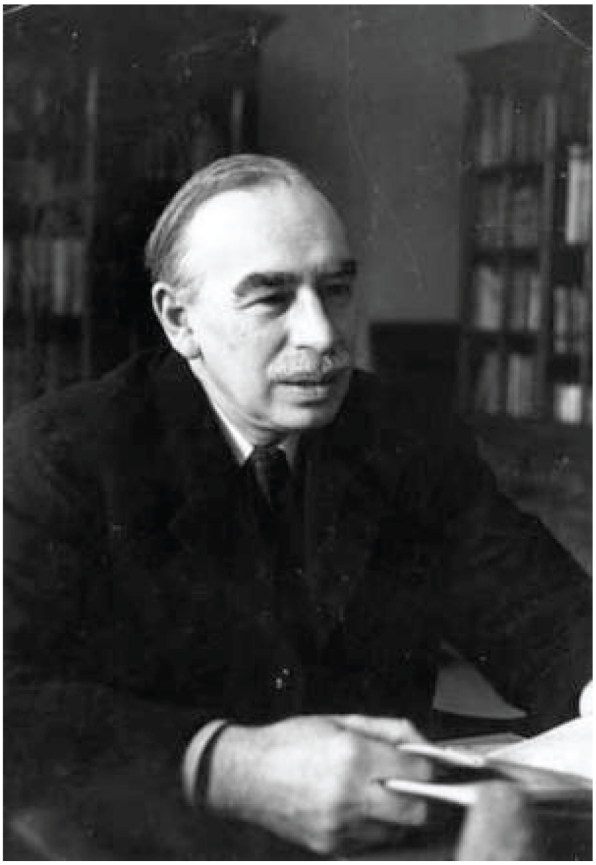

THE ECONOMIC CONSEQUENCES OF MR OSBORNE

FISCAL CONSOLIDATION:
Lessons from a Century of Macro Economics

By Victoria Chick and Ann Pettifor

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1. Introduction

This note looks at national accounts information for government expenditure to examine 'genuine' 'consolidations', episodes when nominal spending actually fell. These are contrasted with fiscal expansions. Spending figures are shown alongside outcomes for public debt, interest rates, unemployment, GDP and prices. Outcomes are seen as running almost entirely contrary to conventional wisdom, or at least contrary to thinking derived from microeconomic considerations: fiscal consolidation increases rather than reduces the level of public debt as a share of GDP and is in general associated with adverse macroeconomic conditions. The exception was the consolidation after World War II.

A summary analysis over all episodes is shown in section 1; section 2 details each of the episodes, and section 3 includes some discussion of results.

Historical background is limited and largely restricted to footnotes were possible, for reasons of length. There is some discussion of monetary policy, because it is important to the context for and impact of fiscal initiatives. A longer-run table and charts are included in Annex 1, with information on sources; the shorthand used throughout the document is explained below:

- public expenditure is measured as the final consumption and fixed capital formation of central and local government;
- public debt is measured as a share of GDP, from the HMT website;
- interest rates figures are for the yield on long-term government bonds;
- prices are measured by the GDP deflator; and
- the unemployment rate is used as the measure of labour market performance

2. Summary of results

In section 3, eight episodes defined according to changes in policy for government expenditure are examined. Summary statistics for public debt and government expenditure are shown in Table 2.1 and plotted in Figure 2.2. Each data point corresponds to the average annual change in (i) government debt as a percentage of GDP and (ii) the percentage growth in nominal spending of government expenditure. Note that the latter figures are based on final demand of government and exclude transfer payments such as benefits and interest payments. From an economic point of view, final demand is likely to be more important to outcomes and follows most directly from deliberate policy action. From an empirical point of view, data on transfers are distorted by outcomes, so that a policy that successfully expands employment will reduce benefit expenditures and (later) interest payments (which may also be affected by monetary policy).[1]

Table 2.1: Annual average change in government finances

	Expenditure	Debt
WWI	62.7	17.4
1918-23	-20.9	13.2
1931-33	-5.4	5.0
1933-39	18.3	-7.0
WWII	38.1	10.6
1944-47	-24.5	17.0
1947-76	10.1	-6.8
1976-2009	7.6	0.4

