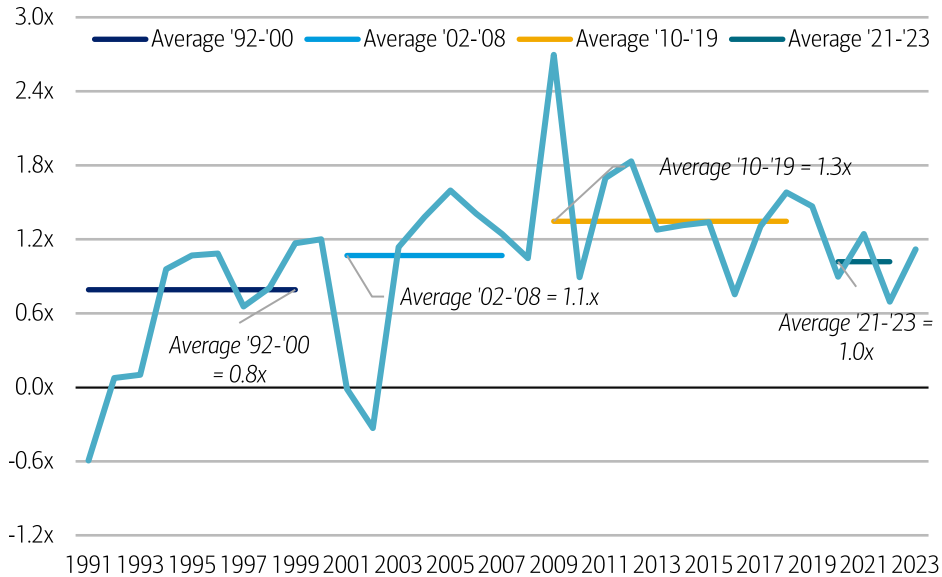
Using the BofA Economics team's forecasts, we forecast that real capex growth decelerated from +10.6% y/y in 2022 in +7.6% y/y in 2023. As a multiple of GDP, we estimate that capex was 0.7x GDP in 2022 but grew faster than GDP in 2023. We would expect this trend to continue in 2024, given BofA Economics forecast decelerating GDP, but secular capex trends should continue to improve.

Pre-COVID, fixed asset investment grew at an average of 1.3x global GDP growth. In 2021, global capex was broadly in line with nominal GDP growth in 2021 (+14.2% vs. +14.5% y/y) and dropped behind real GDP growth in 2022 (+2.4% vs. +3.5% y/y). We believe the temporary drop in 2022 reflects supply chain constraints and a faster rebound in services.

We forecast in line growth in 2023 (+3.4% y/y vs. +3.0% y/y). We use the BofA Economics team's forecasts for real capex, GDP and inflation in '23. We expect capex trends to accelerate further in 2024/2025, driven by US reinvestment and reshoring.

Below we show global gross fixed capital formation (GCFC) as a multiple of GDP over the last 30+ years.

Exhibit 41: Historical global FAI as a multiple of GDP
We use Global Fixed Capital Formation as a proxy for global capex



Source: BofA Global Research, World Bank

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China remains the largest component of capex...

Historically, the US, Europe, and Japan were the biggest contributors to capex growth, but over the past decade China has risen to be the largest driver of Capex. As of 2021, China accounts for 30.3% of global gross fixed capital formation. It has risen steadily over the course of the past three decades, up from 1.7% in 1991. BofA forecasts imply that China will reach 31.1% of global capex by 2023.

Exhibit 42: FAI growth, real GDP growth, and FAI growth multiplier
FAI growth multiplier to average 1.0x 2021-2023

Year	Real FAI growth	Real GDP growth	FAI growth multiplier
1992	0.1%	1.8%	*0.1x*
1993	0.2%	1.5%	*0.1x*
1994	2.9%	3.0%	*1.0x*
1995	3.3%	3.0%	*1.1x*
1996	3.7%	3.4%	*1.1x*
1997	2.4%	3.7%	*0.7x*
1998	2.0%	2.5%	*0.8x*
1999	3.8%	3.3%	*1.2x*
2000	5.3%	4.4%	*1.2x*
2001	0.0%	1.9%	*0.0x*
2002	-0.7%	2.2%	*-0.3x*
2003	3.3%	2.9%	*1.1x*
2004	6.0%	4.4%	*1.4x*
2005	6.1%	3.8%	*1.6x*
2006	6.0%	4.3%	*1.4x*
2007	5.2%	4.2%	*1.2x*
2008	1.9%	1.8%	*1.0x*
2009	-4.7%	-1.7%	*2.7x*
2010	3.9%	4.4%	*0.9x*
2011	5.3%	3.2%	*1.7x*
2012	4.6%	2.5%	*1.8x*
2013	3.4%	2.7%	*1.3x*
2014	3.7%	2.8%	*1.3x*
2015	3.8%	2.9%	*1.3x*
2016	2.0%	2.6%	*0.8x*
2017	4.1%	3.2%	*1.3x*
2018	4.8%	3.0%	*1.6x*
2019	3.6%	2.5%	*1.5x*

Exhibit 42: FAI growth, real GDP growth, and FAI growth multiplier
FAI growth multiplier to average 1.0x 2021-2023

Year	Real FAI growth	Real GDP growth	FAI growth multiplier
2020	-3.4%	-3.8%	*0.9x*
2021	7.2%	5.8%	*1.2x*
2022	2.4%	3.5%	*0.7x*
2023	3.4%	3.0%	*1.1x*

Source: BofA Global Research, World Bank

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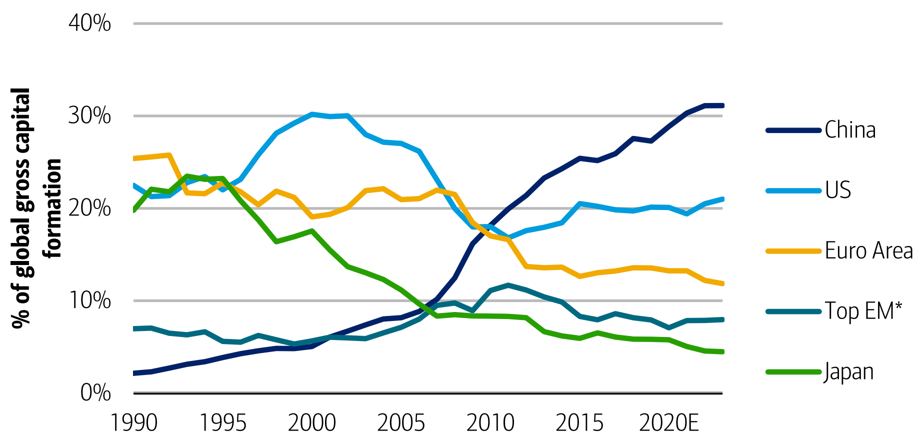
....but growth is stalling

Our analysis indicates that China's % of global gross capital formation stalled in 2021 and will be flat in 2022 and 2023. The US, meanwhile, has increased its contribution in this timeframe. We would expect similar trends to continue going forward.

