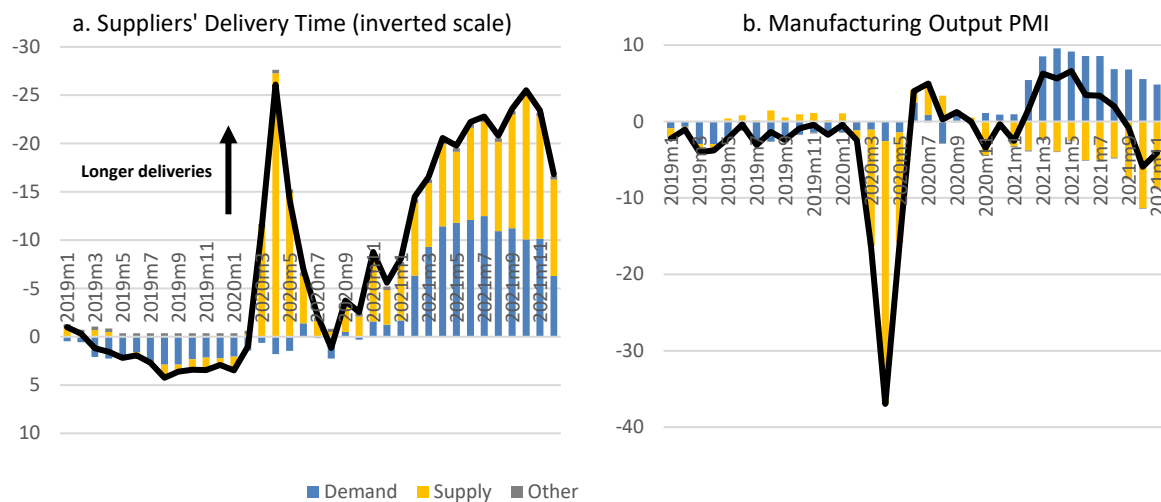


The importance of supply-side bottlenecks in France

By [Stefan Gebauer](#)

Relative to demand factors, supply-side disruptions during the Covid-19 pandemic explain about 60% of longer delivery times and significantly dampened manufacturing output since 2020 in France. According to historical regularities, bottlenecks are expected to unwind in the course of 2022, while forecasts are surrounded by a high degree of uncertainty given the unusual origins of disruptions.

Chart 1: Shock decomposition – Suppliers' delivery time and output PMI France



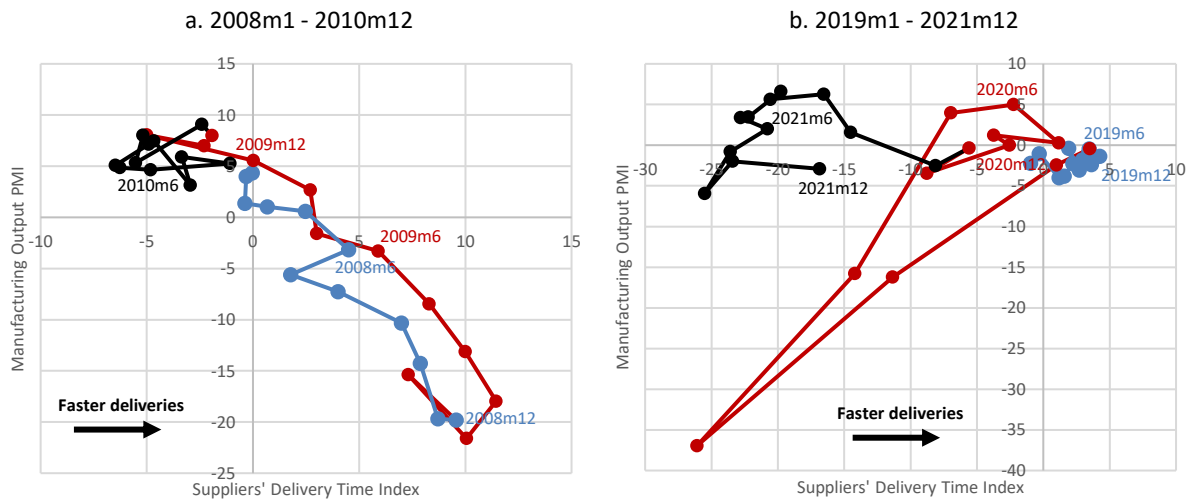
Source: Markit, own calculations.

