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1Q2022

Reports
ITR Economics

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Economic Overview

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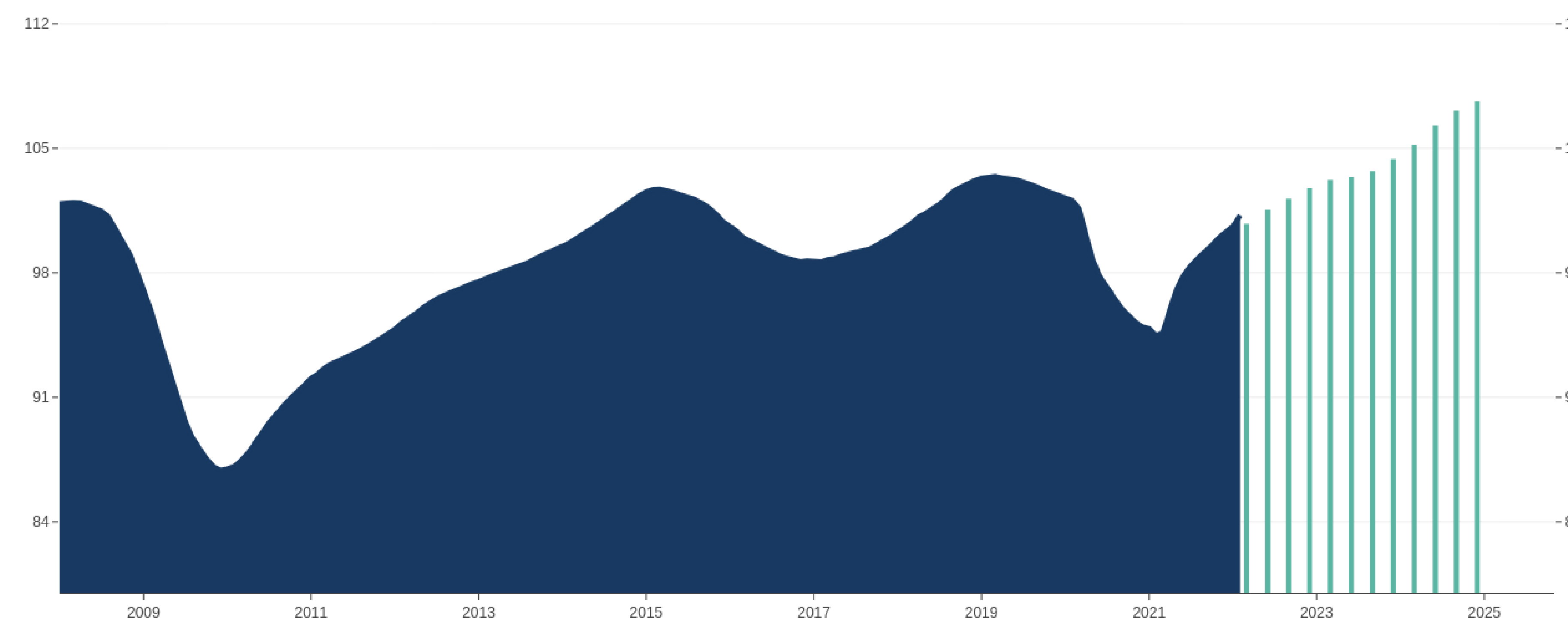
Please note: At ITR Economics, we confine our analysis to the economic impact of events. That does not mean we assign primacy to the economics, and it does not diminish our personal anguish over the pain, suffering, and loss of life resulting from Russia's invasion of Ukraine.

Economic fundamentals that predate the war in Ukraine are pushing the global economy onto the back side of the business cycle. US Real Gross Domestic Product (GDP) is already in a slowing growth trend, and industrial production, retail sales, and business-to-business capex spending are on the cusp of slowing growth. Forward-looking indicators unanimously signal cyclical decline in the quarters ahead, and our business cycle theory points to a 2023 cyclical low for markets that move in tandem with the US macroeconomy. Notable exceptions to this timing are construction markets. US Single-Unit Housing Starts typically lead the macroeconomy and will likely reach a cyclical low this year, while nonresidential construction lags the macroeconomy and is expected to reach a low during 2024.

These expectations all predate the recent volatility and uncertainty caused by the war in Ukraine. The length and breadth of the conflict, as well as the types of weapons used, will determine the impact to the economy. The unknowns are significant, but the knowns at this point do not warrant a change to our macroeconomic expectations.

US Industrial Production Index
Annual Average (12MMA)



Before we discuss further, take solace that the US economy is very sizable: it takes significant and sustained pressure to knock it off course, and history tells us that economic fundamentals prevail in the long run. However, the economy is more sensitive to additional downside pressures when it is in a cyclical declining trend. While Ukraine and Russia are minor destinations for US exports , the conflict and related sanctions have already had economic effects in the US. This is partly due to the interconnectivity of the global economy, and it is especially evident in commodity markets.

One of the early and well-published impacts to the US consumer has been higher prices at the pump. Demand for gas is relatively inelastic, so elevated gas prices will cut into consumers' budgets at a time when inflation, at multi-decade highs, is already reducing their purchasing power. This is important because the consumer is the backbone of the economy. We are paying close attention to the balance of negative and positive indications for the US consumer. While these recent hits to purchasing power are concerning, the consumer has built up savings and has a low debt-to-income ratio.

US businesses will be likely be impacted by the Ukraine conflict through higher commodity prices and exacerbated supply chain disruptions. Heightened uncertainty could reduce willingness to invest in new machinery or systems, hindering capex spending. The impact will not be distributed evenly. The automotive industry is likely more sensitive to supply chain disruptions. Companies with significant exposure to European customers could be impacted more severely, as Europe is experiencing exaggerated effects, especially with regard to energy prices. The defense sector could benefit if the US becomes more involved or an arms race ensues. The US oil and gas sector is already benefiting from the recent spike in prices, and political pressure to increase production could result in more drilling.

We still expect a "soft landing" for the US economy, culminating in flat, but not declining, GDP. Some individual markets are forecast to decline this cycle, but we expect the decline will be mild relative to historical norms. As we gain clarity surrounding the length and breadth of the Ukraine conflict, we will continue to assess the long-run economic impact. Our social media posts and blogs will include timely updates on our perspective. We encourage you to follow along.

Our advice is to stay calm at the helm. Lead with confidence, knowing that after the volatility resolves, economic fundamentals will drive the economy – and our forecasts are based on those economic fundamentals. Try to see past the headlines and keep an eye on the future. Investing in efficiency gains, labor-saving technology, and your competitive advantages while interest rates are still low will be a winning strategy.

Terminology and Methodology

Data Trends: Moving Averages and Totals

Quarterly Average *(Three-Month Moving Average, or 3MMA)*
The average of the latest three months of data, updated every month. In the example, $57.79 is the quarterly average for the three months ending in March 2021 (i.e., the average for January, February, and March 2021).

