

Box 5

CAPACITY UTILISATION IN THE EURO AREA: MEASURES AND IMPLICATIONS

The pressure of demand on the supply capacity of the economy is an important factor for monetary policy-makers. Various measures of economic slack have been developed to evaluate and monitor this pressure – the output gap, unemployment relative to the non-accelerating inflation rate of unemployment and capacity utilisation.¹ This box focuses on the latter. It discusses different indicators of capacity utilisation in the euro area for the manufacturing and services industries, assesses the strength of current capacity pressures within the economy and outlines some implications of capacity utilisation developments for producer prices.

Gauging capacity pressures from opinion survey measures

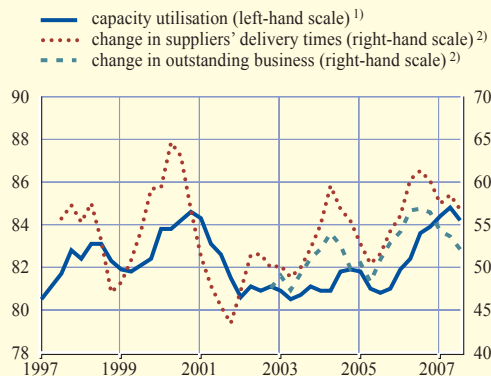
A direct measure of capacity utilisation for the euro area is provided on a quarterly basis by the European Commission's Business and Consumer Surveys. The manufacturing survey asks respondents to provide an estimate of the current level of utilisation as a percentage of total production capacity.² Indirect measures of capacity pressures in manufacturing can be derived from the survey of purchasing managers conducted by NTC Economics (the Purchasing Managers' Index (PMI)), which asks respondents every month about changes in suppliers' delivery times and in firms' outstanding business. Taken together, the two replies provide an indication of the balance between demand and supply: if demand runs ahead of supply, suppliers' delivery times lengthen and backlogs of outstanding business grow, i.e. capacity pressure in the economy should increase. Data on capacity pressures in services industries are more limited. The main indicator available is the assessment of outstanding business provided by the PMI

1 For a discussion of output gap measures, see the box entitled "The (un)reliability of output gap estimates in real time" in the February 2005 issue of the Monthly Bulletin. On capacity utilisation, see also the box entitled "Developments in survey data on limits to manufacturing production" in the January 2007 issue of the Monthly Bulletin.

2 The survey question reads as follows: "At what capacity is your company currently operating (as a percentage of full capacity)?" Answers are collected in January, April, July and October of each year. When considering measures of capacity within firms, a key issue is what is meant by "capacity", i.e. whether it refers only to the utilisation of physical capital used in production. In this box it is assumed that, in judging capacity utilisation, survey respondents provide an answer about their overall resource utilisation, i.e. they consider both capital and labour inputs. This assumption is based on the overall content of the survey, which explicitly asks about various production constraints, including shortages of capital, labour and other inputs, suggesting that respondents have all those production inputs in mind when evaluating their capacity utilisation.

Chart A Survey measures of capacity pressures in manufacturing

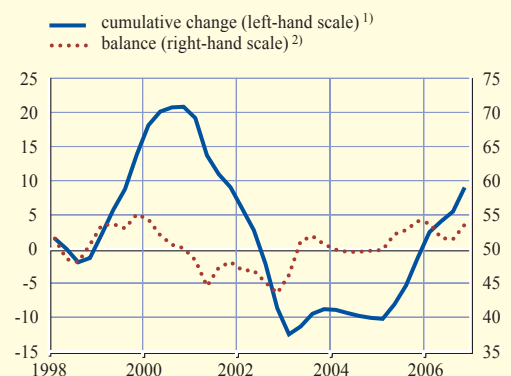
(quarterly data; seasonally adjusted)



Sources: European Commission Business and Consumer Surveys, NTC Economics and ECB calculations.
 1) As a percentage of total capacity.
 2) An index value of 50 indicates an increase; a value below 50 indicates a decrease.

Chart B Outstanding business in market services

(quarterly data; seasonally adjusted)



Sources: NTC Economics and ECB calculations.
 Notes: Market services exclude retail trade and post and telecommunication services.
 1) Cumulated diffusion index since September 1997, where the diffusion index is rescaled by subtracting 50.
 2) An index value of 50 indicates an increase; a value below 50 indicates a decrease.

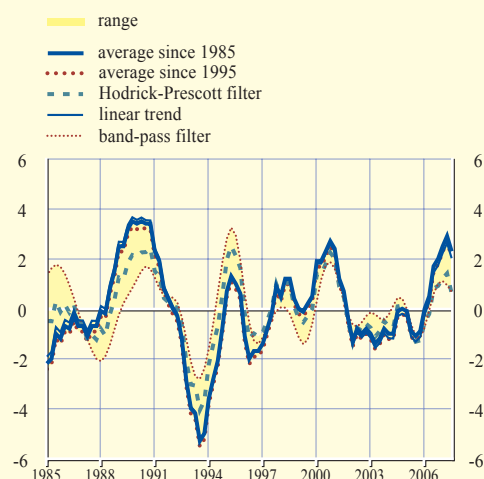
survey in the services industries, which covers market services (excluding the retail and post and telecommunication industries).