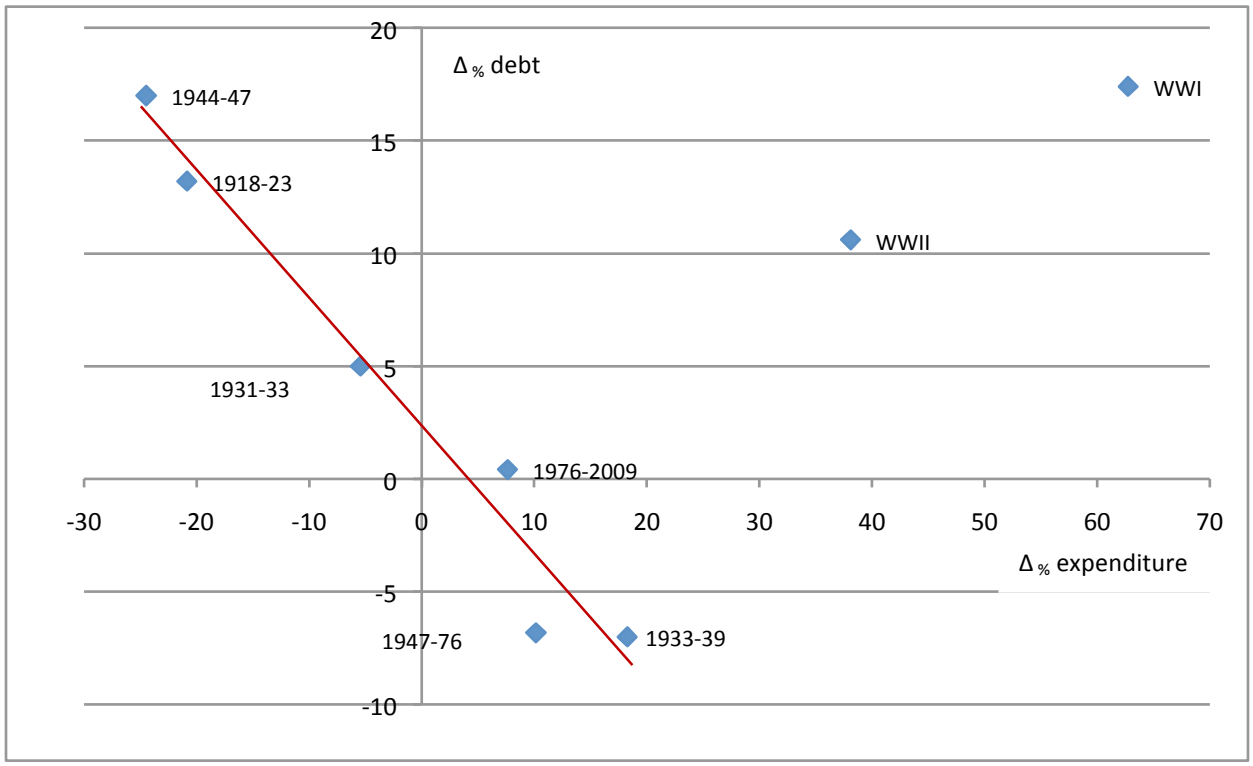
Figure 2.2 shows there is a very strong negative association between public expenditure and the public debt, excluding the two outliers for the world wars. As public expenditure increases, public debt falls, and *vice-versa*. A simple correlation (excluding the wars) shows an R^2 of -0.98 and the following equation:

$$\Delta_{\%} \text{ debt} = 2.2 - 0.6\, \Delta_{\%} \text{ G}.$$

According to this equation, reductions in public debt are only associated with annual increases in public expenditure of more than 4 per cent. Even in war, when debt rises, it does so by a good deal less than the increases in government expenditure. Plainly, with so few observations the equation is not very robust, but the negative association appears very strong (see annex 2 for further discussion).

1 These propositions follow from Keynes's account, discussed in section 4.

Figure 2.2: Changes in government expenditure and debt



Source: see text

3. Analysis of individual episodes

A. Expansion 1: WWI, 1913-1918

Wartime fiscal policies see debt rise heavily in parallel to expenditure. In World War I public expenditure rose from £233m in 1913 to £1850m in 1918, and debt rose from 27 to 114 per cent of GDP.[2] Unemployment fell to nearly zero, though one must be conscious that the statistics disguise the human cost that brought this about. The interest rate on long-term government debt, rose from 3.0 to 4.4 per cent. In volume terms the economy grew by 9 per cent over the course of the war; prices nearly doubled.

Table 3A: Expansion 1

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1913	233	2517	9.3	27	3.4	5.2	3.6	0.7
1914	354	2553	13.9	26	3.5	0.8	4.2	0.7
1915	1062	3139	33.8	36	3.8	10.1	1.2	10.8
1916	1341	3588	37.4	61	4.3	-0.1	0.6	13.8
1917	1691	4537	37.3	90	4.6	0.5	0.7	26.9
1918	1850	5243	35.3	114	4.4	-1.8	0.8	18.6

2 This expansion was aided by the development of 'Bradburys' (named after the Permanent Secretary to HMT), which permitted the money supply to be extended beyond the limits set by the gold standard.

B. Consolidation 1: post-WWI and the 'Geddes Axe', 1918-1923

After World War I, expenditure was cut sharply between 1918 and 1920, and then a further round of cuts was implemented between 1921 and 1923. Based on the recommendations of an independent committee, the latter cuts are known as the Geddes Axe.[3] The Table shows nominal expenditure falling from £1850m in 1918 to £483m in 1923, but public debt as a share of GDP rising from 114 to 180 per cent of GDP in 1923. The post-war macroeconomic outcomes were nasty. There was a very sharp rise in unemployment and fall in GDP – especially in nominal terms; a severe dose of inflation was followed by a severe deflation. Government bond yields remained virtually static in nominal terms, but in real terms yields turned extremely high (not shown, but derived by comparing interest rates with the GDP deflator growth).