Example: Monthly US Crude Oil Spot Prices averaged $57.79 in the first quarter of 2021, a 26.3% increase from the first quarter of 2020.

Quarterly Total *(Three-Month Moving Total, or 3MMT)*
The total of the latest three months of data, updated every month. In the example, $257.8 billion is the quarterly total for the three months ending in February 2021 (i.e., the total for December 2020, January 2021, and February 2021).

Example: Quarterly US Capital Goods New Orders totaled $257.8 billion in February 2021.

Annual Average *(12-Month Moving Average, or 12MMA)*
The average of the latest 12 months of data, updated every month. In the example, 119.0 million is the annual average for February 2021 (i.e., the average for the 12-month period from March 2020 through February 2021).

Example: US Private Sector Employment averaged 119.0 million workers during the 12 months through February 2021, down 7.5% from one year earlier.

Annual Total *(12-Month Moving Total, or 12MMT)*
The total of the latest 12 months of data, updated every month. In the example, $5.849 trillion is the annual total for February 2021 (i.e., the total for the 12-month period from March 2020 through February 2021).

Example: US Wholesale Trade totaled $5.849 trillion during the 12 months through February 2021.

Growth Rates

Monthly Growth Rate *(1/12 Rate-of-Change)*
The percentage change between a given month and the same month one year earlier. In the example, 79.3% is the monthly growth rate for March 2021.

Example: Monthly US Copper Futures Prices were at $4.00 per pound in March 2021, 79.3% above the March 2020 level of $2.29.

Quarterly Growth Rate *(3/12 Rate-of-Change)*
The percentage change between a three-month period and the same three-month period from one year earlier. In the example, 26.3% is the quarterly growth rate for March 2021.

Example: US Crude Oil Spot Prices averaged $57.79 in the first quarter of 2021, a 26.3% increase from the first quarter of 2020.

Annual Growth Rate *(12/12 Rate-of-Change)*
The percentage change between a 12-month period and the same 12-month period from one year earlier. In the example, -7.5% is the annual growth rate for February 2021; that is, US Private Sector Employment during March 2020 through February 2021 came in 7.5% below Employment from March 2019 through February 2020.

Example: US Private Sector Employment averaged 119.0 million workers during the 12 months through February 2021, down 7.5% from one year earlier.

Business Cycle Phases

Recovery (A)

The annual growth rate (12/12) is rising, but the rate of growth is still negative. We denote this phase with blue (for improving).

Accelerating Growth (B)

The annual growth rate (12/12) is rising, and the rate of growth is positive. We denote this phase with green (for go).

Slowing Growth (C)

The annual growth rate (12/12) is positive, but the rate of growth is declining. We denote this phase with yellow (for caution).

Recession (D)

The annual growth rate (12/12) is declining, and the rate of growth is negative. We denote this phase with red (for warning).

IMEC Markets Dashboard

		Current		Annual Growth Rate Forecast (12/12), Year-End*		
Page Number	Indicator	Growth Rate**	Phase	2022**	2023**	2024**
4	US Industrial Production Index	7.1%	B	2.8%	1.6%	3.1%
5	US Nondefense Capital Goods New Orders (excluding aircraft)	15.1%	B	7.3%	4.2%	6.9%
6	US Machinery New Orders	18.8%	B	6.7%	6.3%	8.3%
7	US Food Production Index	3.0%	B	3.3%	1.2%	1.5%
8	US Medical Equipment and Supplies Production Index	9.1%	B	4.3%	0.1%	4.1%

**Coloring denotes the business cycle phase at year-end. For example, if a value in the 2021 column is colored blue, the corresponding indicator is forecasted to be in Phase A, Recovery, at year-end 2021. Green denotes Phase B, yellow Phase C, and red Phase D.*

***Annual growth rate (12/12) except where otherwise noted.*

Recovery (A) Accelerating Growth (B) Slowing Growth (C) Recession (D)

