

Box 2

A closer look at differences between industrial gross value added and industrial production

Industrial gross value added and industrial production are both very informative indicators of developments in industrial activity. Although conceptually similar, there are a number of differences between the two.¹

Looking at the data available for the latest two quarters, the weakness in euro area industrial production excluding construction in the second quarter of 2015 was not matched by weakness in the corresponding value added (quarterly growth rates were -0.1% versus 0.4%). In the third quarter of 2015, however, industrial production growth provided a more positive picture (growth of 0.2% versus 0.0% for value added). Against this background, this box takes a closer look at the differences between these two indicators for the euro area and explains the methodological differences that give rise to them. Industrial production is a short-term statistic that aims to estimate value added on a monthly basis in order to provide a timely measure of industrial activity. In practice, however, it is difficult to collect value added data on a monthly basis, which means that the monthly change in industrial production is typically derived from other sources, including deflated turnover, physical production data, labour input and intermediate consumption of raw materials and energy. Gross value added², on the other hand, is a quarterly national accounts indicator and is measured by subtracting intermediate consumption from output. Industrial production therefore only partly describes the development of industrial value added in terms of volume over a longer period, as the link between industrial production and value added may be affected by changes in input ratios and structures of production.

Movements in euro area industrial value added and production (excluding construction) differ in terms of absolute levels and quarterly growth rates.

Chart A plots both indicators of euro area industrial activity in level terms. It shows that for euro area industry excluding construction, the level of value added has, for the most part, been higher than that of industrial production since 2000. This notwithstanding, both indicators tend to show similar cyclical movements in terms of quarter-on-quarter growth (see Chart B), but there have been marked differences of up to 2 percentage points, positive or negative, in some quarters since 2000. The

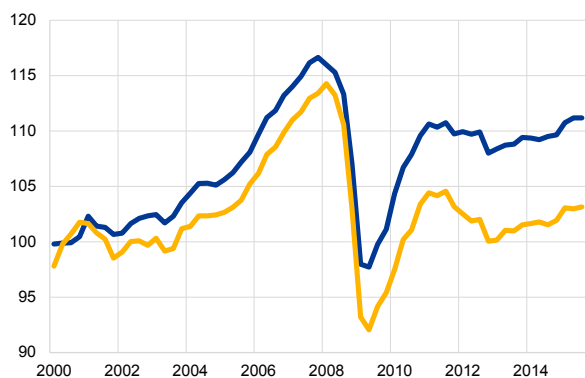
¹ For a more detailed description of these differences, see Lucke, D. and Weiß, J.-P., "International comparison of industrial development in the European context – the problems", *Economic Bulletin*, Vol. 39, Issue 7, German Institute for Economic Research, 2002, pp. 215-220, and "Overview of Industrial Statistics at the OECD", available at <http://www.oecd.org/sti/ind/overviewofindustrialstatisticsattheoecd.htm>.

² Gross value added is one of the main indicators in national accounts and, together with taxes less subsidies on products, it comprises gross domestic product (GDP), which on the income side is equal to the sum of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus.

Chart A**Level of euro area industrial value added and production (excluding construction)**

(2000=100; gross value added: calendar and seasonally adjusted chain-linked volumes; industrial production index: quarterly average of working day and seasonally adjusted monthly data)

■ industrial value added excluding construction
■ industrial production excluding construction

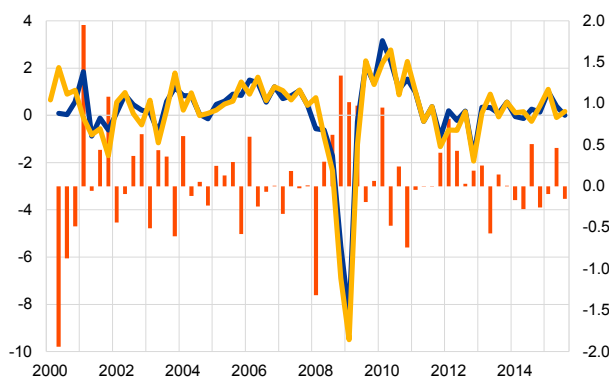


Sources: Eurostat and ECB calculations.

Chart B**Growth in euro area industrial value added and production (excluding construction)**

(quarter-on-quarter growth rates; gross value added: calendar and seasonally adjusted chain-linked volumes; industrial production index: quarterly average of working day and seasonally adjusted monthly data; percentage points)

■ industrial value added excluding construction (left-hand scale)
■ industrial production excluding construction (left-hand scale)
■ difference between value added and industrial production growth (right-hand scale)



Sources: Eurostat and ECB calculations.

difference between the two growth rates has been 0.1 percentage point on average since 2000. Looking at growth differences in absolute terms, the average as well as standard deviation has been 0.4 percentage point since 2000. This outcome implies that the differences in growth rates seen in the second and third quarter of 2015 were in a range one could expect.

