BUILD ELECTRONICS BETTER

AUGUST 2021

ECONOMIC OUTLOOK

The recovery continues along a bumpy path.

I offer 5 key observations this month:

1. Global demand remains strong, but we are starting to see some early signs that demand might be slowing.
2. Even with demand slowing, backorders remain high and inventories remain low which should keep manufacturers busy for the foreseeable future.
3. Stimulus, both fiscal and monetary, is waning which will be a headwind on spending.
4. Prices remain high and will move inversely to demand, but money supply is up significantly suggesting prices will likely remain elevated into next year. The Fed wants a higher rate of inflation and it looks like they are going to get what they want - and possibly more than they want.
5. COVID has become a sledge hammer to confidence.

Global demand remains high, propelled by unprecedented fiscal stimulus and loose monetary policy. Excess money has helped to fuel "revenge spending," as consumers seek to make-up for the months they spent quarantining in their homes. As I've noted in past months, spending on services (think eating out, pedicures, and house cleanings) was likely to benefit the most from economies reopening. Consumer spending on services in the U.S. is up 7.9 percent this year, 11.4 percent over the last year, and has finally moved above pre-pandemic levels. Spending on goods (think computers, TVs, cars) did extremely well during the pandemic and is up nearly 30 percent since the pandemic began. But over the last three months, spending on durable goods has fallen 6.5 percent, while spending on services is up 3.2 percent.

There are other signs that demand for durable goods is waning somewhat. New orders for durable goods fell 0.1 percent in July, driven by the volatile aircraft category where bookings for commercial aircraft fell 48.8 percent. New orders for computers and electronics products slipped 0.4 percent in July, though it is up 9.5 percent from pre-pandemic levels. Overall, the level of new orders is 8.7 percent above the previous record set in 2008. So while it looks like demand is slowing, it remains at historically high levels.

Even if demand slows, manufacturers are likely to remain busy. Inventory levels are extremely low. In the US, the inventories-to-sales ratio for retailers have dropped from 1.4 before the pandemic to 1.08 now. The inventories-

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to-sales ratio for the auto sector has dropped from a longer-term average of 2.4 to 0.683, meaning the auto sector is not even able to carry a month worth of inventory. Lead times have lengthened and back orders remain high. IPC's North American EMS and PCB reports both highlight this trend. In a well functioning environment, shipments typically lag orders by about a month. In recent months, manufacturers have been unable to keep up with historic order flow, primarily due to shortages and delays. The EMS sector delivered about 60 percent of what they normally would have delivered last month. It will take some time to work through backorders and restore inventory levels.

Another headwind for demand will be the presumed end of pandemic-related stimulus. In the U.S., enhanced benefits for unemployed workers are set to expire on September 6th. These benefits include a $300 weekly supplement for traditional benefits paid by states and additional weeks of benefits for the long-term unemployed. Some states have already curtailed additional benefits.

At the same time, Federal Reserve Chairman Jerome Powell indicated last week that the central bank will likely begin tapering asset purchases by the end of the year, but will retain their accommodating stance. He noted, "the timing and pace of the coming reduction in asset purchases will not be intended to carry a direct signal regarding the timing of interest rate liftoff, for which we have articulated a different and substantially more stringent test." The Fed has signaled their desire for a higher average rate of inflation and they are getting what they asked for and then some.

Prices throughout the supply chain remain elevated. Over the last few months, we have seen prices come down slightly, but strong demand coupled with continued distortions in the supply chain are keeping prices high. Copper for example, is down 7 percent from the peak in May 2021, but is up 48 percent over the last year.

In the U.S., producer prices are continuing to move higher, as producers try to catch up with a lag to the higher underlying commodity prices that have persisted in recent months. The overall producer price index is up 20 percent in the last year. Chemicals and allied products are up 23 percent over the same time horizon. These indexes are respectively up 15.3 percent and 17.4 percent since the start of the year and both are at all-time highs.

Over the last two months, The Baltic Exchange Air Freight Index has declined 9.2 percent on the Hong Kong - North American route, 7 percent on the Frankfurt - North American route, and 3.2 percent on the Hong Kong - Europe route. But over the last year, prices on these routes are up 59.3 percent, 9.9 percent, and 44.5 percent respectively.

Prices are likely to remain elevated for sometime. Some prices take time to adjust and many of those adjustments haven't been made yet. In recent weeks, we've started to see announcements that companies are increasing prices as a result of higher raw material costs and capacity constraints. More announcements will inevitably follow as those price increases move through supply chains.

COVID, of course, remains the X factor. Surging COVID cases in the US have tampered expectations which in turn could hinder the recovery. The Consumer Sentiment Index fell by 13.4 percent in August, recording the least favorable economic prospects in more than a decade. The Index has only recorded larger losses six other times since 1978. With economies reopening, consumers likely felt that COVID was behind us. The recent spike in cases is a reminder that a return to normal could be more permanently delayed.

-7.0%

Global copper prices are down 7 percent from the peak in May 2021, but remain up 48 percent over the last year.

55.4

The J.P.Morgan Global Manufacturing PMI declined slightly in July. The eurozone remains a bright spot, but purchase price inflation ticked higher and was near the steepest increase in the past 13 years.

5.4% & 7.1%

The labor markets in the US and Europe have both improved strongly in recent months. Unemployment rates have fallen but there is still ground to make up.

