

## Research Briefing | US

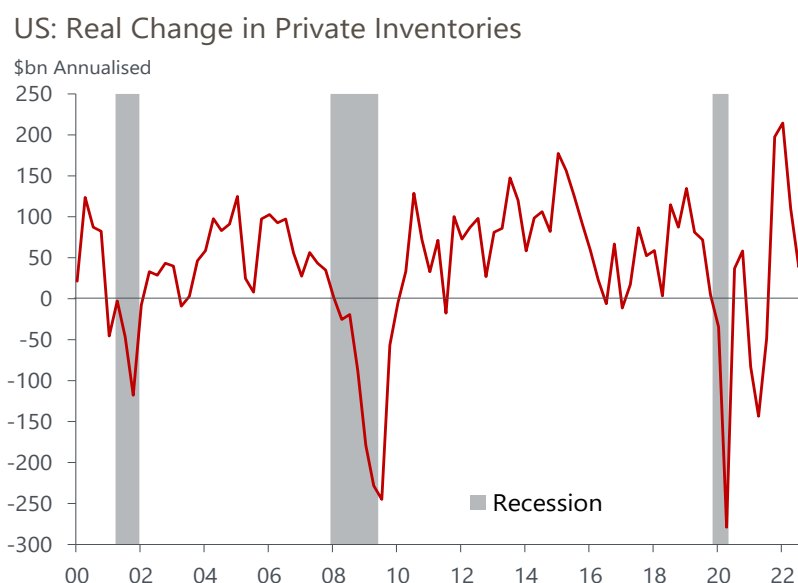
# Inventories to go from boosting, to dragging on growth

- Shortages have supported a wave of inventory rebuilding in the US this past year. But with inventories now above normal levels relative to sales in a range of sectors, we expect a sharp downturn in stock accumulation, which is a downside risk to our forecast in H1 2023.
- What matters for GDP growth is not just the change in inventories, but also the *rate* of change. As the economy slows, firms usually switch from adding to stockpiles to reducing them. High interest rates raise the cost of keeping inventory, making stock building one of the most interest-rate sensitive and cyclical parts of GDP. In recessions since 1970, slower inventory accumulation on average has accounted for more than half of the peak-to-trough decline in output.
- The unprecedented strains in supply chains in recent years mean inventories were unusually lean. The resulting wave of restocking is one reason why economic growth has continued to surprise to the upside. But inventory is no longer low relative to sales and – with the notable exception of the auto sector – inventories in many sectors now appear bloated. With sales growth slowing and interest rates rising further, we expect a sharp slowdown in inventory accumulation.
- Our base case is that inventory accumulation swings from a positive for GDP growth in 2022 to a negative in 2023, helping to drag the overall economy into recession. The upside risk to that view is if firms continue to build inventories over coming years as a buffer against supply disruptions.

There are plenty of reasons behind the surprising resilience of the economy over the past year, from the stock of excess savings to the continued strength of the labor market. But one overlooked factor that is unique to this cycle is the continued boost from restocking by firms (**Chart 1**).

As supply chain issues eased and consumers shifted their spending away from goods toward services, real private inventories rose at an average pace of \$125bn annualized in 2022. This allowed businesses to rebuild depleted stocks.

Chart 1: Inventories were a big boost to GDP in 2022



Source: Oxford Economics/Haver Analytics

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That is the opposite of what we would expect to see as the economy worsens. Inventory accumulation is typically one of the first components of GDP to slow as deteriorating sentiment causes firms to slash new orders and focus on selling stock. Rising interest rates reinforce the effect, raising the cost of holding inventory. That is usually a major part of the business cycle. In the eight recessions since 1970, inventory accumulation slowing has contributed on average more than half of the peak-to-trough decline in GDP.

The unique aspect of this cycle has been the extreme shortages seen throughout 2021 and 2022, as unprecedented demand for goods was met with constrained supply as Covid restrictions held back production in East Asian economies. As goods demand eased and supply rebounded, firms have rebuilt inventories.