Table 3B: Consolidation 1

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1918	1850	5243	35.3	114	4.4	-1.8	0.8	18.6
1919	968	6230	15.5	136	4.6	-8.7	6	17.8
1920	591	5982	9.9	133	5.3	-6.7	3.9	20.3
1921	648	5134	12.6	150	5.2	-5.8	16.9	-10.5
1922	555	4579	12.1	170	4.4	3.5	14.3	-16.1
1923	483	4385	11.0	180	4.3	3.1	11.7	-8.0

3 The Committee on National Expenditure was appointed in August 1921 by David Lloyd George. It was chaired by Sir Eric Geddes (business background, leading Minister in the war, Conservative MP).

C. Consolidation 2: into the Great Depression and the May Committee, 1931-1933

Government expenditure was permitted to grow modestly over the rest of the 1920s, barring modest declines in 1928 and 1929 (nominal spending grew at an average of 2.5 per cent). The declines in GDP were arrested, but the wider context of the return to the gold standard meant that much of the decade was characterised by austerity.

With the Great Depression growing in intensity and the gold standard constraining the use of monetary policy, there were regular financial crises through 1930 and 1931. In February 1931 the Chancellor set up the 'Economy Committee', under Sir George May (the Secretary of the Prudential Assurance Company). Their Report was published on 31 July; it called for a reduction of £97m in public expenditure.[4] The Labour Government imploded; on 24 August the National Government was formed and, within a month (21 September), took the UK off gold. The May proposals were not implemented in full, but, between 1931 and 1933, public expenditure was cut by about 10 per cent. Nominal GDP fell by 2.3 per cent, and public debt rose from 173 to 183 per cent of GDP. Unemployment was around and even over 20 per cent for the duration.

At least by 1933 a floor had been put under the collapse. For Keynes this would have been a consequence of the greater freedom of monetary action afforded by leaving gold, rather than fiscal consolidation. The Bank of England reduced discount rates over 1932. Then HMT took direct action on long-term interest rates: in the conversion operation of June 1932, interest on the 1917 War Loan was reduced from 5 per cent to 3½ per cent (which can be seen in the interest rate figures for 1932 and 1933).[5]

Table 3C: Consolidation 2

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1931	575	4359	13.2	173	4.5	-5.1	21.3	-2.4
1932	538	4276	12.6	177	3.8	0.3	22.1	-3.6
1933	514	4259	12.1	183	3.4	1.1	19.9	-1.4

4 Equivalent to 2.4 per cent of GDP and to £34 billion in 2009. The report included recommendations to reduce unemployment benefit by 20 per cent, to cut wages for teachers, the armed forces and the police and to reduce public works expenditures.

5 The actions were aided by the instigation of 'exchange management', whereby exchange rates were managed at fixed parities by the Bank of England buying and selling sterling rather than manipulating discount rates (the Exchange Equalisation Account was set up for these purposes, with large-scale cash resources). Some degree of capital control was instigated for the conversion operation.

D. Expansion 2: public spending, 1933-1939

In October 1932, correspondence in *The Times* between leading economists instigated a debate on the desirability of additional public expenditure to reduce unemployment.[6] In 1934, nominal expenditure increased by 3.6 per cent and was allowed to grow at a rapidly accelerating pace throughout the rest of the 1930s. The extent of this expansion, from 12 to 23 per cent of GDP, is not widely appreciated, with conventional wisdom holding that the conversion to 'Keynesianism' came after the war. The economy recovered: real GDP rose by an average annual rate of 4 per cent, the unemployment rate was halved and the public debt fell from 183 to 141 per cent of GDP.[7] The long-term rate of interest was reduced to a historic low of 2.9 per cent in 1935 and 1936, but the authorities then allowed it to drift upwards to 3.7 per cent in 1938 (perhaps partly reflecting the return of more normal price inflation).

Table 3D: Expansion 2

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1933	514	4259	12.1	183	3.4	1.1	19.9	-1.4
1934	535	4513	11.9	177	3.1	6.8	16.7	-0.7
1935	591	4721	12.5	168	2.9	3.8	15.5	0.9
1936	668	4905	13.6	162	2.9	3.1	13.1	0.6
1937	782	5289	14.8	150	3.3	4.3	10.8	3.7
1938	937	5572	16.8	147	3.4	3.0	12.9	2.8
1939	1359	5958	22.8	141	3.7	3.9	9.3	4.4

6 The opening letter of 17 October was organised by Professor Pigou of Cambridge and was signed by Professor D. H. MacGregor of Oxford, Walter Layton, Josiah Stamp, Arthur Salter and Keynes. The most notorious of the critical letters was from the LSE economists, T. E. Gregory, Friedrich von Hayek, Arnold Plant and Lionel Robbins. Keynes entered the debate most substantially with his March 1933 series of articles in *The Times*, 'The Means to Prosperity', later collected and published as a single volume. http://www.gutenberg.ca/ebooks/keynes-means/keynes-means-00-h.html

7 Though note the repercussions on unemployment of the 1938 US recession, when US fiscal and monetary stimulus was temporarily withdrawn.