US Industrial Production Index

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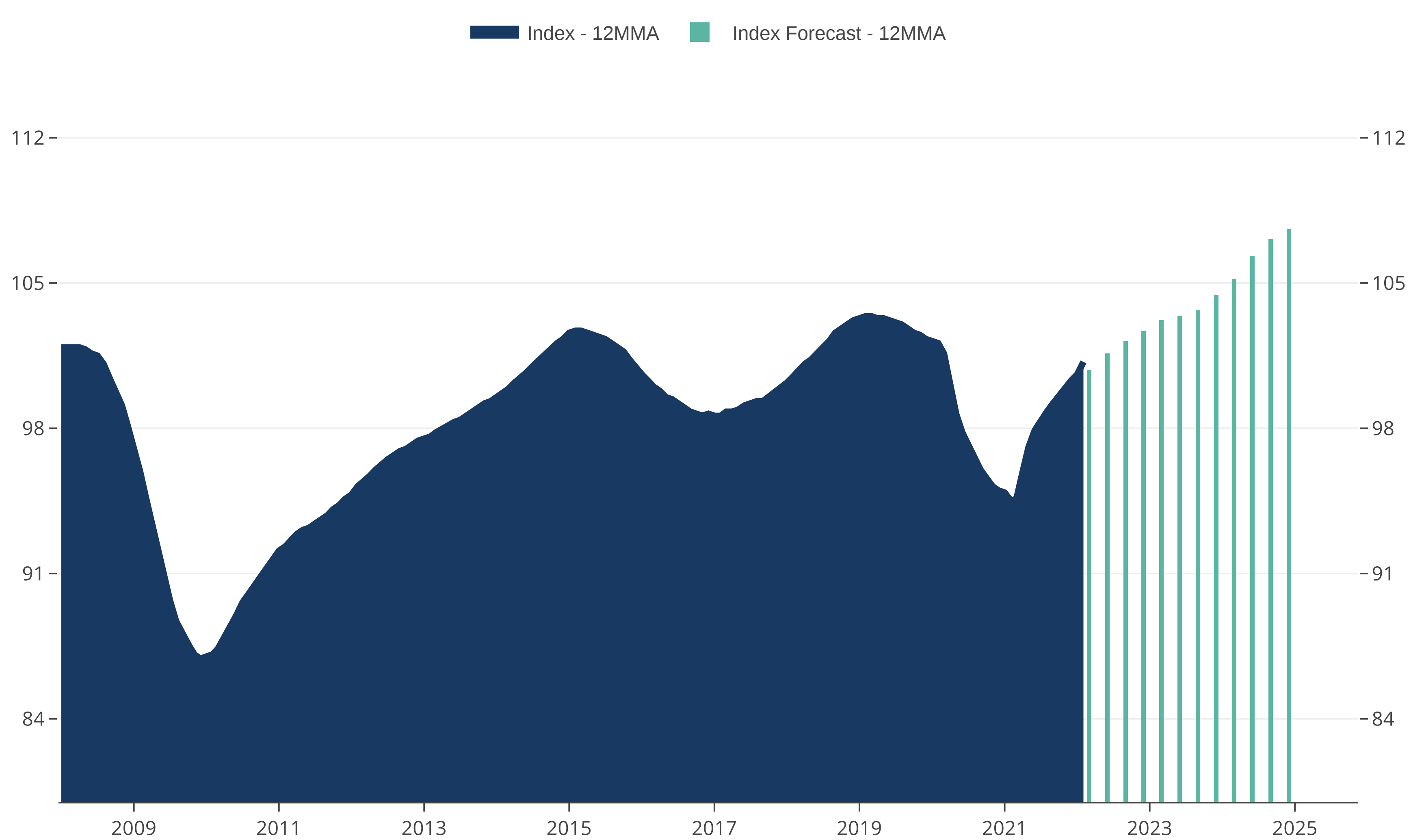
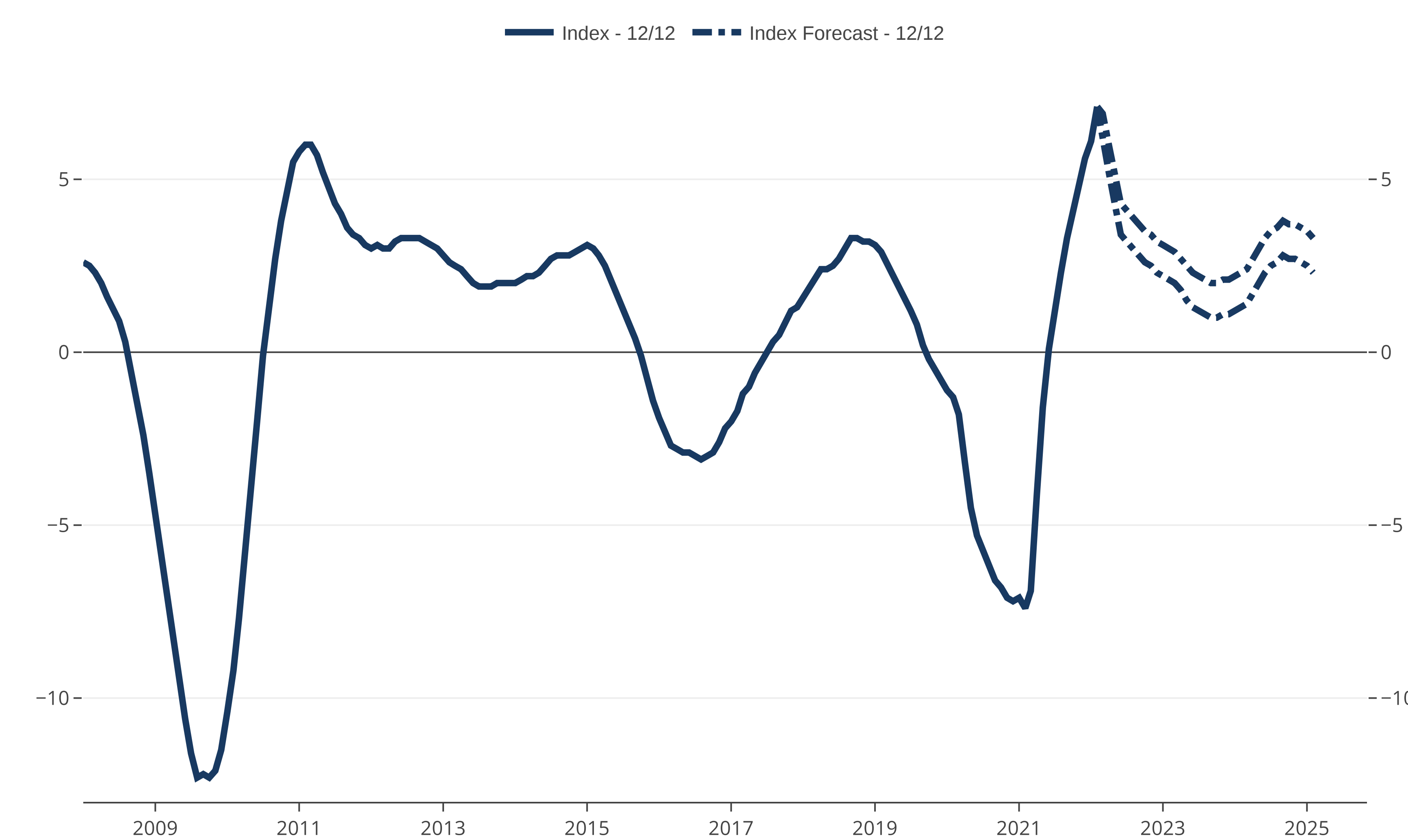
Transition to Slowing Growth Imminent; Growth Rate to Diminish Into Late 2023

Annual Average (12MMA)



Annual Growth Rate (12/12)



Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- February 2022 Annual Growth Rate (12/12): 7.1%
- February 2022 Annual Average (12MMA), 2017=100: 101.2

Industry Outlook

Year	Annual Growth Rate
2022	2.8%
2023	1.6%
2024	3.1%

Outlook & Supporting Evidence

- Annual Production will rise through at least 2024, surpassing the prior record high around mid-2023.
- The manufacturing segment of Industrial Production has recovered 75% of the activity lost during the pandemic, while mining has only recovered 42% of lost activity. Expect mining's heretofore relatively slow recovery to give way to more robust growth, which will be spurred by high commodity prices. The oil and gas market in particular could be an area of opportunity as Phase B, Accelerating Growth, will last into late this year, longer than the overall industrial sector. Manufacturing growth, however, will slow imminently.
- The consumer is in a healthy financial position after building up savings during the pandemic and paying down debts. Consumers are the backbone of the economy and are expected to help drive growth in the coming years, albeit at a slower pace than in 2021.
- Downside risks to our outlook include a protracted or broadened war in Ukraine, which would exacerbate labor shortages, and the possibility of new COVID-19 variants. Upside risks include unanticipated tailwinds from the stimulus and reshoring activity.
- Lead with confidence. We are forecasting a "soft landing" this cycle, in which Production Production undergoes slowing growth but avoids Phase D, Recession at the low of the cycle.