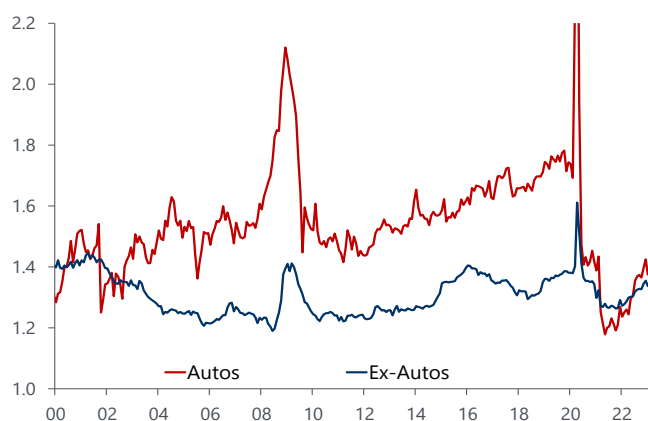
Now the big problem is that the pendulum appears to have swung too far in the other direction. This is the so-called bullwhip effect in action, where inventory decisions are magnified as they ripple down the supply chain. Producers facing shortages place even larger orders to prevent shortages further down the line.

High inflation is also contributing to the volatility in inventories. This is the "cobweb theory", or the idea that big changes in prices can lead to fluctuations in supply which cause a cycle of rising and falling prices. This normally applies to agriculture, but the pandemic brought inflation volatility back to the US and now the cobweb theory can be applied to a large portion of the economy.

While inventory levels remain lean in the auto sector – which was hit hard by the chip shortage in 2022 – the inventory-to-sales ratio in the rest of the economy is now back to pre-pandemic trend (**Chart 2**).

## Chart 2: Excluding autos, inventories are back to normal levels

US: Business Inventory to Sales Ratio



Source: Oxford Economics/Haver Analytics

Looking at the breakdown by stage of production and sector, we see that inventory levels in the retail sector are lean, but that is almost entirely due to continued low levels of inventory among auto retailers. Across other parts of retail and in the wholesale and manufacturing sectors, inventory-to-sales ratios are now above levels implied by pre-pandemic trends in most subsectors (**Table 1**).

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Table 1: After widespread squeeze in 2021 and 2022, inventory levels now above normal in most sectors

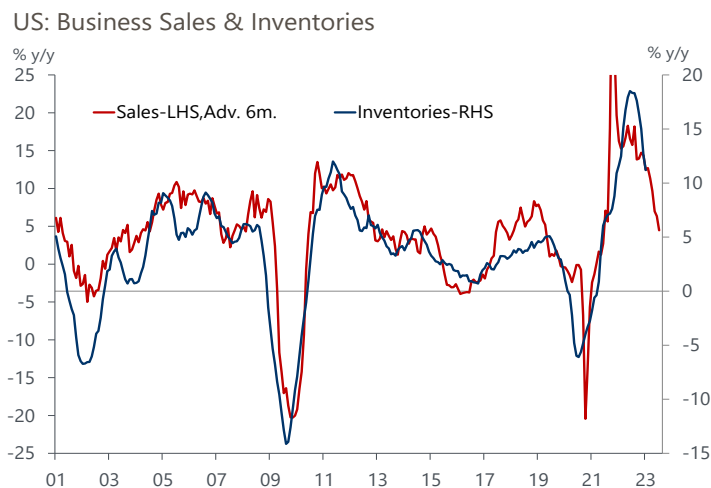
Difference in Inventory to Sales Ratio from Pre-Pandemic Trend (2000-2019)				
Sector	2020	2021	2022	Latest (Jan. 2023)
<b>Total</b>	0.08	-0.08	-0.04	-0.01
<b>Manufacturing</b>	0.22	0.11	0.06	0.07
<b>Durables</b>	0.23	0.07	0.01	-0.01
- Autos & Parts	0.25	0.18	0.14	0.11
- Aircraft	2.98	1.51	0.63	0.06
- Machinery	0.23	0.00	0.04	0.12
<b>Non-Durables</b>	0.16	0.10	0.07	0.09
- Chemicals	0.10	0.04	-0.01	-0.03
<b>Wholesale</b>	0.06	-0.14	0.02	0.14
<b>Durables</b>	0.10	-0.06	-0.01	0.05
- Autos & Parts	0.12	-0.18	-0.05	0.00
- Machinery	0.22	-0.14	-0.05	0.26
- Electronics	0.03	-0.03	0.16	0.16
<b>Non-Durables</b>	0.10	-0.03	-0.04	-0.04
- Pharmaceuticals	0.11	0.11	0.11	0.12
- Clothing	0.73	-0.23	0.54	0.84
<b>Retail</b>	-0.06	-0.27	-0.18	-0.16
- Autos	-0.18	-0.95	-0.87	-0.79
- Furniture	0.09	-0.22	0.10	0.04
- Build Mats.	-0.23	-0.17	0.01	0.06
- Grocery	-0.03	-0.02	0.01	0.02
- Clothing	1.87	-0.47	-0.21	-0.24
- Gen. Merch	-0.03	-0.02	0.26	0.14

Note: Color scale based on difference versus 2000-2019 trend. Green cells signify above normal levels of inventory; yellow close to normal; red cells below normal.