E. Expansion 3: WWII, 1939-1944

The great increase in government expenditure from £1.4 bn in 1939 to a wartime maximum of £5.2 bn in 1944 led to a corresponding rise in public sector debt. It was not possible for private activity to keep pace, given the extent of the re-orientation of the economy to wartime production and the associated reliance on US imports. Again the whole labour force was deployed. In volume terms the economy grew by about 20 per cent, significantly more than in World War I and presumably an important factor in the overall war effort. In spite of the rise in public debt, the interest rate on government bonds was maintained at three per cent.[8]

Table 3E: Expansion 3

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1939	1359	5958	22.8	141	3.7	3.9	9.3	4.4
1940	3212	7521	42.7	121	3.4	14.4	6	8.6
1941	4337	8831	49.1	131	3.1	6.0	2.2	9.0
1942	4806	9591	50.1	149	3.0	1.0	0.8	7.2
1943	5163	10208	50.6	168	3.1	1.8	0.6	4.5
1944	5206	10272	50.7	194	3.1	-4.5	0.6	6.0

8 This was achieved by changes to debt management policy, including the development of Treasury deposit receipts (TDRs), a mechanism that obliged banks to lend to the government at very low interest. Note that Keynes had originally advocated a long rate of 2½ per cent (which was the rate that prevailed in the US).

F. Contraction 3: De-militarisation, 1944-1947

The manner in which the economy was restored to a peace footing contrasted markedly with the process after WWI. Public expenditure was reduced from £5.2 to £2.2 bn between 1944 and 1947. The public debt rose sharply to 1946 but then fell for the first time in 1947. Unlike after World War I, the level of activity was maintained at the greatly elevated wartime levels; critically, nominal GDP was not permitted to contract, except in 1945. While macroeconomic outcomes were not perfect, the authorities managed a fairly seamless transfer of the conduct of activity from public to private sector. These processes demand a separate study, but private demand was no doubt fostered by the continuation and extension of the cheap money policy,[9] government incentives for GFCF, Keynes's schemes in *How to Pay for the War*[10] and, of course, by the macroeconomic effects of not letting public expenditure fall below the level established at the end of the 1930s.

Table 3F: Contraction 3

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1944	5206	10272	50.7	194	3.1	-4.5	0.6	6.0
1945	4365	9831	44.4	232	2.9	-6.2	1.3	3.0
1946	2575	9959	25.9	252	2.6	-0.6	2.5	1.9
1947	2156	10655	20.2	245	2.8	-2.4	3.1	9.0

9 For example in 1945 the rate on Treasury bills was reduced from 1 to ½ per cent, and the rate on TDRs from 1 1/8 to 5/8%.

10 Keynes proposed an income tax scheme, where higher payments to reduce consumer demand during the war would be released to boost consumer demand after the war. The extent to which Keynes's proposals were adopted has not been addressed; they were opposed by many, with rationing generally preferred to Keynes's desire to use the price mechanism.

G. The long expansion from 1947-2009 and the 1975-1976 consolidation

From 1947 to the present, nominal government expenditure has been on an uninterrupted upward trajectory:

- there has been no year with a fall in nominal government expenditure;
- however, there have been occasional annual falls in real expenditure; and
- as a share of GDP, public expenditure has fluctuated around a rate of about 22 per cent, a figure that has been remarkably stable, beyond some counter-cyclical variation and movements above trend in the 1970s and to a lesser extent the 1980s.[11]

Table 3G.1: Public expenditure as % of GDP, decades

50s	60s	70s	80s	90s	00s
22.4	21.8	27.3	23.3	21.4	22.5

However, the dynamics of the public debt rather than public expenditure are used to define the fiscal stance: there are two distinct features (see chart in Annex 1). Between 1947 and 1975, the public debt fell each year. The first rise in the public debt of the post-war era came between 1976 and 1978; since then, the underlying trend of improvement ceased, and the debt has fluctuated with the state of the economy.

This first post-war rise in debt coincides with the 1976 fiscal consolidation, discussed recently in a JP Morgan Research Bulletin by Barr and Monks.[12] A decline in sterling led eventually to a full-blown exchange crisis and the famous call on the IMF. The price for exchange support was a reduction in public expenditure and control of the public deficit. While nominal public expenditure was not reversed, its growth was reduced substantially and there was a real decline in 1977.