Differences in the movements of the two indicators also occur at the euro area country level, but to a varying degree. Among the four largest euro area countries, the difference between the quarter-on-quarter growth in industrial value added and industrial production (excluding construction) since 2000 has been greatest for Spain (0.4 percentage point), France (0.3) and Italy (0.2), but small for Germany (0.03). For five euro area countries this difference in growth over the same period has been negative, most markedly for Ireland and Luxembourg (both -0.6 percentage point). It should be borne in mind, however, that these results are also dependent on the period under investigation. For example, for Germany – where more historical data are available – the slight positive bias in growth rates for the period from 2000 turns slightly negative if the observation period starts in 1991.

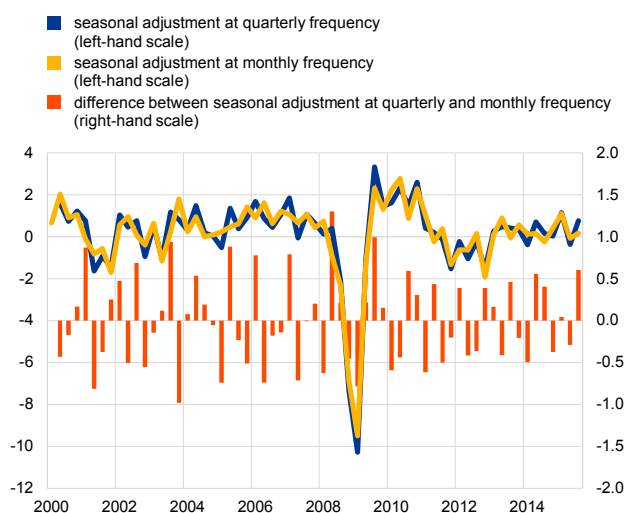
In addition to conceptual factors, a number of other factors contribute to the differences between the two indicators,³ such as seasonal adjustment on an infra-annual basis, as value added is adjusted at a quarterly frequency and

³ See the box entitled “Differences between industrial production and value added data in industry in the first quarter of 2004”, *Monthly Bulletin*, ECB, August 2004. It examined the difference between industrial production and value added in the first quarter of 2004 (industrial production growth was 0.2 percentage point compared with value added growth of 0.9 percentage point; according to the revised data as of the time of writing, these figures are 0.2 percentage point and 0.8 percentage point respectively). The difference was attributed to seasonal adjustment and geographical coverage. Geographical coverage has improved considerably since 2004. Where country data is missing, estimates are used for the euro area aggregate.

Chart C

The effects of seasonal adjustment on data measuring growth in euro area industrial production (excluding construction)

(quarter-on-quarter growth rates; percentage points)



Sources: Eurostat and ECB calculations.

industrial production at a monthly frequency.

In order to quantify this factor, industrial production data were seasonally adjusted across euro area countries at a quarterly frequency. The outcome, which depends on the parameters applied for the seasonal filters, shows that quarterly growth rates can differ substantially depending on whether the seasonal adjustment is monthly or quarterly (see Chart C). Using data that are seasonally adjusted on a quarterly rather than a monthly basis, the average absolute difference between the growth rates of euro area industrial production is shown to have been 0.5 percentage point since 2000. On average, however, the impact of the other factors remains sizeable.

Prices are treated differently in the two indicators.

Gross value added is compiled using basic prices and does not include taxes (less subsidies) on products, whereas industrial production is at factor cost. The difference between value added at basic prices and at factor cost is other taxes (less subsidies) on production, figures for which are not available in volume terms at a

quarterly frequency. In addition, whereas gross value added volumes are calculated using annual chain-linking, only a few countries so far apply this for industrial production.

Different economic activities are included in the two indicators. Value added includes water supply, sewerage, waste management and remediation activities (Section E⁴), whereas industrial production does not. The share of this activity in industrial value added excluding construction since 2000 has varied between 4.2% in 2007 and 5.0% in 2009. Chain-linked volume value added series for this sector are only published at an annual frequency and are rather acyclical. Calculations breaking down these annual data into quarterly data indicate that the quarter-on-quarter difference in the growth rate of industrial value added and production remains, on average, at a similar magnitude. Nevertheless, for specific quarters, the impact of Section E is found to be sizeable, i.e. up to 2.2 percentage points during the Great Recession and up to 0.8 percentage point during “normal” times.

A further source of difference between the two indicators is that industrial production typically covers firms above a certain threshold (in terms of turnover or number of employees), with thresholds varying across countries.

National accounts attempt to provide a more complete picture by using data from a variety of alternative sources.

⁴ These activities form Section E of the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2).

All in all, despite the close link between value added and industrial production, the differences between the two indicators reflect all of the above-mentioned factors to some degree, although their relative importance is difficult to assess. From an economic perspective, it is useful to monitor both indicators to assess the economic status of industrial activity. Further harmonisation between national accounts and short-term statistics, as well as between national practices for seasonal adjustment, would help to reduce these differences.