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3Q2022

Reports
ITR Economics

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Table of Contents

Economic Overview

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The global economy has shifted rapidly since the start of the year. Global trends include elevated inflation and slowing growth or even contraction in industrial, capex, and retail sectors. Furthermore, some countries are contending with weakening housing markets as central banks hike interest rates and consumers face affordability issues.

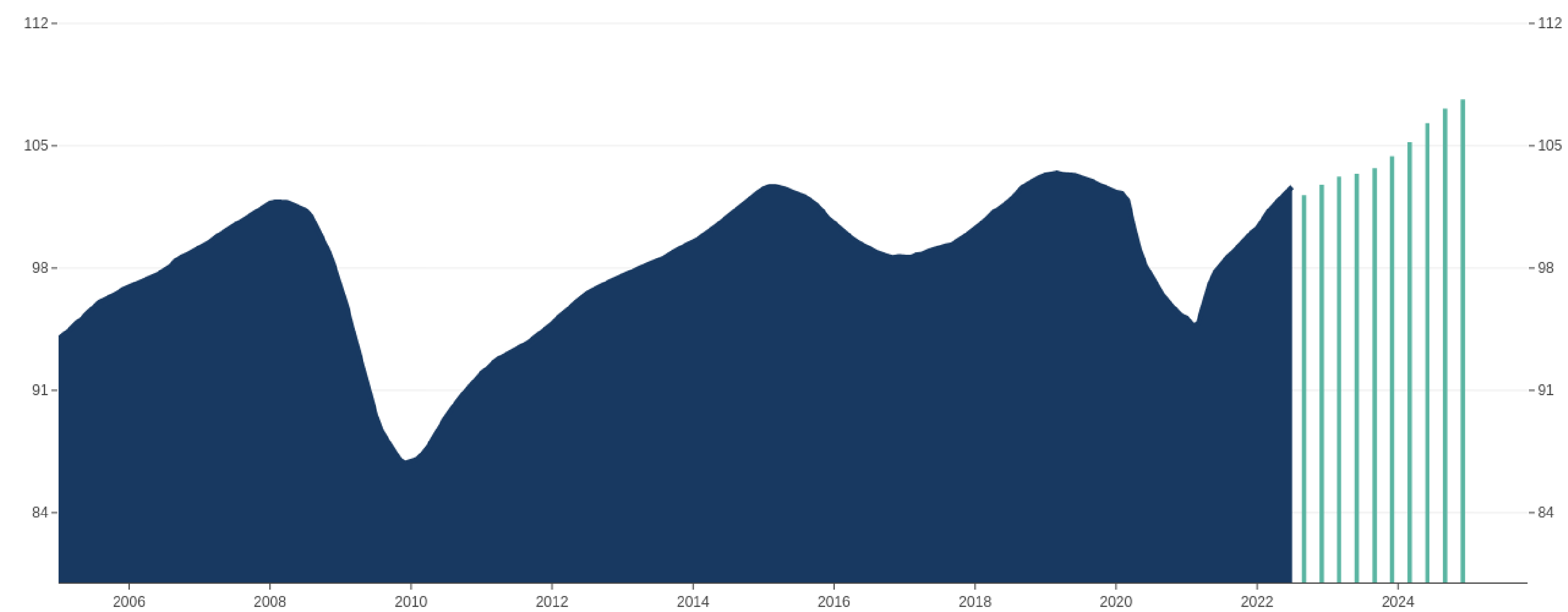
The US is working through a hangover stemming from the enormous fiscal and monetary stimulus of the preceding years, but the American consumer is providing a solid foundation for the economy and could help usher it through a relatively mild back side of the business cycle.

Other countries are not so fortunate and face more severe headwinds. Europe is still contending with war in Ukraine and now faces an energy crisis as it tries to rapidly wean itself away from Russian gas. We downgraded our outlook for European Union Industrial Production and anticipate contraction next year.

China-specific leading indicators show budding upward movement, but that country faces a unique real estate crisis. Large property developers have defaulted on their debt and are unable to complete projects. Further, lockdowns due to China's zero-COVID policy have disrupted production and increased uncertainty. Across most countries, leading indicators are generally declining, providing insight into the next two to four quarters. However, the back side of the business cycle is not uniform, but will continue to evolve.

US Industrial Production Index

Annual Average (12MMA)



In the US, a shift from inflation to disinflation is underway. The US Consumer Price Index in August came in 8.3% higher than in August of 2021. That 8.3% rate of inflation is a decrease from June's 9.1%, largely due to lower fuel costs. The supply chain has shown sustained improvement (though uneven across markets) from the gridlock of recent years; the Global Supply Chain Pressure Index has declined for four consecutive months, confirming that the relief is real. Additionally, retailers who overordered during COVID-related surges are now marking down excess inventory. These are clear signals that supply-side drivers of inflation are easing. Demand is also softening, taking the form of decline or slowing growth depending on the market.

Monetary policy is the other major factor impacting inflation. The Federal Reserve Board has been very hawkish, stating that it is committed to returning inflation to an average of 2.0%. The Fed is rolling back its balance sheet (i.e., quantitative tightening) and has raised the federal funds rate from the near zero of early this year to 3.00-3.25% as of late September. Based on the Fed's track record, we are concerned that it may overtighten and adversely impact the business cycle. We are monitoring the 3-month to 10-year yield curve; if we see an extended inversion, it may impact our macroeconomic outlook.
Mortgage rates were around or below 3% for an extended period in 2020-21 and have since more than doubled, coming in at north of 6% at the time of this writing. Between higher borrowing costs and the prior surge in home prices, many would-be homebuyers are now facing affordability issues. This is cooling single-unit residential construction volume; companies operating in this market should plan on cyclical decline into mid-2023. The multi-unit market is benefiting somewhat from the lack of affordable single-family homes.

Elevated interest rates could also hinder businesses capital expenditures. However, built-up backlogs, demand for labor-saving equipment, and reshoring trends will help buoy business-to-business activity. Elevated interest rates could still have a cooling effect, but, per historical precedent, the impact would not be immediate.

What will the future hold? Our analysis suggests a rate-of-change low for the global economy in late 2023 followed by mild cyclical rise in 2024. However, central bank policies, the potential for escalating war, and regional economic problems (including the aforementioned issues in Europe and China) pose risks. At times like these, it takes courage to invest in your business. We encourage you to do so, but focus on high-ROI projects that address the long-term issues of margin squeeze and labor market tightness. Be conservative in your cash flow estimates so you don't get caught in a tough spot if some of the risks come to fruition.