Exhibit 43: % of global gross capital formation
China flattens out, US picking up



Source: BofA Global Research, World Bank, Bloomberg
Note: *Top Emerging Markets (EM) include Brazil, Russia, Mexico, and India

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PMIs still bottoming, looking for an inflection

The US manufacturing PMI for February was 47.8. This is down from January at 49.1. The ISM calculates the "headline" PMI using an equal-weighted average of five series: new orders, production, employment, inventories, and supplier deliveries. While the ISM's Report on Business also has indexes for prices, customers' inventories, backlog, exports, and imports these do not factor into the headline PMI.

Lead times dropped 3 days to 80. We believe lead times are putting additional impact on the index given the impact of lead times on orders and inventories. Better lead times mean companies need to carry less buffer stock, which leads to lower orders. Notably, supplier deliveries expanded this month, with a 50.1 reading versus 49.1 last month. While generally supply chains have improved, the pace has been slow.

Exhibit 44: "Headline" manufacturing PMI components & weightings
While the ISM Report on Business has other readings – only these five go into the headline PMI

Weight	Sub-index	Description
20%	New Orders	m/m change in units orders (not dollars)
20%	Production	m/m change in units produced (not dollars)
20%	Employment	m/m change in employment levels (not payroll dollars)
20%	Supplier deliveries	m/m change in supplier delivery times (lead times + transportation time)
20%	Inventories	m/m change in units of manufacturers' own inventory

Source: Institute for Supply Management, BofA Global Research

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Below are the TTM readings for the headline PMI and components. In February, New orders, Production Employment, and inventories were below 50.

The industries that reported month-over-month growth in New Orders are (in order): Apparel, Leather & Allied Products; Paper Products; Plastics & Rubber Products; Wood Products; Fabricated Metal Products; Chemical Products; Primary Metals; Transportation Equipment; Electrical Equipment, Appliances & Components; Miscellaneous Manufacturing; and Computer & Electronic Products.

The industries that reported month-over-month declines in New Orders are (in order): Furniture & Related Products; Textile Mills; Food, Beverage & Tobacco Products; and Machinery.

Exhibit 45: TTM US manufacturing PMI components

Four of the five components were below 50 in February

	New orders	Production	Employment	Supplier deliveries	Inventories	Manufacturing PMI
3/31/2023	44.3	47.8	46.9	44.8	47.5	**46.3**
4/30/2023	45.7	48.9	50.2	44.6	46.3	**47.1**
5/31/2023	42.6	51.1	51.4	43.5	45.8	**46.9**
6/30/2023	45.6	46.7	48.1	45.7	44.0	**46.0**
7/31/2023	47.0	48.4	45.0	46.1	45.8	**46.5**
8/31/2023	46.4	49.9	48.6	48.6	44.3	**47.6**
9/30/2023	48.6	51.9	50.9	46.4	45.4	**48.6**
10/31/2023	46.2	50.0	47.1	47.7	43.6	**46.9**
11/30/2023	47.8	48.8	46.1	46.2	44.3	**46.6**
12/31/2023	47.0	49.9	47.5	47.0	43.9	**47.1**
1/31/2024	52.5	50.4	47.1	49.1	46.2	**49.1**
2/29/2024	49.2	48.4	45.9	50.1	45.3	**47.8**

Source: Institute for Supply Management, BofA Global Research

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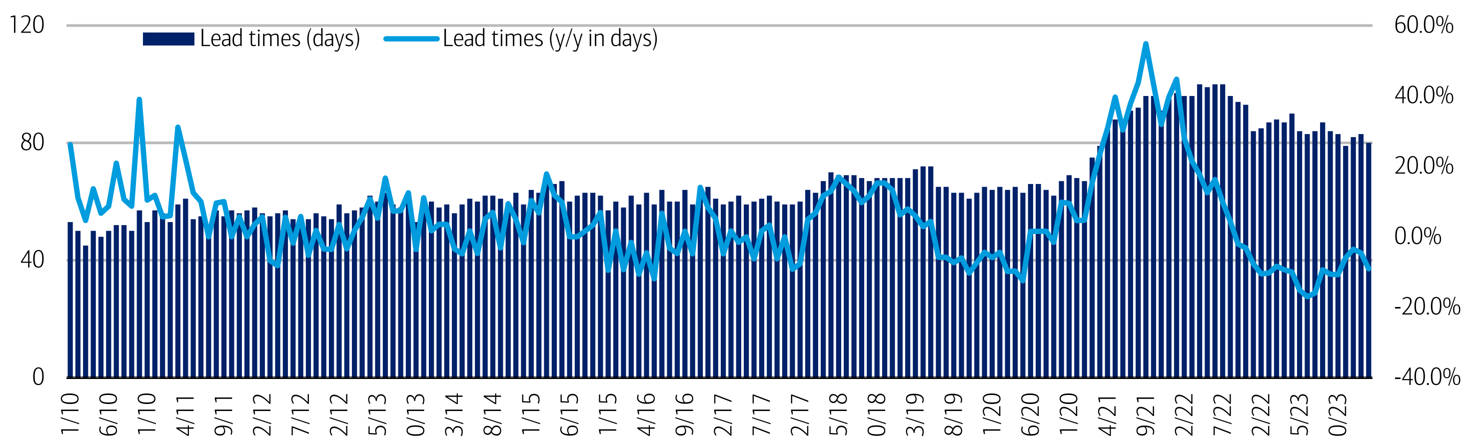
Supplier deliveries and lead times ticked up sequentially in January. Lead times for production materials fell slightly to 80 days from 83 days in January. Lead times fell below 80 days in November 2023, to 79 days, for the first time since March 2021. Lead times remain stubbornly elevated relative to pre-COVID averages of ~62 levels, but below 100 day peaks.

Exhibit 46: Lead times for production materials, days

Lead times remain elevated versus history



Source: Institute for Supply Management, BofA Global Research

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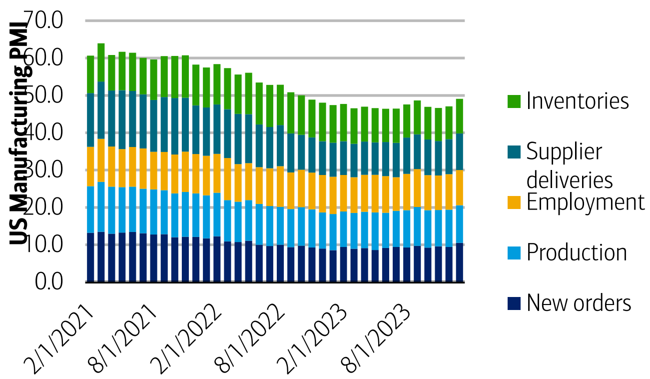
Exhibit 47: US manufacturing PMI was at 47.8 in January
Components of US manufacturing PMI