11 Note that the figure in the annex for 2009 is greatly distorted by the severity of the decline in GDP.

12 http://www.scribd.com/doc/26619495/JPMorgan-Economic-Research-note-UK-fiscal-policy-some-lessons-from-the-1976-crisis

Table 3G.2: Growth of public expenditure (per cent)

	Nominal	Real
1975	33.2	5.8
1976	15.8	1.7
1977	5.6	-1.2
1978	11.5	1.8

The IMF loan was a defining moment in twentieth century economic history, marking a decisive shift in macroeconomic philosophy between two quarter centuries that has extended through to the present (though changes to monetary policies had been underway for some time before 1976: see below). Outcomes in this longer time-frame can be assessed by switching perspective to annual average figures (also, the absence of periodic deflations means that more emphasis needs to be given to real figures):[13]

13 Moving outside macroeconomic statistics, Figure 2A of the Report of the National Equalities Panel shows figures for the UK income distribution from 1937 to the present as a 'U-shape' trajectory, or 'inverse Kuznets-curve'. The base of the U coincides with the mid-1970s, marking the point when the continuous improvement in the income distribution after the war was halted and the progressive deterioration to the present level of inequality began. http://sticerd.lse.ac.uk/dps/case/cr/CASEreport60_summary.pdf

Table 3G.3: The long expansion

Average over years:	**1947-1975**	**1976-2009**
Government expenditure (% GDP)	22.5	22.6
Government expenditure (real growth)[14]	2.3	1.4
Change in public debt (percentage points)	– 7.1	+ 0.5
GDP (real growth)	2.7	2.2
Unemployment	2.2	7.7
GDP deflator (growth)	5.8	5.6
Nominal interest rate	6.7	8.1
Real interest rate	0.9	2.4

So, just as in the data on levels for the first half of the twentieth century, higher rates of growth in real government expenditure coincided with reductions in the public debt, higher GDP growth and greatly lower unemployment. And *vice versa*.

In nominal terms, high government expenditure and high GDP in the first period contrasted with lower government expenditure and lower GDP in the second period, so that the actual ratio was virtually static. The public debt was reduced by the preserved high level of post-war activity and subsequent real growth. Again, interest rates were lower in the first period; real rates in the second period were 2½ times as high as in the first period.

These differences in interest rates would have had wider macroeconomic effects. In the first period, the low rates fostered high rates of private fixed capital investment[15] and meant lower interest payments on government debt.

14 These figures exclude government investment, so they are likely to be an underestimate in the earlier period. The more recent figures are based on 'outcome' indicators, derived by the UK Centre for Measurement of Government Activity of the Office for National Statistics, which are less useful as an indicator of the pressure of demand. This is likely to mean that government demand is understated in the second period.

15 GFCF grew by 4.6 per cent a year in the earlier period and 2.6 in the later (these figures exclude intangibles). By decade, average annual growth was as follows:

50s	60s	70s	80s	90s	00s

Rather than real outcomes, macroeconomic debate has tended to focus on inflation. The choice of dividing line might flatter the respective performances, but not to any great extent. Figures for the growth in the GDP deflator by decade are shown on Figure 3G.4.

Figure 3G.4: GDP deflator, growth

50s	60s	70s	80s	90s	00s
4.3	3.6	13.0	7.6	3.6	2.4

In general, the analysis shows that increased government expenditure led to both higher nominal and higher real GDP. The policies that supported employment and public debt improvements were not detrimental to inflation. Outcomes in the 1970s do not disprove this rule. In the early years of the 1970s there were major changes in the monetary environment – not least, relaxation of credit control and the termination of the Bretton Woods Agreement[16] – and a very reckless and inept approach to policy. It is incorrect to regard the inflation as *solely* the cumulative effect of expansionary policy.

5.5	5.9	1.4	4.4	2.5	1.4

16 Hyman Minsky has financial liberalisation beginning in 1966, with the Eurobond market.

4. Discussion

The empirical evidence runs exactly counter to conventional thinking. Fiscal consolidations have not improved the public finances. This is true of all the episodes examined, except at the end of the consolidation after World War II, where action was taken to bolster private demand in parallel to public retrenchment.

Fiscal expansion is less straightforward to unravel, but no less clear-cut. In World War I, policy was less refined, but the authorities were still successful in arranging financing to support a substantial expansion in public expenditure and public debt. Post-war policy was focussed on consolidation to reduce the burden of debt built up during the war. The effects were disastrous, even before the repercussions of the Great Depression. The fiscal expansion and monetary changes of the 1930s were then a reversal of this position, which resulted in a steady increase in the utilisation of labour and had no adverse effects. The slower pace of expansion relative to wartime production meant that increased tax revenues and associated savings on benefits and debt-interest payments were able to keep pace with government expenditure. The financing of World War II was highly effective, in part reflecting the lessons of the 1930s. Any notions of consolidation had been dismissed in post-war policy discussions: the authorities focussed on employment and economic expansion to reduce the debt. Perhaps they had finally understood Keynes's dictum from January 1933: "Look after the unemployment, and the budget will look after itself" (*Collected Writings*, Volume XXI, p. 150). The approach was completely successful; within only two years, the debt was on a downward trajectory, and the wartime production and employment gains were preserved and extended through to the 1970s.