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	4.4%	C	2.8%	1.6%	3.1%
5	US Nondefense Capital Goods New Orders (excluding aircraft)	11.0%	C	7.6%	2.4%	8.2%
6	US Machinery New Orders	14.1%	C	9.0%	3.4%	9.4%
7	US Food Production Index	0.2%	B	1.7%	2.5%	1.6%
8	US Medical Equipment and Supplies Production Index	7.1%	B	10.1%	0.1%	3.7%

**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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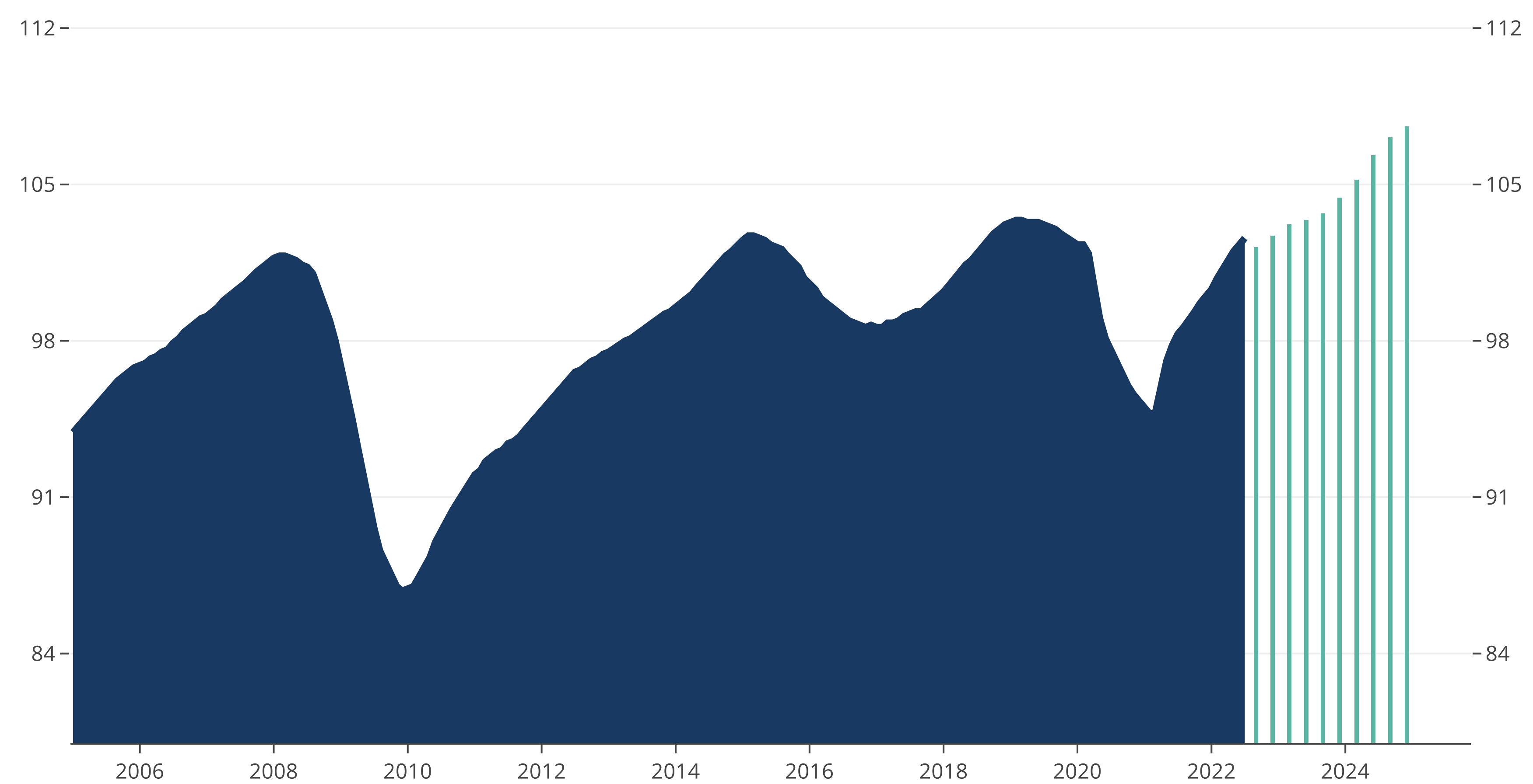
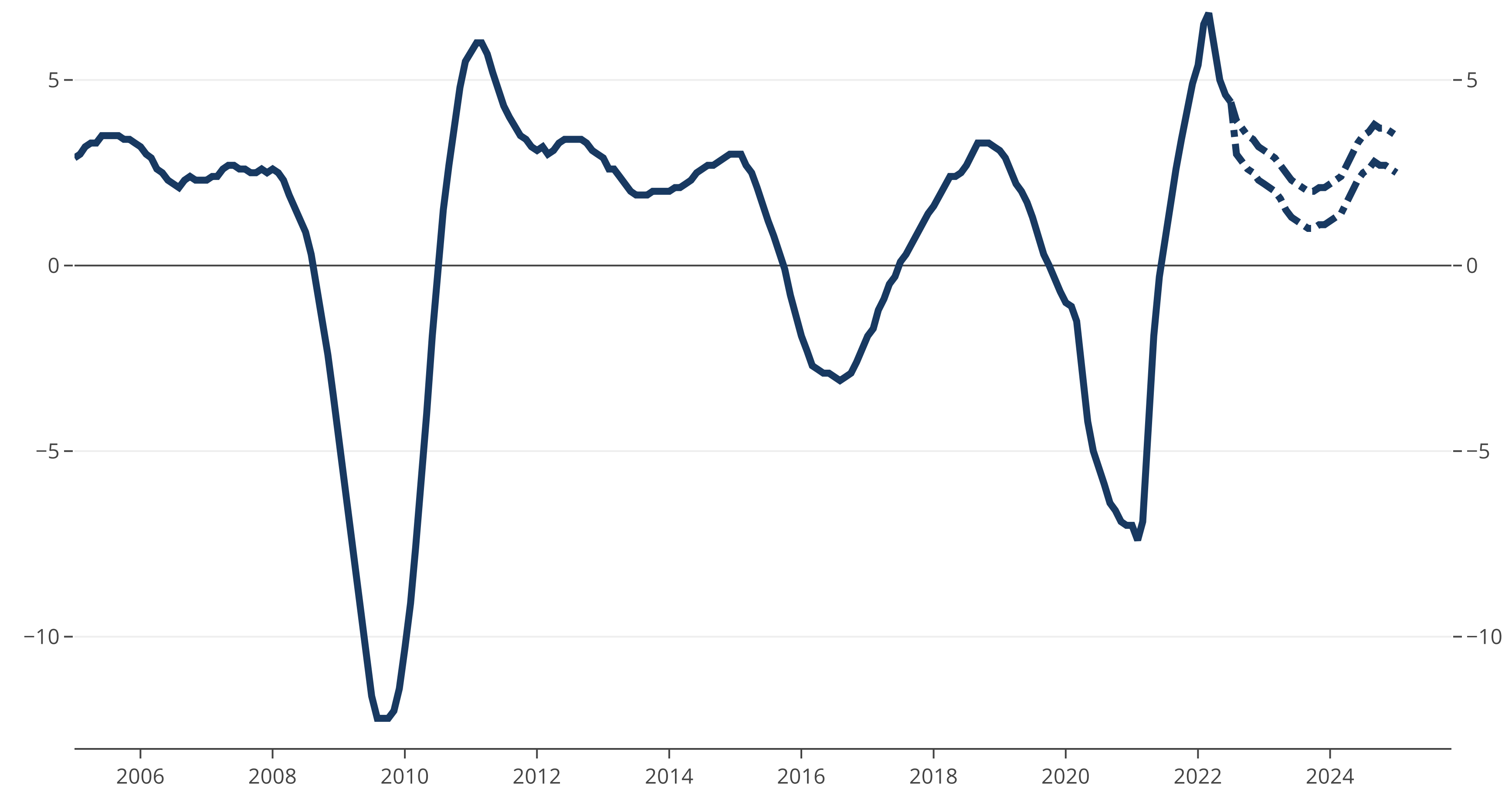
Soft Landing Expected This Cycle; Backlogs, Consumer and Business Finances, Reshoring Support Growth