US Nondefense Capital Goods New Orders (excluding aircraft)

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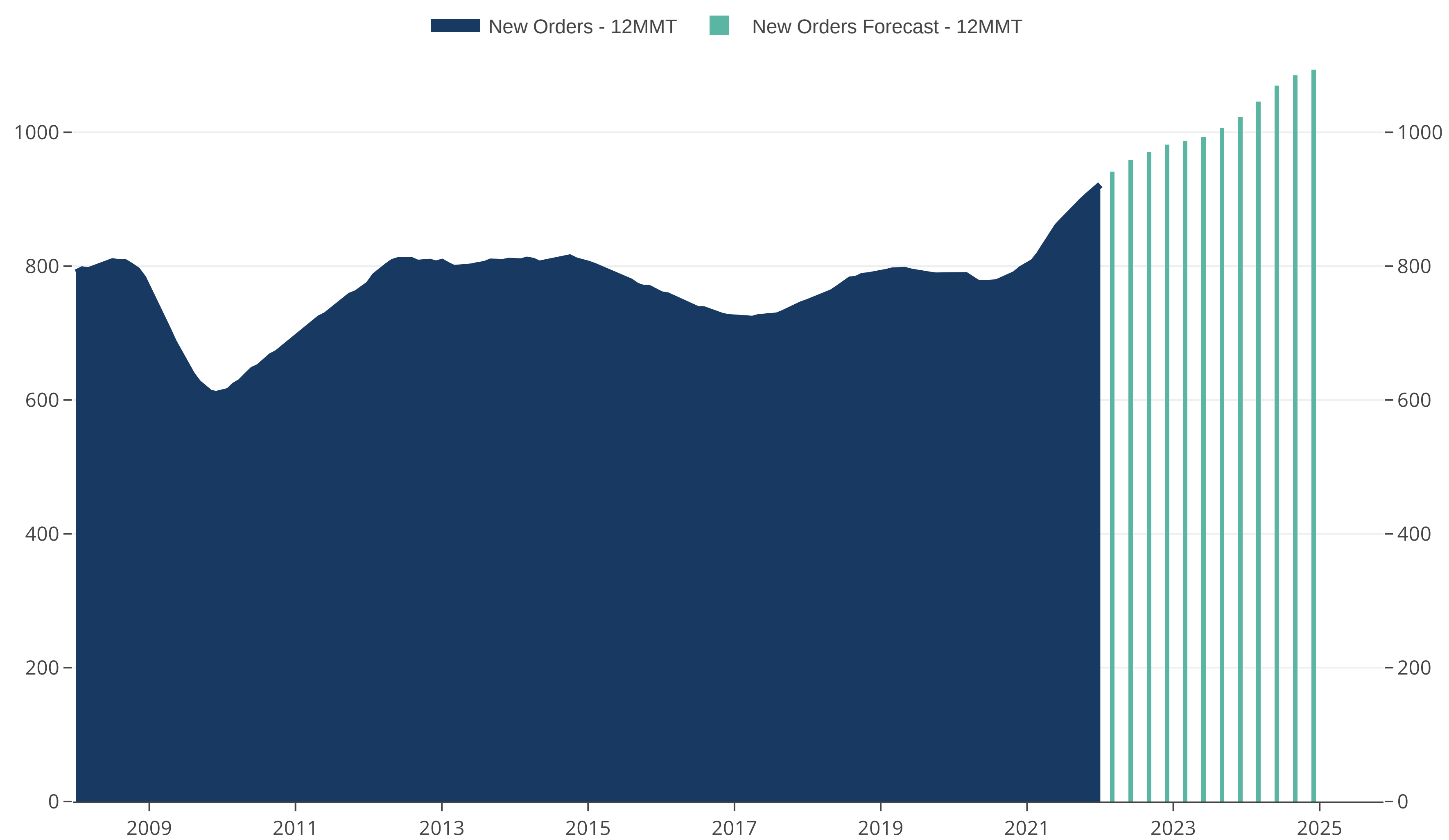
Record-High Corporate Profits Bode Well for New Orders Rise, but Expect a Slowing Pace of Growth

Annual Total (12MMT)



Annual Growth Rate (12/12)

Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- January 2022 Annual Growth Rate (12/12): 15.1%
- January 2022 Annual Total (12MMT), Billions of USD: $921.6

