

Core Debt

An Approach to Monitoring the Sustainable Investment Rule

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HM TREASURY

Core debt: an approach to monitoring the Sustainable Investment Rule

INTRODUCTION

1.1 The economic cycle has a significant impact on public sector finances. The Government's fiscal rules – the golden rule and the sustainable investment rule – are both defined over the cycle¹. Setting fiscal rules over the cycle promotes economic stability by allowing the automatic stabilisers to operate freely so that fiscal balances vary with the cyclical position of the economy.

1.2 Under the *Code for Fiscal Stability*, the Government is required to publish estimates of the cyclically-adjusted fiscal position. This helps to promote transparency in the operation of fiscal policy and enhances the quality of policy decisions. In public finance forecasts since the 1998 Pre-Budget Report, the Government has published cyclically-adjusted figures for the current budget balance and public sector net borrowing in each Budget and Pre-Budget Report to illustrate the impact of the cycle on key fiscal balances.

1.3 From Budget 2002 onwards, the Government will also publish figures for public sector net debt excluding the effect of cyclical fluctuations. This concept will be called '**core debt**' reflecting the fact that its evolution will be determined primarily by borrowing for long-term investment, rather than as a result of cyclical movements in the economy.

1.4 The principal difference between total net debt and core debt is that the main variable element in the debt stock (the cycle) has been removed from core debt.

1.5 The key benefit of a core debt measure is that it will **increase the transparency of the fiscal framework** by:

- facilitating a better understanding of the impact of net investment spending on debt;
- improving understanding of the impact of the economic cycle on total debt; and
- assisting analysis of performance under the sustainable investment rule, when the economy is away from trend.

1.6 This paper sets out the details of how core debt is defined, together with an explanation of the methodology used to calculate it. Figures for core debt are shown in Box 2.4 and Table 2.7 of the 2002 Economic and Fiscal Strategy Report (EFSR).

¹ For further explanation of the Government's fiscal rules see Chapter 9 of *Reforming Britain's Economic and Financial Policy*, HM Treasury, Palgrave 2002. For further information on this book see: www.hm-treasury.gov.uk/documents/uk_economy/ukecon_reform.cfm

DEFINITION OF CORE DEBT

1.7 The simplest case to consider is where the public sector holds no financial assets, and income and expenditure are measured on a cash rather than an accruals basis. It will further be assumed for the moment that there are no revaluations of the debt stock². Under these assumptions, net and gross debt are equivalent and the public sector budget identity is given as:

$$D_t = D_{t-1} + S_t - R_t + I_t \quad (1)$$

$$D_t = D_{t-1} + Def_t \quad (2)$$

$$Def_t = S_t - R_t + I_t \quad (3)$$

where D is debt, S is non-interest public spending, R is total revenue, I is interest payments, and Def is the financial deficit. The subscripts refer to time periods and debt stocks are measured at the end of the period. All variables are measured in current prices.

1.8 By repeated substitution, debt may be written as follows:

$$D_t = \sum_{i=1}^t Def_i + D_0 \quad (4)$$

Thus, debt is simply the accumulation of past deficits, where D_0 is the initial stock of debt. To construct a measure of core (cyclically adjusted) debt the calculation starts from the cyclically adjusted deficit.

1.9 The total deficit can be broken down into its structural and cyclical components as follows:

$$Def_t = Def_{S_t} + Def_{C_t} \quad (5)$$

$$Def_{S_t} = S_{S_t} - R_{S_t} + I_t \quad (6)$$

$$Def_{C_t} = S_{C_t} - R_{C_t} \quad (7)$$

$$S_{C_t} = f(OG) \text{ and } R_{C_t} = g(OG) \quad (8)$$

$$(S_{C_t} < 0 \text{ when } OG > 0 \text{ and } R_{C_t} > 0 \text{ when } OG > 0) \quad (9)$$

² None of these assumptions are critical to the concept of core debt, and in the subsequent discussion of the practical issues of calculation these assumptions are relaxed.