Annual Average (12MMA)



Annual Growth Rate (12/12)



Current Phase

Phase C
Slowing Growth

Current Indicator Amplitude

- July 2022 Annual Growth Rate (12/12): 4.4%
- July 2022 Annual Average (12MMA), 2017=100: 102.6

Industry Outlook

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

Outlook & Supporting Evidence

- US Industrial Production in the 12 months through July came in 4.4% above the year-ago level. Growth in the industrial sector is slowing, and we expect slowing growth to persist into the latter half of 2023.
- Our outlook calls for the overall industrial economy to avoid Phase D, Recession, this business cycle. The relative strength of the US consumer and healthy balance sheets of US businesses fundamentally support growth. Additionally, backlogs and reshoring will help buffer cyclical decline. However, some individual markets will contract this cycle. If a market experienced an outsize benefit from stimulus or the pandemic, it may normalize back toward its pre-pandemic trajectory. Some other markets are more volatile and prone to contraction.
- We expect accelerating rise to return in late 2023 and last through late 2024, but growth will be more mild than in 2020 and 2021.
- The Federal Reserve's messaging has been very hawkish, indicating that they body is committed to not only diminishing inflation but returning it back to 2%. There is a risk that the Federal Reserve could over-tighten and cause more overt strain on the economy. We are monitoring the 10-year to 3-month yield curve; a prolonged inversion could pose a downside risk to our macroeconomic outlook.

US Nondefense Capital Goods New Orders (excluding aircraft)

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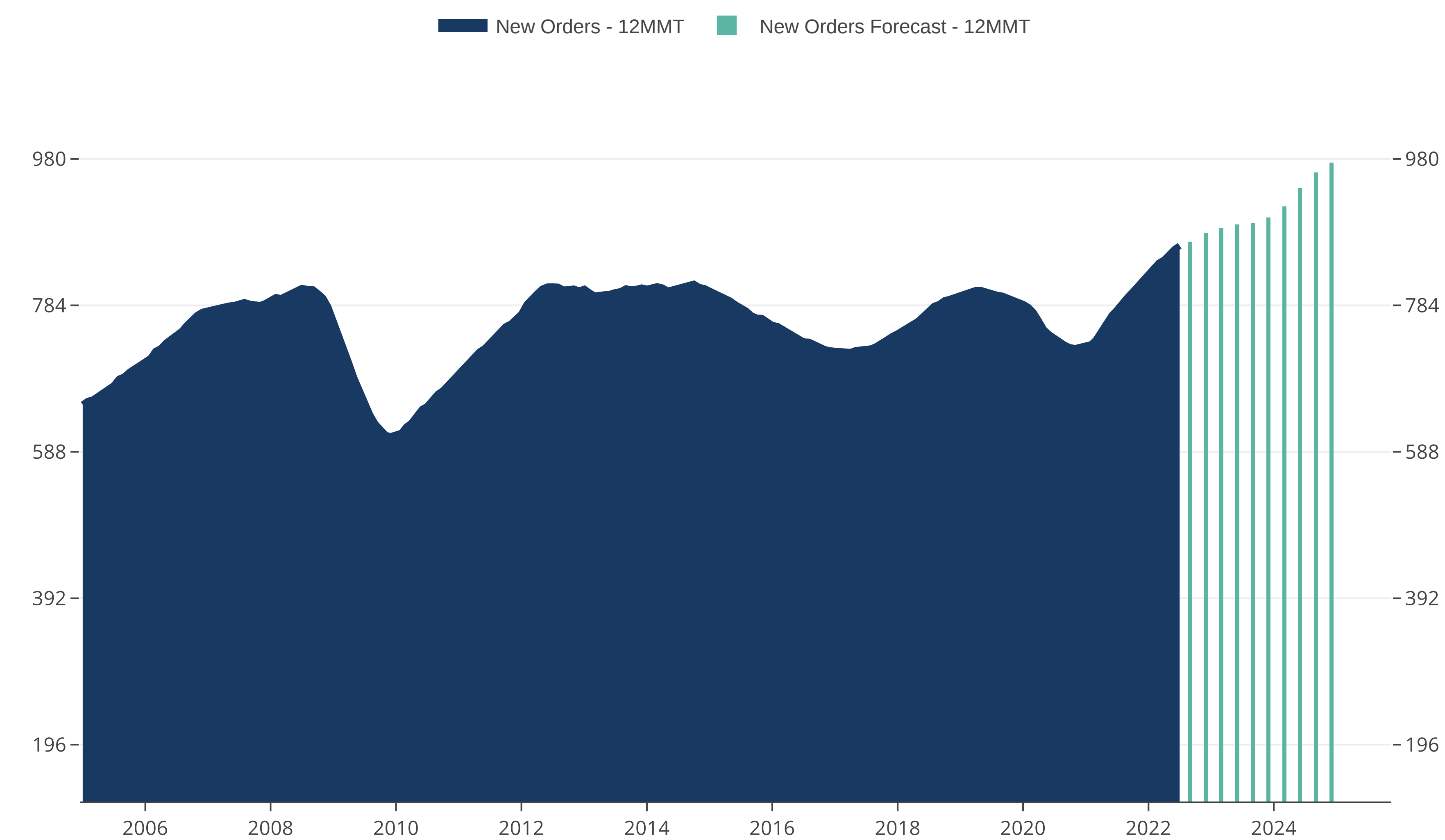
Elevated Business Applications Signal Growth in Capex; Rate of Rise to Diminish in 2023