Source: Institute for Supply Management, BofA Global Research

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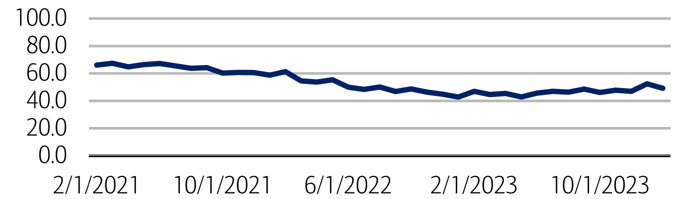
Exhibit 48: New Orders came in at 49.2 in February
ISM New Orders, 2/21 to 2/24



Source: Institute for Supply Management, BofA Global Research

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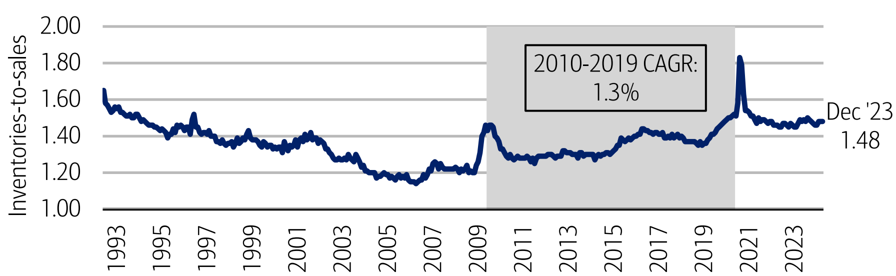
Manufacturing inventories flat sequentially in December

Aggregate manufacturing inventories-to-sales (data from the US Census Bureau) were sequentially flat in December at 1.48 months, and flat with 1.48 months at the start of the year.

In absolute dollar terms, US manufacturing sales ended '23 up y/y, but inventories were down 0.7% y/y. Manufacturing inventories-to-sales ratios remain higher than pre-pandemic levels. However, the pace of inventory normalization has been fairly slow.

We note that manufacturing inventories have been rising over the last decade as a result of offshoring (contrary to investor perception of just-in-time inventory).

Exhibit 49: Manufacturing inventories flat sequentially in Dec, and flat with the start of 2023
Manufacturing inventories-to-sales ratio, seasonally adjusted



Source: US Census Bureau

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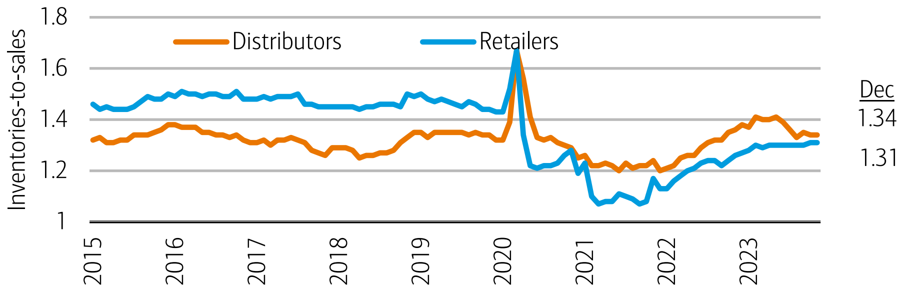
Distributor inventories flat sequentially in December

Distributor inventories-to-sales stood at 1.34 months in December, flat sequentially. In absolute dollars, wholesale inventories ended down (1.5)% y/y versus sales up 1.6%. Over the past three months, wholesale inventories have been relatively stable (in absolute dollars). For all the discussion of distributor destocking, in absolute dollars inventory since October has been relatively flat and ended 2023 up 2% y/y in absolute dollars, suggesting that a hard destock has yet to happen.

Retailer inventories were flat sequentially in December but ended 2023 up 4% y/y.

Exhibit 50: Retailer and distributor inventories flat in December
Wholesaler and retailer inventories-to-sales, 2015-2023



Source: US Census Bureau, BofA Global Research

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Durable goods channel inventories tick down in December

The chart below breaks down wholesaler inventories-to-sales for various sectors. In the last six months (June to December 2023), durable goods inventories to sales were up 6% from the same period pre-pandemic (June to December 2019). Compared to 2015-2019 averages, durable goods distributors are holding an extra 9% of inventory on average. Chemicals and Petroleum and petroleum products continue to have low channel inventories. In most other areas, distributor inventories are either elevated relative to pre-COVID levels or in line.

Exhibit 51: Durable goods channel inventories above pre-COVID levels
Wholesaler inventories-to-sales by sub-industry, June - Dec '23 vs. pre-COVID

Wholesaler inventories-to-sales	**June - December '23, Avg**	**June - December '19, Avg**	**Change**	**2015-2019, Avg**
Durable goods	1.8	1.7	0.1	1.7
Motor Vehicle and Motor Vehicle Parts and Supplies	1.8	1.7	0.1	1.7
Furniture and Home furnishings	1.7	1.7	0.0	1.7
Lumber and other construction materials	1.6	1.6	0.1	1.5
Professional and commercial equipment and supplies	1.2	1.2	0.1	1.1
Metals and minerals, except petroleum	2.3	2.3	0.0	2.2
Household appliances and electrical and electronic goods	1.3	1.2	0.2	1.1
Hardware and plumbing and heating equipment and supplies	2.4	2.1	0.3	2.1
Machinery, equipment, and supplies	2.9	2.9	0.0	2.7
Miscellaneous durable goods	1.7	1.7	0.0	1.6
Nondurable goods	1.0	1.0	-0.1	1.0
Paper and paper products	1.0	1.1	-0.1	1.1
Drugs and druggists' sundries	1.0	1.1	-0.1	1.1
Apparel, piece goods, and notions	2.9	2.2	0.6	2.1
Grocery and related products	0.7	0.7	0.0	0.7
Farm product raw materials	1.1	1.6	-0.4	1.4
Chemicals and allied products	1.1	1.2	-0.1	1.2
Petroleum and petroleum products	0.3	0.4	-0.1	0.4
Beer, Wine, and Distilled Alcoholic Beverages	1.6	1.3	0.3	1.3
Miscellaneous nondurable goods	1.8	1.7	0.1	1.6

Source: US Census Bureau, BofA Global Research

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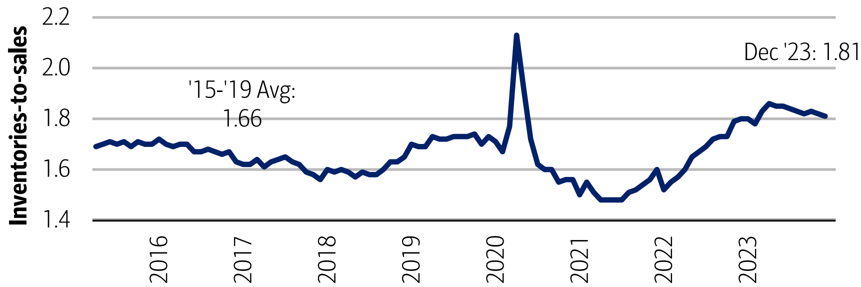
Durable goods wholesaler inventories-to-sales were down sequentially at 1.81 in December. Channel inventories had been rising throughout the year but have come down slightly since June but are above pre-COVID levels. Many categories have inventory that is elevated vs. pre-COVID levels. This poses industry-wide risks of destocking if demand slows.

