

A new indicator for the volume of industrial output

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Particularly since last year's reform of national accounts, it has been very difficult to estimate changes in the volume of industrial output.

The present article introduces an alternative monthly indicator of industrial output calculated on the basis of publicly available material. The quarter-on-quarter changes derived with this indicator correspond on average more closely to the developments recorded in the national accounts than the volume index of industrial output calculated by Statistics Finland. The new indicator is available on the Bank of Finland website.

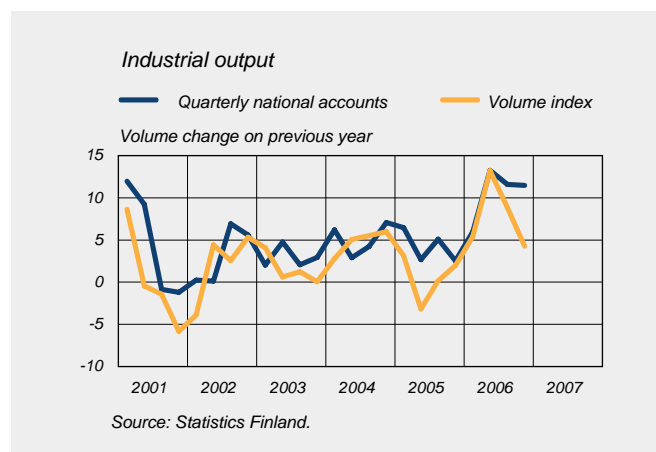
In 2006, Statistics Finland reformed the methodology for calculating the national accounts. As a consequence, the picture of the Finnish economy has changed in several respects from the picture considered valid only a year ago.¹ One of the items that has changed most in terms of both calculation methods and data sources is value-added industrial production, which reflects industry's share of GDP.

Previously in the quarterly national accounts, industrial value added was largely calculated on the basis of the monthly volume index of industrial output, even though this actually measures gross output. In the new quarterly national accounts, industrial value added is calculated more accurately by deducting intermediate consumption from gross output. The statistical sources for gross output and intermediate

consumption are now also different from before: industrial output is measured on the basis of turn-over, which can, from time to time, differ from actual production during the same period. As a result, the volume index of industrial output calculated monthly by Statistics Finland can differ considerably from the figures for industrial value added published in the national accounts (Chart 1).

There are two possible explanations for the differing paces of growth in the national accounts and the volume index of industrial output: 1) differing statistical bases for gross output and 2) the effect of intermediate consumption. This article discusses option 1 by calculating, on the basis of indices of turnover and producer prices in industry, a new monthly indicator for gross industrial output at prices of the reference year 2000. As well as the value added series of the national accounts, the index is also compared with the volume index of industrial output. At a sectoral level, we also seek to assess to what extent the differences in the statistics are caused by differences in

Chart 1.



¹ See Bank of Finland Bulletin 3/2006, p. 32–33.

sector-specific turnover and the number of items produced.

Measurement of gross industrial output

In the national accounts, industrial value added is primarily estimated on the basis of the monthly indices of turnover in industry and the producer price indices of the corresponding items. These are used to derive the industrial value added at prices of the reference year 2000. Data on turnover indices is mainly published 75 days from the end of the respective month. For the first month of each quarter, the time lag is even longer. The time lag for publishing producer price indices is much shorter, only about 17 days.

The time lag with which the turnover index is available is long for the compilation of a fast monthly indicator. For example, Eurostat's flash estimate for quarterly GDP growth must be available within 45 days of the end of the respective quarter. The advantage of the traditional volume index of industrial output is its speed,

since it is available with a time lag of only about 30 days.

The new monthly indicator for the volume of output in manufacturing industry (Statistics Finland's standard industrial classification, economic activity sector D, manufacturing) presented in this article is calculated, as far as possible, in accordance with the methodology of the national accounts. In practice, the greatest differences arise from the fact that the sectoral breakdown is not as detailed in the new indicator as in the national accounts. This has a direct impact on the calculation of price indices in particular. In other respects (for example the chain index used in the calculation of figures at reference-year prices) the methodology is the same. The stages in calculating the new indicator are outlined in Table 1. In practice, the new indicator denotes gross output in manufacturing (economic activity sector D) at prices of the reference year 2000, calculated with turnover and producer price indices that are changed into euro by using annual national accounts data. The method for chaining is the 'annual overlap' method used by Statistics Finland. In this case this means that the monthly index points for volume are derived by using the previous year – ie the average of monthly observations in the previous calendar year – as the base year. The resulting one-year index series are chained in relation to the changes in the aggregated yearly volumes (for example, output at 2004 prices in 2005 as a whole in relation to output at year 2004 prices in 2004 as a whole).

Turnover indices in industry are published in a very detailed sectoral

Table 1.

Calculation of the indicator
1) Collection of sector-specific turnover indices, 2000 = 100.
2) Change of index points to euro with help of annual national accounts data.
3) Normalisation of output in euro to year 2000 prices using producer prices.
4) Aggregation and chaining (annual overlap).
5) Seasonal adjustment (Tramo/Seats).