Annual Total (12MMT)



Annual Growth Rate (12/12)

Current Phase

Phase C
Slowing Growth

Current Indicator Amplitude

- July 2022 Annual Growth Rate (12/12): 11.0%
- July 2022 Annual Total (12MMT), Billions of USD: $863.7

Industry Outlook

Year	*Annual Growth Rate*
2022	7.6%
2023	2.4%
2024	8.2%

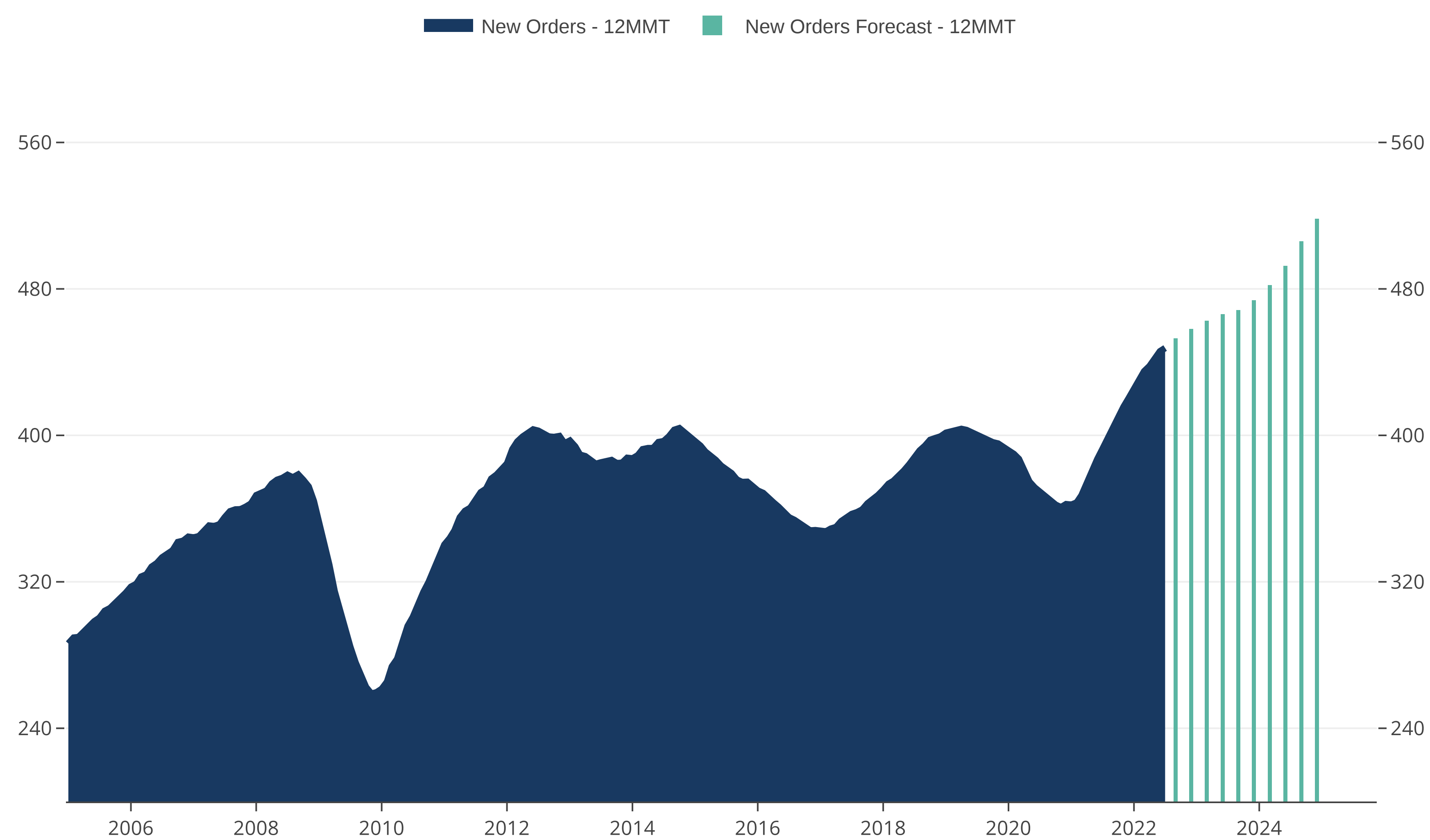
Outlook & Supporting Evidence

- Annual US Nondefense Capital Goods New Orders (excluding aircraft) totaled $863.7 billion in July, up 11.0% from the prior year.
- Pricing trends are reflected in dollar-denominated New Orders. We are beginning to see disinflation - i.e., ongoing rise, but at a slowing pace - in US Producer Prices, and even price decline in some commodities such as steel and oil. We anticipate pricing pressures will continue to ease in 2023. It will remain important to analyze your business on both units- and dollar-based bases.
- Though declining, US New Business Applications remain well-elevated relative to pre-pandemic levels. This suggests entrepreneurs have confidence in the US economy over the long term. New businesses may require capital goods to start their operations, supporting our outlook for New Orders growth.
- Annual New Orders will rise through at least 2024. The pace of rise will continue to slow into the end of 2023. The pace of rise will subsequently accelerate in 2024.