Industry Outlook

Year	*Annual Growth Rate*
2022	7.3%
2023	4.2%
2024	6.9%

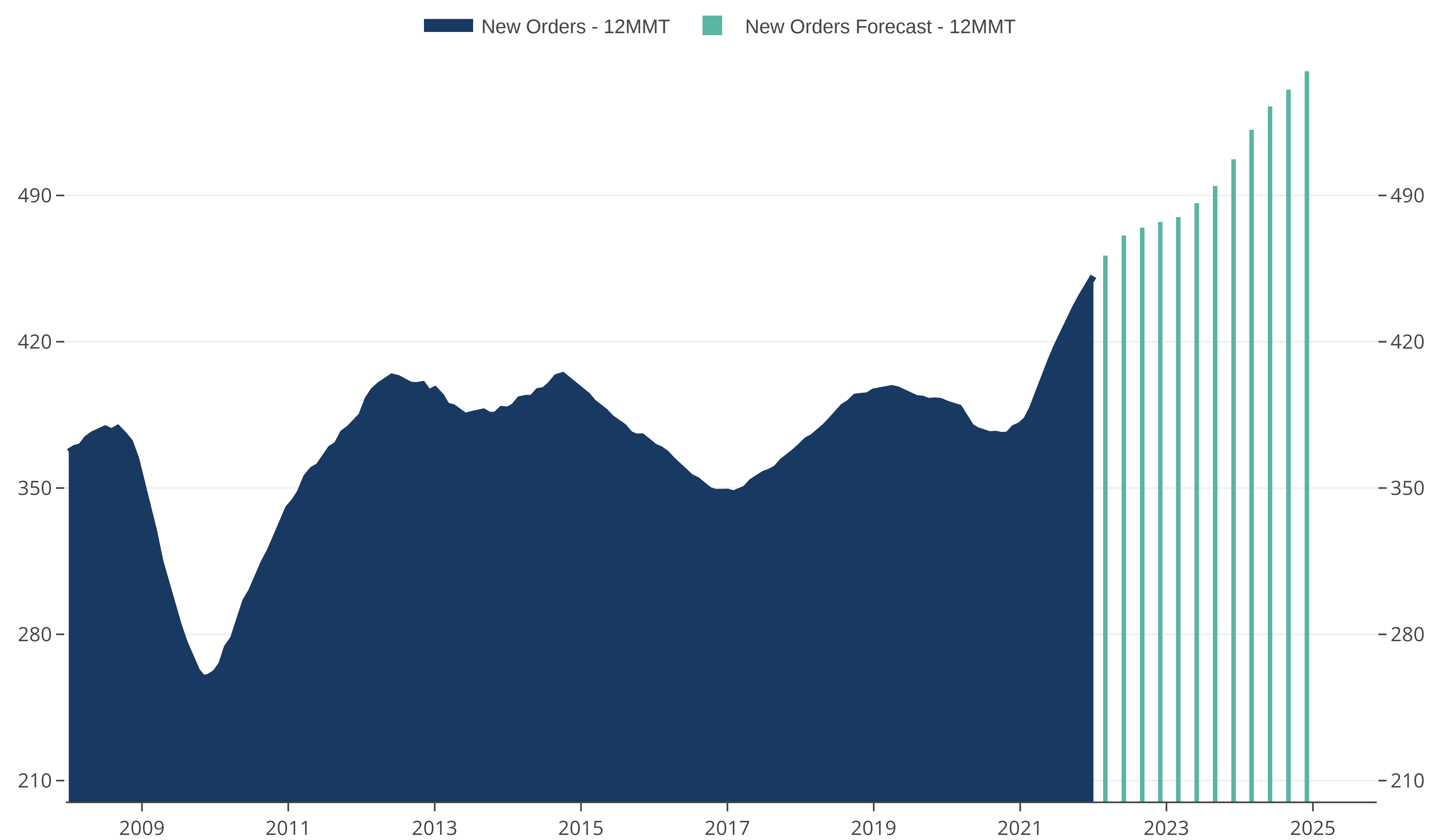
Outlook & Supporting Evidence

- US Nondefense Capital Goods New Orders (excluding aircraft) totaled $921.6 billion in the 12 months through January, up 15.1% from one year prior. The annual growth rate is the highest since the 1980s; however, we expect that growth rate to peak imminently. Growth will then slow into the second half of 2023.
- Our outlook calls for rise in annual New Orders through at least 2024.
- Elevated prices are contributing to the accelerating rise in dollar-denominated New Orders. Inflation-adjusted New Orders have already transitioned to Phase C, Slowing Growth. Monitor both dollars- and unit-based measures for your company in the coming years, as the inflationary environment has shifted relative to what we became accustomed to in the 2010s.
- While the pace of growth has slowed, quarterly US Nonfinancial Industries Corporate Profits With Capital Consumption Adjustments were at a record high in the fourth quarter of 2021. This signals healthy balance sheets for US businesses, aligning with our outlook for growth in New Order in the quarters to come, albeit at a slower pace.

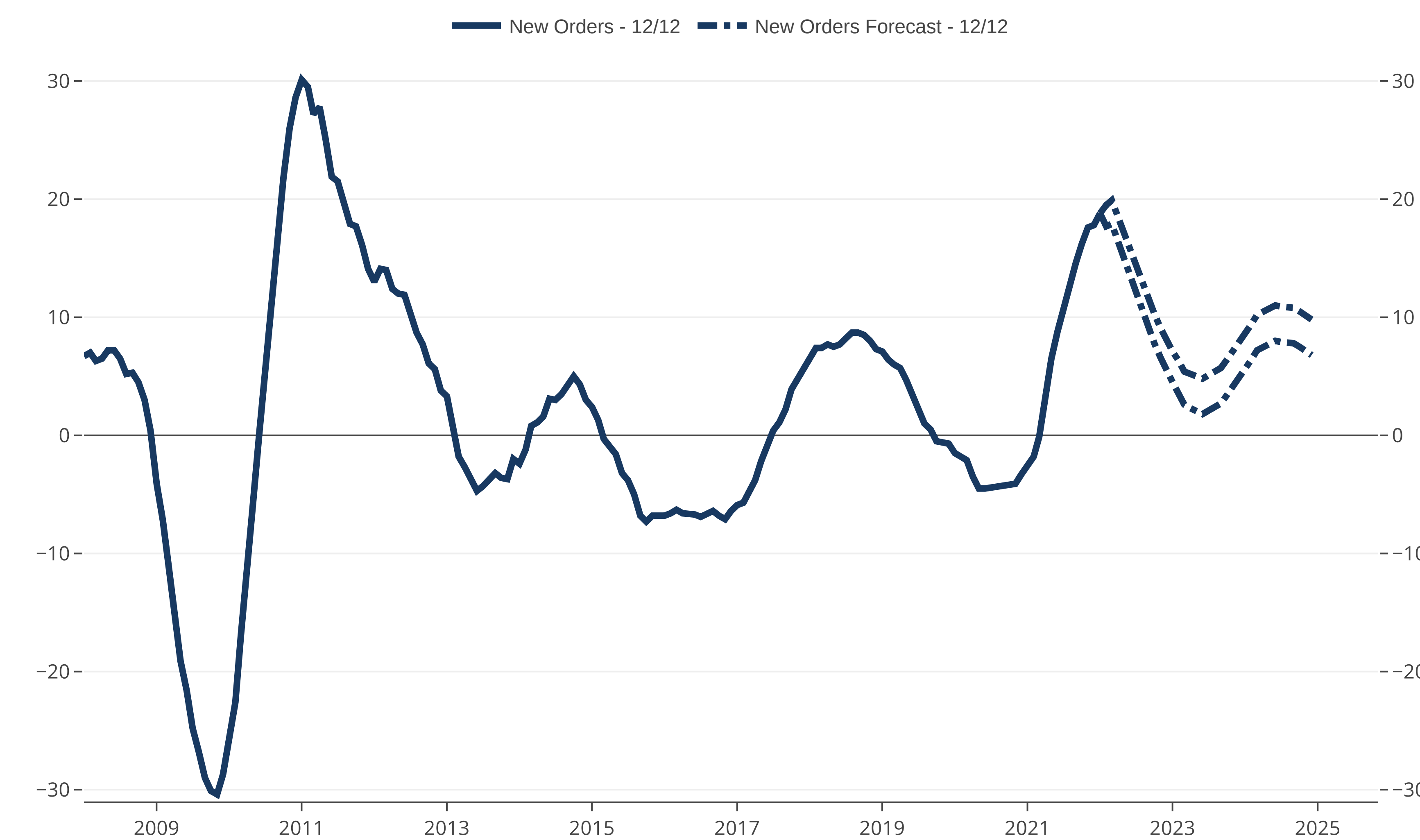
US Machinery New Orders

Unfilled Orders and Capacity Utilization Trends Signal Growth Ahead, but at a Slowing Pace

Annual Total (12MMT)



Annual Growth Rate (12/12)



Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- January 2022 Annual Growth Rate (12/12): 18.8%
- January 2022 Annual Total (12MMT), Billions of USD: $451.3

