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FEBRUARY 2022

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HIGHLIGHTED IN THIS PUBLICATION:

GLOBAL STRATEGIC ASSET ALLOCATION

GLOBAL SECURITY SELECTION

REGIONAL ASSET ALLOCATION

REGIONAL PORTFOLIO CONSTRUCTION

For some time, consumers around the world have been affected by shortages of goods, from basic necessities to microchips. At the same time, concerns about inflation have grown. In this edition of *Infocus*, EFG chief economist Stefan Gerlach looks at the relationship in the US between supply chain disruptions and inflation.

The Covid pandemic has led to a surge in inflation, particularly in the US. There are many obvious causal factors including exceptionally expansionary fiscal and monetary policies leading to strong growth of demand, a shift in demand from services to goods, rising energy prices and a reduction in the supply of labour. However, much attention has focused on supply chain disruptions, which appear to have played a critical role although historically they have not played much part in discussions of inflation.

Such disruptions come in many forms. Lockdowns, restrictions on mobility and factory closures have reduced transportation and supply capacity, leading to a surge in transport costs and lengthened delivery times for goods. And delayed deliveries of inputs have reduced the supply of goods further up the production chain, leading to additional price increases. Overall, it is argued, supply disruptions have reduced the economy's capacity to bring goods to the market at a time of strong demand. The result has been a sharp boost to inflation.

The NY Fed's Global Supply Chain Pressure Index
Recently, economists at the New York Fed have proposed a measure intended to capture the severity of such disruptions.[1] The Global Supply Chain Pressure Index (GSCPI) uses data on a range of indicators to provide a composite view of the state of global supply chains.

The first set of indicators focus on international transportation costs:

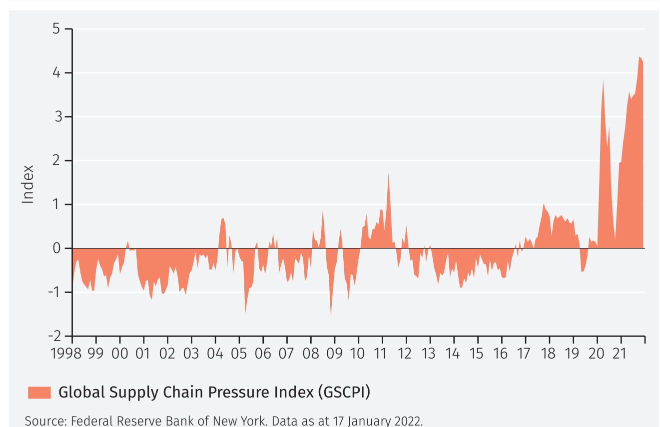
- The Baltic Dry Index (BDI), which tracks the cost of shipping raw materials, such as coal or steel;
- The Harpex index, which tracks container shipping rates;
- Measures of the cost of freight transportation by air.

The second set of indicators rely on country-level manufacturing Purchasing Manager Index (PMI) surveys, focusing on data from China, the eurozone, Japan, Korea, Taiwan, the UK and the US. The authors use the following subcomponents:

- 'Delivery time', which captures the extent to which supply chain delays in the economy impact producers;
- 'Backlogs', which quantifies the volume of orders that firms have received but have yet to either start working on or complete;
- 'Purchased stocks', which captures inventory accumulation by firms in the economy.

The GSCPI, which is available monthly since September 1997, is shown in Figure 1 below.[2] The key point is obvious: while supply chain pressures have fluctuated in the past, they have surged since the start of the pandemic in early 2020. They rose sharply from February to April 2020 during the first wave of Covid but declined during the summer and reached a low well within the normal range of fluctuations in October. They then started to rise again, reaching a peak in October 2021 and remaining close to that level in November and December. Overall, supply chain disruptions were severe during 2021.

1. Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York. Data as at 17 January 2022.

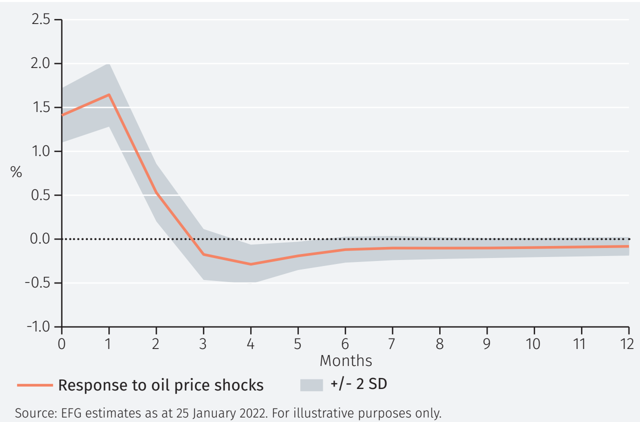
These data suggest that supply side pressures have played a role in the surge in US inflation in 2021. To explore this hypothesis formally, statistical analysis is necessary.

