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ECONOMIC OUTLOOK

As we discussed last month, the omicron variant has been regressive to growth but COVID cases appear to have peaked in many places, at least for now, and will likely peak in most places in the coming weeks and months. Restrictions put in place in December are being lifted. For example, restaurants, bars, and cultural venues in the Netherlands were allowed to open until 10 PM after having been closed since December 19th.

This month we are publishing updated forecasts for 2022 and introducing our initial forecasts for 2023. Data suggests growth is decelerating, but we still see good growth for the year ahead. After growing 6.1% in 2021, we expect global growth to slow to 4% in 2022 and close to that in 2023. In North America, we expect growth will fall from 5.4% in 2021 to 3.7% in 2022. In 2023, we expect growth to slow further, clocking in at 2.6%. In Europe, growth will slip this year from 5% to 4% and will decline to 2.4% next year. In Asia, growth will fall from 6.7% to 4.8% this year. Asia's strong growth in 2021 was aided in large part by 8.1% GDP growth in China. We expect Asia will grow roughly 5% in 2023.

While growth slows this year, this should not necessarily be interpreted as weak growth. Growth rates in 2022 will generally be higher than they were headed into the pandemic. For example, prior to the pandemic, we expected the U.S. economy to grow just 1.8%. By this measure, 2023 will also grow a bit better than we might have expected prior to the pandemic. Of course, 2020 was a strongly negative year in almost every country so it will take several years to recover the pre-pandemic trajectory. Most economies would be bigger today had it not been for COVID, despite strong growth in 2021.

One of the risks to growth is high inflation rates. Inflation in the U.S. is up an estimated 5.6% for calendar year 2021, the highest rate of inflation for

any calendar year since 1981. Eurozone inflation hit a new record high of 5% in December. Slower price increases for food and energy have kept consumer inflation lower in Asia compared with other regions but that could change if freight rates remain high or Asia imports higher inflation through other imported goods. Despite high rates of inflation, the 10-year breakeven inflation rate, the average inflation rate the market expects over the next 10 years is 2.46%. This is generally in line with longterm expectations and is also aligned with the messaging the Fed has conveyed about its willingness to accept somewhat higher rates of inflation than its historical 2% target.

Supply chain challenges remain acute, but appear to be abating somewhat. We expect this to continue over the next year. We have probably seen the worst of supply chain disruptions for now but other issues could develop.

Prices for commodities like copper and aluminum are at, or near, all time highs. While prices are likely to remain elevated, they have likely already peaked and will recede somewhat in 2022. This should also be the case with transportation costs. Trucking rates in the United States are up about 50% but do not appear to be continuing to rise. Container rates and air freight rates both appear to have peaked in 2021. Prices

are unlikely to decline quickly and they might remain higher than pre-pandemic levels well into 2023, but they should continue to decline through much of the year ahead. This does not mean all supply chain disruptions will be resolved in the coming months. Lead times, for example, are likely to stay high.

The backlog at ports has also improved markedly. At the Port of Los Angeles, there were over 40 ships at anchor waiting for a berth in early November. Today that number is around four. Prior to the pandemic, that figure was frequently zero so we haven't returned to pre-pandemic levels guite yet but we are well below the elevated levels we saw in the mad rush before the holidays.

The equity markets have started the year much weaker than last year. Volatility is expected in a rising rate environment and the market is certainly signaling that they expect the Fed to start raising rates in March. Equity prices also appear generally pricey on a number of metrics which also induced some volatility. This dynamic is likely to stay with us for much of 2022.

Growth is decelerating. While this will help alleviate some of the supply chain disruptions and shortages, it will also create a more competitive environment for companies.

8.1%

China's GDP grew 8.1% in 2021. We expect growth to slow in 2022.

5.6%

U.S. inflation was an estimated 5.6% for calendar year 2021, the highest rate of inflation for any calendar year since 1981.

The number of ships anchored and waiting for a berth in order to be offloaded at the Port of LA has fallen from a higher of over 40 ships in December to 4 today.

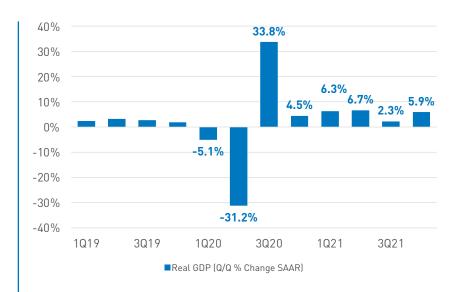
2.46%

Despite high rates of inflation, the 10-year breakeven inflation rate, the average inflation rate the market expects over the next 10 years is 2.46%.