Exhibit 52: Durable goods channel inventories fell in December
Durable goods wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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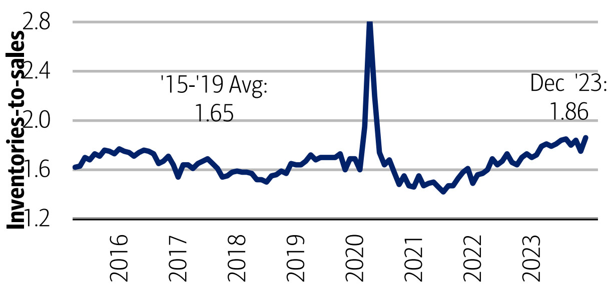
We look at channel inventory levels for motor vehicle/motor vehicle parts and supplies (the chart on the left) and machinery (the chart on the right). Motor vehicle channel inventories-to-sales rose sequentially in December to 1.86, still above average levels in 2015-2019. Machinery channel inventories-to-sales were flat sequentially at 2.94. Machinery inventories are also above historic levels.

Exhibit 53: Motor vehicle channel inventories rose in December
Motor vehicle and motor vehicle parts and supplies wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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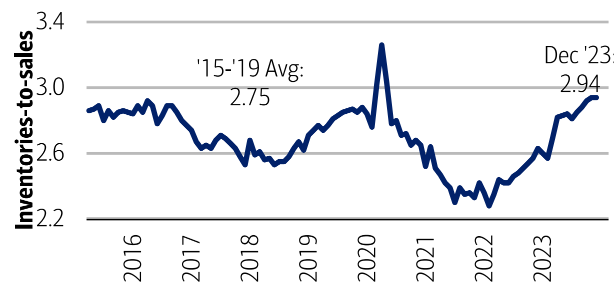
Exhibit 54: Machinery channel inventories were flat in December
Machinery, equipment, and supplies wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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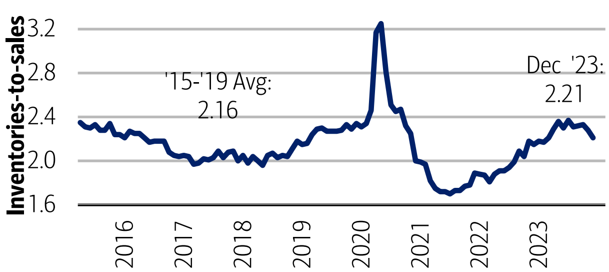
We look at channel inventories for metals and minerals (the chart on the left) and chemicals (the chart on the right). Metals and minerals wholesaler inventories fell sequentially to 2.2, but still remain above pre-pandemic levels. Chemicals wholesaler inventories were flat sequentially at 1.04. We highlight chemicals channel inventories as one area that is still depressed relative to pre-pandemic levels.

Exhibit 55: Metals and minerals channel inventories fell in December
Metals and minerals, except petroleum wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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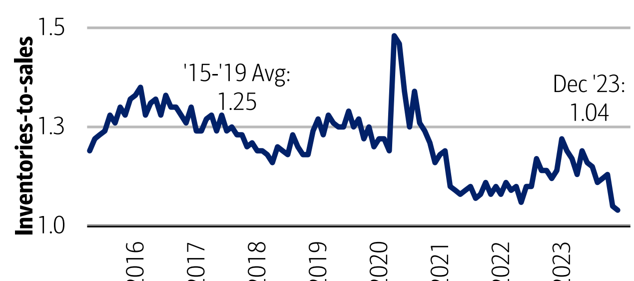
Exhibit 56: Chemicals channel inventories fell in December
Chemicals and allied products wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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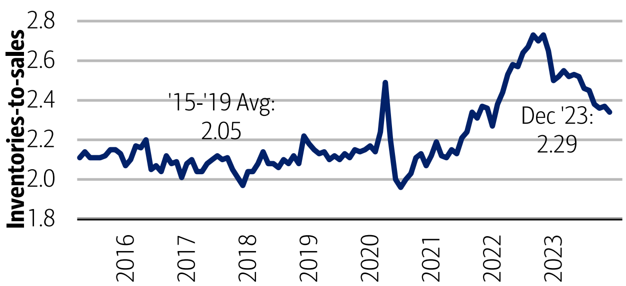
We look at channel inventories for hardware and plumbing and heating equipment (the chart on the left) and household appliances and electrical and electronic goods (the chart on the right). Hardware wholesaler inventories ticked down sequentially to 2.29 in December. Household/electrical wholesaler inventories fell to 1.30 sequentially in December. Both channel inventories for hardware and plumbing and heating equipment remain above pre-pandemic levels.

Exhibit 57: Hardware and plumbing and heating equipment and supplies channel inventories ticked down in Dec

Hardware and plumbing and heating equipment and supplies wholesaler inventories-to-sales, 2015-2023



Source: US Census Bureau

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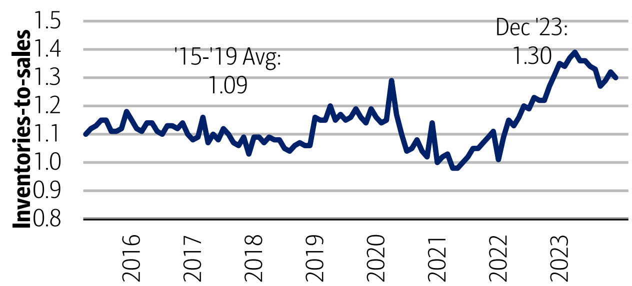
Exhibit 58: Household appliances and electrical and electronic goods channel inventories down in Dec

Household appliances and electrical and electronic goods wholesaler inventories-to-sales, 2015-2023



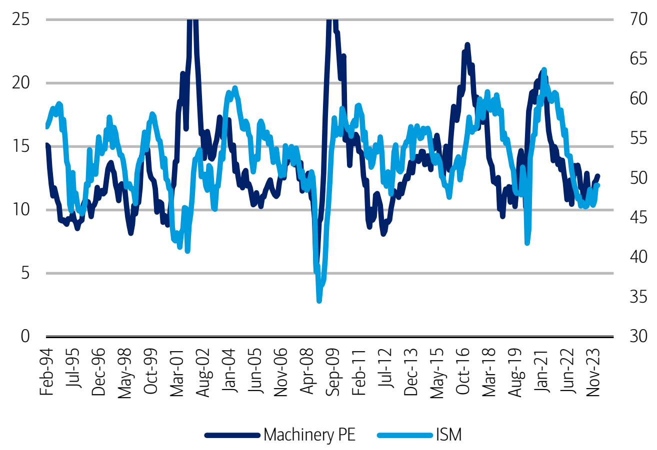
Source: US Census Bureau

BofA GLOBAL RESEARCH

US Machinery: why indicators matter

Industrial demand is slowing: local rental markets moderating, construction starts weakening, aggregates shipments 'flat to down', etc. In our view, this development is not a surprise post an aggressive tightening cycle & subdued indicators (ISM in contraction for 15 consecutive months). This is why the inflection in BofA's Industrial indicators & Surveys - Ken Hoexter's Truck Shipper Survey, Andrew Obin's Fluid Power Survey, Factory Automation Indicator, Industrial Momentum Indicator – is somewhat promising.