Source: Bank of Finland.

breakdown: manufacture of food products (SIC sector DA); manufacture of textiles, clothing, leather and footwear (DB, DC); manufacture of wood and paper (DD, DE21); publishing (DE22); chemicals (DF, DG, DH); manufacture of non-metallic mineral products (DI); manufacture of basic metals (DJ27); manufacture of fabricated metal products (DJ28); manufacture of machinery and equipment (DK); manufacture of electrical and electronic products (DL); manufacture of transport equipment (DM); manufacturing not classified elsewhere (DN). With regard to the calculation of the new indicator presented in this article, the most significant shortcomings in the sectoral breakdown of turnover indices relate to the lack of sub-sectors for the chemical and forest industries.

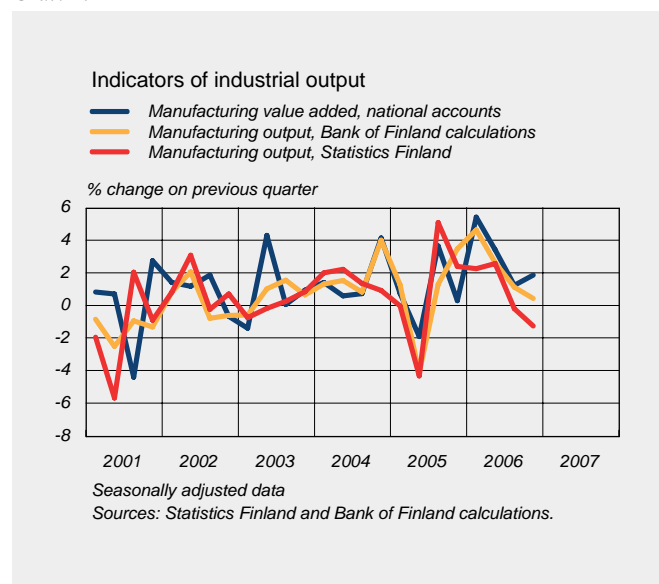
In addition, the sectoral breakdown of turnover indices differs to some extent from that published for producer price indices. For this reason, price indices are calculated for the manufacture of wood and paper as well as the chemical industry on the basis of producer price indices' sub-sectors and levels recorded in the annual national accounts. In addition, historical price developments (2000–2005) in the electronics industry have been forced to add up to the respective levels in the annual national accounts. In practice this means that the electronics industry prices used for calculating the gross output indicator presented in this article do not fall as sharply as they would according to the producer price index. Moreover, for the manufacture

of transport equipment, calculations are based on the volume index of industrial output rather than the turnover index, because the turnover index for the transport equipment industry only includes the manufacture of motor vehicles, trailers and semi-trailers.

Developments as shown by the new indicator

Chart 2 compares developments according to the new indicator, the volume index of industrial output and the value added series in the national accounts. The data is presented as quarterly changes of seasonally adjusted series. The new indicator follows quarterly national accounts series more closely than the index of industrial output produced by Statistics Finland. The correlation coefficient between the new indicator and the quarterly national accounts series is 0.61 for the whole period for which data is

Chart 2.



available, ie from the second quarter of 2000 to the third quarter of 2006. The correlation coefficient between Statistics Finland's industrial output volume index and the quarterly national accounts series is much smaller, at 0.38.

It is interesting to note that the new indicator paints a very similar picture specifically of the first quarter of 2006 as the value added series does and that it differs clearly from the volume index of industrial output. At least in retrospect it would have been possible to make a much more precise estimation of developments in industrial output in line with the national accounts using the new indicator than using the industrial output volume index.

The new indicator has been constructed for the analysis of current economic developments, ie developments relating to the past few months. The indicator's long-term trend is therefore not significant. However, when longer-term trends are considered, industrial output growth as recorded with the new indicator is noticeably slower than in the quarterly national accounts series. The difference in the long-term trend is at least partly due to intermediate consumption, which the new indicator ignores, since it calculates the volume of gross output.

In which sectors do the indicators diverge?

Particularly as regards observations for 2006, sector-specific developments in industry appear very different depending on whether they are examined by volume or turnover indices. Chart 3 compares changes in production in