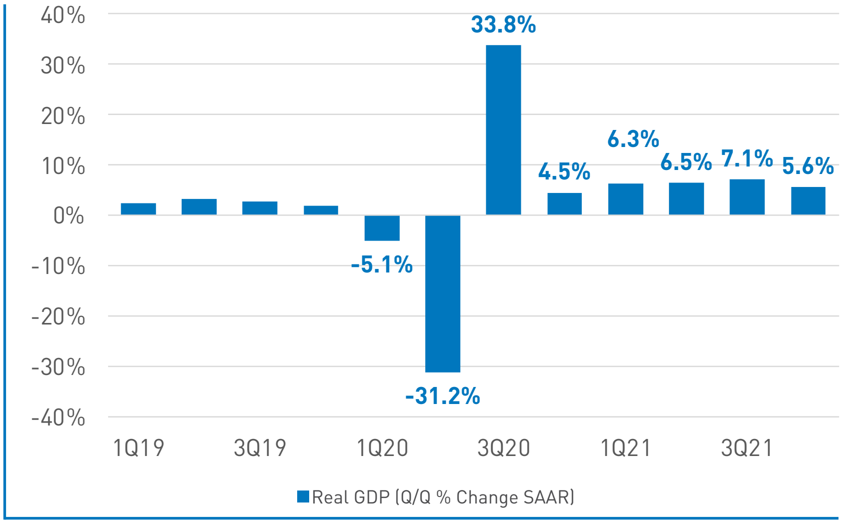
70.3

The Consumer Sentiment Index fell by 13.4 percent in August, recording the least favorable economic prospects in more than a decade.

U.S. OUTLOOK

ECONOMIC GROWTH

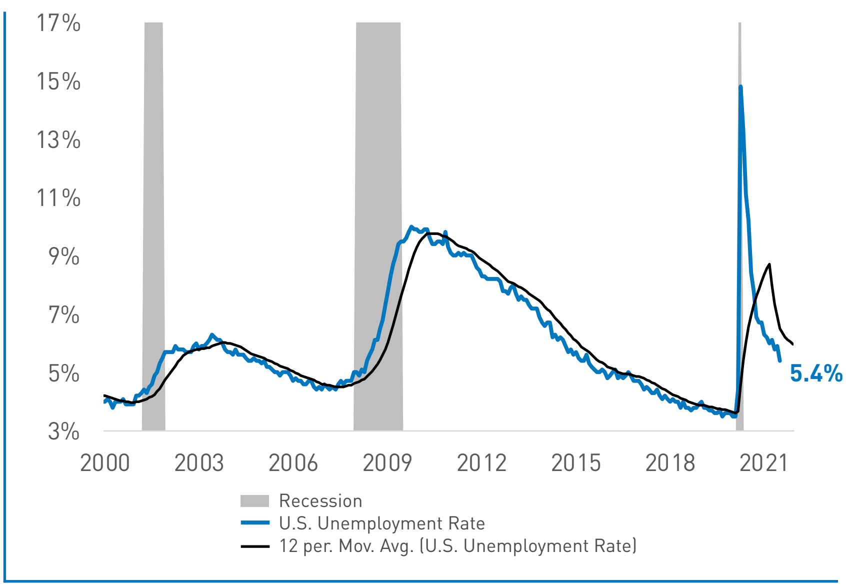
The U.S. economy grew 6.6 percent (seasonally adjusted annual basis) in the second quarter. This was below the original 8.5 percent consensus expectations but strong enough growth to push the economy above pre-pandemic levels for the first time. The economy remains below the pre-pandemic trend — in other words, where it would have been without the pandemic. But the economy can cross that mark by the end of the year if it is able to maintain 6.5 percent growth through the remainder of the year. Net exports subtracted 0.2 percentage points from growth in the second quarter while inventory investment pulled GDP down by 1.3 percentage points. Consumer spending (up 11.9 percent) and business investment (up 9.3 percent) were both strong during the quarter.



	2021 ECONOMIC GROWTH (GDP % Change)	2022 ECONOMIC GROWTH (GDP % Change)	2021 EXCHANGE RATE (v. USD)	2022 EXCHANGE RATE (v. USD)
UNITED STATES	6.2%	4.4%	N/A	N/A
CANADA	6.2%	4.0%	1.25	1.25
MEXICO	5.8%	3.0%	20.26	20.60
EURO AREA	4.7%	4.3%	1.19	1.22
CHINA	8.5%	5.6%	6.45	6.47