Exhibit 59: Machinery 12 month forward PE vs ISM
Machinery multiple re-rates typically with ISM going up



Source: Bloomberg

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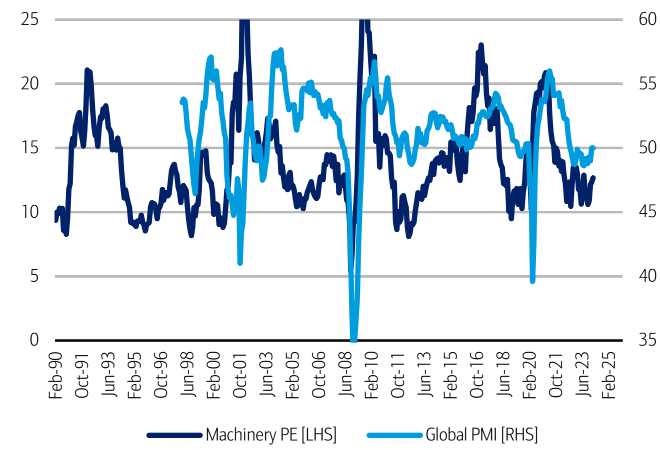
Exhibit 60: Machinery 12 month forward PE vs Global PMI
Machinery multiple re-rates typically with Global PMI going up



Source: Bloomberg

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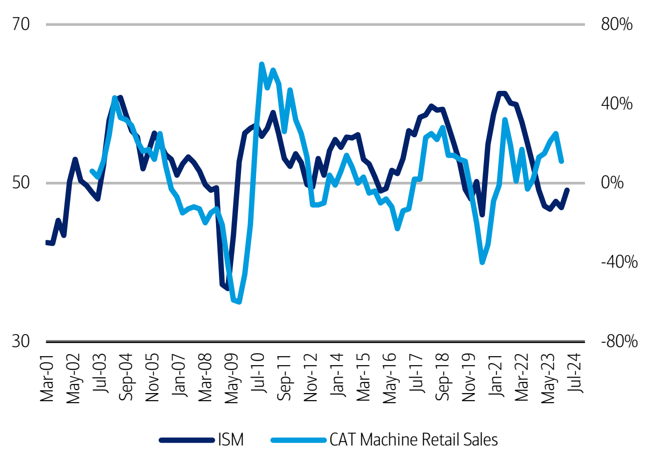
Exhibit 61: ISM vs CAT Dealer Retail Sales
CAT dealer retail sales typically follow the ISM



Source: Bloomberg, Company Filings

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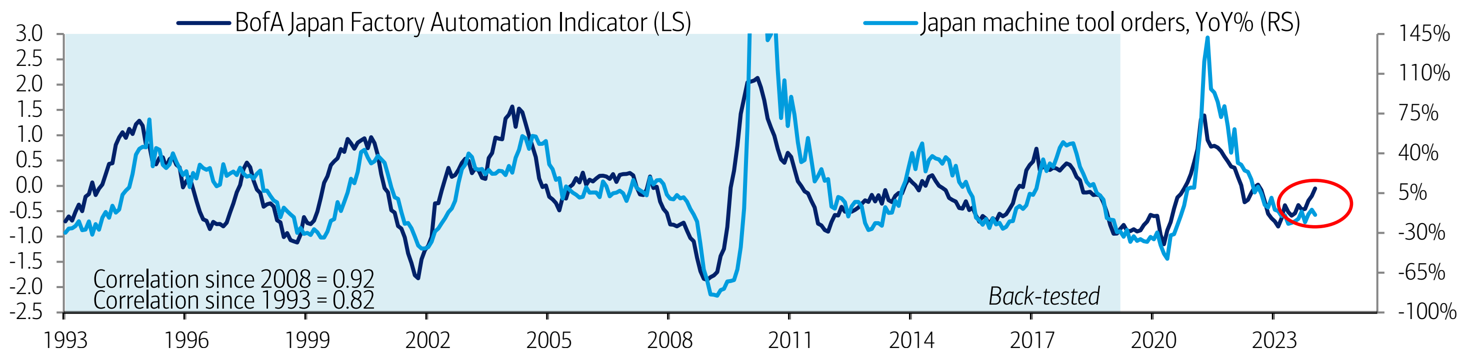
Asia: FA appears to be bottoming out

BofA Japan FA Indicator suggests upside risk to outlook: The BofA Japan Factory Automation (FA) Indicator accelerated to levels last seen in late-2022. The latest reading builds on the positive momentum witnessed last month, which saw the indicator show the first signs of coming out of the protracted bottoming process in the FA cycle. Moreover, the breadth of *leading inputs* showing improvement compared with three months ago increased to 63% from 50% the previous month. Based on our back-testing, the indicator leads YoY% growth in FA related revenue by around two quarters and leads the YoY% growth in Japan machine tool orders by three months. As such, while the near-term outlook for FA remains sluggish, we believe the indicator is signalling to us to stay constructive on the outlook for the FA cycle.

Exhibit 62: BofA Japan FA Indicator vs. Japan machine tool orders (YoY%)
The indicator improved sharply



Disclaimer: The BofA Japan FA Indicator is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. The indicator was not created to act as a benchmark. Notes: 1. This performance is back-tested and does not represent the actual performance of any account or fund. Back-tested performance depicts the theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein. 2. Back-tested data are highlighted, and data from April 15, 2019 are based on actual performance. Source: JMTBA, BofA Global Research; **Source:** JMTBA, BofA Global Research

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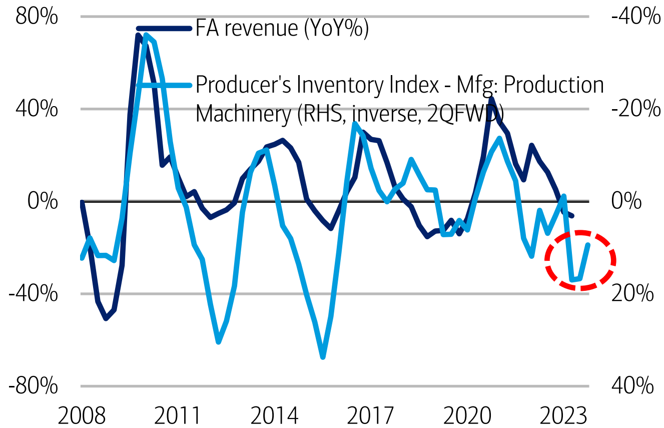
Bottom-up - inventory normalization and semis to drive initial phase of recovery: Based on December quarter results, it is clear that companies continue to grapple with high levels of inventory, which is likely to continue to weigh on near-term earnings. However, compared to September quarter results, company commentary on inventory was more nuanced, which we think suggests that we could be approaching a turning point. We believe this is reinforced by recent trends in inventory data, which also appear to be bottoming out (Exhibit 63). In terms of semis, the acceleration in key indicators such as South Korea semi exports, alongside BofA's view of higher semi capex in 2024-25, suggests that semis related FA demand should pick-up. In terms of timing, we think we could start to see improvements emerge into the June/September quarters. On the other hand, the outlook for China remains muted, although we don't anticipate a second dip. See Japan Capital Goods: Factory Automation results wrap: Staying the course, despite short-term uncertainty 29 February 2024.