U.S. OUTLOOK

ECONOMIC GROWTH

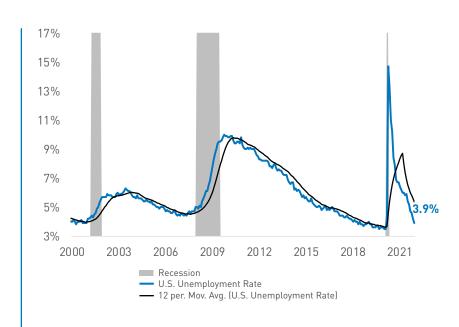
Fourth-quarter GDP will be published at the end of the month and should show the year ended strongly, finishing with growth of around 5.9% for the fourth quarter. For all of 2021, GDP grew around 5.4%. This is the fastest calendar-year growth since 1984. At the same time, economic growth is up just 1.4% (annualized) since the end of 2019. The economy would be bigger today had it not been for COVID, despite strong growth in 2021. Looking forward, the economy is set to expand by 3.9% in 2022. Growth is moderating and our forecast for the year is down from a high of 4.5% published last July. At the same time, 3.9% growth is higher than the trajectory pre-COVID.



	2022 ECONOMIC GROWTH (GDP % Change)	2023 ECONOMIC GROWTH (GDP % Change)	2022 EXCHANGE RATE (v. USD)	2023 EXCHANGE RATE (v. USD)
UNITED STATES	3.9%	2.6%	N/A	N/A
CANADA	4.1%	2.9%	1.24	1.23
MEXICO	2.8%	2.4%	21.21	21.54
EURO AREA	4.0%	2.4%	1.14	1.18
CHINA	5.0%	5.3%	6.49	6.42

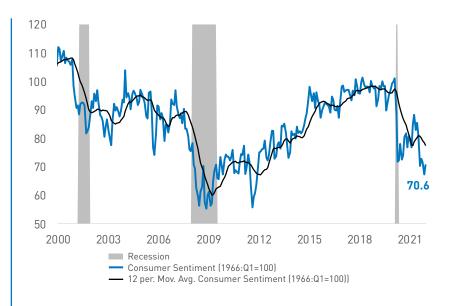
EMPLOYMENT

The U.S. labor market added 199,000 jobs in December, well below consensus expectations for 450,000 new jobs. Payroll gains in the prior two months were revised up by 141,000 jobs, but the gap between expectations and reality remains acute. In more positive news, civilian employment, an alternative measure of jobs that includes startups, increased 651,000 during the month. The unemployment rate dropped from 4.2% to 3.9%. Manufacturing added 26,000 new jobs. And both average hourly earnings and hours worked rose during the month. Average hourly earnings are up 4.7% over the last year, and hours worked are up 5% over the same horizon. Combined, total worker pay is up 9.9% from a year ago.



SENTIMENT

Consumer sentiment improved in December. The index rose 3.2 points, increasing from 67.4 to 70.6. The rise was attributed to an increase in sentiment among households with incomes in the bottom third of the distribution. Households in this segment of the population expect incomes to rise 2.8% over the next year. This is up from 1.8% last December. Moreover, there have only been five times in the last 50 years that expectations of income growth for this group have exceeded 2.8%. On the other side, rising inflation appears to be negatively impacting consumers' evaluations of their current finances which remained at low levels.



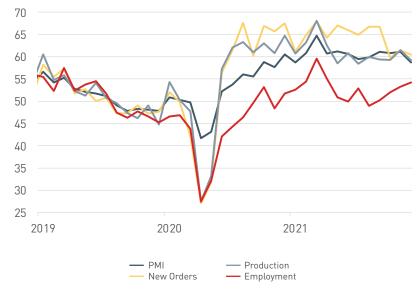
TRADE-WEIGHTED U.S. DOLLAR INDEX

The trade-weighted U.S. dollar index rose strongly in December, increasing 0.7% from the prior month. The dollar's value is up 3.5% over the last year. The increase in the dollar's value in December is likely being driven in advance of the first of several expected interest rate increases from the Federal Reserve. The dollar should remain strong until markets are certain U.S. inflation has peaked. The Fed is expected to increase rates sooner than other Central Banks, creating positive interest rate differentials which will draw money into the U.S. and put upward pressure on the dollar.



MANUFACTURERS' SENTIMENT (PMI)

The U.S. manufacturing sector expanded in December — the 19th consecutive month of growth — but growth was slower than the prior month. New orders and production both decelerated, though both continued to indicate expansion. The Prices Index fell measurably in the month but continues to suggest prices are rising. Supply chain challenges continue to be acute, but things seem to have improved somewhat over the last month. The Supplier Deliveries Index softened, suggesting delivery rates are improving. Likewise, the Customers' Inventories Index improved but remains at a very low level suggesting inventories remain tight.