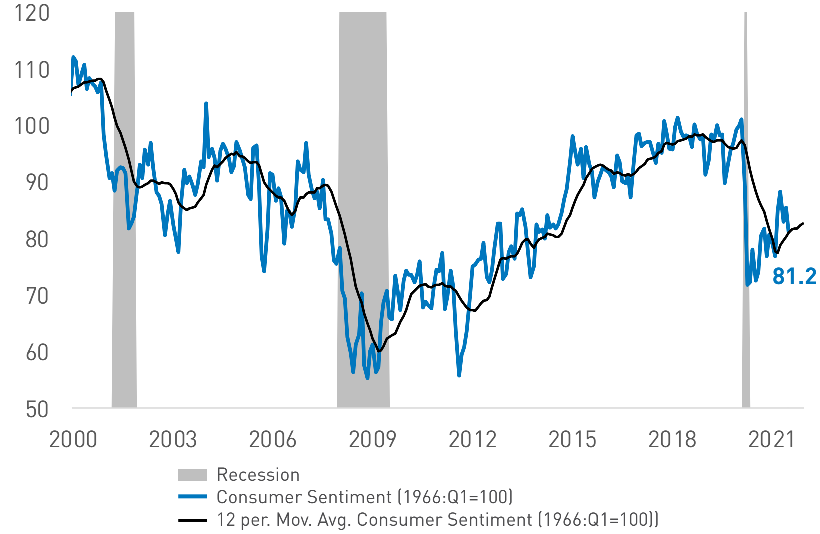
EMPLOYMENT

The economy added 850,000 jobs in June. The U.S. labor market recovered further ground in July. Nonfarm payroll added 943,000 jobs. This follows an upwardly revised gain of 938,000 jobs in the prior month. The coming months should also bring sizable gains as pandemic-related stimulus programs expire. Leisure and hospitality was again the largest contributor, adding 380,000 jobs. Manufacturing added 27,000 new jobs. The unemployment rate fell from 5.9 percent to 5.4 percent during the month. Payroll employment has regained three-quarters of the ground lost during the pandemic and is just 3.7 percent below the pre-pandemic peak. Average hourly earnings rose 0.4 percent in July and are up 4 percent over the last year. Aggregate hours worked rose 0.6 percent during the month and are up 6.3 percent over the last year. Combined, total pay for workers rose 0.9 percent during the month. Average hourly earnings are up 7.1 percent from February 2020, and total hours worked are up 2.7 percent.



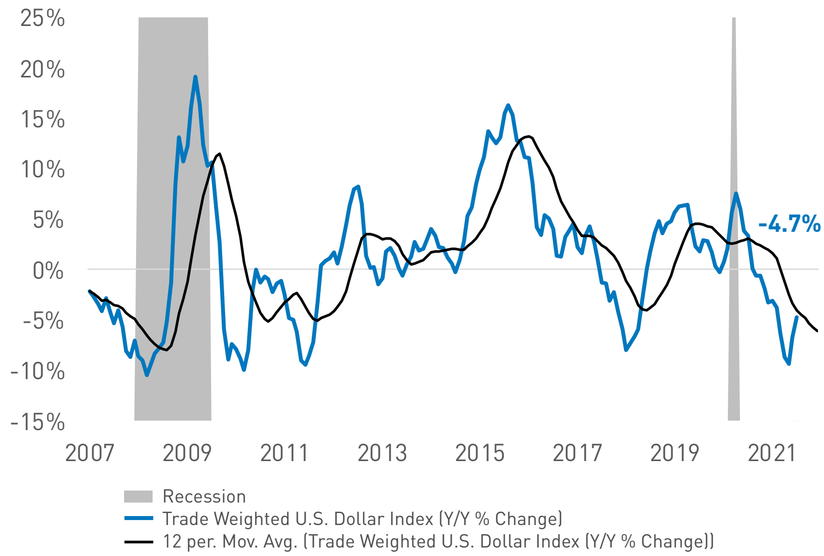
SENTIMENT

Consumer sentiment in the U.S. fell precipitously in the early weeks of August. The 13.5 percent drop from the previous month is only surpassed in magnitude by two months: the drop near the start of the pandemic in April 2020 (down 19.4 percent) and the decline in the depths of the 2007-2009 recession in October 2008 (down 18.1 percent). Large month-to-month declines are rare and are typically connected to a rapid change in the economy. The declines in early August were widespread across socioeconomic backgrounds (i.e., income, age, education) and across all aspects of the economy (i.e., inflation, employment, personal finances, economy outlook). The resurgence of the pandemic over the last month is clearly exerting pressure on the consumer psyche.



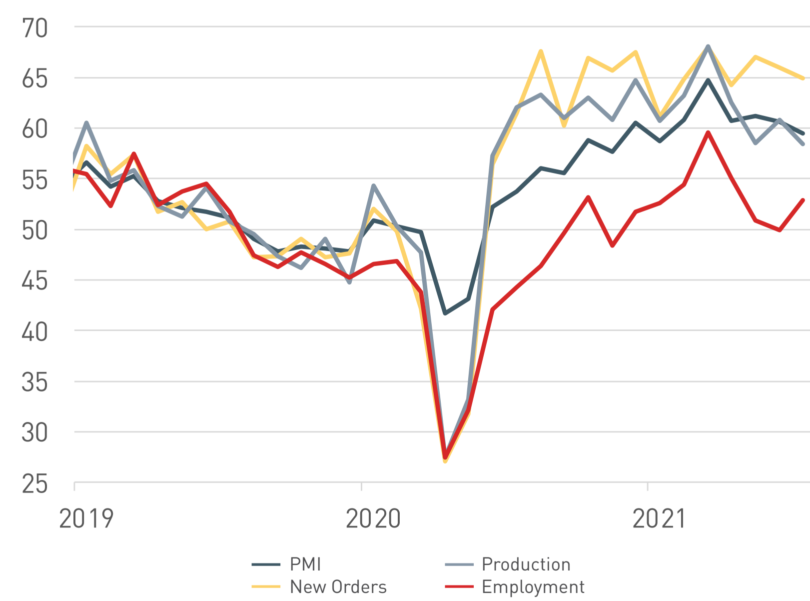
TRADE-WEIGHTED U.S. DOLLAR INDEX

The dollar moved higher again in July. The trade-weighted U.S. dollar index increased 1.3 percent over the last month. The trade-weighted dollar index is off 4.7 percent over the last year and 1.5 percent over the last two years. The trade-weighted dollar index has continued to rise in August and is near a high for the year. The trajectory of the Delta variant, and other COVID variants to follow, has created uncertainty around the economic outlook and provided support for the dollar. At the same time, all eyes are on Fed Chair Powell and his speech in Jackson Hole, Wyoming, at the end of August in the hopes of gleaning any information about the Fed's taper timing.