Supply chain pressures and inflation
Next a simple statistical model is estimated to study how inflation responds to shocks to oil prices and the GSCPI index.[3]

Figure 2 shows that a 'normal' shock to oil prices raises (annualised, monthly) inflation by 1.5% when it happens,

[1] Gianluca Benigno, Julian di Giovanni, Jan J. J. Groen, and Adam I. Noble, *A New Barometer of Global Supply Chain Pressures*, Liberty Street Economics, 4 January 2022.
[2] The index has been normalised to have zero mean and unit standard deviation.
[3] A VAR(2) model is estimated on monthly data on the log-level of West Texas Intermediate oil prices, the GSCPI index and of (annualised) monthly CPI inflation over the period November 1997 to December 2021. The oil price and CPI data are from FRED.

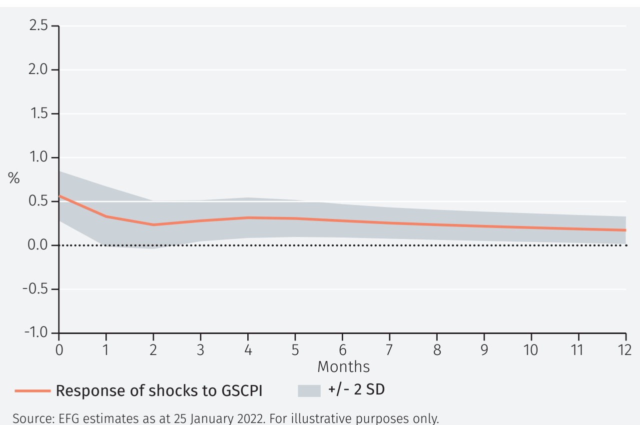
2. Response of inflation to oil price shocks



Source: EFG estimates as at 25 January 2022. For illustrative purposes only.

but after about three months the impact on inflation has subsided.[4] This finding merely confirms that oil price shocks have large effects on inflation – as is well-known. More interestingly, Figure 3 shows that a 'normal' shock to the GSCPI index raises inflation by 0.6% when it happens, and that the impact on inflation is highly persistent but insignificant after about 15 months.[5] This supports the common impression that supply chain disruptions have played a role in the sharp pick-up in inflation during the Covid pandemic. Of course, since the GSCPI index did not fluctuate much before the Covid pandemic it is not surprising that this effect has not been noticed before.

3. Response of inflation to GSCPI shocks



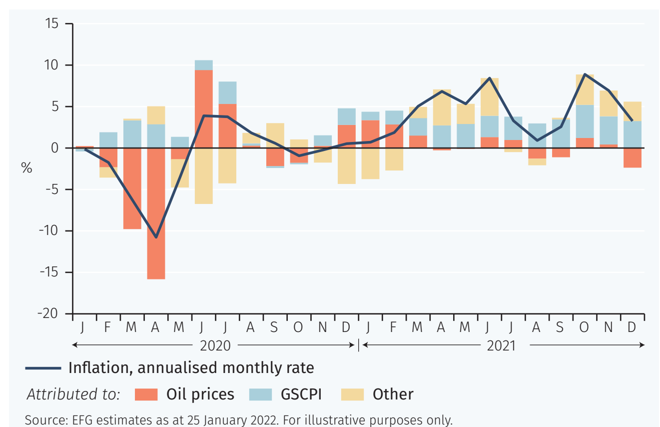
Source: EFG estimates as at 25 January 2022. For illustrative purposes only.

Inflation during the Covid pandemic

But just how important have supply chain disruptions been for the variations in inflation during the Covid pandemic? To assess this question, the VAR model is used to decompose movements in monthly, annualised inflation (relative to a deterministic trend) in 2020-21 into the parts attributable to shocks to oil prices and the GSCPI. What these shocks do not explain is attributed to "other" factors.

The results are shown in Figure 4. Consider first the sharp decline in inflation as the pandemic started in early 2020. The results show that falling energy prices led to very pronounced downward pressure on inflation. Supply chain disruptions pushed up inflation, but by much less, leading overall inflation to fall. The model attributes the recovery in inflation in June and July principally to rising oil prices. Thus, oil price swings were much more important than supply chain pressures in explaining fluctuations in inflation in 2020.

4. Decomposition of inflation



Source: EFG estimates as at 25 January 2022. For illustrative purposes only.

The picture for 2021 is different. From November 2020 onwards, tightening supply chain pressures pushed up inflation every month, and particularly so in the second and fourth quarters when inflation rose to high levels. While oil prices pushed up inflation during the first quarter, during the rest of the year they generally reduced inflation.

Conclusions

There has been much commentary on the potential role of supply chain strains as a new driver of inflation during the Covid pandemic. The short empirical analysis above suggests they have indeed had a large impact on CPI inflation in the US, particularly in early 2020 and throughout 2021. The analysis also shows that the impact on inflation of supply side strains only disappears gradually.

One important implication is that the speed by which inflation returns to the Federal Reserve's 2% objective will very much depend on how speedily the current supply chain tensions are overcome. While it is too early to say, recent evidence suggests that they may have started to relax.

[4] The 'normal' shock is defined as a one standard deviation innovation (or 9.9%) in the equation for oil prices in the VAR. In the interest of brevity, it is not shown.
[5] This shock is constructed analogously to the oil price shock and raises the index by 0.4.

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