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where Def_S , R_S , S_S and Def_C , R_C , S_C are the structural and cyclical³ deficits, revenues and expenditures respectively, and f and g are functions that link cyclical spending and revenues to the output gap. OG is the output gap between actual and trend output.

1.10 The budget identity can thus be written as:

$$D_t = D_{t-1} + Def_{S_t} + Def_{C_t} \quad (10)$$

1.11 Thus, in any year the debt will accumulate partly from the structural deficit and partly from the cyclical deficit. Total debt is clearly the sum of past cyclical and structural deficits or, equivalently, the sum of the stocks of cyclical and of structural or 'core' debt:

$$D_t = \sum_{i=1}^t Def_{S_i} + \sum_{i=1}^t Def_{C_i} + D_{Core_0} + D_{C_0} \quad (11)$$

$$D_{Core_t} = \sum_{i=1}^t Def_{S_i} + D_{Core_0} \quad (12)$$

$$D_{C_t} = \sum_{i=1}^t Def_{C_i} + D_{C_0} \quad (13)$$

$$D_t = D_{Core_t} + D_{C_t} \quad (14)$$

where D_{Core} and D_C are structural ('core') and cyclical debts respectively. It can be seen from these definitions that core debt includes interest payments on total net debt. While this does introduce a small element of cyclicity into the concept, this assumption is made to keep the calculation of core debt simple and transparent (see paragraph 1.22 below for more details on this point).

1.12 Cyclical debt D_C would vary from positive to negative with a mean of zero over the long-term. To calculate cyclical debt and core debt it is necessary to select a year in which the cyclical debt is assumed to be zero. If this occurs in year n then the cyclical debt in any year t will be:

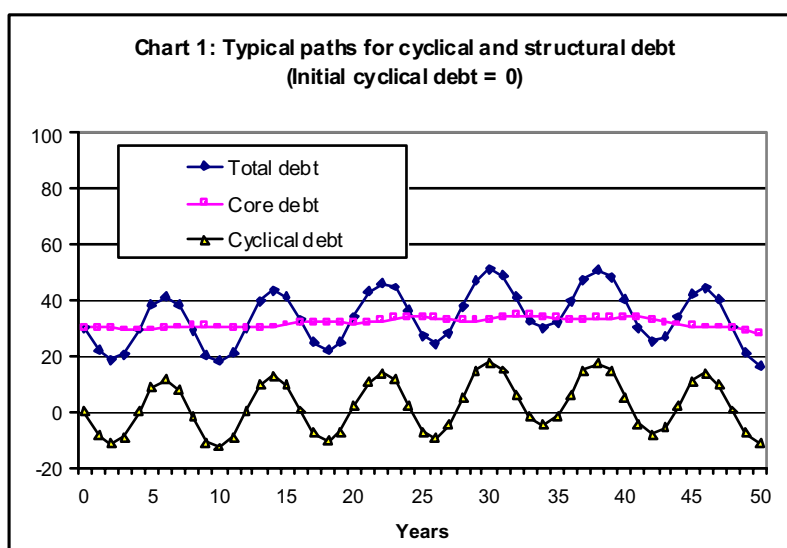
$$D_{C_t} = \sum_{i=n+1}^t Def_{C_i} \quad \text{and} \quad (15)$$

$$D_{Core_t} = \sum_{i=n+1}^t Def_{S_i} + D_n \quad (16)$$

³ The cyclical revenues and expenditures correspond to the automatic stabilisers. Principally they are tax revenues that increase in a cyclical upturn and expenditures (unemployment and social security) that rise in a cyclical downturn.

1.13 For practical purposes it does not much matter which year is selected as the base year from which to start the calculations. The paths of cyclical and core debt would be identical to their true paths shifted by a constant. For practical purposes it is the paths of the debt which are of interest, rather than the absolute levels.

1.14 In Chart 1 below, artificial data over 50 years with an 8 year symmetric cycle of the output gap were used to plot the path of total debt, cyclical debt and core debt. Although structural revenue and expenditure were growing at 1 per cent annually in the example, they were both subject to annual stochastic shocks, to generate a relatively typical debt path. The most notable feature, as expected, is that total debt experiences large variations over time in response to the cyclical variations of the economy. Moreover, in the real world, cycles will be of variable intensity and duration, which suggests that the debt path could exhibit wider fluctuations in practice without jeopardising sustainability.