Industry Outlook

Year	*Annual Growth Rate*
2022	6.7%
2023	6.3%
2024	8.3%

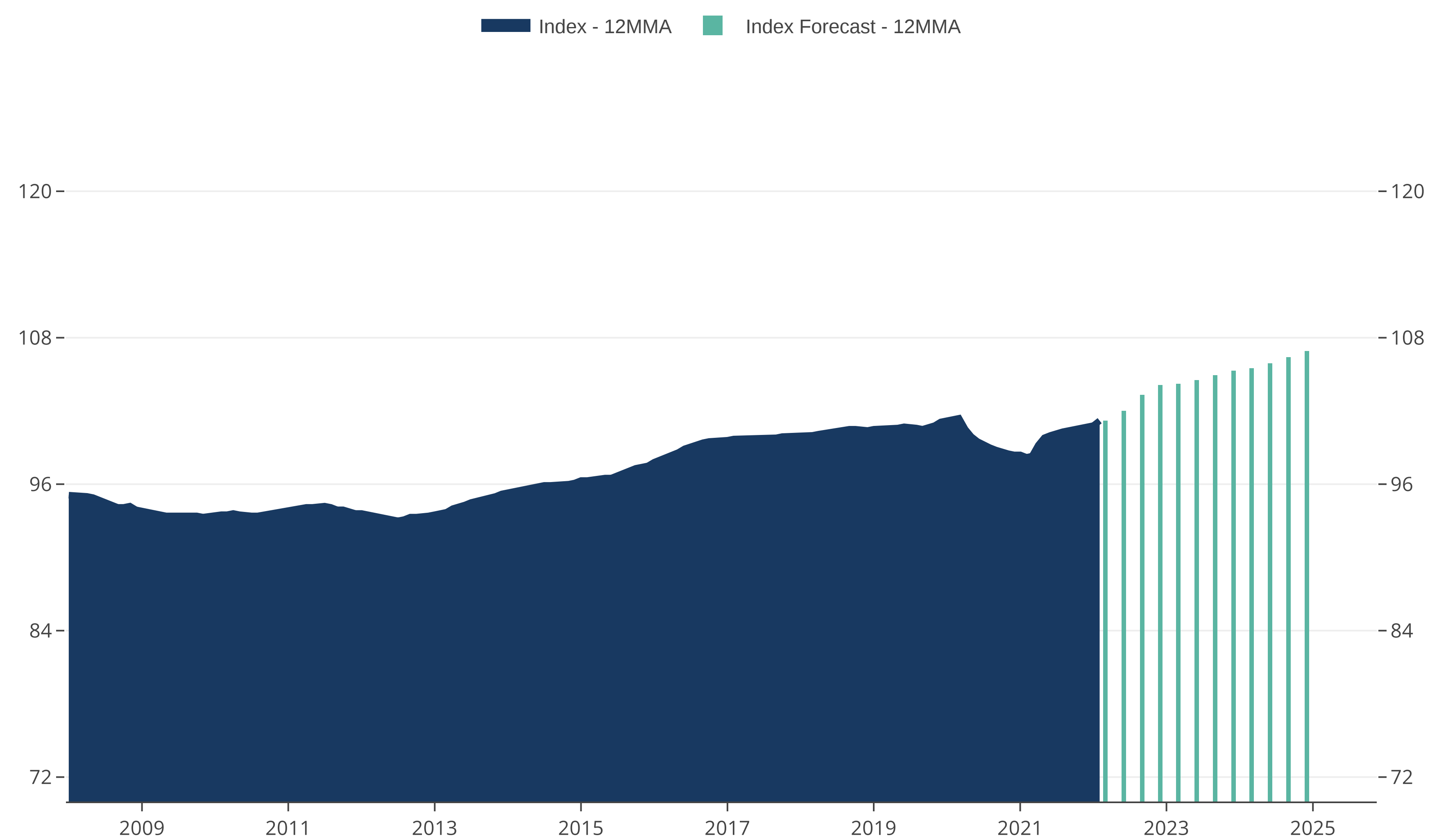
Outlook & Supporting Evidence

- Annual US Machinery New Orders came in at $451.3 billion in January, 18.8% higher than the previous year. We expect Phase C, Slowing Growth, to occur imminently. Expect annual New Orders to generally rise through at least 2024.
- US Consumer Durable Goods Unfilled Orders recently transitioned to a slowing growth trend, signaling that manufacturers' backlogs may be easing slightly. This could contribute to upcoming slowing growth in Machinery New Orders, but growth is still the most likely outcome, as US manufacturers are operating at a higher-than-normal capacity and will likely need to add capacity to take on rising demand in the coming years.
- Interest rates are rising but still low compared to the prior decade. Now is an opportune time to invest in your business. Additionally, slowing growth in the economy for much of this year and next could afford you more time to implement changes.

US Food Production Index

Above-Average Growth Expected This Year; Domestic Production to Rise to Replace Lost Imports

Annual Average (12MMA)



Annual Growth Rate (12/12)

Current Phase

Phase B
Accelerating
Growth

Current Indicator Amplitude

- February 2022 Annual Growth Rate (12/12): 3.0%
- February 2022 Annual Average (12MMA), 2017=100: 101.2

Industry Outlook

Year	Annual Growth Rate
2022	3.3%
2023	1.2%
2024	1.5%

Outlook & Supporting Evidence

- Annual Food Production is nearly even with the March 2020 record high. We expect further rise through at least 2024. We anticipate annual Production will generally rise every quarter through at least year-end 2024.
- As both Russia and Ukraine are major food sources for the world, the US will likely move to make up for some of the production associated with a shortfall caused by the war. This will result in a robust Production growth rate this year and an above-average growth rate in 2023 relative to most of the last decade.
- The US Consumer Food and Beverage Price Index in February 2022 was 7.6% higher than the February 2021 level. However, producers in upstream food production are reporting higher costs. The US Intermediate Food Materials Producer Price Index in was up 18.0% in February, and agriculture inputs such as fertilizer are up even more. The disparity in prices signals margin squeeze along the food supply chain.
- Labor markets are expected to remain tight in the coming years, which could pose an obstacle to food manufacturers. Manufacturers may look for creative new ways to automate in order to reduce dependence on labor.