Exhibit 63: FA revenue vs. Japan machinery inventory
Inventories seem to be past the worst point



Source: Company data, METI, BofA Global Research

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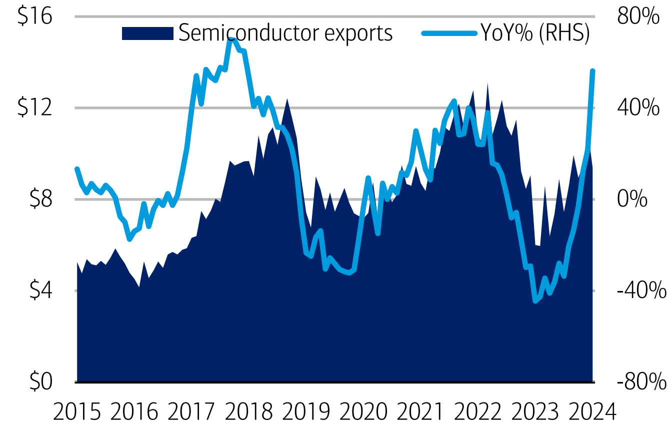
Exhibit 64: South Korean Exports - Semiconductors (US$bn)
Sharp recovery in semi exports bodes well for FA demand



Source: Ministry of Trade, Industry and Energy, BofA Global Research

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2024 Global Industrial Conference agenda

Tuesday, 19 March 2024 - The Landmark Hotel London

Location	Track 1 Grand Ballroom 1	Track 2 Grand Ballroom 2
7.15am	**Registration & Light Breakfast**	
7.50 – 8.00am	**Opening Remarks** **Alex Virgo**, *EMEA Capital Goods, Aerospace & Defence,* BofA Global Research **Andrew Obin,** *AMRS Multi-Industry and Engineering and Construction,* BofA Global Research	
8.00 – 8.40am	**Howmet Aerospace** John Plant, *CEO* *Moderator: Ron J. Epstein, AMRS Aerospace & Defence Electronics, BofA Global Research*	**Stadler Rail AG** Raphael Widmer, *Group CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
8.50 – 9.30am	**BAE Systems PLC** Brad Greve, *CFO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Metso Corporation** Pekka Vauramo, *CEO* Moderator: *Elliott Robinson, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
9.40 – 10.20am	**Teledyne Technologies Inc** Edwin Roks, *CEO* *Moderator: Ron J. Epstein, AMRS Aerospace & Defence Electronics, BofA Global Research*	
10.20 – 10.35am	**Coffee Break | Marble Ballroom**	
10.35 – 11.15am	**Siemens AG** Ralf Thomas, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Vontier Corp** Anshooman Aga, *CFO* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*
11.25 – 12.05pm	**Parker-Hannifin Corp** Jennifer Parmentier, *CEO* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**Expert Speaker: Rementum Research and Management** Carl Holmquist, *Executive Chairman* Douglas Floyd, *Managing Director of Germany, Continental Europe and North America* *Moderators: Michael Feniger, AMRS Industrial Machinery, BofA Global Research & Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
12.15 – 12.55pm	**Rolls-Royce Holdings PLC** Tufan Erginbilgic, *CEO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**12.05 – 1.05pm** **Lunch | Marble Ballroom**
1.05 – 1.45pm	**ITT Inc** Luca Savi, *CEO* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**Signify NV** Eric Rondolat, *CEO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
1.55 – 2.35pm	**Timken Co/The** Philip Fracassa, *Executive Vice President, CFO* *Moderator: Michael Feniger, AMRS Industrial Machinery, BofA Global Research*	**Parsons Corp** Carey Smith, *Chair, President & CEO* Matt Ofilos, *CFO* *Moderator: Mariana Perez Mora, AMRS Aerospace & Defence Electronics, BofA Global Research*

Companies hosting 1-1/group meetings

ABB Ltd - *IR*
Arcadis – *CEO, CFO, IR*
Atlas Copco AB - *IR*
BAE Systems PLC – *CEO, CFO, IR*
Dassault Aviation SA - *IR*
Deere & Co – *CTO, IR*
Epiroc AB – *CFO, IR*
Fortive Corp – *CFO, IR*
General Electric - *IR*
Hensoldt AG – *CFO, IR*
Howmet Aerospace – *CEO, CFO, IR*
ITT – *CEO, CFO, IR*
Jacobs Engineering Group Inc – *CEO, IR*
Metso Corporation – *CEO, IR*
MTU Aero Engines AG - *IR*
NKT A/S – *CEO, IR*
Parker-Hannifin Corp – *CEO, IR*
PARSONS CORP – *CEO, CFO, IR*
RBC Bearings Inc - *COO*
Rolls-Royce Holdings PLC – *CEO, IR*
Safran SA - *IR*
Siemens AG – *CFO, IR*
Signify NV – *CEO, IR*
Stadler Rail AG – *CFO, IR*
Teledyne Technologies Inc – *CEO, Vice Chair*
Timken Co/The - *CFO, IR*
Vontier – *CFO, IR*
Wabtec Corp – *CFO, IR*

2.35 – 2.50pm	**Coffee Break | Marble Ballroom**	
2.50 – 3.30pm	**Fortive Corp** Chuck McLaughlin, *SVP & CFO* Elena Rosman, *VP, Investor Relations* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**Hensoldt AG** Christian Ladumer, *CFO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
3.40 – 4.20pm	**Expert Speaker: Discussing the Outlook for Grid Infrastructure Investment** Wilfried Breuer, *Managing Director,* Maschinenfabrik Reinhausen *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
5.10pm	**Conference Drinks | Hotel Bar**	