Source: Oxford Economics/Haver Analytics

Firms not only have to worry about inventory levels relative to sales, but also the trend for future sales. The continued moderation in sales growth suggests that inventory accumulation is set to slow markedly over the first half of this year (**Chart 3**).

Chart 3: Inventory cycle turning as sales growth slows further



Source: Oxford Economics/Haver Analytics

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## Implications for GDP

Because inventories are a stock, it's the change that matters for GDP – moreover, it's the *change* in the change (that is, the second derivative) that matters for GDP growth. So, even a slowdown from the recent rapid inventory build has the potential to weigh heavily on economic growth in the first half of this year. A stalling in real inventory accumulation would slash \$125bn annualized from output – a 0.6ppts hit to GDP.

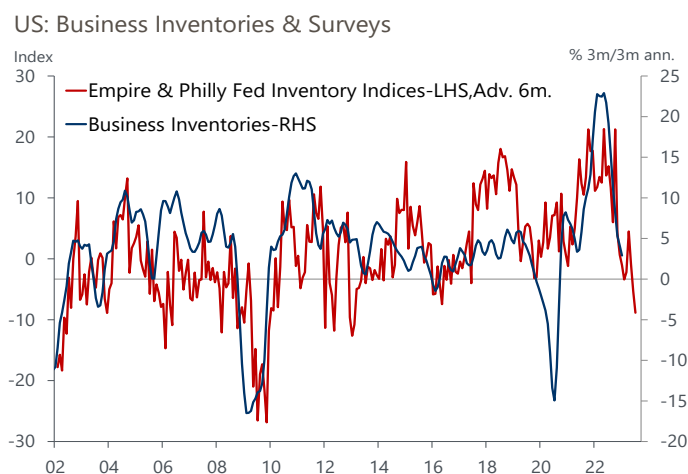
In reality, we expect that, as the economy enters recession, firms will cut inventories outright. Our baseline forecast envisages a modest drop in real inventories in the second half of the year, with the overall impact likely to be close to erasing 1ppt off GDP growth this year, albeit spread over the course of the year. We must be careful interpreting the inventory data particularly in real time because the data are particularly prone to revisions. With that warning in mind, the drag from inventories is potentially large enough to be the difference between a "soft landing" and the economy entering a mild recession.

## Gaming out some scenarios

That said, the forecast carries with it substantial risks in both directions. High and volatile inflation means it is more likely that firms will make mistakes, either by cutting orders too far or hoarding as a buffer against future volatility. With many firms reconfiguring their supply chains to focus on resilience rather than optimising purely for cost, it is possible they may choose to hold higher levels of inventories over the medium term, in which case the stockpiling slowdown we envision could be delayed.

If we shock our baseline forecast and assume continued strong inventory accumulation growth this year, that would help to cushion the downturn we expect but would not be sufficient to prevent a recession. In that scenario, we'd expect GDP to fall by around 0.5% rather than the closer to 1% decline in our baseline. All the early signs suggest this scenario is unlikely, with the survey evidence pointing to a rapid normalisation in firms' inventory intentions, consistent with a sharp slowdown in stock accumulation (**Chart 4**).

### Chart 4: Surveys consistent with further slowdown



Source: Oxford Economics/Haver Analytics

The downside risks to the forecast are perhaps more plausible. Adoption of new technology could lead inventories to settle at lower levels over the medium term relative to sales. Auto retailers are a clear example, with some automakers seeking to adopt a direct online ordering of vehicles, with lean inventories on dealer lots. Moreover, with supply chain problems easing quickly, firms that decided to hold additional inventories as a buffer could decide it's no longer worth the hit to profitability to do so.

We modelled what would happen if inventories were to fall at a similar pace as they did in previous recessions. In that scenario, the peak-to-trough decline in GDP this year would be double – with output falling by 2% peak to trough rather than 1%. In other words, a sharper inventory correction is the difference between a mild recession and a downturn that is closer in line with an "average" recession.

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While inventories are likely to be a drag on the economy this year, perhaps the bigger point over the medium term is that, thanks to the supply shortages of the past few years and growing US-China tensions, inventories are re-emerging as a large source of volatility in the GDP statistics.