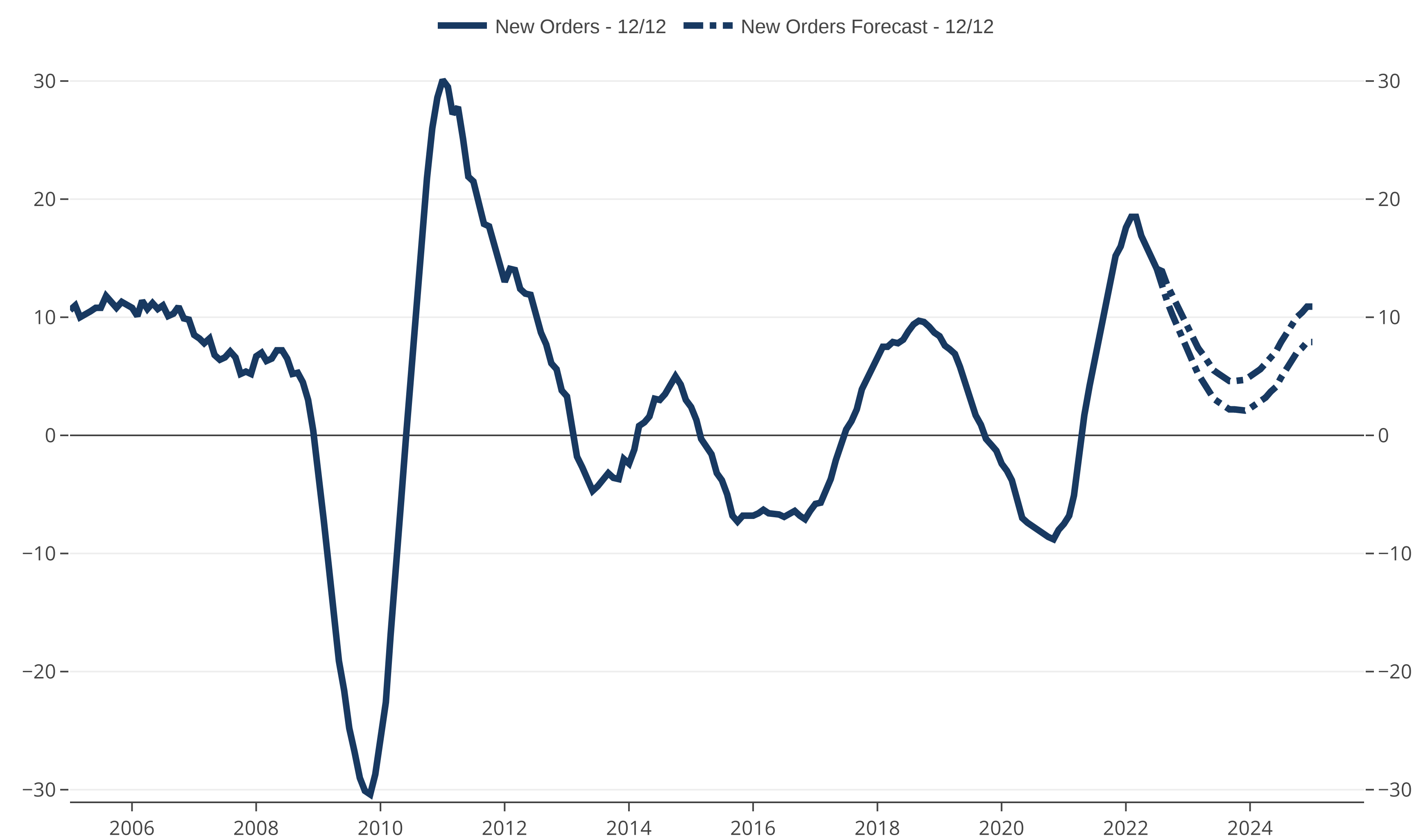
US Machinery New Orders

Industrial, Single-Unit Residential Demand for Machinery Waning Alongside Macroeconomic Cycle

Annual Total (12MMT)



Annual Growth Rate (12/12)



Current Phase

Phase C
Slowing Growth

Current Indicator Amplitude

- July 2022 Annual Growth Rate (12/12): 14.1%
- July 2022 Annual Total (12MMT), Billions of USD: $447.7