Note: Demeaned index value and ppt. contributions, index increase = faster deliveries. Most recent observation: 2021M12.

Different factors may explain longer delivery times for manufactured goods. First, strong demand exceeding existing supply capacities may delay the treatment of orders. Second, supply-side disruptions unrelated to demand may adversely affect supply chains and delay goods deliveries. While the former effect is usually associated with increasing output, supply-side disruptions negatively affect economic activity. Purchasing Managers' Index (PMI) data for France show that suppliers' delivery times (SDT) have increased substantially in recent months, while output in the manufacturing sector has declined (as reflected in the "south-west" movement in Chart 2b). These developments follow a sharp drop in activity in 2020, when both manufacturing output collapsed and delivery times surged. The data thus show that global supply-side bottlenecks and the lack of production inputs are at the root of the substantial lengthening of delivery times and that they have hampered the economic recovery from the Covid-19 pandemic. The current situation also markedly differs from the Great Recession of 2008-2009, which was driven almost exclusively by a shortfall in demand,

i.e. a decline in both output and delivery times (depicted by a “south-east” movement in Chart 2a).

Chart 2: Manufacturing output and suppliers' delivery times



Source: Markit, own calculations.

Note: Demeaned index value, SDT index increase = faster deliveries. Blue: 2008(a)/2019(b), red: 2009(a)/2020(b), black: 2010(a)/2021(b). Last observation: 2021M12.

In order to assess the quantitative impact of supply bottlenecks, a structural Bayesian vector autoregression (VAR) model including both the SDT and manufacturing output indices is estimated for France. Statistical inference via sign restrictions is based on the notion that a negative demand shock is associated with a decline in both manufacturing output and delivery times - reflected in an *increase* in the SDT index - and that a supply shock is associated with a decline in output and a lengthening of deliveries - reflected in a *decline* in the SDT index. This set-up relates to similar work recently conducted by the [ECB](#) at the euro area level.

Supply bottlenecks have strongly impeded manufacturing output in recent months

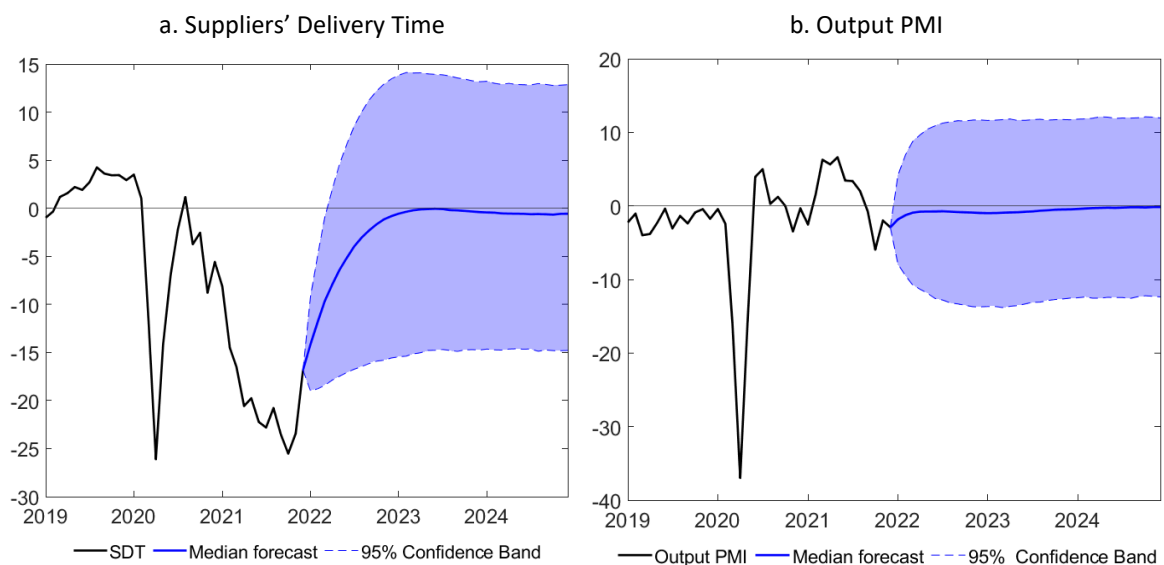
Between January 2020 and December 2021, the cumulative contribution of supply shocks to the increase in delivery times amounted to 62%, compared to 36% on average for demand shocks (Chart 1a). This is in stark contrast with the period between 1999 and 2019, for which the cumulative contribution of supply shocks stood at 26% only. Results for France are comparable with [previous estimates by the ECB for the euro area](#) indicating that roughly two-thirds of the lengthening of delivery times during Covid-19 can be attributed to supply-side disruptions. Finally, Chart 1a also shows that during the first lockdown in spring 2020 - which resulted in a partial shutdown of activity in manufacturing, transportation, and service sectors in France - mainly supply shocks made a negative contribution to output PMI and a lengthening of delivery times.