MANUFACTURERS' SENTIMENT (PMI)

The manufacturing sector expanded last month — the 14th consecutive month of growth. The July Manufacturing PMI declined 1.1 percentage points to 59.5 but continues to indicate the sector is growing. The manufacturing sector continues to be bogged down by supply chain disruptions. Raw material lead times remain historically long, and shortages persist for many basic materials. Supplier deliveries continue to be curtailed by labor and production shortages and transportation bottlenecks. The Consumer's Inventories Index remains at historically low levels, and the backlog of orders is still high. Prices remain higher, adding further pressure to operations.



U.S. END MARKETS FOR ELECTRONICS

Industrial production increased in July, rising 0.9 percent. Overall production is up 6.6 percent over the last year but down 0.9 percent over the last two years. Manufacturing production increased 1.4 percent during the month, and manufacturing output is now 1.1 percent above pre-pandemic levels.

AUTOMOTIVE PRODUCTS

Auto production rose a strong 10.8 percent in July, but shortages continue to hamper production levels. Output is 1.3 percent below pre-pandemic levels despite strong demand.

TRANSIT EQUIPMENT

Transit equipment production rose 7.7 percent over the last month. The sector is up 1.7 percent from pre-pandemic levels but down 22.6 percent from two years ago.

INFORMATION PROCESSING & RELATED EQUIPMENT

Production in the information processing and related equipment sector increased 1.3 percent over the month. The sector is up 6.8 percent over the last year, 14.4 percent from two years ago and 6.7 percent from February 2020.

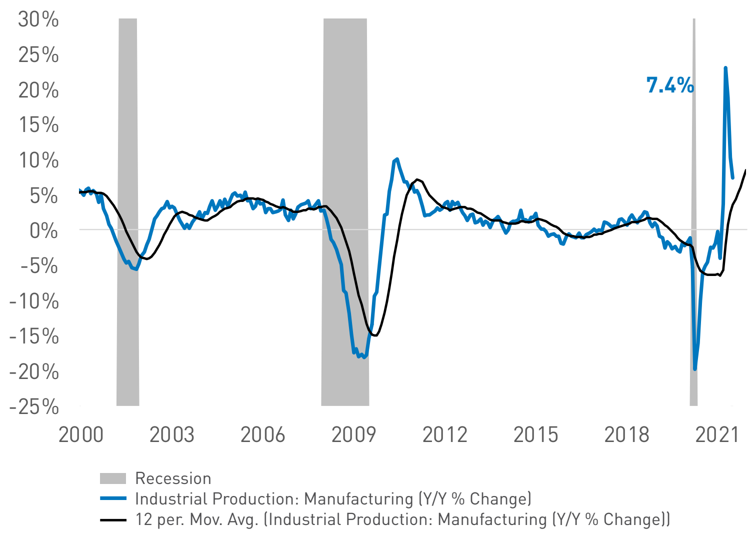
INDUSTRIAL & OTHER EQUIPMENT

The industrial segment grew 1.1 percent last month. The sector is up 11.6 percent over the last year but just 0.2 percent from the start of the pandemic.

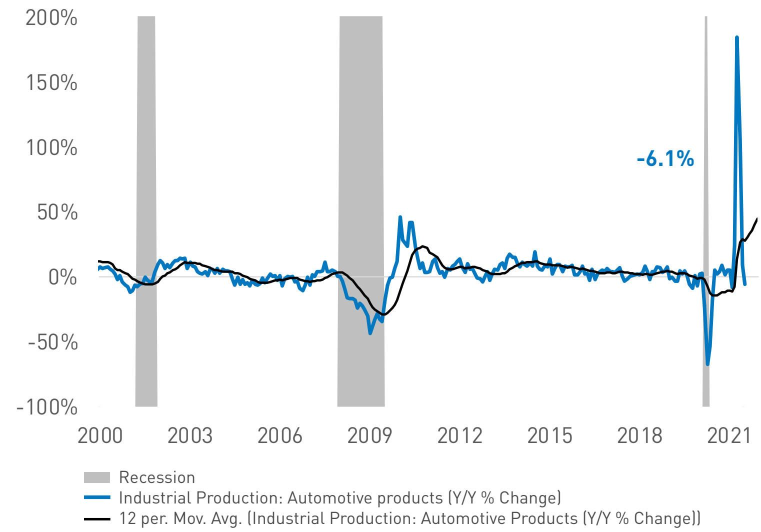
DEFENSE & SPACE EQUIPMENT

The defense and space equipment segment rose 1.8 percent over the last month. The sector is up 16.5 percent over the last year and up a strong 11.6 percent since the start of the pandemic.