US Medical Equipment and Supplies Production Index

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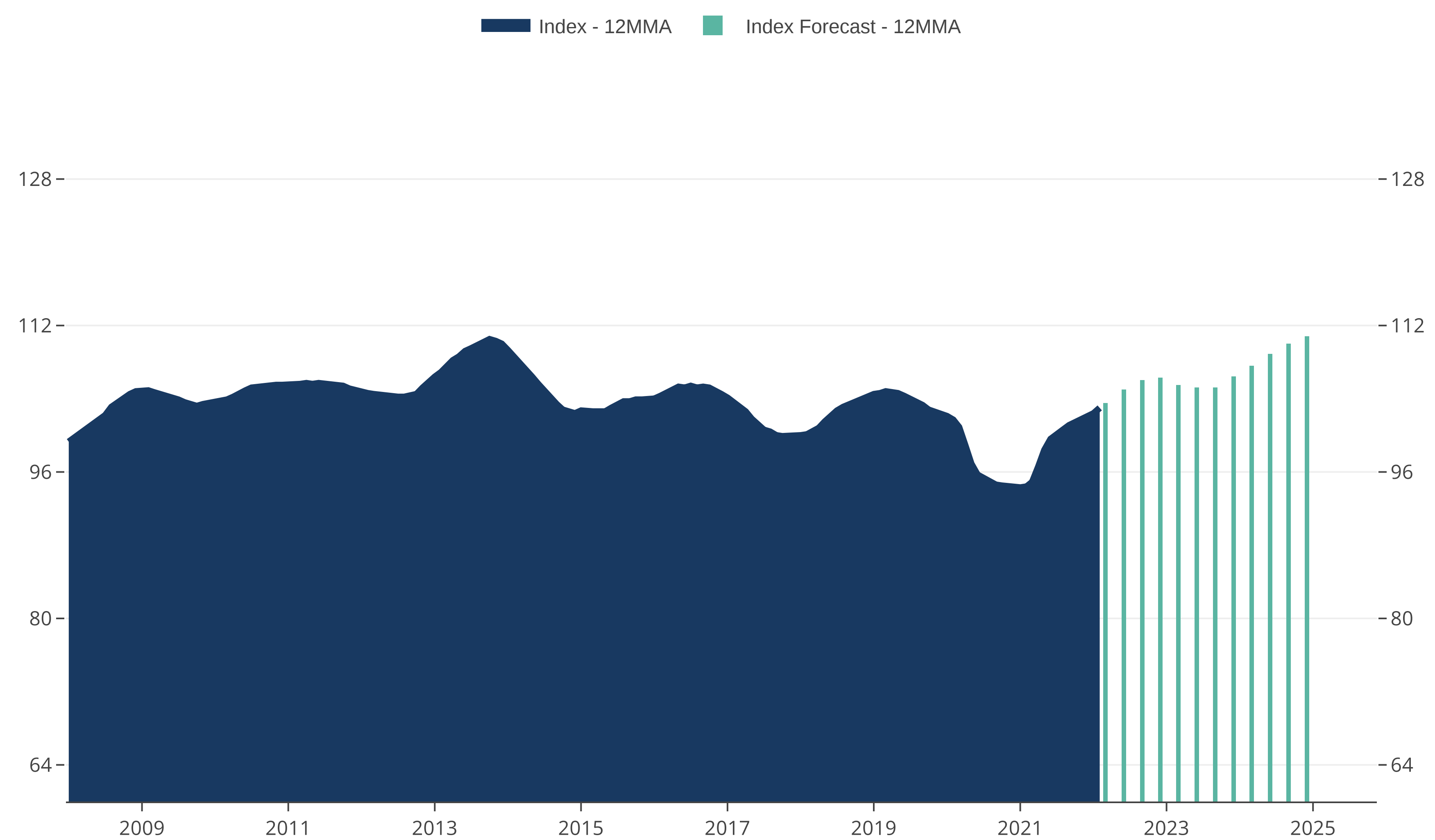
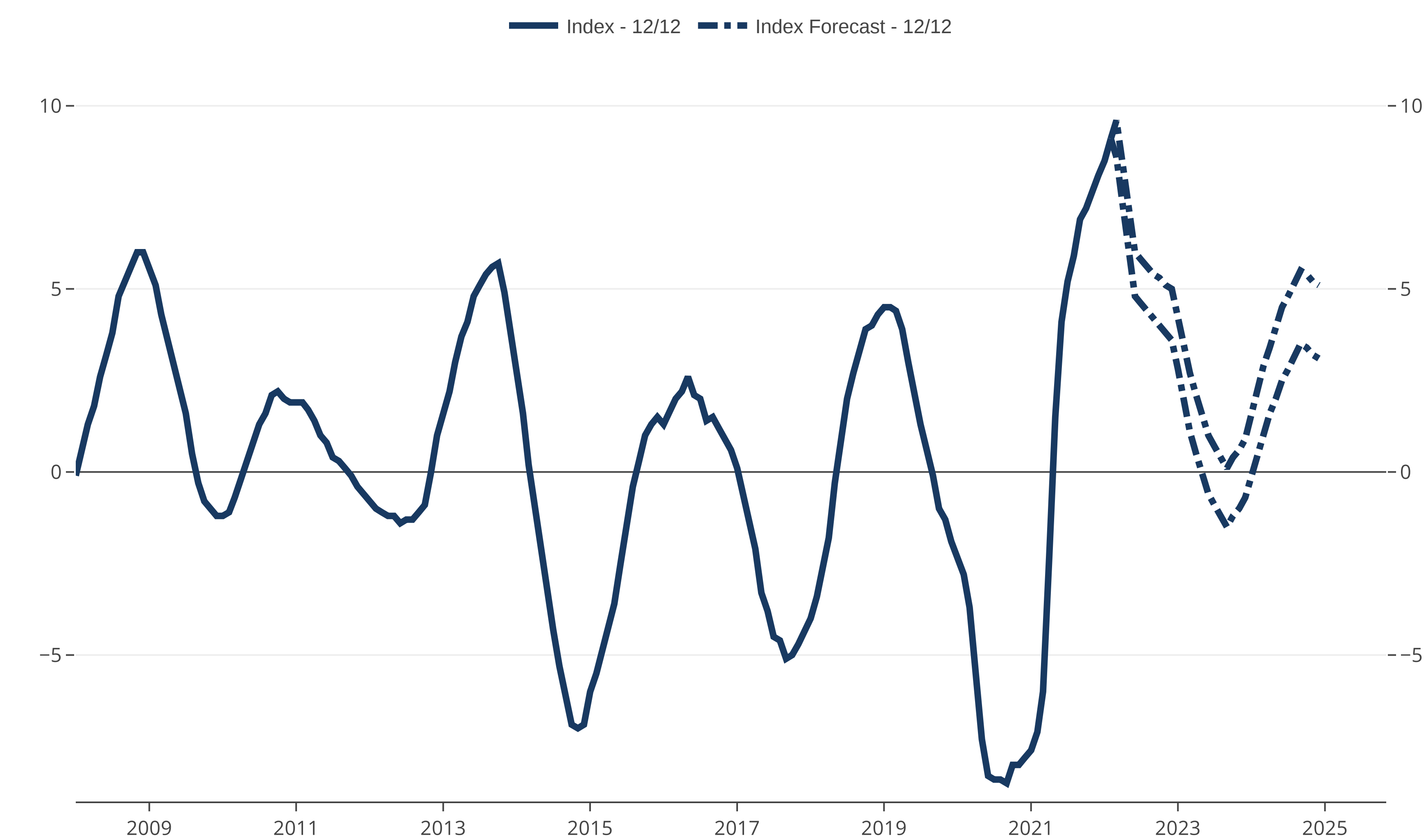
Hospital and Lab Revenue Points to Slowing Growth for Production This Year

Annual Average (12MMA)



Annual Growth Rate (12/12)



Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- February 2022 Annual Growth Rate (12/12): 9.1%
- February 2022 Annual Average (12MMA), 2017=100: 103.0