METHODOLOGY FOR CALCULATING CORE DEBT

1.15 To see how core debt is calculated in practice it is necessary to reconcile measures of fiscal balance with measures of debt.

1.16 A measure of the overall fiscal balance is public sector net borrowing (PSNB). This measure is currently a hybrid cash-accruals concept and to be reconciled with changes in debt it must be converted to a cash basis. It is also necessary to take account of revaluations of the stock of net debt (which are largely due to exchange rate changes and variations in the market value of government bonds). Broadly speaking we can say that:

$$\text{PSNB}_t + \text{AA}_t = \text{PSNCR}_t \quad (17)$$

$$\text{Ndebt}_t = \text{Ndebt}_{t-1} + \text{PSNCR}_t + \text{Rev}_t \quad (18)$$

i.e. where AA is the sum of the accruals adjustments and asset sales⁴ necessary to convert the PSNB to the public sector net cash requirement (PSNCR). Ndebt is the conventionally measured net debt and Rev are the revaluations. From the data available revaluations are in practice calculated as a residual from the difference between debt stocks and the PSNCR.

1.17 PSNB can be split into its structural and cyclical components using ready reckoners updated from the estimates in the Treasury publication *Fiscal policy: public finances and the cycle*⁵. Thus the structural component of PSNB (CAPSNB) is given by:

$$\frac{\text{CAPSNB}_t}{\text{GDP}_t} = -\alpha \text{OG}_t - \beta \text{OG}_{t-1} \quad (19)$$

The values of α and β have varied due to changes in the tax system. Currently, the values of α and β are 0.5 and 0.2 – see footnote 5.

1.18 Having calculated this cyclical component of PSNB, we can proceed directly to calculate cyclical debt as:

$$D_{C_t} = \sum_{i=n+1}^t \text{Def}_{C_i} \quad (20)$$

1.19 Where n was chosen as 1986-87, when the economy is believed to have been on-trend. If the starting year for the calculation of core debt is one where the economy was on trend then cyclical debt will be close to zero in the long term. The choice of starting year will not affect the path of evolution of core debt, however. Core debt in each year is then calculated as:

$$D_{\text{Core}_t} = \text{Ndebt}_t - D_{C_t} \quad (21)$$

1.20 Core debt (D_{Core}) is thus determined as a residual. As a result it implicitly includes the accumulated accounting adjustments (ΣAA) and accumulated revaluations (ΣRev). While this is not ideal, since the pure concept of core debt would only include the debt due to the structural fiscal deficit, it is necessary in order to preserve the simplicity and transparency of the calculation.

⁴ For example, the sale of the 3G licences had the effect of reducing debt by almost 2 per cent of GDP, but it appears as an accruals adjustment since it affects debt in cash terms immediately, but is accrued over time as a licence payment.

⁵ *Fiscal policy: public finances and the cycle*, March 1999, HM Treasury. The ready reckoners set out in this publication suggest that if GDP growth were 1 percentage point higher or lower than assumed over the coming year, net borrowing might be lower or higher by around 0.4 per cent of GDP in the first year and 0.3 per cent in the following year. However, these figures are now closer to 0.5 per cent and 0.2 per cent when allowance is made for the reduction in the lag between profits and corporation tax receipts resulting from the introduction of the instalment system for corporation tax.

1.21 It is to be expected that over time the mean of both the revaluation term and the accruals adjustment will be small but positive. It should be noted, however, that in recent years these adjustments have been considerable (as a result of the sales of 3G licences and adjustments for the effects of windfall taxes). Over the next few years it is expected that these adjustments will, on average, add about 0.5 per cent of GDP to net debt every year.