Wednesday, 20 March 2024 - The Landmark Hotel London

7.15am	Registration & Light Breakfast		
Location	**Track 1** **Grand Ballroom 1**	**Track 2** **Grand Ballroom 2**	**Companies hosting 1-1/group meetings**
7.50 – 8.00am	**Opening Remarks** **Ben Heelan**, *EMEA Capital Goods, Aerospace & Defence, BofA Global Research*		**AerCap Holdings NV** – *CFO, IR* **AGCO Corp** – *SVP – Fendth & Valtra – GM EME, IR* **Allegion PLC** – *CFO, IR* **Ariston Group** – *CEO, IR* **Ashtead Group** – *CFO, IR* **Assa Abloy AB** - *IR* **BAE Systems PLC** – *IR* **Boeing Co/The** – *CFO, IR* **BWX Technologies Inc** – *CEO, CFO* **Canadian National Railway Co** – *CFO, IR* **Chart Industries** – *CEO, IR* **Dassault Aviation SA** - *IR* **Eaton Corp PLC** – *COO, IR* **Epiroc AB** – *CFO, IR* **ESAB Corp** – *CFO, IR* **Halma PLC** – *CFO, IR* **Herc Holdings Inc** – *CEO, CFO, IR* **Hexagon AB** – *CEO, IR* **Industrie de Nora Spa** – CFO **IPG Photonics Corp** - *IR* **Kongsberg Gruppen ASA** – *CFO, IR* **Montana Aerospace** – *Co-CEO & CFO, IR* **MSA Safety** – *CFO, IR* **Nexans SA** – *CEO & CFO, IR* **Rexel SA** – *CEO, CFO, IR* **Rheinmetall AG** – *CEO, IR* **Rockwell Automation Inc** – *SVP, Intelligent Devices, IR* **Prysmian SpA** - *CEO, CFO, IR* **Safran SA** - *IR* **Siemens AG** – *CFO, IR* **SKF AB** – *CTO, IR* **Spectris PLC** – *CFO, IR* **Wabtec Corp** – *CFO, IR*
8.00 – 8.40am	**Prysmian SpA** Massimo Battaini, *CEO-Designate & COO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**SKF AB** Annika Ölme, *CTO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
8.50 – 9.30am	**Hexagon AB** Paolo Guglielmini, *CEO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Halma PLC** Funmi Adegoke, *Sector Chief Executive, Safety* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
9.40 – 10.20am	**Boeing Co/The** Brian West, *CFO & Executive Vice President, Finance* *Moderator: Ron J. Epstein, AMRS Aerospace & Defence Electronics, BofA Global Research*	**Herc Holdings Inc** Larry Silber, *President & CEO* Mark Humphrey, *SVP & CEO* *Moderator: Sherif El-Sabbahy, AMRS Industrial Machinery, BofA Global Research Team*	
10.20 – 10.35am	**Coffee Break | Marble Ballroom**		
10.35 – 11.15am	**Ashtead Group** Michael Pratt, *CFO* *Moderator: Arnaud Lehmann, Head of EMEA Building and Construction, BofA Global Research Team*	**Rheinmetall AG** Armin Papperger, *CEO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
11.25 – 12.05pm	**Rexel SA** Guillaume Texier, *CEO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Nexans SA** Jean-Christophe Juillard, *Deputy CEO & CFO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
12.05 – 1.05pm	**Lunch | Marble Ballroom**		
1.05 – 1.45pm	**Ariston Group** Maurizio Brusadelli, *CEO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Chart Industries** Jill Evanko, *President & CEO* *Moderator: Saurabh Pant, US Energy Services, BofA Global Research*	
1.55 – 2.35pm	**Spectris PLC** Derek Harding, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*		

2.35 – 2.50pm	**Coffee Break | Marble Ballroom**	
2.50 – 3.30pm	**Rockwell Automation** Tessa Myers, *SVP Intelligence Devices* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**AerCap Holding NV** Peter Juhas, *CFO* *Moderator: Ron J. Epstein, AMRS Aerospace & Defence Electronics, BofA Global Research*
3.40 – 4.20pm	**Allegion PLC** Mike Wagnes, *SVP & CFO* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**Kongsberg Gruppen ASA** Mette Toft Bjørgen, *CFO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
5.10pm	**Conference Drinks | Hotel Bar**	

Thursday, 21 March 2024 - The Landmark Hotel London

7.15am	Registration & Light Breakfast	
Location	**Track 1** **Grand Ballroom 1**	**Track 2** **Grand Ballroom 2**
8.00 – 8.40am	**Aalberts NV** Stéphane Simonetta, *CEO* Rutger Relker, *Director of IR* Moderator: *Elliott Robinson, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Iveco Group** Gerrit Marx, *CEO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
8.50 – 9.30am	**Leonardo SpA** Roberto Cingolani, *CEO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Knorr-Bremse AG** Frank Markus Weber, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
9.40 – 10.20am	**Carrier Global Corp** Patrick Goris, *SVP & CFO* *Moderator: Andrew Obin, AMRS Multi-Industry and Engineering and Construction, BofA Global Research*	**KION Group AG** Christian Harm, *CFO* *Moderator: Ben Heelan, EMEA Aerospace & Defence, BofA Global Research*
10.20 – 10.35am	**Coffee Break | Marble Ballroom**	
10.35 – 11.15am	**Daimler Truck** Martin Daum, *CEO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Fluidra SA** Javier Tintore, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
11.25 – 12.05pm	**Siemens Energy** Maria Ferraro, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
12.05 – 1.05pm	**Lunch | Marble Ballroom**	
1.05 – 1.45pm	**Airbus** Thomas Toepfer, *CFO* *Moderator: Ben Heelan, EMEA Aerospace & Defence, BofA Global Research*	
1.55 – 2.35pm	**Sandvik AB** Stefan Widing, *President & CEO* *Moderator: Ben Heelan, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
2.35 – 2.50pm	**Coffee Break | Marble Ballroom**	
2.50 – 3.30pm	**Alfa Laval AB** Tom Erixon, *CEO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	**Saab AB** Christian Luiga, *CEO* *Moderator: Virginia Montorsi, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*
3.40 – 4.20pm	**GEA Group AG** Bernd Brinker, *CFO* *Moderator: Alex Virgo, EMEA Capital Goods, Aerospace & Defence, BofA Global Research*	
5.10pm	**Conference Drinks | Hotel Bar**	

Companies hosting 1-1/group meetings

Aalberts NV – CEO, IR
Airbus - *CFO (fireside chat only)*
Alfa Laval AB – *CEO, IR*
Assa Abloy AB - *IR*
Carrier Global Corp – *CFO, IR*
Daimler Truck – *CEO, IR*
Eaton Corp PLC – *COO, IR*
Fluidra SA – *Chairman, CFO, IR*
GEA Group AG – *CFO, IR*
Hexcel Corp - CFO
IMI PLC – *IR*
Iveco Group – *CEO, CFO, IR*
KION GROUP AG – *CFO, IR*
Knorr-Bremse AG – CFO, IR
Legrand SA - *IR*
Leidos Holdings Inc – *CEO, IR*
Leonardo SpA – *CEO*
PACCAR – *CFO, IR*
Saab AB – *CFO/Deputy CEO, IR*
Sandvik AB – *CEO, IR*
Siemens Energy AG – *CFO, IR*
Traton SE – *CFO, IR*

Disclaimers

Background on the BofA Industrial Momentum Indicator

This is not your typical regression

The primary analytics method used in our analysis is called principal component analysis, which differs from a typical linear regression. Principal component analysis is a mathematical technique that converts a set of possibly correlated variables into linearly uncorrelated variables called principal components. As most of our inputs are correlated with each other, we found principal component analysis to be an appropriate choice. We then determined a subset of the principal components (derived from our inputs) which are added together to create a series that best correlates with the target variable, or Global Manufacturing PMI.

Methodology

Our BofA Industrial Momentum Indicator was developed using principal component analysis, or PCA. Under this approach, the input data series are first standardized using their respective means and standard deviations. PCA converts the original five data series (which are likely correlated) into five new data series that are uncorrelated with each other. These five new data series are called the principal components, or PCs, and each is a combination of the five original data series, weighted and added together (see Table 3). Each PC represents a portion of the total variance of the original data series.

