The use of Gross domestic product (GDP) in public sector fiscal ratio statistics

Aims to explain the methodology used for the presentation of GDP ratios in the UK PSF publication and in particular for the public sector net debt where a centred approach (requiring forecasts) is used.

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Table of contents

1 . Background

The monthly Public sector finances (PSF) statistical bulletin is jointly produced by the Office for National Statistics (ONS) and HM Treasury (HMT) and aims to inform its users of the state of the UK government financial position.

It enables users (including government, the public, economists and financial analysts) to monitor public sector expenditure, receipts, investments, borrowing and debt. By comparing these data with forecasts from The Office for Budget Responsibility (OBR), the current UK fiscal position can be evaluated.

PSF is compiled on the national accounts framework and in accordance with the standards set out in the European System of Accounts 2010 (ESA2010) under European law.

2 . Aim of article

Public sector fiscal statistics are often presented as ratios of gross domestic product (GDP), which is a measure of the total value of all goods and services produced within a country within a given time period.

In the UK, the PSF statistical bulletin reports: public sector net borrowing, public sector current budget deficit, public sector net investment and public sector net debt as ratios of GDP.

This article aims to explain the methodology used for the presentation of GDP ratios in the UK PSF publication and in particular for the public sector net debt where a centred approach (requiring forecasts) is used.

3 . The monthly public sector finances bulletin

All monetary values in the PSF bulletin are presented in terms of “current prices; that is, they represent the price in the period to which the expenditure or revenue relates and are not adjusted for inflation.

In order to remove the effects of inflation, to aid international comparisons and provide an indication of a country’s ability to service borrowing and debt, the Office for Budget Responsibility (OBR) and other commentators often discuss changes over time to fiscal aggregates in terms of GDP ratios.

The monthly PSF bulletin presents (Table PSA5A and PSA5B) public sector current budget deficit, net investment, net borrowing and net debt as ratios of GDP on both an including and excluding public sector banks basis.

Table PSA5A presents the fiscal statistics as a proportion of GDP by financial years (April to March) for the period 1997 onwards. Table PSA5B presents the same information but as a quarterly rather than annual time series.

Similarly, graphical presentations in the Public sector finances bulletin present some of the main fiscal statistics as a ratio of GDP.

4 . The current budget deficit, net investment and net borrowing

Public sector current budget deficit, net investment and net borrowing measure activity over a period of time and so to calculate their ratios as a proportion of gross domestic product (GDP), the GDP values used are those of the published UK National Accounts values over the same time period.

The particular GDP measure used is the non-seasonally adjusted, nominal GDP (ONS series identifier BKTL), largely because public sector current budget deficit, net investment and net borrowing are also not seasonally adjusted.

This is generally a straightforward exercise; however, complications arise when the latest financial year has just been completed. At this point the financial year outturn for current budget deficit (along with the net investment and net borrowing) is available, but only 3 of the 4 quarterly GDP observations are published. Until this remaining quarter becomes available (towards the end of June) a forecast of GDP is required.

The procedure for deriving GDP forecasts for periods when national accounts outturn GDP is not available is described below.

The Office for Budget Responsibility (OBR) produces forecasts of the economy and public finances twice a year (normally in March and November or December) within their Economic and Fiscal Outlook (EFO) publications. Table 1.4, Nominal GDP (£ billion, non-seasonally adjusted), of the [Economic and fiscal outlook supplementary economy tables - March 2016](), contains quarterly forecast nominal GDP (that is, GDP in current prices).

From these quarterly levels of GDP, we calculate quarterly growth rates which are applied to our published GDP outturn data for the corresponding quarters of the previous financial year to create forecasts for periods where there is no outturn available.

So, for example:

The OBR forecast growth rate for nominal GDP between 2015q1 and 2016q1 is applied to the outturn GDP for 2015q1 to produce a GDP estimate for 2016q1:

GDP estimate 2016q1 = GDP outturn 2015q1 + [(OBR GDP 2016q1 - OBR GDP 2015q1) / OBR GDP 2015q1] x GDP outturn 2015q1

Where “q” refers to a quarter; for example, 2016q1 refers to the first quarter (or 3 months – January, February and March) of 2016.