After World War II, general government expenditure had effectively doubled as a share of the economy relative to the 1920s. The positive outcomes of this surely undeniably substantial change are inexplicable according to conventional economic analysis, and the quarter century after the war is rightly known as the 'Golden Age'. A return to what is commonly understood as a more market-orientated economy from 1976 has not seen any reduction in public expenditure as a share of GDP, and the performance on the public debt, let alone all measures of real outcome, has been worse than in the previous quarter century.

Interest rate trajectories are no less important. Table 4.1 compares each of the episodes examined in the first half of the twentieth century. The figures decisively rebut any notion that higher debt is associated with higher interest (the correlation coefficient is –0.5). Over these years it became understood that the long-term rate could be brought under the control of the authorities whatever the planned extent of government expenditure. After the war, that control was rapidly abandoned.

Table 4.1: Interest rates and public debt

		Average debt	Average interest
Expansion 1	1914-18	65.4	4.1
Contraction 1	1919-23	153.8	4.8
Contraction 2	1931-33	177.7	3.9
Expansion 2	1934-39	157.5	3.2
Expansion 3	1940-44	152.6	3.1
Contraction 3	1945-47	243.0	2.8

While this is not the place for a full discussion, for explanations we must look to macroeconomics. The public sector finances are not analogous to household finances. Given spare capacity, public expenditures are not only productive but also foster additional activity in the private sector. Productive activity generates revenue and economises on benefits (and then debt interest) expenditures. This was one of Keynes's central conclusions: "For the proposition that supply creates its own demand, I shall substitute the proposition that expenditure creates its own income" (*Collected Writings*, Volume XXIX, p. 81). Conversely, reducing expenditure would reduce income. Equally, reducing public expenditure will increase income only if it is outweighed by expansions in private expenditure. [17]

Keynes did not think that supply was unimportant and favoured a market approach where possible, but, outside full employment, acting on demand with monetary and fiscal policy was likely to be the best way of improving economic outcomes. Among the pressures on wages that emerged in the late 1960s-1970s was a change in the allocation of increased income between the factors of production, following developments in industrial and social relations. While there were undoubted practical challenges, these changes do not invalidate or devalue the underlying economic reasoning.

Finally, it should be emphasised that each of these fiscal expansions was facilitated and permitted by wider considerations of financial architecture and monetary policy. More specifically, any rapid growth in public expenditure requires the utilisation of credit creation to bridge the gap between expenditures and revenues. The authorities have created various mechanisms (Bradburys, Treasury deposit receipts

[17] Issues of counterfactuals merit some discussion here. In each of these episodes it could be that the change in public expenditure merely coincided with a parallel change in private expenditure. But this would require a lot of coincidences. Moreover, in the event that a private sector recovery was underway, the public expansion would still have accelerated and increased the improvement (and *vice versa*). The same charge may have more force against the analyses of successful contractions, typified by Broadbent's recent analysis for Goldman Sachs, 'Limiting the fall-out from fiscal adjustment' (2010: http://www2.goldmansachs.com/ideas/global-economic-outlook/limiting-the-fallout-doc.pdf). Many of the 'textbook' consolidations took place in the wider context of the global expansions of the second halves of the 1980s and 1990s. For example in the Irish consolidation of 1988, G was reduced by 1.3% in 1988, but private demand (C+I+X) in 1987 was already growing by 10 per cent (there may also have been other policy measures that were acting on business and market confidence). Note also that the consolidation was short lived: in 1990 G was up by 11 per cent and in 1991 by 10 per cent.

and quantitative easing) to facilitate this process. This suggests an overlap between any debate about financial regulation and reform and any debate about fiscal policy.

Annex 1: Long-run data and charts

Data sources

Public expenditure is used as shorthand for the final consumption expenditure and gross fixed capital formation of general government (i.e. central and local government). The data are based on the components of GDP(E) and hence exclude transfers, especially benefit and debt interest payments. They are preferred to fuller measures of general government expenditure, first because these latter variables are dependent on the state of the cycle and hence on the government's fiscal policy and second because the GDP(E) measure is the measure that most directly affects demand. GDP is measured at market prices. Data from the mid-1940s are drawn from the National Accounts dataset (corresponding to the 'UK output, income and expenditure' dataset released at the end of February 2010). Before that, Charles Feinstein's estimates are used (Tables T2, T3, T5 and T39). No attempt has been made to adjust for Southern Ireland before 1919, and splicing is quite crude. There is no sectoral breakdown for Government GFCF in World War II, so this allocation is guesswork. Pre-1948 data for the GDP deflator are at factor cost (Table T61).

Feinstein, C. H. (1976 [1972]) *Statistical Tables of National Income, Expenditure & Output of the UK 1855–1965*, Cambridge: Cambridge University Press.