U.S. END MARKETS FOR ELECTRONICS

Industrial production declined 0.1% in December, but is up 3.7% over the last year. Manufacturing output fell 0.3% in the month, but is also up 3.7% over the last month. Much of the decline in manufacturing output is related to auto production declines caused by supply chain disruptions. Non-auto manufacturing output is up 4.4% over the last year.



AUTOMOTIVE PRODUCTS

Auto production fell 2.1% in December, after rising 1.9% in the prior month. Output is off 6.4% over the last year and 5.2% from prepandemic levels.



TRANSIT EQUIPMENT

Transit equipment production declined 2.5% over the last month. The sector is down 5.9% over the last vear and down 26.6% from two years ago.



INFORMATION PROCESSING & RELATED **EQUIPMENT**

Production in the information processing and related equipment sector increased 0.9% in the month, one of the few sectors to grow in December. The sector is up 7.9% over the last year and 10.8% from two years ago.



INDUSTRIAL & OTHER **EQUIPMENT**

The industrial sector edged 0.1% lower during the last month. The sector is up 6.8% over the last year and now up 1.1% from the start of the pandemic.



DEFENSE & SPACE **EQUIPMENT**

The defense and space equipment segment rose 0.3% last month. The sector is up 17.4% over the last year and a comparable 16.9% over the last two years.

Manufacturing



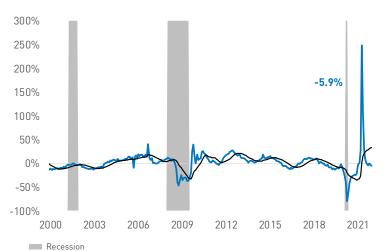
Industrial Production: Manufacturing (Y/Y % Change) 12 per. Mov. Avg. (Industrial Production: Manufacturing (Y/Y % Change))

Automotive Products



- 12 per. Mov. Avg. (Industrial Production: Automotive Products (Y/Y % Change))

Business Transit Equipment (Y/Y % Change)



Industrial Production: Business Transit equipment (Y/Y % Change)

- 12 per. Mov. Avg. (Industrial Production: Business Transit equipment (Y/Y % Change))

Industrial & Other Equipment (Y/Y % Change)

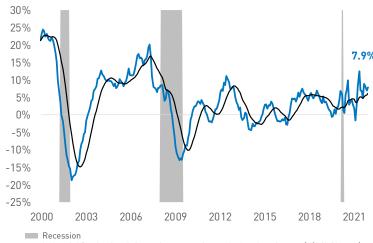


Recession

Industrial Production: Industrial and other equipment (Y/Y % Change)

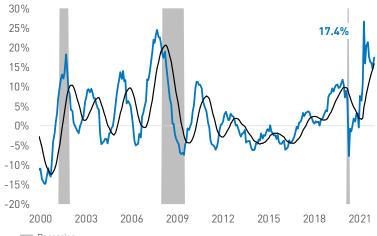
12 per. Mov. Avg. (Industrial Production: Industrial and other equipment (Y/Y % Change))

Information Processing & Related Equipment (Y/Y % Change)



Industrial Production: Information processing and related equipment (Y/Y % Change)
 12 per. Mov. Avg. (Industrial Production: Information processing and related equipment (Y/Y % Change))

Defense & Space Equipment (Y/Y % Change)



Recession

Industrial Production: Defense and space equipment (Y/Y % Change)

— 12 per. Mov. Avg. (Industrial Production: Defense and space equipment (Y/Y % Change))

MANUFACTURING CAPACITY UTILIZATION

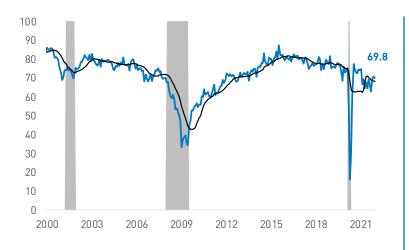
Overall capacity utilization declined during the month, falling to 76.5% in December, from 76.6% in November. Manufacturing capacity utilization fell to 77%, but remains roughly 2.7% above pre-pandemic levels. Computer and electronic production capacity utilization rose 0.3% to 79.2% and is 3.9% above pre-pandemic levels. Electrical equipment, appliances and components utilization rose 0.1% to 79.3%. Utilization for the motor vehicles and parts sector fell 1.3% to 69.8%. This is 7.2% below pre-pandemic levels. Finally, utilization in the aerospace and miscellaneous transportation equipment sector fell 0.9% to 71.7%.