1.22 As can be seen from the original formulation of the structural deficit (equation 6) core debt includes all interest payments. This means that core debt will contain a small residual cyclical element, because all interest payments (including those related to cyclical debt) are included in core debt. While a case might be made for attributing a part of interest payments to the cyclical debt (as interest accumulates on the cyclical debt), there would be an arbitrary element in this division. Transparency suggests the simpler solution. With low interest rates the cyclical element in core debt is likely to be very small. It is preferable to accept this distortion rather than compromise the concept with debates on how to divide interest payments between core and cyclical debt.

1.23 From the above arguments it can be seen that core debt includes a number of additional components over and above the cyclically-adjusted PSNB:

$$D_{\text{Core}_t} = D_{\text{Core}_{t-1}} + \text{CAPSNB}_t + \text{AA}_t + \text{Rev}_t \quad (22)$$

1.24 The concept of core debt developed in this paper is a means of increasing the transparency of the fiscal framework and assisting the analysis of performance against the sustainable investment rule. It allows the sustainable investment rule to be monitored on a similar basis as the golden rule. In the annex, the sources and methods for the calculation of the concept are described in detail.

ANNEX A: CORE DEBT CALCULATION: SOURCES AND METHODS

Core debt can be calculated using published public finance data. The basic data required is:

Net Debt (Ndebt)

Source: Financial Statistics, ONS, Table 1.1A, ONS code RUTN

Public Sector Net Borrowing (PSNB)

Source: Financial Statistics, ONS, Table 1.1B, ONS code –ANNX

Cyclically-Adjusted Public Sector Net Borrowing (CAPSNB)

Source: Financial Statement and Budget Report, HM Treasury, Table C23

Gross Domestic Product at market prices (GDP)

Source: ONS code BKTL

All data refer to financial years. Net debt is the end of year stock.

From the basic data two auxiliary variables are derived:

Cyclical component of PSNB (Def_C):

$$Def_{C_t} = PSNB_t - CAPSNB_t$$

Cyclical Debt (D_C):

$$D_{C_t} = D_{C_{t-1}} + Def_{C_t}$$

In the base year (1986-87) cyclical debt is assumed to be zero (see paragraph 1.19 in the body of this paper for an explanation of the assumption), so that future stocks of debt are the sum of accumulated cyclical deficits.

Core debt (D_{Core}) for any year can be calculated as:

$$D_{Core_t} = Ndebt_t - D_{C_t}$$

To obtain core debt as a percentage of GDP a measure of GDP centred on end-March is used. This is calculated as the sum of quarterly GDP data from the two previous quarters of the corresponding financial year and the following two quarters. For example, for 1999-00 centred GDP is the sum of 1999Q4 to 2000Q3.

The detailed calculations of core debt are shown in Table A1 below.

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Table A1: Core Debt Calculations, (£ billion)

	PSNB	CAPSNB ¹	Def _c	D _c	Ndebt	D _{Core}	D _{Core} /GDP ²
86/87	8.0	7.4	0.6	0.0	167.8	167.8	41.1
87/88	4.2	9.1	-5.0	-5.0	167.4	172.4	37.9
88/89	-6.4	5.6	-12.0	-16.9	153.9	170.8	34.0
89/90	-1.2	13.1	-14.3	-31.3	152.2	183.5	33.4
90/91	5.7	14.4	-8.7	-40.0	151.3	191.3	33.1
91/92	22.4	19.3	3.1	-36.9	166.1	203.0	33.5
92/93	46.6	33.6	13.0	-23.9	202.3	226.2	35.8
93/94	51.0	35.3	15.7	-8.2	249.4	257.6	38.3
94/95	43.2	33.5	9.7	1.5	289.3	287.8	40.6
95/96	34.9	29.4	5.6	7.0	321.3	314.3	41.9
96/97	28.4	24.2	4.2	11.2	348.5	337.3	42.3
97/98	6.0	5.8	0.1	11.4	352.9	341.5	40.2
98/99	-5.5	-2.9	-2.6	8.7	348.7	340.0	38.3
99/00	-16.3	-14.3	-2.0	6.7	340.1	333.4	35.7
00/01	-15.9	-11.7	-4.2	2.5	305.9	303.4	31.0

1. Corresponds to figures published in FSBR 2002 as a percentage of GDP

2. Percentage of GDP