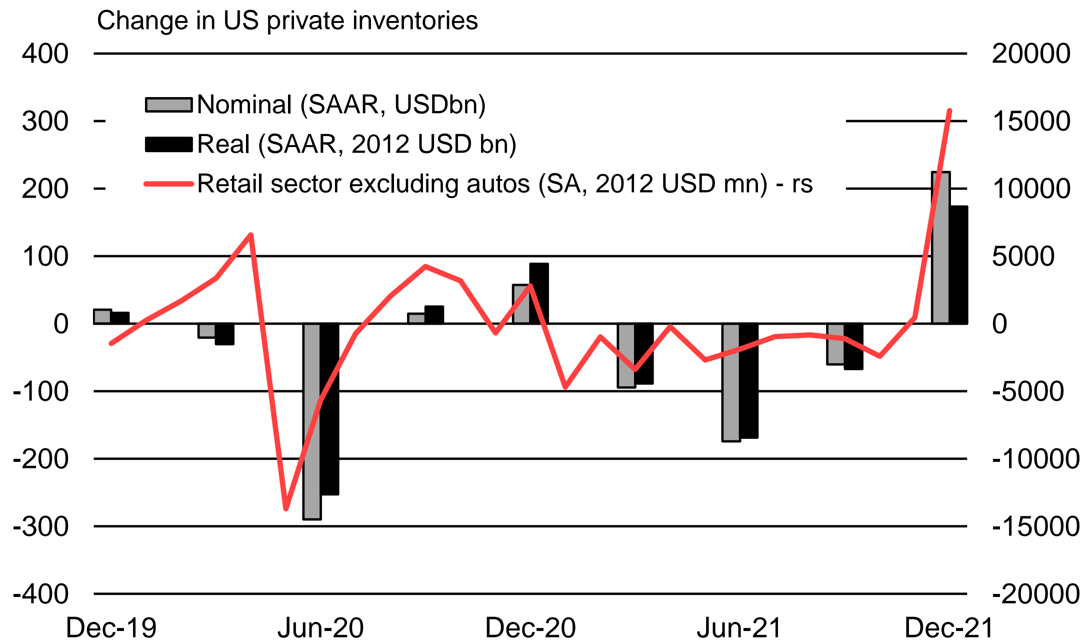
Beware of the bullwhip effect



Note: The "Nominal" and "Real" series plotted are from the BEA quarterly National Accounts, and the latest observation is for 4Q21. "Retail sector excluding autos" is the monthly inventories data from the US Census Bureau. It is nominal but we have deflated it using the PPI for goods.

Source: BEA, Census Bureau, UniCredit Research

- The US economy expanded at a rapid rate of 6.9% qoq annualized in the fourth quarter of last year, but a jump in inventories contributed a huge 4.9pp to growth. If we remove the contribution from inventories then GDP growth was just 2% annualized, roughly in line with US potential growth that would neither put upward nor downward pressure on underlying inflation.
- For the first three quarters of 2021, strong demand for goods and intensifying supply disruption pushed inventories down to very low levels. As demand for goods moderated towards the end of the year, and supply disruption eased somewhat, firms started to rebuild their inventory levels. But the big jump in inventories suggests the supply-chain "bullwhip effect" has occurred. The "bullwhip effect" here is that, as a result of supply shortages and long delivery times, retailers order more goods, both to meet expectations of strong demand but also to replenish their stocks and more, for fear of running out of items. One step along the supply chain, wholesalers see this increased demand from their retail customers and increase orders, both to meet this higher demand as well as to replenish their own inventories and more, again for fear of running out. Further up the supply chain, manufacturers do the same, and the result is that the number of orders and, hence, inventories is amplified. This then might create an overhang ahead, particularly when demand moderates, which triggers retailers to reduce or cancel orders in order to work off their excess inventories, and the effect is magnified as it ripples back through the supply chain.
- What matters for GDP growth is the change in the rate of change of inventories. This is likely to turn into a drag for GDP growth in the coming quarters, particularly now that the fiscal stimulus is fading, and monetary policy is set to tighten, which will moderate demand growth.

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