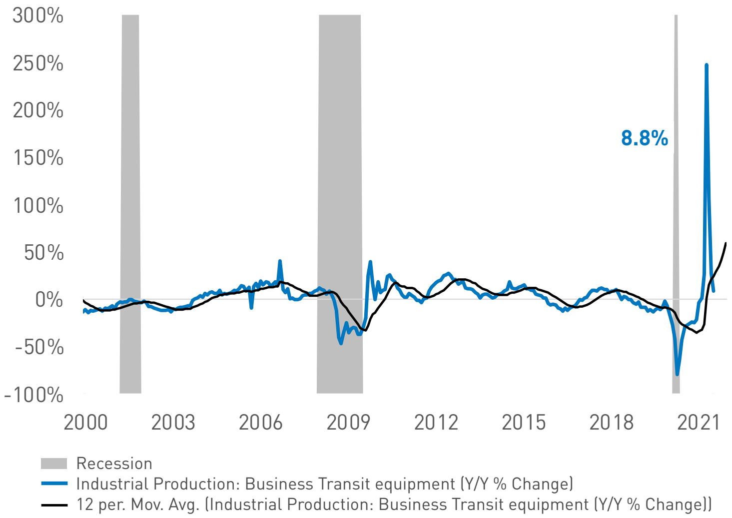
Manufacturing



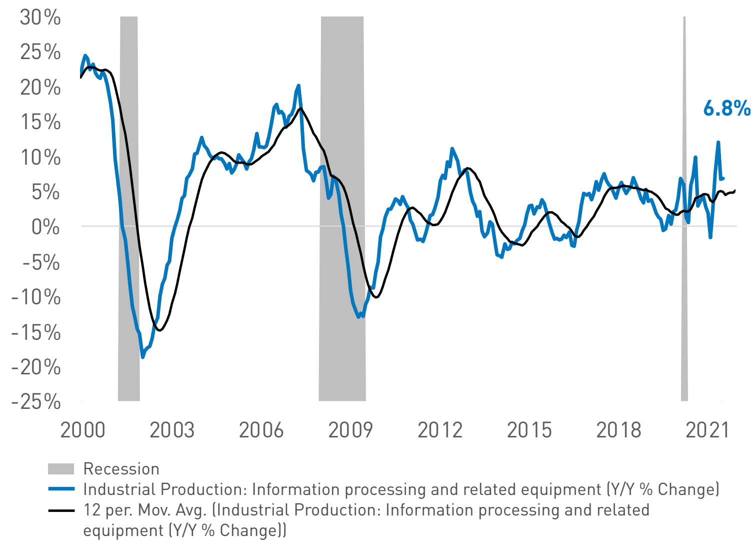
Automotive Products



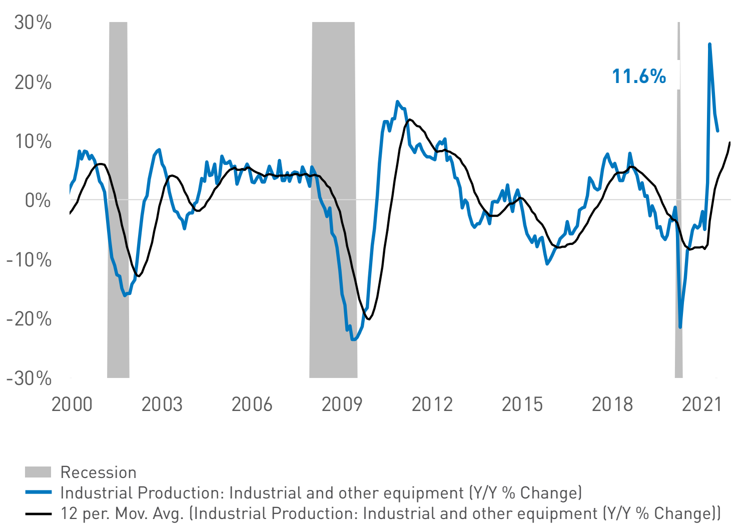
Business Transit Equipment (Y/Y % Change)



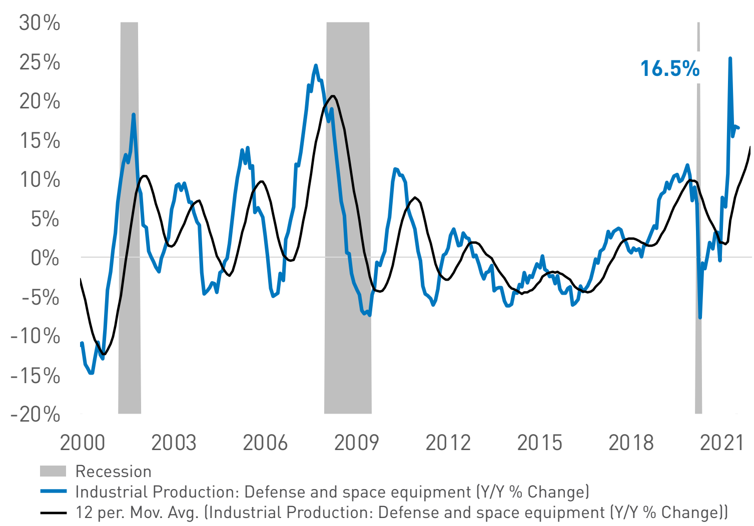
Information Processing & Related Equipment (Y/Y % Change)



Industrial & Other Equipment (Y/Y % Change)



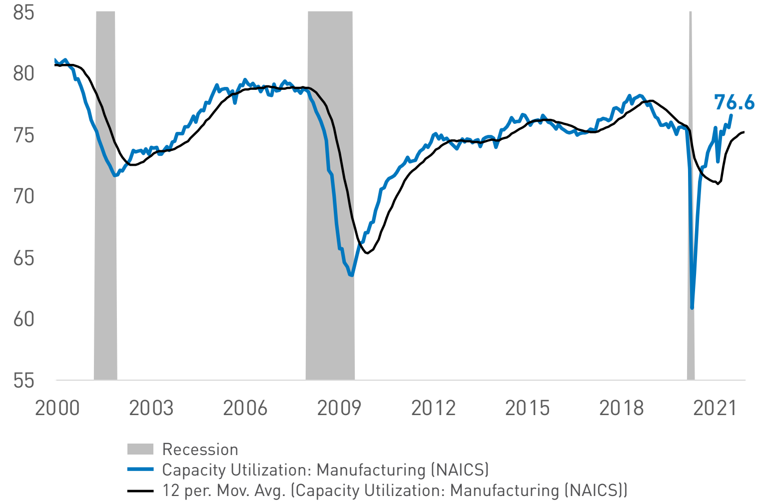
Defense & Space Equipment (Y/Y % Change)