5 . Net debt

Debt is a measure of how much the government owes at a point in time, whereas gross domestic product (GDP) is a measure of the country’s economic activity during a period of time. Debt, represented as a proportion of a country’s GDP, is often viewed as an indication of that country’s ability to pay back their debt.

Unlike the fiscal measures in the previous section, net debt is measured at a point in time. Therefore, in order to calculate net debt as a ratio of GDP, the GDP denominator is calculated so that it represents the 12 months centred round the debt observation (the 6 months before it and 6 months after it).

GDP is only published as a quarterly time series. Monthly GDP is calculated by simply dividing the quarterly data by 3.

The procedure for deriving GDP forecasts for periods when national accounts outturn GDP is not available is based on the Office for Budget Responsibility (OBR) forecasts as explained in the previous section. However, due to the nature of the 12 month centred approach, GDP must be forecast 3 quarters in advance.

As an example, consider the UK public sector finances, June 2016 statistical bulletin, published in July 2016. This release published an estimate of public sector net debt for end-July 2016 for the first time and alongside this an estimate of this public sector net debt as a percentage of GDP.

The GDP estimate required for the June 2016 net debt ratio covers the period from January 2016 to December 2016. However, in July the published outturn GDP is only available up until the first quarter (January to March) of that year. Therefore forecasts are needed for the second quarter (April to June), third (July to September) and fourth (October to December). These GDP forecasts are derived in the same way as previously described.

The OBR forecast growth rate in nominal GDP for the period 2015q2 to 2016q2 is applied to the outturn GDP for 2015q2 to produce a GDP estimate for 2016q2:

GDP estimate 2016q2 = GDP outturn 2015q2 + [(OBR GDP 2016q2 - OBR GDP 2015q2) / OBR GDP 2015q2] x GDP outturn 2015q2

Similarly, the OBR forecast growth rate in nominal GDP for 2015q3 to 2016q3 is applied to the outturn GDP for 2015q3 to produce a GDP estimate for 2016q3:

GDP estimate 2016q3 = GDP outturn 2015q3 + [(OBR GDP 2016q3 - OBR GDP 2015q3) / OBR GDP 2015q3] x GDP outturn 2015q3

And, the OBR forecast growth rate in nominal GDP for 2015q4 to 2016q4 is applied to the outturn GDP for 2015q4 to produce a GDP estimate for 2016q4:

GDP estimate 2016q4 = GDP outturn 2015q4 + [(OBR GDP 2016q4 - OBR GDP 2015q4) / OBR GDP 2015q4] x GDP outturn 2015q4

As a result of this estimation procedure, the debt ratio is provisional when first published and subject to later revision when outturn GDP becomes available.

6 . International comparisons of debt and deficit

The EU’s 2 main fiscal statistical measures are general government (central and local government in the UK) net borrowing (deficit) and consolidated general government gross debt.

These measures are required to be reported as part of the Excessive Deficit Procedure. Article 104 of the 1992 Maastricht Treaty obliges member states to avoid excessive budgetary deficits.

The Protocol on the Excessive Deficit Procedure, annexed to the Maastricht Treaty, and the related Stability and Growth Pact legislation, defines the measures of deficit and debt and the reference values required for compliance. These reference values are presented as ratios between the current price measures and gross domestic product (GDP).

The Protocol on the Excessive Deficit Procedure defines the GDP series to be used as GDP at current prices (that is, nominal GDP) which is the same GDP valuation as used in the ratios in the UK monthly public sector finances.

There are, however, 2 differences. Firstly, the GDP data used in the Excessive Deficit Procedure (EDP) statistics is seasonally adjusted (ONS series identifier YBHA). Secondly, and more significantly, the GDP data used in the EDP statistics is that for the year being reported for both deficit and debt statistics. For deficit (that is, net borrowing) this is the same treatment as in the UK Public sector finance (PSF) release, but for debt the treatment is different as the GDP used is not centred on the time of the debt observation (as in the PSF) the GDP over the 12 month period preceding the time of the debt observation is used instead. Taking the example of debt at the end of December 2014, the PSF approach is to take the debt as a proportion of GDP between July 2014 and June 2015 (as described in the previous section) whereas the EDP statistical approach is to take it as a proportion of GDP between January 2014 and December 2014.

7 . Contact details

In addition, queries may be directed to the Media Relations Office email: media.relations@ons.gsi.gov.uk