

Box 6

The contribution of inventory changes to business cycle fluctuations

Inventory changes often play an amplifier role in economic cycles. For instance, a marked downward adjustment of inventories was an important feature of the slowdown in economic growth in 2001, cutting real GDP growth by around 0.4 percentage point. In 2002 the negative contribution of inventory changes to GDP growth was smaller, but destocking continued throughout the year. The extent of destocking in the current cycle is relatively substantial and comparable with that observed during the 1993 slowdown. Following that slowdown, however, inventory changes made a significant contribution to the recovery in economic growth in 1994 and 1995. This box first discusses the reliability of the data on inventory changes, and then examines some aspects of euro area inventory cycles in more detail.

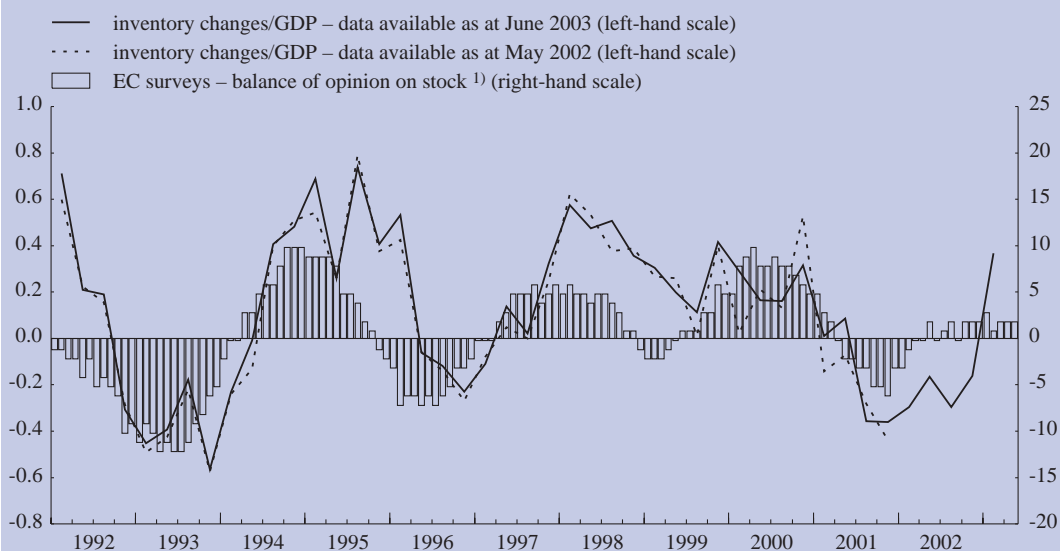
How reliable are national accounts data on inventory changes?

Conceptually, national accounts data on inventory changes are measured by the value of entries less the value of withdrawals and the value of any recurrent losses of goods held in inventories. However, statistical sources are often incomplete or become available with considerable delay. Moreover, when inventory changes are measured as a residual of gross value added and the components of the expenditure approach, the resulting estimates for inventories may also include statistical discrepancies due to the separate compilation of the output and expenditure side of GDP. Finally, euro area estimates for changes in inventories also include estimates for acquisitions less disposals of valuables, since separate data for the latter is often not available.

Reflecting updated estimates of all other components of GDP, inventory changes are often revised significantly between releases of quarterly national accounts. The quarterly national accounts data are also revised following the release of more complete annual national accounts data, in which the statistical coverage of inventories is generally better. Over the last five years, revisions to the contribution of inventory changes to quarterly real GDP growth have been around 0.1 percentage point from the first to the second release of the national accounts data, increasing to up to 0.2 percentage point after four releases.

Inventory changes/GDP and EC surveys on manufacturing stocks

(percentage)



Sources: Eurostat, European Commission Business and Consumer Surveys.

1) Inverted – deviation from mean.

Despite sizeable revisions to the quarterly profile of the data, the overall pattern of the inventory cycle tends to remain broadly unaffected. In particular, the ratio of inventory changes to GDP, which measures the degree of restocking or destocking in the economy, seems to display clear cycles which are not markedly affected by ex post revisions. For example, compared with the national accounts data of May 2002, the ratio of inventory changes to GDP according to the June 2003 data displays a broadly unchanged pattern over the period 2000 to 2001 (see chart). The information content of the national accounts data is also evident from the correlation, of around 65%, between the ratio of inventory changes to GDP and the balance of opinions on manufacturing stocks (see chart). The correlation is negative and survey results appear to lead the evolution of inventory changes by around a quarter, reflecting the fact that when a growing proportion of businesses consider stocks as too high, stockbuilding is reduced subsequently.

The contribution of inventories to cyclical fluctuations

With regard to the impact of inventory changes on activity, it is useful to distinguish between contributions to real GDP growth over the medium to long term and contributions to short-term fluctuations in output.

Over the medium to long term, the contribution of inventories to real GDP growth should, on average, be close to zero, although the average contribution could deviate from zero for a protracted period of time. This might reflect technological changes and developments in the sectoral distribution of activity. In particular, the introduction of just-in-time production techniques and the growing importance of services sector activity are two elements that may imply a trend negative contribution of inventory changes. Indeed, the average contribution to both quarterly and annual real GDP growth was zero or slightly negative from 1993 to 2002. With regard to the contribution of inventory changes to short-term fluctuations in output, changes in inventories appear to be an important factor driving output volatility in the short term. The contribution of inventory changes to the standard deviation of output growth is significant, despite their small average contribution to output growth. For instance, over the last decade inventory changes accounted for around 15% of the standard deviation of quarterly output growth, despite the fact that they accounted on average for only around 0.5% of real GDP. The contribution to quarterly output volatility remained roughly unchanged in the 1990s, but the average contribution to the volatility of annual output growth seems to have decreased in the second half of the 1990s.

Turning to recent developments, opinions on the appropriateness of stocks have remained broadly unchanged in recent months, indicating a relatively neutral contribution of inventory changes to economic activity at the current juncture. However, business sentiment is marked by a high degree of uncertainty regarding the outlook for growth in the euro area, and elsewhere. Once this uncertainty declines and a recovery starts, conditions should be in place for more lasting positive contributions by inventory changes to growth.