Overall, these indicators suggest that capacity pressures have risen over the past two years. In the manufacturing sector, direct measures increased sharply in recent quarters to levels broadly comparable with the previous peak at the end of 2000, before falling slightly in July 2007. Changes in suppliers' delivery times and outstanding business suggest a similar picture of high but declining levels of capacity utilisation (Chart A). In the services sector, the "outstanding business" balance provides only an indication of changes in the balance of supply and demand (Chart B). However, a crude indicator of the level of capacity pressure can be constructed by cumulating consecutive changes in the outstanding business balance. In order to assess the magnitude of capacity pressures, a reference value would also be needed, corresponding to a period when capacity pressures were close to normal, which is difficult without a sufficiently long back-run of data. Nevertheless, the cumulative index can be used to assess capacity pressures relative to previous peaks. According to this indicator, current pressures in the services sector have not yet reached the levels experienced in 2000 and 2001, but are still rising (Chart B).

The European Commission's business survey in manufacturing provides a quantitative estimate of the current degree of capacity utilisation in the euro area. For this measure to be a useful indicator of capacity pressures in the economy, sustainable rises in output (or "trend" increases) need to be separated from increases that reflect utilisation. One option is to assess utilisation relative to some long-run average. However, this method could overstate current capacity pressures if "trend" utilisation has changed over time. For example, utilisation may have increased if competition has forced firms to work more efficiently (i.e. at higher rates of utilisation); technological change may have allowed firms to operate routinely with less spare capacity; or the decline in the volatility of demand observed over recent years may have allowed firms to reduce the capacity they previously retained to cushion themselves against sudden

Chart C Range of deviations from “trend” of manufacturing sector capacity utilisation

(percentage deviation from trend)

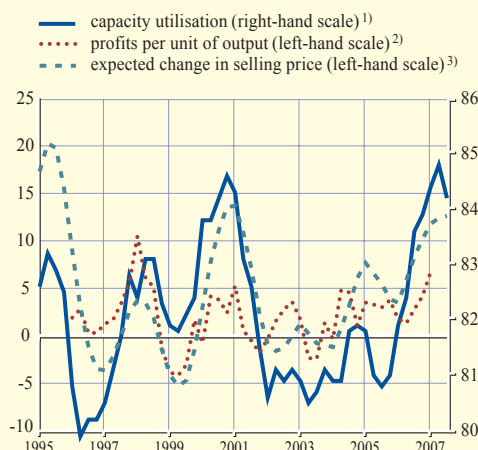


Sources: European Commission Business and Consumer Surveys and ECB calculations.

Note: The chart shows the percentage deviation from trend of capacity utilisation, with “trend” measured using different techniques: the average rate of utilisation since 1985; the average rate of utilisation since 1995; a linear trend since 1985; a Hodrick-Prescott filter; and a band-pass filter.

Chart D Capacity utilisation in manufacturing and unit profits and expected change in output prices of industrial firms

(seasonally adjusted data)



Sources: European Commission Business and Consumer Surveys, Eurostat and ECB calculations.

1) As a percentage of total capacity.
2) Defined as gross operating surplus per unit of output in industry. Industry excludes construction. Annual percentage changes.
3) Percentage balances; a positive value indicates an increase; a negative value indicates a decrease.

surges in demand. Another option, therefore, is to assess utilisation relative to some long-run linear trend or a statistical filter (e.g. Hodrick-Prescott or band-pass filter).

Chart C shows a range of estimates for the deviation of capacity utilisation from trend in the manufacturing industry, based on different methods of determining trend utilisation. The measures are broadly consistent in suggesting that capacity utilisation is currently above trend, although there is some variation between the different estimates of capacity pressures. Estimates based on average figures for trend suggest that current capacity pressures are similar to the peak at the end of 2000; other measures (using a linear trend and statistical filters) indicate that capacity pressures are somewhat lower.

How are capacity pressures affecting prices?

Faced with persistent increases in demand and high capacity utilisation, firms are likely to respond by increasing investment, thereby expanding capacity. In the short run, however, rising capacity utilisation may increase price pressure by raising production costs and lending firms some degree of pricing power. With high levels of utilisation, bottlenecks in production and resource shortages may appear, and firms may face higher costs owing to a scarcity of factors of production that are fixed in the short term. High utilisation rates may also be associated with reduced marginal productivity, which in turn can imply higher overall unit costs of production. Moreover, if firms have a degree of pricing power, they may take advantage of stronger demand conditions and raise profit margins. The combination of rising costs and mark-ups may put upward pressure on prices and, hence, on inflation.

There is some evidence that higher capacity utilisation has provided firms with a degree of pricing power in the euro area. Profits per unit of output have tended to increase as utilisation has increased, and manufacturing firms have also demonstrated a greater ability or willingness to raise their selling prices when capacity utilisation has risen (Chart D). Empirically, however, a firm and stable link between measures of capacity utilisation and producer prices in the euro area is more difficult to demonstrate. The more general discussion about a possible flattening of the Phillips curve in industrial countries over the past decade is relevant in this context.³

Several interpretations have been put forward to explain the apparent flattening of the Phillips curve, including the influence of technological change and globalisation. More fundamentally, it has been argued that a more credible monetary policy dampens movements in actual inflation by anchoring inflation expectations, implying that the role of capacity constraints weakens and that of inflation expectations increases. For example, if monetary authorities are quick to tighten policy in response to indications of rising capacity pressures, increases in such indicators are not followed by rising prices simply because monetary policy reacts more firmly to bring inflation under control when capacity constraints signal risks to price stability. Accordingly, a close monitoring of such indicators continues to be important in assessing risks to price stability.

³ See, for example, Chapter 3 entitled “How has globalisation affected inflation?” of the IMF’s “World Economic Outlook”, April 2006.