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Economics Group

Special Commentary

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From Hero to Zero

What the Coming Change in Inventory Dynamics Means for GDP

In prior economic expansions going back 35 years, inventories have never been as much of a factor in GDP growth as they have been in this cycle. The most recent quarter offers a prime example: inventories boosted GDP growth by 0.8 percentage points. That influence is about to fade. In this special report, we highlight the changing environment in which inventories have had an uncharacteristically influential role recently in shaping broader economic growth.

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The combination of the most-tepid growth backdrop in the post-WWII era, the unique changes in the energy sector (both technological and price swings) as well as a continued evolution in inventory management have all played a role in elevating the importance of inventories in this cycle. At this late stage in the expansion, other growth drivers are finally expected to increase at more long-term-normal rates. When you combine that pick-up and broadening in growth drivers with the fading influence of stockpiling due to less-volatile energy dynamics and stabilization in the inventory-to-sales ratio, we anticipate the role of inventories changing from hero to zero.

Figure 1

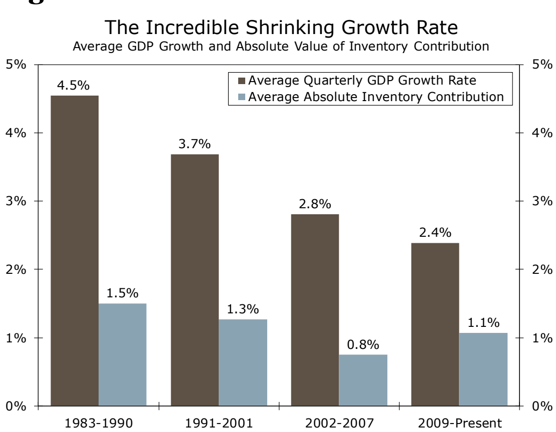
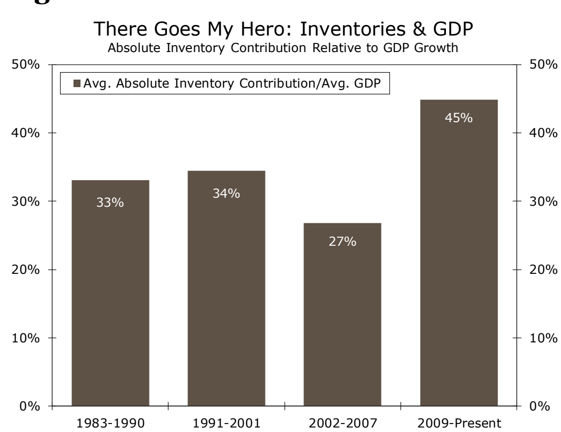


Figure 2



Source: U.S Department of Commerce and Wells Fargo Securities

We looked at economic expansions going back to the early 1980s and measured the contribution to change in GDP growth from inventories. In particular, we looked at the absolute value of the contribution, because we wanted to capture the ups *and* the downs—the times that inventories boosted growth and the times when they caused a drag. We found that the contribution from inventories in this cycle was not particularly remarkable; the 1.1 percentage point swing factor attributable to inventories did not stand out relative to the 0.8 to 1.5 percentage point range in prior cycles (Figure 1). However, when we looked at the contribution as a share of the overall growth rate, we found that inventories have punched well-above fighting weight in the current expansion (Figure 2). With historically slow GDP growth, the average inventory swing this expansion is equivalent to 45 percent of GDP growth—well above the 27-34 percent share it comprised in past expansions.

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Use that Evidence, Race It Around

We do not anticipate inventories to be much of a factor supporting growth in the final quarter of the year.

In a special report in August, *Inventories: The Tail that Wags the Dog in Q3?,* we highlighted the fact that "the stage is set for inventories to potentially play a significant role in third quarter GDP growth."[1] In our forecast prior to the official first estimate of third quarter GDP, we looked for a contribution of 0.8 percentage points to headline GDP. In that first release, the actual boost from inventories came in at 0.7 percentage points, although that was lifted to 0.8 points in the Bureau of Economic Analysis' (BEA) second look, which printed at the end of November (Figure 3). The third quarter number is still subject to further revision and as of this writing we have but one month's worth of data for the fourth quarter. With a 0.1 percent decline in business inventories in October, we do not anticipate inventories to be much of a factor supporting growth in the final quarter of the year.