Computer & Electronic Product



 12 per. Mov. Avg. (Capacity Utilization: Durable Manufacturing: Computer and electronic product)

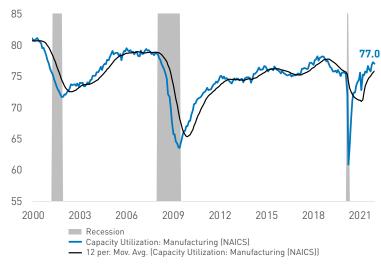
Motor Vehicles & Parts



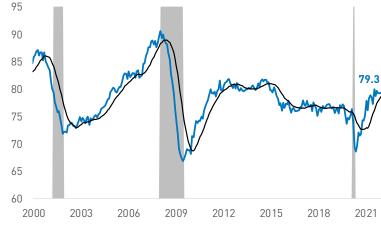
Capacity Utilization: Durable Manufacturing: Motor vehicles and parts

— 12 per. Mov. Avg. (Capacity Utilization: Durable Manufacturing: Motor vehicles and parts)

Manufacturing (NAICS)



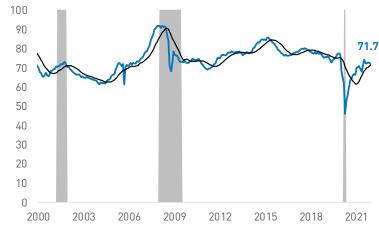
Electrical Equipment, Appliance, & Component



Recession

Capacity Utilization: Durable Manufacturing: Electrical equipment, appliance, and component
 12 per. Mov. Avg. (Capacity Utilization: Durable Manufacturing: Electrical equipment, appliance, and component)

Aerospace & Miscellaneous Transportation Equipment



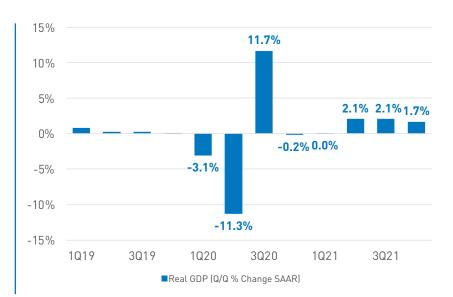
 Capacity Utilization: Durable Manufacturing: Aerospace and miscellaneous transportation equipment

— 12 per. Mov. Avg. (Capacity Utilization: Durable Manufacturing: Aerospace and miscellaneous transportation equipment)

EUROPEAN OUTLOOK

ECONOMIC GROWTH

Fourth guarter GDP data will be released at the end of the month. We expect to see year-over-year growth in Q4 of around 4.5%. GDP rose 2.2% in the euro area during the third guarter (2.1% in the European Union). On an annualized basis, GDP rose 9.3% in the euro area and 8.8% in the European Union, far outpacing 2.3% GDP growth in the United States over the same period. The reemergence of COVID had stymied Europe's recovery early in the year, but Europe is quickly getting growth back on track. Growth in the third quarter was 3.7% higher than a year-ago. Growth in the third quarter was highest in Australia (3.8%), France (3%), and Portugal (2.9%).

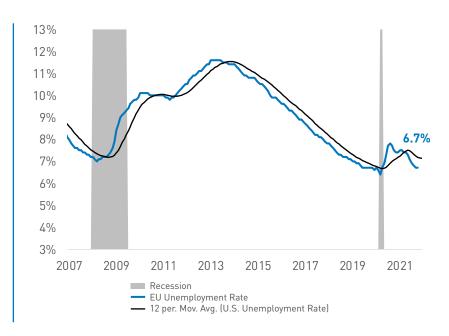


	Q	Q/Q PERCENTAGE CHANGE			Y/Y PERCENTAGE CHANGE			
	2020Q4	2021Q1	2021Q2	2021Q3	2020Q4	2021Q1	2021Q2	2021Q3
EURO AREA	-0.4%	-0.2%	2.2%	2.2%	-4.4%	-1.1%	14.4%	3.9%
EU (27)	-0.2%	-0.0%	2.1%	2.1%	-4.1%	-1.1%	13.8%	4.1%
GERMANY	0.7%	-1.9%	2.0%	1.7%	-2.9%	-3.0%	10.0%	2.6%
FRANCE	-1.1%	0.1%	1.3%	3.0%	-4.3%	1.5%	18.8%	3.3%
ITALY	-1.6%	0.3%	2.7%	2.6%	-6.6%	-0.6%	17.1%	3.9%
SPAIN	0.2%	-0.6%	1.1%	2.0%	-8.8%	-4.2%	17.5%	2.7%