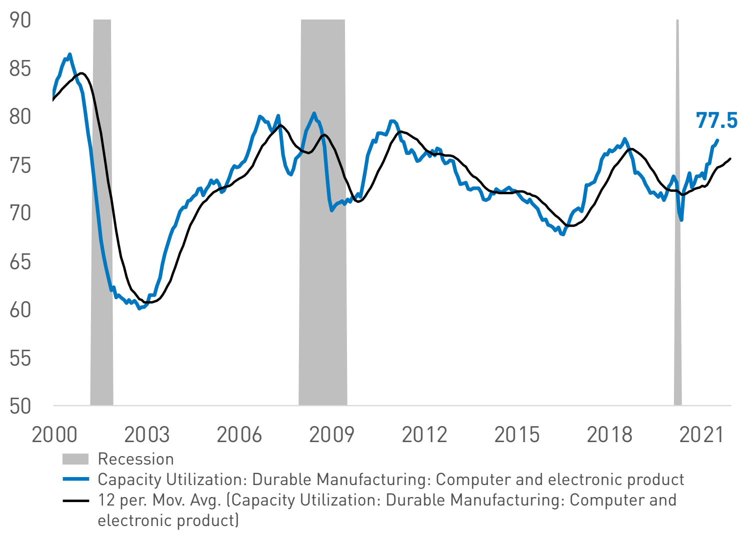
MANUFACTURING CAPACITY UTILIZATION

The industrial and manufacturing sectors continue to recover, but shortages and other supply chain disruptions are hindering production levels. Overall capacity utilization moved higher in July, increasing from 75.4 percent in June to 76.1 percent in July. Manufacturing capacity utilization rose to 76.6 percent in July from 75.5 percent in the prior month. Computer and electronic production capacity utilization moved to 76.6 percent; electrical equipment, appliances and components utilization increased to 77.5 percent; and utilization for the motor vehicles and parts sector revised the previous decline and rose to 71.9 percent, the best reading since January. Utilization in the aerospace and miscellaneous transportation equipment sector increased to 70.5 percent.

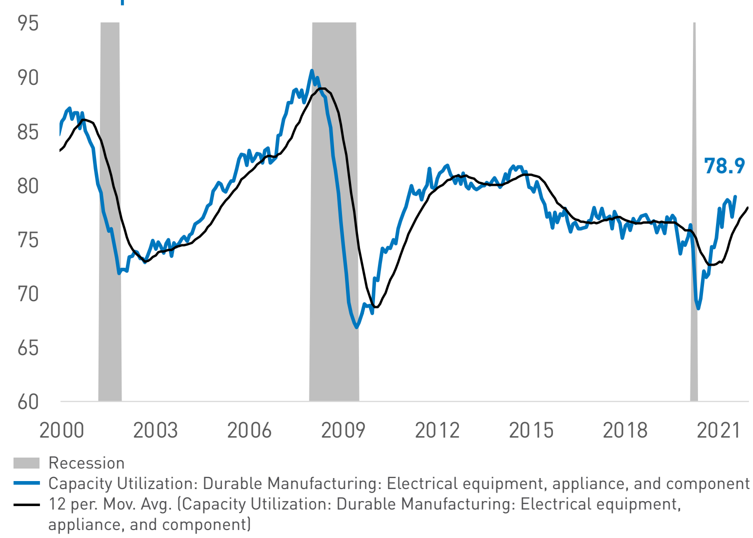
Manufacturing (NAICS)



Computer & Electronic Product

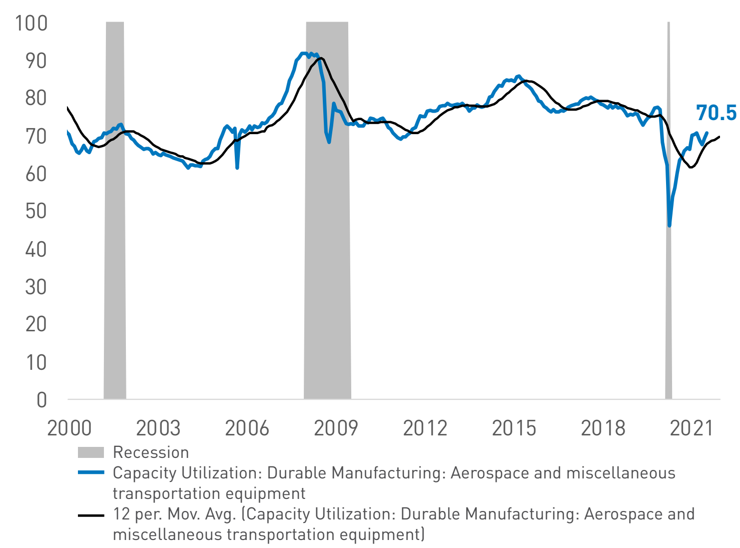


Electrical Equipment, Appliance, & Component



Motor Vehicles & Parts

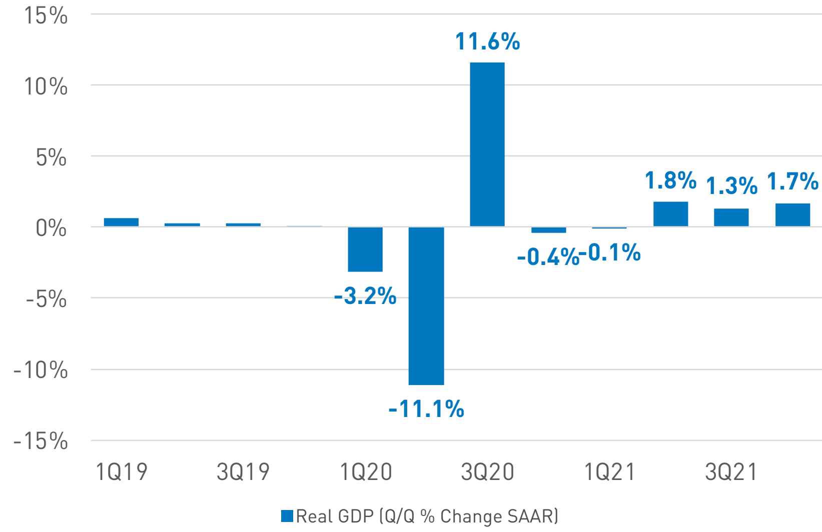
Aerospace & Miscellaneous Transportation Equipment