Public debt figures are taken from the 'public finances databank' on the HMT website, Table A10.

http://www.hm-treasury.gov.uk/d/public_finances_databank.xls

These do not correspond to the figures for public sector net debt in the National Statistics 'Public Sector Finances Statistical Bulletin', perhaps because they are for general government. Data from 2005 to 2008 are drawn from the Maastricht figures, which are defined as general government gross consolidated debt. 2009 is presently a guesstimate based on movements in the headline figures.

Interest rate estimates are from Sidney Homer's History, Table 59, the annual average yield for 2 ½ per cent consols. From 1963 the figures are joined to the gross flat yield of 2½ consuls, from *Financial Statistics*, table 7.1D (ALJF; the match in the overlap is reasonable)

Homer, S. and Sylla, R. (1991) *A History of Interest Rates*, 3rd edition, New Brunswick, NJ: Rutgers University Press.

Unemployment data are taken from the labour market statistics dataset. Historical information (for 1909-1994) comes from the January 1996 *Labour Market Trends* (pp. 6-7). These are headed 'administrative unemployment rates'. They match almost exactly with figures for 'insured

unemployment as a percentage of insured employees' shown in Feinstein's Table 58. The series then matches closely the LFS unemployment rate (MGSX), which is used from 1995 to the present.

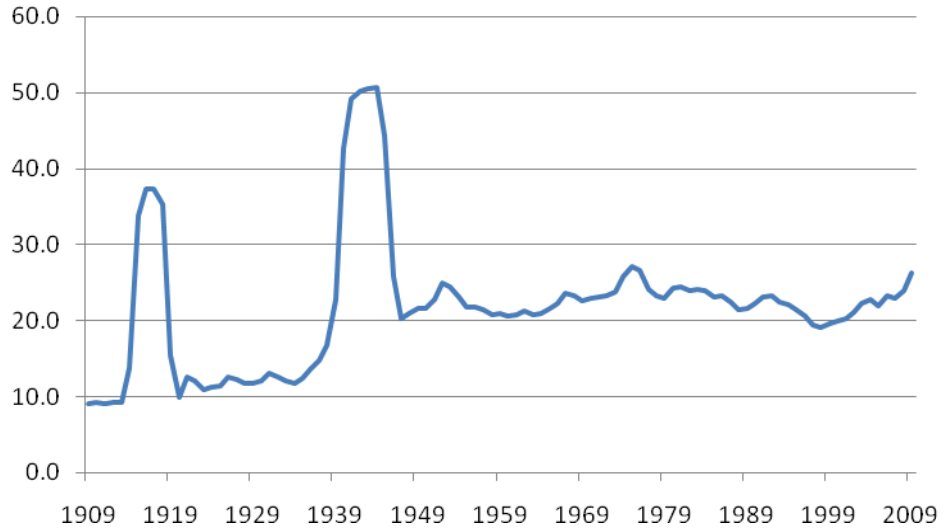
	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1909	197	2143	9.2	33	3.0	3.3	7.7	-0.4
1910	206	2233	9.2	33	3.1	3.5	4.7	0.3
1911	211	2316	9.1	30	3.2	2.3	3	1.5
1912	221	2378	9.3	29	3.3	-0.3	4	3.1
1913	233	2517	9.3	27	3.4	5.2	3.6	0.7
1914	354	2553	13.9	26	3.5	0.8	4.2	0.7
1915	1062	3139	33.8	36	3.8	10.1	1.2	10.8
1916	1341	3588	37.4	61	4.3	-0.1	0.6	14.2
1917	1691	4537	37.3	90	4.6	0.5	0.7	26.9
1918	1850	5243	35.3	114	4.4	-1.8	0.8	18.6
1919	968	6230	15.5	136	4.6	-8.7	6	17.8
1920	591	5982	9.9	133	5.3	-6.7	3.9	20.3
1921	648	5134	12.6	150	5.2	-5.8	16.9	-10.5
1922	555	4579	12.1	170	4.4	3.5	14.3	-16.1
1923	483	4385	11.0	180	4.3	3.1	11.7	-8.0
1924	495	4419	11.2	176	4.4	3.0	10.3	-1.4
1925	534	4644	11.5	167	4.4	5.0	11.3	0.3
1926	557	4396	12.7	175	4.6	-4.6	12.5	-1.4
1927	566	4613	12.3	167	4.6	7.0	9.7	-2.4
1928	550	4659	11.8	165	4.5	1.7	10.8	-1.1
1929	556	4727	11.8	162	4.6	2.4	10.4	-0.3
1930	569	4685	12.1	162	4.5	-0.1	16	-0.4
1931	575	4359	13.2	173	4.5	-5.1	21.3	-2.4
1932	538	4276	12.6	177	3.8	0.3	22.1	-3.6
1933	514	4259	12.1	183	3.4	1.1	19.9	-1.4