Figure 3

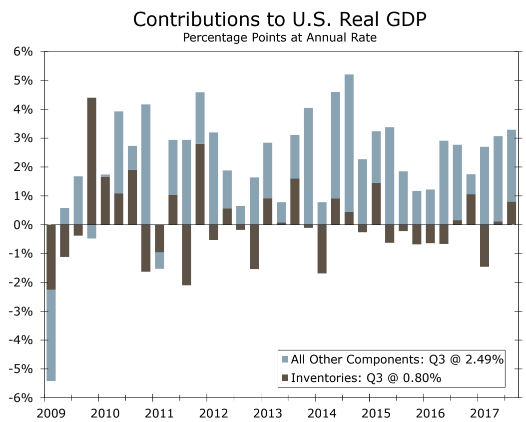
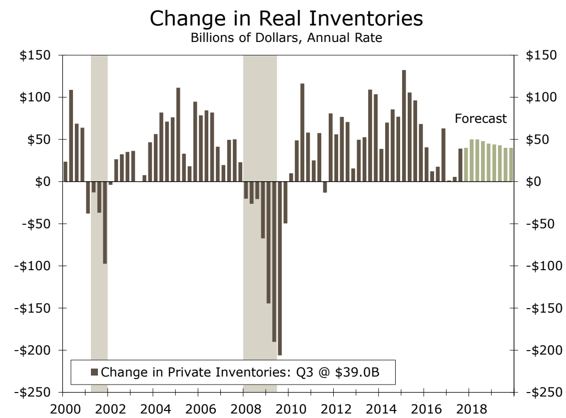


Figure 4



Source: U.S Department of Commerce and Wells Fargo Securities

Our baseline expectation for the quarterly change in inventories, plotted in the forecast graph in Figure 4, makes a case for relatively modest inventory building with quarterly increases of just $40-50 billion dollars per quarter between now and the end of 2018.

A glance at the historical figures in the same graph demonstrates that it is almost assuredly not going to be quite so smooth. In any give quarter a one-off dynamic could change things temporarily, and we will monitor the developments in our indicator coverage along the way. Our base-case scenario is informed by our prior study of late-cycle inventory dynamics which suggests a slowing in the pace of inventory investment. We augment that prior analysis with our read on what is happening in the energy space as well as other industries by looking at how inventories are holding relative to sales.

Energy Inventories Are Getting Back on Track

Inventory swings this cycle have in no small part been driven by the energy sector.

Inventory swings this cycle have in no small part been driven by the energy sector. The shale revolution unleashed a flood of new supply, leading crude inventories to begin piling up in 2014. The BEA does not explicitly break out crude and other raw energy products in its inventory data; however, we can get a rough sense of a role it has played by stripping out farm and business inventories (manufacturing, wholesale and retail). The balance corresponds to inventories from mining, utilities and the construction sector. As illustrated in Figure 5, this "other" segment of inventories began to grow north of $20 billion per quarter beginning in Q2-2014, reaching a zenith in the first quarter of 2015. That quarter, total inventories boosted topline GDP by a full 1.5 percentage points.

[1] T. Quinlan, S. House, and S. Seery. *Inventories: The Tail that Wags the Dog in Q3?*. 22 Aug. 2017. Available upon request.

Since then, the energy market has made strides in becoming more balanced. After growing more slowly in 2016, seasonally-adjusted U.S. crude inventories have declined over the past three quarters (Figure 6). Some of the drawdown looks to have ended up as processed products. Inventories of manufactured and wholesale petroleum products after adjusting for inflation were up 7 percent year-over-year in the third quarter, although that marks a noticeable slowdown from the 25 percent annual gain registered in the final quarter of 2016.