Industry Outlook

Year	Annual Growth Rate
2022	9.0%
2023	3.4%
2024	9.4%

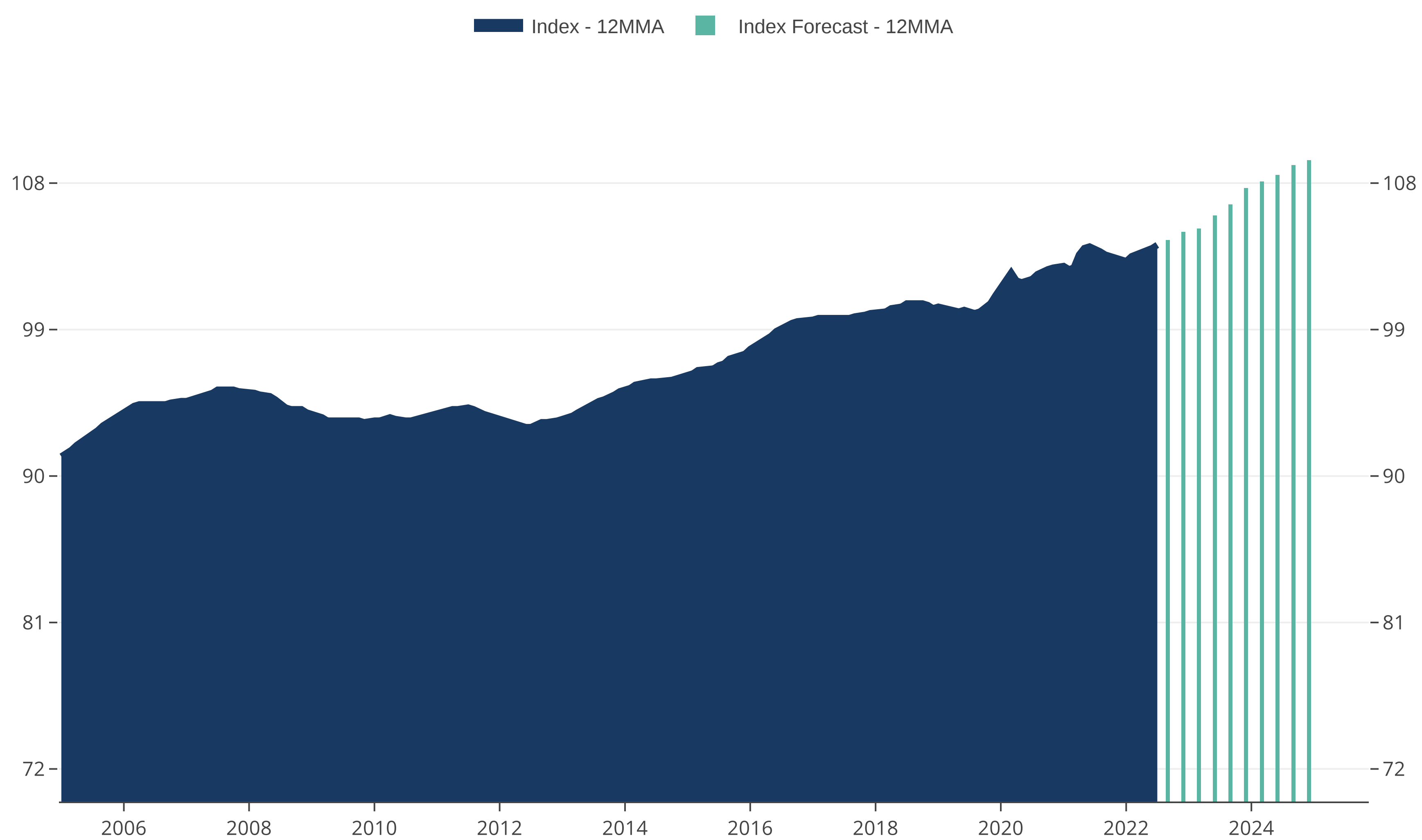
Outlook & Supporting Evidence

- Annual US Machinery New Orders totaled $447.7 billion in July, up 14.1% from the previous year.
- Demand for machinery stemming from the construction sector is mixed. US Single-Unit Housing Starts are in a declining trend, while Multi-Unit Starts and nonresidential construction are on the rise. Demand for machinery used in the industrial sector will likely slow in pace alongside slowing growth in US Industrial Production.
- US Steel Scrap Producer Prices are on the decline, down roughly 34% from record highs posted earlier this year. We expect steel prices to generally decline for the remainder of 2022. Steel prices will factor into machinery prices, but other input prices, especially labor, are likely to rise further. Given expected trends in steel prices, and other leading indicator trends, we expect slowing growth for New Orders for the rest of 2022 and 2023.
- The labor shortage will remain a pain point for US manufacturers through at least 2024, incentivizing purchases of labor-saving machinery where possible.
- Annual New Orders will rise through at least 2024, though the pace of rise will continue to slow through the end of 2023. An accelerating growth trend will characterize 2024.

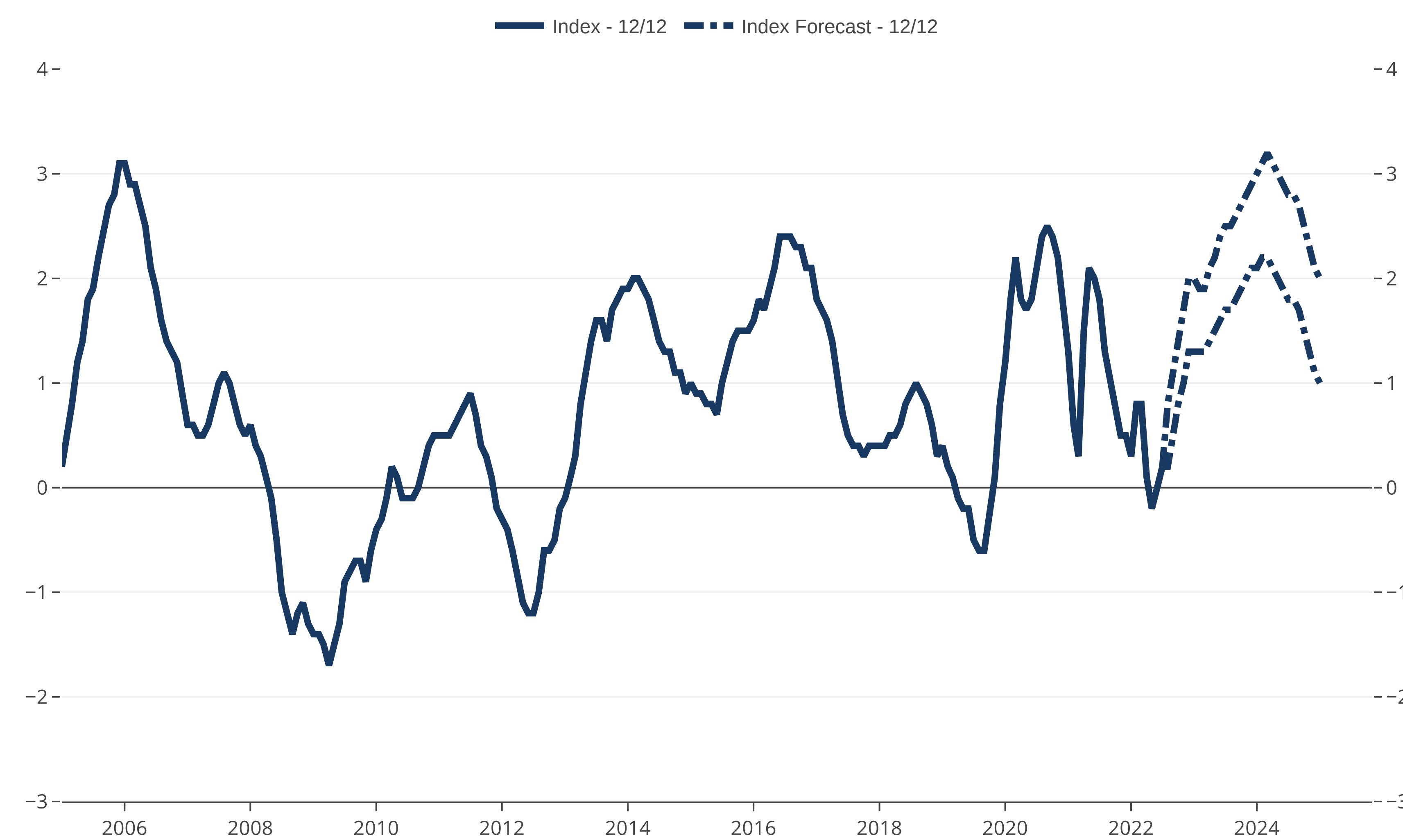
US Food Production Index

Data Revision Reveals Stagnant Production; Revised Forecast Calls for Rise Through at Least 2024