Chart 1b highlights that supply bottlenecks made a negative contribution to manufacturing output, in particular since the end of 2020. Quantitatively, the absolute cumulative contribution of supply shocks has been large over the course of the pandemic (around 60% against 40% for demand shock contributions), especially in comparison to the pre-pandemic period when mainly demand shocks contributed to movements in output PMI (71% against 26% for supply shock contributions). Strikingly, amid a strengthening economic recovery, demand shock contributions to manufacturing output PMI were entirely positive over the course of 2021. However, large negative supply shock contributions related to an even stronger tightening of supply bottlenecks outweighed these positive demand contributions from September 2021 onward.

Bottlenecks likely to further affect manufacturing output in early 2022

The abovementioned results show the strong impact of supply bottlenecks on delivery times and manufacturing output in recent months. Thus, depending on the pandemic situation, their unwinding will crucially determine the path of the global economic recovery. In order to assess the potential length of remaining bottlenecks in France, Chart 3 shows the unconditional forecasts of the Bayesian VAR for delivery times and manufacturing output PMIs.

Chart 3: Unconditional forecasts – SDT and output PMI France



Source: Markit, own calculations.

*Note: Demeaned index value and ppt. contributions, index increase meaning faster deliveries.
Last observation: 2021M12.*

The model forecasts imply that, based on historical regularities, the adverse effects of supply bottlenecks on delivery times could largely unwind during the first half of 2022, and almost completely fade out by early 2023. In turn, less binding bottlenecks could lead to a recovery in manufacturing output, as shown by a projected gradual rebound of the output PMI index in 2022.

Uncertainty about the exact magnitude and path of bottleneck shocks is high

Of course, the precise path of the unwinding of supply bottlenecks is highly uncertain. In particular, historical regularities may provide only limited guidance given the unprecedented nature of the current crisis. Against this backdrop, the future course of the pandemic and related policy measures will strongly determine the path of bottlenecks. For instance, potential new lockdown measures may imply renewed supply-side disruptions. However, their economic impact would crucially depend on their actual scope and magnitude, and to what extent supply chains would be affected. Furthermore, [precautionary motives](#) may weigh more heavily on aggregate demand once uncertainty about the future path of the pandemic increases, for instance due to the emergence of new variants or a lower-than-expected vaccination efficacy. Such factors may rebalance the importance of demand and supply factors and affect the fading-out of bottleneck effects. Second, the large confidence bands in Chart 3 indicate that even under fairly stable conditions without further pandemic distortions, the predicted paths of delivery times and output PMIs are prone to significant statistical uncertainty. Third, non-bottleneck factors potentially captured in part by the identified supply shock could lead to overestimate bottleneck effects. Finally, the SDT index may not fully reflect bottleneck effects unrelated to delivery times, which would imply underestimating the overall effect.