Figure 5

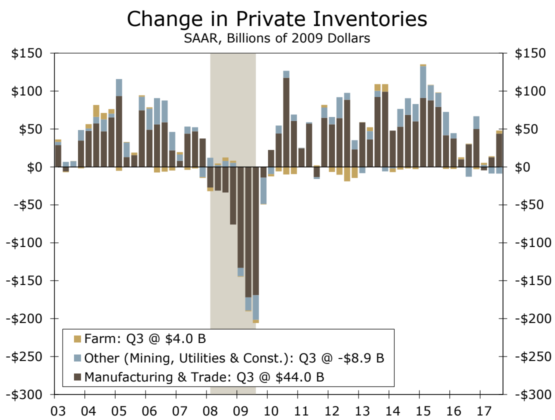
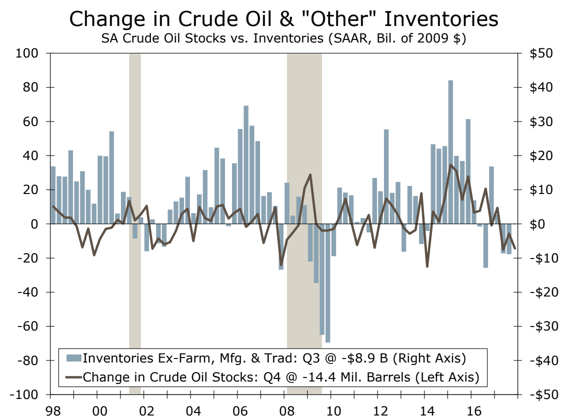


Figure 6



Source: U.S. Department of Energy, U.S. Department of Commerce and Wells Fargo Securities

Business Inventories Looking Leaner

Crude inventories were not the only reason stockpiles swelled in 2015. As shown in Figure 5, nonfarm business inventories also ramped up that year, posting the largest annual gain on record. The stockpiling looked to be unintended as activity in the industrial sector began to weaken and sales started to slow sharply. The inventory-to-sales ratio shot up more than 10 bps from the summer of 2014 to the start of 2016.

The inventory-to-sales ratio has fallen back to the lowest level in nearly two years.

Determined to get stockpiling under control, businesses cut back investment in inventories. This led to the pronounced slowdown in inventory building over 2016 and the first half of 2017. The inventory environment looks much improved today. Along with sales picking up again after the mid-cycle slowdown of 2016, the inventory-to-sales ratio has fallen back to the lowest level in nearly two years (Figure 7).

Figure 7

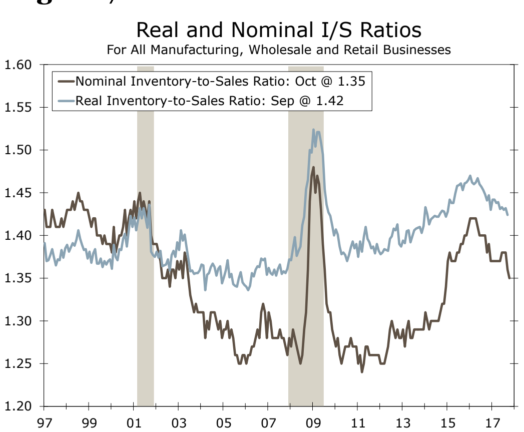
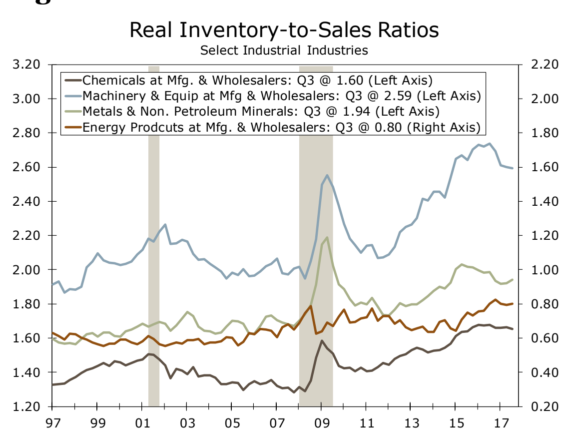


Figure 8



Source: U.S. Department of Commerce and Wells Fargo Securities

Part of the improvement in the inventory-to-sales ratio reflects pricing dynamics. Sales are valued using current prices, while inventories are valued using the prevailing price when they are

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created. The result is that when prices are rising—like commodity prices since early 2016—sales get an extra boost relative to inventories. After adjusting for price changes, however, the "real" inventory-to-sales ratio has declined to the lowest level in almost two years (Figure 7). Yet this still leaves the inventory-to-sales ratio at a level usually not seen outside of a recession. Should we worry?

In a number of ways, it makes sense for businesses to be carrying more inventory today than in prior periods. In recent years, supply chain disruptions due to natural disasters (like the flooding in Thailand in 2011) or worker disputes (like at the West Coast ports in 2015) may have led some companies to build more of a cushion into "just-in-time" inventory management. At the same time, historically low interest rates have held down the cost of carrying more inventories.