Industry Outlook

Year	Annual Growth Rate
2022	4.3%
2023	0.1%
2024	4.1%

Outlook & Supporting Evidence

- Annual US Medical Equipment and Supplies Production will rise into the end of 2022 and then mildly into the second half of 2023. Production will then rise through at least the second half of 2024.
- Quarterly US Hospital Service Revenue is at a record high but undergoing slowing growth, and US Medical and Diagnostic Lab Revenue in the fourth quarter came in 1.2% below the fourth quarter of 2020. Rate-of-change trends in these revenue datasets suggest Phase C, Slowing Growth, for Medical Equipment and Supplies Production.
- We expect slowing growth to characterize Production in 2022 and much of 2023. Expect Production to enter Phase D, Recession, this business cycle; the contraction will be very mild relative to previous cycles.
- The US economy and healthcare sector have exhibited robust rise off the pandemic lows. Quarterly US Medical Care Services Personal Consumption Expenditures are1% shy of the record high set prior to the COVID-19 lockdowns. Robust demand for medical care and services will increase the need for medical equipment and supplies.
- If a new COVID-19 variant were to emerge, Production would be potentially impacted as the industry shifted resources to address the pandemic. COVID-19 variants pose a risk to our outlook.

US Leading Indicators

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Indicator	Direction 2Q22	3Q22	4Q22
ITR LEADING INDICATOR™	🔴	🔴	N/A
ITR RETAIL SALES LEADING INDICATOR™	🟢	🟢	🟢
US OECD LEADING INDICATOR	🔴	🔴	N/A
US ISM PMI (PURCHASING MANAGERS INDEX)	🔴	🔴	🔴
US TOTAL CAPACITY UTILIZATION RATE	🔴	🟢	N/A

Green denotes that the indicator signals cyclical rise for the economy in the given quarter. Red denotes the opposite.

What It Means for the US Economy

• The majority of leading indicators suggest imminent slowing growth for US Industrial Production.

• The system of leading indicators also suggests that this upcoming period of slowing growth will persist into at least the second half of 2022; some of the individual indicators portend slowing growth into at least 2023.

• ITR Economics™ is monitoring the conflict in Ukraine, as political events can cause disruptions to the fundementals that typcially drive the US econonomy.

Leading indicators are pointing to cyclical decline into at least late this year. Analyze your company's rate-of-change in relation to that of a benchmark for the economy or your industry. Do your peaks and troughs occur concurrently with those of the benchmark, or is there a consistent difference? Does your company tend to have soft landings at the bottom of the business cycle or do you typically fall into Phase D, Recession? Understanding these factors will help you apply our macroeconomic and market-specific analysis to your individual company.

Market Definitions

US Industrial Production Index

Index of total industrial production in the United States; includes manufacturing, mining, and utilities. Source: Federal Reserve Board (FRB). 2017 = 100, not seasonally adjusted (NSA).

US Machinery New Orders

New orders for machinery in the United States. Industries in the machinery manufacturing subsector create end products that utilize mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining, which are used to shape individual pieces of metal. Processes such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine. Moreover, complex assembly operations are an inherent part of the production process. Source: US Census Bureau. Measured in billions of dollars, not seasonally adjusted (NSA).

US Medical Equipment and Supplies Production Index

Medical equipment and supplies manufacturing index for the United States. Examples of products made by these establishments are surgical and medical instruments, surgical appliances and supplies, dental equipment and supplies, orthodontic goods, ophthalmic goods, dentures, and orthodontic appliances. Source: Federal Reserve Board. NAICS Code: 3391. Index, 2017 = 100, not seasonally adjusted (NSA).

US Nondefense Capital Goods New Orders (excluding aircraft)

New orders for nondefense capital goods, excluding aircraft, in the United States. Includes farm machinery and equipment, construction machinery, mining machinery, nondefense small arms and ordnance, industrial machinery, commercial and service industry equipment, other general purpose machinery, photographic equipment, metalworking machinery, turbine and generator manufacturing, power transmission equipment, pumps and compressors, material handling equipment, electronic computers, computer storage devices and peripheral equipment, communications equipment, nondefense search and navigation equipment, electrometrical equipment, electrical equipment, heavy duty truck manufacturing, railroad rolling stock, nondefense ship and boat building, office and institutional furniture, and medical equipment and supplies. Source: US Census Bureau. Measured in billions of dollars, not seasonally adjusted (NSA).

US Food Production Index

Industries in the US Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers. Source: Federal Reserve Board. NAICS Code: 311. Index, 2017 = 100, not seasonally adjusted (NSA).

Management Objectives™

Phase A

Recovery

- Scrupulously evaluate the supply chain
- Model positive leadership (culture turns to behavior)
- Start to phase out marginal opportunities (products, processes, people); repair margins
- Perform due diligence on customers and extend credit
- Be on good terms with a banker; you will need the cash more now than in any other phase
- Invest in customer market research; know what they value and market/price accordingly
- Hire key people and implement company-wide training programs ahead of Phase B
- Allocate additional resources to sales and marketing
- Invest in system/process efficiencies
- Make opportunistic capital and business acquisitions; use pessimism to your advantage

Phase B

Accelerating Growth

- Ensure quality control keeps pace with increasing volume
- Invest in workforce development: hiring, training, retention
- Ensure you have the right price escalator; space out price increases
- Maximize your profit margins through differentiation; stand out from the crowd and set yourself apart
- Use improved cash flow to strategically position the business to beat the business cycle
- Expand credit to customers
- Improve corporate governance (rent a CFO; establish a board of advisors or board of directors)
- Communicate competitive advantages; build the brand
- Query users for what they want and what is important to them
- Sell the business in a climate of maximum goodwill

Phase C

Slowing Growth

- Know if your markets are headed for a soft landing or a hard landing
- Cash is king; beware of unwarranted optimism
- Stay on top of aging receivables
- Revisit capital expenditure plans
- Lose the losers: if established business segments are not profitable during this phase, eliminate them
- Use competitive pricing to manage your backlog through the coming slowdown
- Avoid committing yourself to long-term expenses at the top of the price cycle, but lock in revenue
- Go entrepreneurial and/or counter-cyclical
- Evaluate your vendors for financial strength; if needed, look for additional vendors as a safety net
- If the cycle looks recessionary, cross-train key people to prepare for workforce attrition/reduction

Phase D

Recession

- Implement aggressive cost-cutting measures
- Offer alternative products with a lower cost basis
- Perform due diligence on acquisitions while valuations are falling
- Reduce advertising as consumers become more price conscious
- Enter or renegotiate long-term leases
- Negotiate labor contracts
- Consider capital equipment needs for the next cycle
- Tighten credit policies
- Develop programs for advertising, training, and marketing to implement in Phase A
- Lead with optimism, remembering that Phase D is temporary