EUROPEAN OUTLOOK

ECONOMIC GROWTH

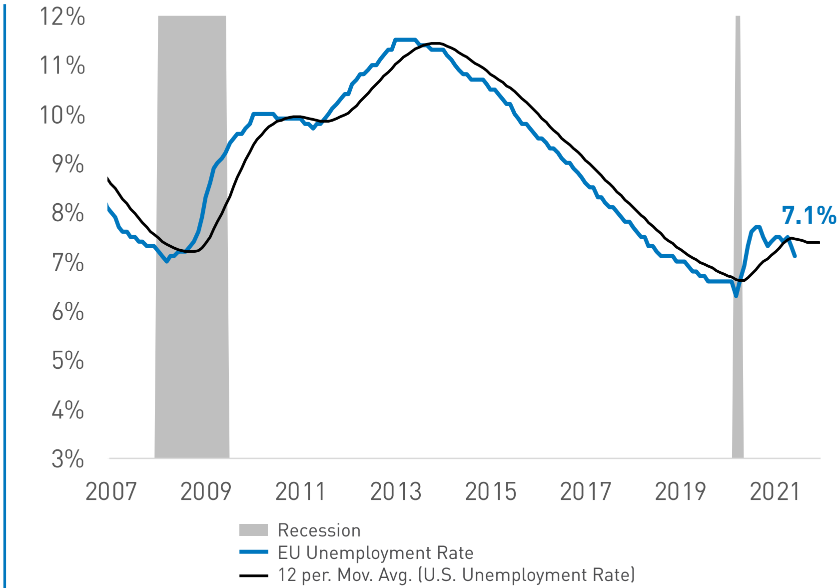
GDP in the euro area rose 2 percent in the second quarter (1.9 percent in the European Union). On an annualized basis, GDP rose 8.2 percent in the euro area and 7.9 percent in the European Union, which compares to 6.6 percent GDP growth in the United States over the same period. GDP in the euro area is up 13.7 percent over the last year. Despite a strong growth rate during the quarter, European GDP has not yet returned to pre-pandemic levels as it has in the United States. But the data make clear that reopening of nonessential stores and businesses is propelling economic growth. There are signs that business investment plans are improving and momentum is carrying into the third quarter, and the broader economy is experiencing accelerating growth following the relaxation of COVID-19 restrictions. This is especially true in the services sector. The IHS Markit Eurozone Composite PMI, which includes services, is near a 15-year high.



	Q/Q PERCENTAGE CHANGE				Y/Y PERCENTAGE CHANGE			
	2020Q3	2020Q4	2021Q1	2021Q2	2020Q3	2020Q4	2021Q1	2021Q2
EURO AREA	12.4%	-0.6%	-0.3%	2.0%	-4.0%	-4.6%	-1.3%	13.6%
EU (27)	11.6%	-0.4%	-0.1%	1.9%	-3.9%	-4.3%	-1.3%	13.2%
GERMANY	9.0%	0.7%	-2.1%	1.5%	-3.7%	-2.9%	-3.2%	9.2%
FRANCE	18.8%	-1.0%	0.0%	0.9%	-3.6%	-4.2%	1.7%	18.7%
ITALY	16.0%	-1.8%	0.2%	2.7%	-5.2%	-6.5%	-0.7%	17.3%
SPAIN	17.1%	0.0%	-0.4%	2.8%	-8.6%	-8.9%	-4.2%	19.8%

	2021 ECONOMIC GROWTH (GDP % CHANGE)	2022 ECONOMIC GROWTH (GDP % CHANGE)
EURO AREA	4.7%	4.3%
GERMANY	3.4%	4.4%
FRANCE	5.7%	4.2%
NETHERLANDS	3.0%	3.3%

EMPLOYMENT



Employment growth has picked up in Europe, in line with the reopening of the economy and relaxation of COVID-19 restrictions. In June 2021, the euro area seasonally adjusted unemployment rate declined three-tenths of a percentage point to 7.7 percent. The EU unemployment rate fell from 7.3 percent to 7.1 percent. These are the lowest unemployment rates since May 2020. The number of employed persons increased 0.5 percent in the euro area during the first quarter and 0.6 percent in the European Union. Employment in the first quarter had fallen by 0.2 percent in both areas. Europe has experienced much lower peak unemployment than the United States, thanks to national job-retention schemes that often allowed workers to work shorter hours for less pay and avoid layoffs. But Europe has also experienced a strong decline in the labor-force participation rate. In the United States, about half of the fall in labor force participation is related to workers retiring. In Europe, it includes many young workers who will likely be looking to resume working in the coming months. Altogether, Europe has about 2.5 million fewer people working than at the end of 2019, and many of these people are not classified as unemployed because they are not actively seeking work.