That said, inventory levels across some industries suggest there is still more work to do and leads us to expect that the pace of inventory building in the coming quarters will be fairly moderate. Inventories in industrial-related industries still look to be rather high (Figure 8). The real I/S ratios for machinery, chemicals and energy products remain above each industry's respective highs hit during the past recession. Metals and nonpetroleum mineral inventories also remain elevated for this stage of the cycle. The global economic expansion got a second wind in 2017 which helped stabilize or reduce the I/S ratio in many of these industries this year. We suspect that trend will continue in 2018, but with worldwide growth expected to come in near its historical average, the correction will not happen overnight.

In more consumer-facing industries, the level of business inventories looks healthier. Retailers generally look to have become more disciplined in recent years. The real I/S ratio for the retail sector fell to a 20-year low in the third quarter (Figure 9). Furniture & electronics stores, building material outlets, and "other" retailers (which would include non-store retailers like Amazon) have all seen inventories levels relative to sales fall to the lowest levels on record this year. Inventories in other areas of the retail sector, like clothing and department stores have been fairly stable.

Figure 9

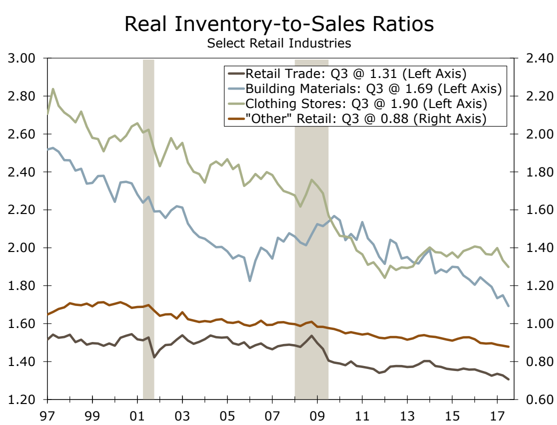
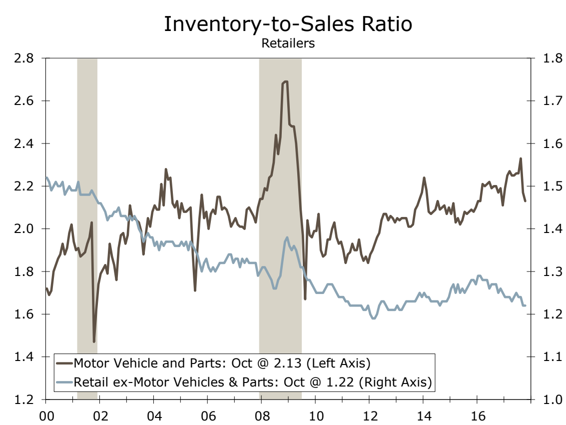


Figure 10



Source: U.S. Department of Commerce and Wells Fargo Securities

Stronger growth in the coming year should lead to businesses adding to inventories over the next few quarters.

Even auto inventories are beginning to look a little leaner. The real I/S ratio for motor vehicles and parts across the supply chain (manufacturers, wholesalers and retailers) declined to a two-year low in the third quarter. The correction looks to have carried over into the fourth quarter as replacement demand following recent natural disasters have supported sales. While price-adjusted figures are not yet available for October, another strong month of sales has led to the I/S ratio plummeting 20 bps over the past two months (Figure 10).

Conclusion: Inventories Less Likely to Be Swing Factor in GDP

Stronger growth in the coming year should lead to businesses adding to inventories over the next few quarters. The pace is not expected to be as jaw-dropping as earlier in the expansion when businesses got out over their skis then subsequently had to dial their inventory-building back.

Looking at various industries, a moderate pace of inventory building looks to be in the cards for the year ahead. Inventories in the industrial sector are still somewhat high, but should improve further as global growth and manufacturing activity continues to recover. Meanwhile, lean inventories in more consumer-facing sectors suggest businesses will need to take on more stock to keep pace with sales.

A moderate pace of inventory building looks to be in the cards for the year ahead.

The current expansion has thus far been characterized by inventories being a major factor in GDP growth. The relative importance of inventories as a growth driver should recede as broader growth picks up, the volatility in the energy sector fades a bit and as businesses appear to be taking a more deliberate approach to stockpiling.

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