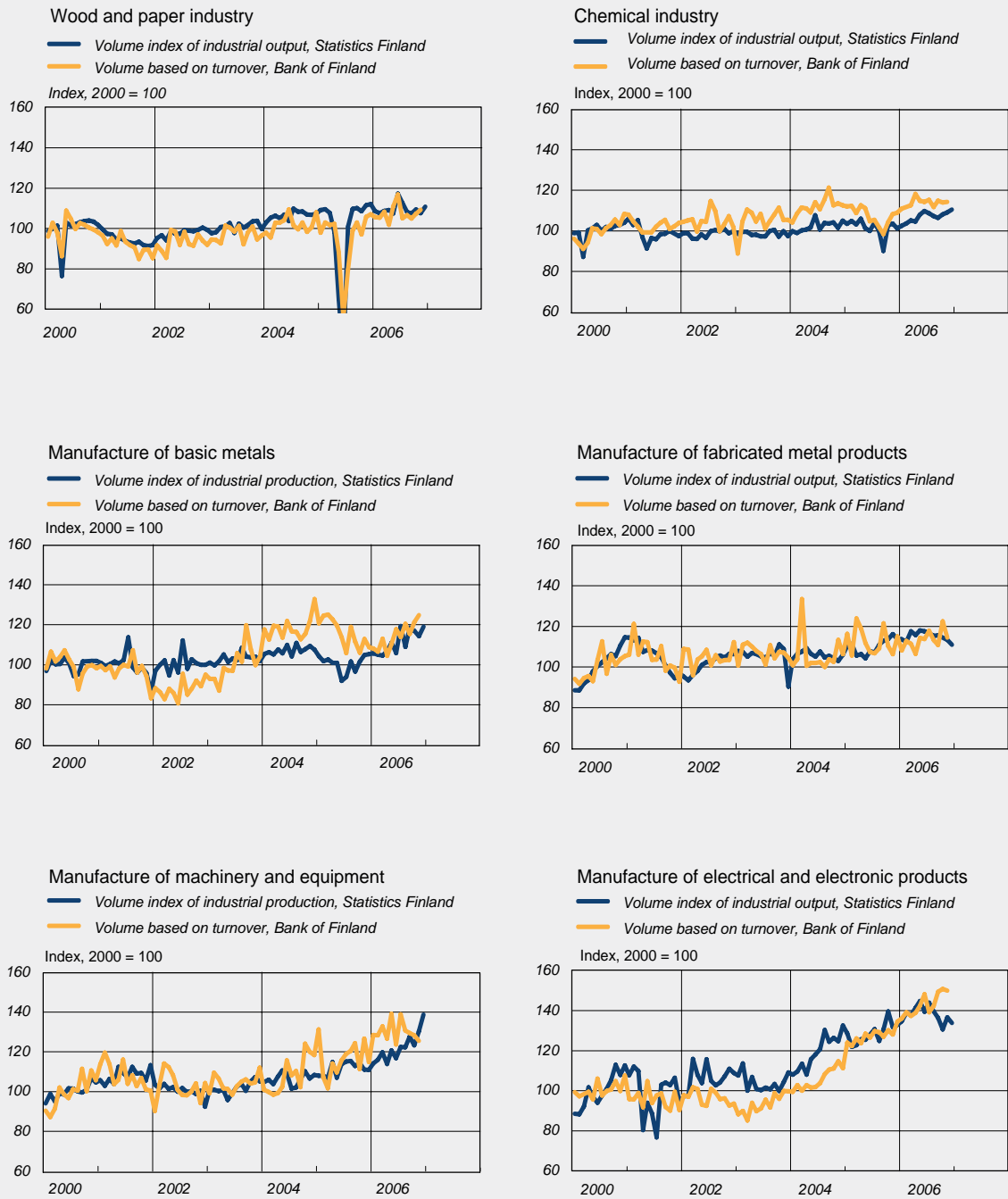
major manufacturing sectors according to the two different indicators.

Of the industrial sectors presented in Chart 3, the levels of the two indicators have developed fairly similarly in the 2000s in forest industry and the manufacture of fabricated metal products as well as machinery and equipment. In contrast, clear differences can be observed in the manufacture of basic metals and electronics industry. The greatest difference between the indicators relates to the electronics industry for which it is very difficult to divide output into volume, ie volume adjusted for quality changes, and price. Interpreting developments in the manufacture of basic metals is more difficult, since quality changes in this sector are not as significant a factor hampering the compilation of statistics as in the electronics industry.

Data on electronics industry show considerable divergences in the past few months: at the end of 2006 output as recorded with the volume index has developed weaker than that as observed with the turnover index. This could be attributable to the fact that the industrial output volume index only shows industrial products (goods) manufactured in Finland whereas the turnover index can also comprise services and other activities. Particularly the subdued growth in the electronics industry at the end of 2006 as observed with the output volume index is in line with developments in goods exports in this sector. Hence, this difference could be seen in the national accounts in data on services exports.

Chart 3.

Sectoral trends in industry based on selected measures



Sources: Statistics Finland and Bank of Finland calculations.

An even better indicator could be constructed

The new indicator for industrial production presented in this article seems to create a more up-to-date indicator for estimating value added in industry than the volume index of industrial output published by Statistics Finland. However, it is probable that the new indicator would have made a better estimate of value added in industry prior to the methodological reform of national accounts. Since value added is also deflated separately in the new national accounts (double deflation), the accuracy of the new indicator is not always the best possible even when analysing changes. The calculation of monthly value added would also require that intermediate consumption was also taken into consideration, which is too demanding a task for a body other than Statistics Finland; the estimation of value added requires data of sector-specific input and, for these, similar calculation procedures than required for the calculation of gross output.

The timely estimation of GDP is regrettably uncertain with the indicators currently available. This could, at worst, lead to mistakes in economic policy planning. The new indicator for industrial production presented in this article attempts to alleviate these problems. An even more significant improvement in the timely estimation of GDP would be that Statistics Finland started to publish, instead of the current volume index of industrial output (and also the monthly indicator of GDP), improved monthly indicators that measure value added and for which the statistical base would correspond to that used in the calculation of national accounts.