MANUFACTURERS' SENTIMENT (PMI)

Manufacturing sentiment remains high in Europe, despite a small loss in momentum over the last month. The PMI in July was 62.8, down from the record high in June of 63.4. While rates of improvement slowed over the last month across a number of countries, they remain near historic highs. The Netherlands continues to be the fastest growing country in Europe, and growth in Germany hit a three-month high that was also the third-highest on record. Order flow continues to be strong and backlog remains high. IHS reports firms are hiring additional staff at a rate unseen in 24 years of data collection. Strong demand continues to be met by sizable supply chain obstacles. Input lead-times lengthened to one of the greatest degrees ever recorded according to IHS and shortages remain acute. Moreover, input prices continue to rise, as they do almost everywhere, but manufacturers are able to pass some of these price increases forward. Europe saw both a record increase in input costs and a record rise in selling charges.

E.U. END MARKETS FOR ELECTRONICS

Manufacturing output declined in June, falling 0.2 percent. While manufacturers remain optimistic and demand remains strong, supply chain constraints have hindered production. Output is up 11.4 percent over the last year but down 0.8 percent 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, fell 4.3 percent in June. The sector is up 16.8 percent over the last year and 28.1 percent over the last two years.

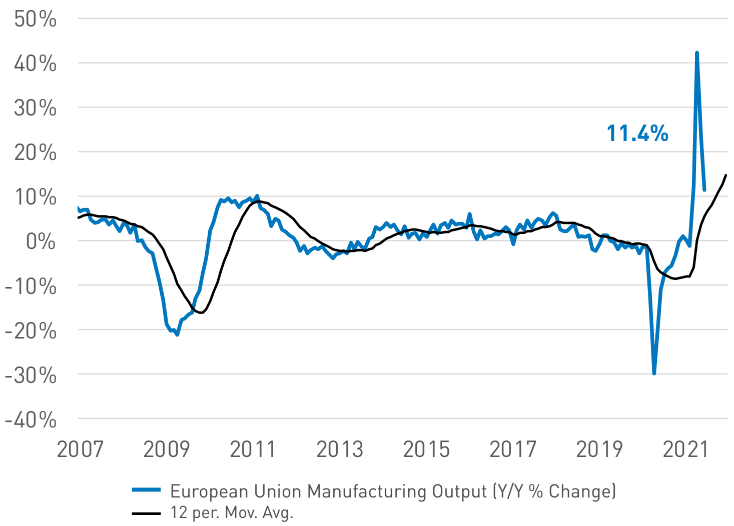
MOTOR VEHICLES

The motor vehicle manufacturing production index decreased another 1.4 percent in June. Auto production continues to be hampered by supply shortages. Auto production in the European Union remains off 36.2 percent from two years ago.

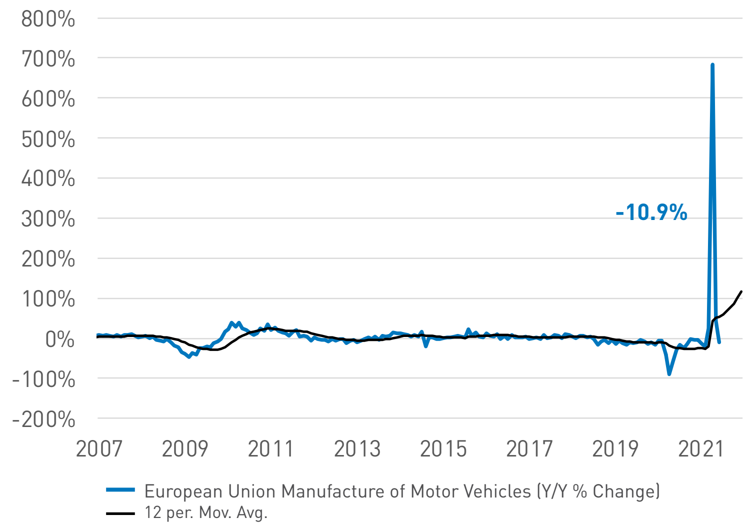
AIR & SPACECRAFT & RELATED MACHINERY

The air and spacecraft manufacturing sector rose 3.2 percent in June. The segment is flat over the last year but down 25 percent over the last two years.

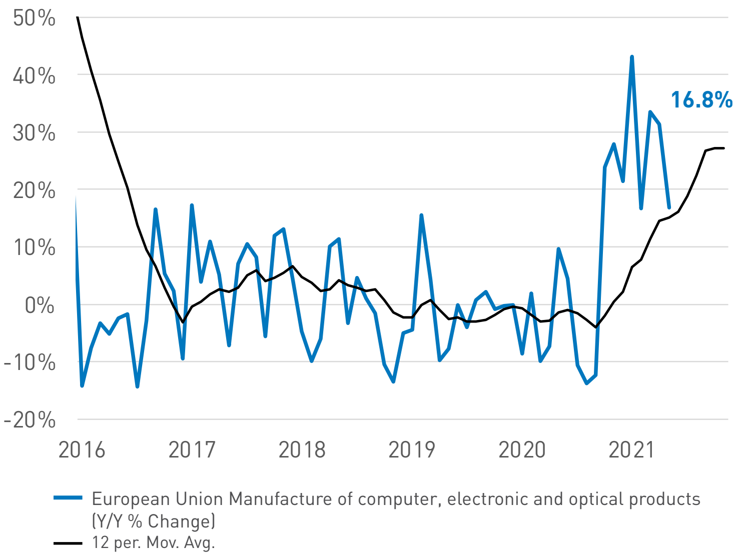
E.U. Manufacturing Output



E.U. Manufacture of Motor Vehicles



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



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