Annual Average (12MMA)



Annual Growth Rate (12/12)



Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- July 2022 Annual Growth Rate (12/12): 0.2%
- July 2022 Annual Average (12MMA), 2017=100: 104.2

Industry Outlook

Year	*Annual Growth Rate*
2022	1.7%
2023	2.5%
2024	1.6%

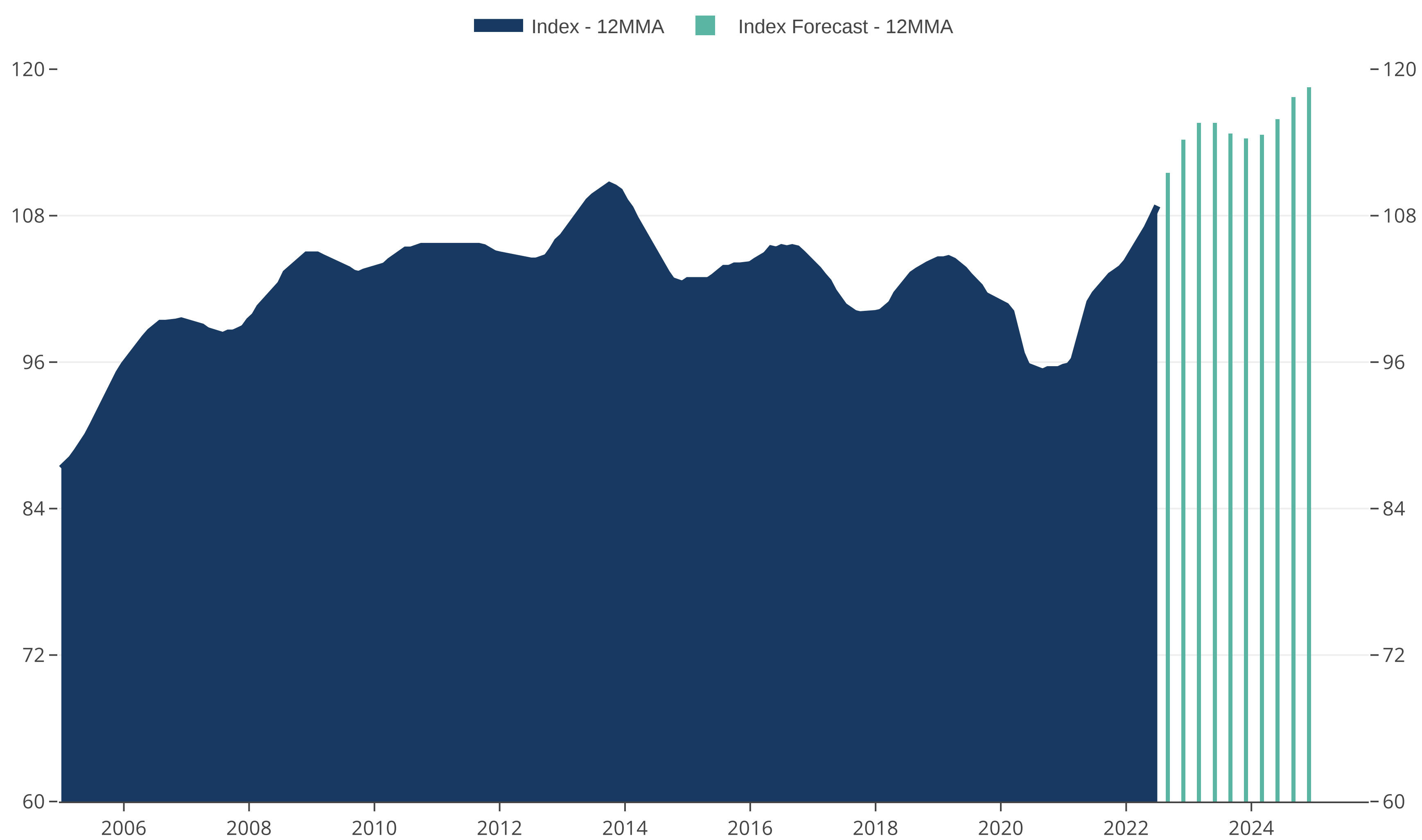
Outlook & Supporting Evidence

- Our forecast for US Food Production still calls for rise through at least 2024, but it has been revised to account for a data revision by the Federal Reserve Board that shifted the business cycle trend. The data previously showed pandemic-driven decline during 2020 and early 2021. The updated data shows general rise, with some volatility, during that time period, followed by stagnant Production. Data through July indicates that annual Production is virtually even with the year-ago level.
- The US Food Capacity Utilization Rate indicates cyclical rise will continue for Production. We expect Production to trend in Phase B, Accelerating Growth, into the first half of 2024.
- The US Food Consumer Price Index was up 11.4% in August from one year prior. Across the US, consumers are tightening their belts amid the current inflationary environment. In this environment, consumers are more likely to shift to generic-brand and lower-cost foods. Producers may benefit by shifting their product mix to cater to this demand in the coming quarters.