	2022 ECONOMIC GROWTH (GDP % CHANGE)	2023 ECONOMIC GROWTH (GDP % CHANGE)
EURO AREA	4.0%	2.4%
GERMANY	3.9%	2.7%
FRANCE	3.8%	2.0%
NETHERLANDS	3.3%	2.0%

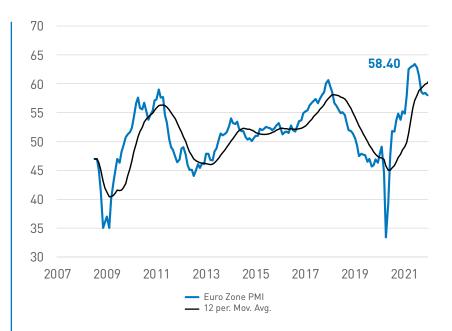
EMPLOYMENT

The unemployment rate in the EU declined two-tenths of a percentage point in November, falling from 6.7% to 6.5%. Reuters recently reported on tight labor supply in some sectors of the economy, noting some firms are offering cash bonuses for individuals who interview for open positions. Some European countries are reporting extremely low unemployment rates. Czechia reported 2.2% unemployment for December while Poland reported 3% unemployment for example. Germany's unemployment rate stands at 3.2% while Po. Greece and Spain both continue to have double-digit unemployment, but Greece's unemployment rate is below pre-pandemic levels while Spain's is close.



MANUFACTURERS' SENTIMENT (PMI)

Manufacturing sentiment in Europe suggests the sector continues to expand despite ongoing supply chain disruptions. The Eurozone Manufacturing PMI slipped four-tenths of a percentage point to 58. This is the lowest reading in ten months, an indication of less robust growth. At the same time, backlogs continue to grow suggesting manufacturers have work for the months ahead. Lead times remain long, as they do in many parts of the world, but they don't appear to be lengthening at rates seen earlier in 2021. IHS Markit reports firms added inventories at the fastest rate ever recorded by the survey. Prices remain high, though it appears rates have likely hit their peaks and are starting to trend downward.



E.U. END MARKETS FOR ELECTRONICS

Manufacturing output rose 2.5% in November. Manufacturing output is down 0.6% over the last year, but up 0.9% over the last two years.



COMPUTER, ELECTRONIC & OPTICAL PRODUCTS

The electronics industry, which includes categories such as components, loaded boards, computers, communications equipment and consumer electronics, saw output increase a robust 4.9% during the month. The sector is up 10.6% over the last two years.



MOTOR VEHICLES

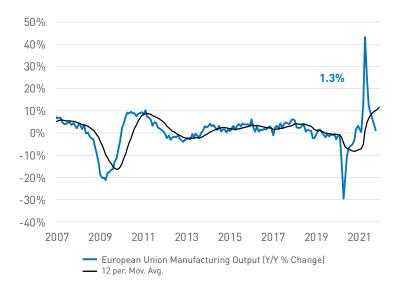
The motor vehicle manufacturing production index shot up again in November, rising 7.8%. Auto production continues to be hampered by supply shortages, but the market in Europe is showing solid signs of recovery. Auto production in the European Union remains off 29% from two years ago.



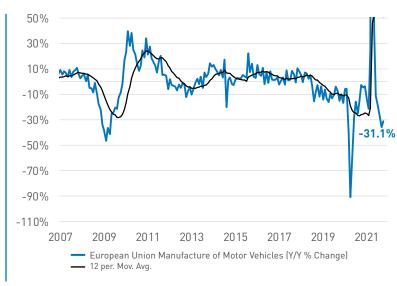
AIR & SPACECRAFT & RELATED MACHINERY

The air and spacecraft manufacturing sector declined 7.2% in November. The segment is off 6.8% over the last year and 29.7% over the last two years.

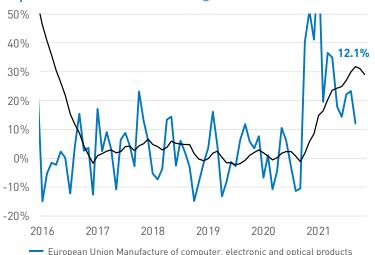
E.U. Manufacturing Output



E.U. Manufacture of Motor Vehicles



E.U. Manufacture of Computer, Electronic & Optical Products (Y/Y % Change)



European Union Manufacture of computer, electronic and optical products (Y/Y % Change)

12 per. Mov. Avg.

E.U. Manufacture of Air & Spacecraft & Related Machinery (Y/Y % Change)