Exhibit 65: "Principal components" weights by input
Weights by input

Inputs	PC1	PC2	PC3	PC4	PC5
Net % overweight in Basic Materials	0.32	0.80	-0.05	0.51	-0.01
Net % say global profit will improve	0.41	0.25	-0.51	-0.71	-0.01
LME Copper cash ($)	0.38	0.11	0.84	-0.34	-0.13
BofA Truckload Diffusion Indicator (Demand)	0.52	-0.42	-0.17	0.29	-0.66
BofA Truckload Rates Indicator (Rates)	0.55	-0.34	-0.01	0.19	0.74

Source: BofA Global Research

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We then ran an exhaustive list of various combinations of the PCs against the target variable (Global Manufacturing PMI) to determine the correlation for each combination. This results in a table of the various combinations of the PCs and their respective results, which we use to choose a combination (based on our discretion) that we found had a high correlation to be our indicator.

Framework specification

Based on the results from the principal component analysis, our BofA Industrial Momentum Indicator is PC1+PC2+PC5. As a way of back-testing the model, we split the model into training (range: August 2012 – April 2018) and test (May 2018 – January 2019) periods. This combination results in a correlation with Global Manufacturing PMI during the training period of 0.70 and during the test period of 0.97.

Exhibit 66: Components of BofA Industrial Momentum Indicator
Components

Inputs	PC1	PC2	PC5	Indicator Weights(PC1+PC2+PC5)
Net % overweight in Basic Materials	0.32	0.80	-0.01	1.11
Net % say global profit will improve	0.41	0.25	-0.01	0.65
LME Copper cash ($)	0.38	0.11	-0.13	0.36
BofA Truckload Diffusion Indicator (Demand)	0.52	-0.42	-0.66	-0.56
BofA Truckload Rates Indicator (Rates)	0.55	-0.34	0.74	0.95

Source: BofA Global Research

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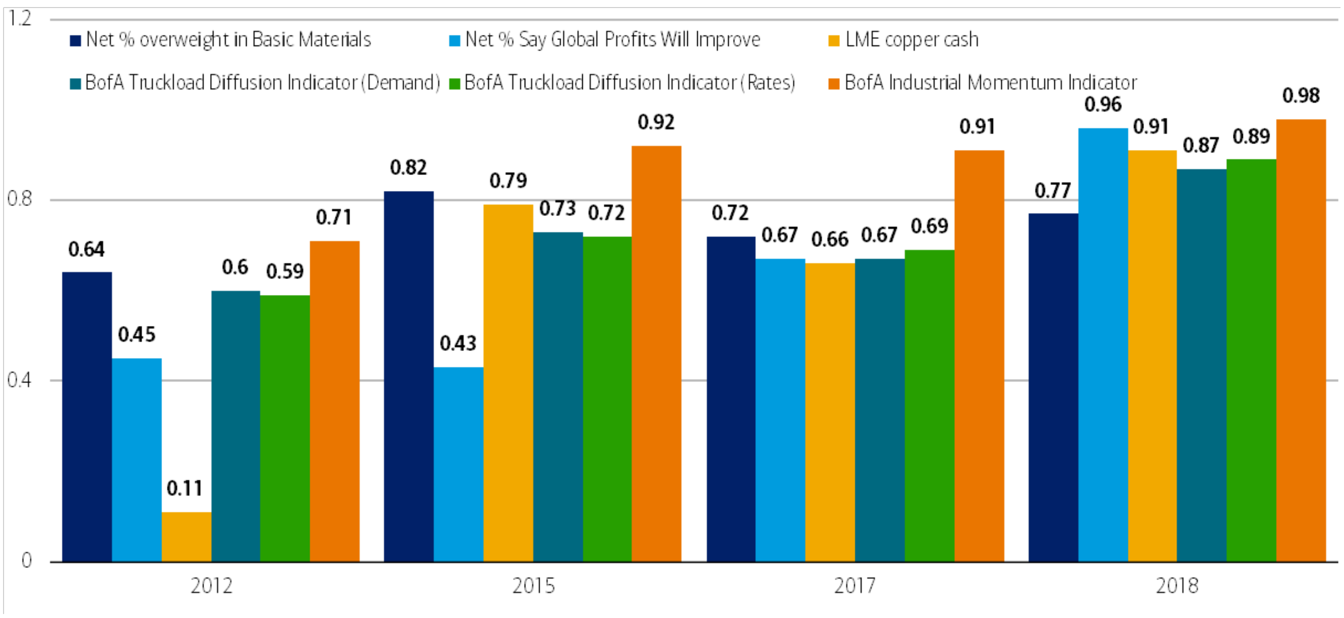
These components can then be combined to give a final indicator:

Indicator = (Net % overweight in Basic Materials Sector) x 1.11 +
(Net % say global profit will improve) x 0.65+
(LME copper cash) x 0.36 +
(BofA Truckload Diffusion Indicator (Demand)) x -0.56 +
(BofA Truckload Diffusion Indicator (Rates)) x 0.95

Indicator Performance Comparison

We have observed that none of the individual inputs is as highly correlated to the Global Manufacturing PMI as the BofA Industrial Momentum Indicator.

Exhibit 67: Correlation: We have observed that none of the individual inputs is as highly correlated to the Global Manufacturing PMI as the BofA Industrial Momentum Indicator
Correlation analysis



Source: BofA Global Research

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Risks to our Indicator

Fund managers positioning in basic materials and shipping manager's rate expectations have the highest weightings in the BofA Industrial Momentum Indicator. Changes in these inputs may significantly impact the Indicator. Additionally, any spikes in the copper market due to supply events rather than demand could impact the Indicator.

Historical framework testing

In order to test the model over various historical time periods, a rolling 2-year window (starting 2013) correlation of the modeled indicator and the corresponding historical target variable was examined. According to our backtest, the overall average correlation across all 2 year rolling windows is 0.82.

The performance of the Indicator as set out in this report is backtested and does not represent the actual performance of any account or fund. Backtested performance depicts the hypothetical backtested performance of a particular strategy over the time period indicated. In future periods, market and economic conditions will differ and the same strategy will not necessarily produce the same results. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein. In fact, there are frequently sharp differences between backtested returns and the actual results realized in the actual management of a portfolio. Backtested performance results are created by applying an investment strategy or methodology to historical data and attempts to give an indication as to how a strategy might have performed during a certain period in the past if the product had been in existence during such time. Backtested results have inherent limitations including the fact that they are calculated with the full benefit of hindsight, which allows the security selection methodology to be adjusted to maximize the returns. Further, the results shown do not reflect actual trading or the impact that material economic and market factors might have had on a portfolio manager's decision-making under actual circumstances. Backtested returns do not reflect advisory fees, trading costs, or other fees or expenses.

BofA Japan FA Indicator

Disclaimer: The BofA Japan FA Indicator is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. The indicator was not created to act as a benchmark.

Notes:

1. This performance is back-tested and does not represent the actual performance of any account or fund. Back-tested performance depicts the theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein.

2. Back-tested data are highlighted, and data from April 15, 2019 are based on actual performance.

Disclosures

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