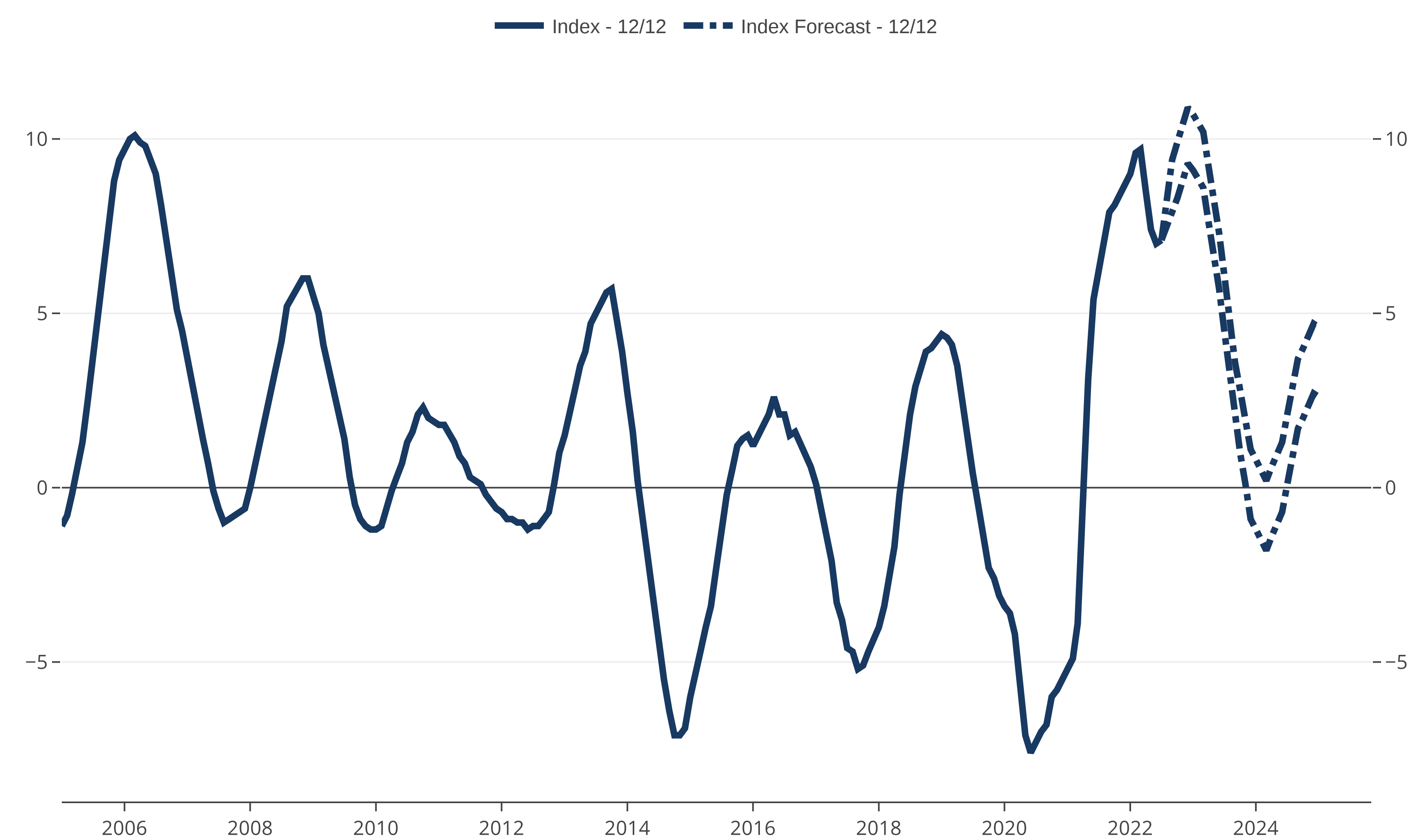
US Medical Equipment and Supplies Production Index

Forecast Revised; Catch-Up on Elective Procedures to Contribute to "M"-Shaped Growth Rate Peak

Annual Average (12MMA)



Annual Growth Rate (12/12)



Current Phase

Phase B Accelerating Growth

Current Indicator Amplitude

- July 2022 Annual Growth Rate (12/12): 7.1%
- July 2022 Annual Average (12MMA), 2017=100: 108.8

Industry Outlook

Year	*Annual Growth Rate*
2022	10.1%
2023	0.1%
2024	3.7%

Outlook & Supporting Evidence

- Annual US Medical Equipment and Supplies Production was 7.1% higher than it was for the previous year and is in a general accelerating growth trend.
- The Federal Reserve Board issued its annual revision to the underlying Production data, raising recent annual results by upwards of 2%. The data revision, along with recent atypically strong results, necessitated a new forecast. The annual growth rate outlook for 2022 was lifted by 5.8 percentage points. The growth rate outlooks for 2023 and 2024 were little changed.
- The postponement of elective medical procedures during the last two years has resulted in stronger-than-normal rise in Production. Many of these procedures were pushed to later dates, driving the current strong demand for medical equipment and supplies. As a result, quarterly Production is showing renewed strength and is at record highs. We expect an "M"-shaped peak in the annual growth rate as a result.
- Annual Production will rise into the middle of next year, then decline in the second half of that year. Rise is expected in 2024.

US Leading Indicators

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Indicator	Direction		
	4Q22	1Q23	2Q23
ITR LEADING INDICATOR™	Red	Red	N/A
ITR RETAIL SALES LEADING INDICATOR™	Green	Red	Red
US OECD LEADING INDICATOR	Red	Red	N/A
US ISM PMI (PURCHASING MANAGERS INDEX)	Red	Red	Red
US TOTAL CAPACITY UTILIZATION RATE	Red	Red	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

• As of the most recent month of data, the US Total Industry Capacity Utilization Rate signals that US Industrial Production will be on the back side of the business cycle through the first quarter of 2023, corroborating what other leading indicators have signaled.

• The US ISM PMI (Purchasing Managers Index), which looks a little further out, signals growth-rate decline in Industrial Production will persist through the second quarter of next year.

• The ITR Retail Sales Leading Indicator™ is declining. While the timing relationship has been altered this cycle due to the unprecedented fiscal stimulus issued during the pandemic, decline in the Indicator aligns with our expectation for growth-rate decline in US Total Retail Sales. The Indicator suggests Retail Sales will be on the back side of the business cycle into at least the second half of 2023.

A silver lining of slowing global growth will be improved availability and delivery times for inputs. We are already seeing supply chains improve, albeit not across the board. Smoother production flow could free up management time. Use any extra time during the next year of slowing economic growth to focus on your longer-term plans. Can you improve your efficiency? Are there new products you can introduce or markets you can enter in the coming years to grow your business?

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. Measured in billions of dollars, not seasonally adjusted (NSA). Source: US Census Bureau

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