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1934	535	4513	11.9	177	3.1	6.8	16.7	-0.7
1935	591	4721	12.5	168	2.9	3.8	15.5	0.9
1936	668	4905	13.6	162	2.9	3.1	13.1	0.6
1937	782	5289	14.8	150	3.3	4.3	10.8	3.7
1938	937	5572	16.8	147	3.4	3.0	12.9	2.8
1939	1359	5958	22.8	141	3.7	3.9	9.3	4.4
1940	3212	7521	42.7	121	3.4	14.4	6	8.6
1941	4337	8831	49.1	131	3.1	6.0	2.2	9.0
1942	4806	9591	50.1	149	3.0	1.0	0.8	7.2
1943	5163	10208	50.6	168	3.1	1.8	0.6	4.5
1944	5206	10272	50.7	194	3.1	-4.5	0.6	6.0
1945	4365	9831	44.4	232	2.9	-6.2	1.3	3.0
1946	2575	9959	25.9	252	2.6	-0.6	2.5	1.9
1947	2156	10655	20.2	245	2.8	-2.4	3.1	9.0
1948	2505	11974	20.9	217	3.2	2.6	1.8	7.3
1949	2748	12726	21.6	201	3.3	3.3	1.6	2.5
1950	2871	13308	21.6	197	3.6	3.2	1.6	2.4
1951	3363	14784	22.7	178	3.8	2.7	1.3	7.1
1952	3985	15983	24.9	164	4.2	0.1	2.2	8.9
1953	4178	17121	24.4	154	4.1	3.8	1.8	4.1
1954	4194	18126	23.1	149	3.8	4.1	1.5	0.0
1955	4261	19490	21.9	141	4.2	3.5	1.2	5.9
1956	4573	20956	21.8	133	4.7	0.9	1.3	5.6
1957	4757	22105	21.5	125	5.0	1.7	1.6	3.5
1958	4805	23050	20.8	121	5.0	0.3	2.2	3.4

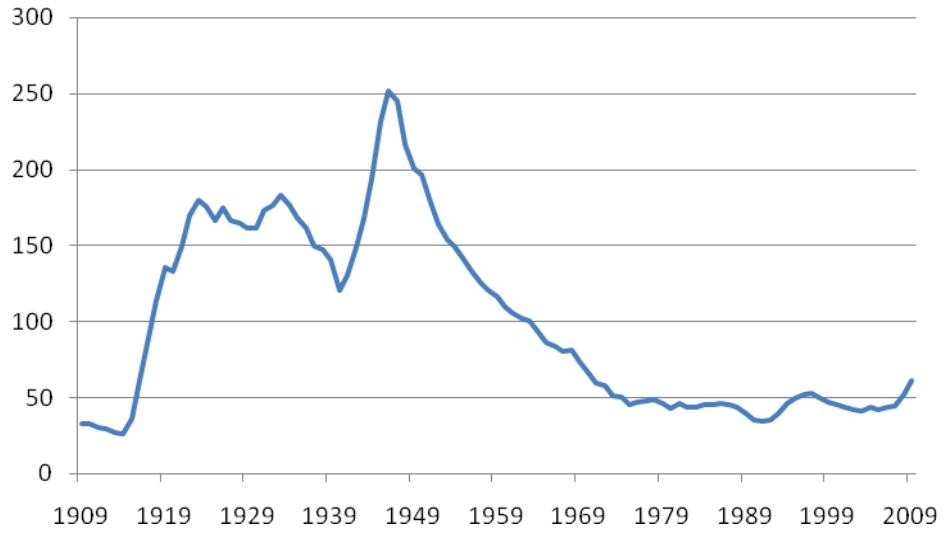
	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1959	5100	24348	20.9	116	4.8	4.3	2.3	1.6
1960	5366	25977	20.7	109	5.4	5.3	1.7	1.6
1961	5709	27413	20.8	105	6.2	2.3	1.6	3.2
1962	6124	28711	21.3	102	6.0	1.1	2.1	3.1
1963	6341	30409	20.9	101	5.8	4.3	2.6	1.5
1964	6959	33228	20.9	93	6.3	5.5	1.7	4.4
1965	7769	35888	21.6	87	6.5	2.2	1.5	5.6
1966	8510	38189	22.3	84	6.7	1.9	1.6	4.0
1967	9498	40281	23.6	80	7.1	2.5	2.5	3.8
1968	10179	43656	23.3	81	8.1	4.2	2.5	3.7
1969	10644	47023	22.6	74	8.9	2.1	2.5	4.8
1970	11879	51696	23.0	66	9.7	2.2	2.7	8.0
1971	13333	57670	23.1	60	8.5	2.1	3.5	9.5
1972	15010	64621	23.2	58	9.9	3.7	3.8	7.7
1973	17689	74545	23.7	51	12.3	7.2	2.7	8.0
1974	21747	84513	25.7	50	17.1	-1.3	2.6	14.9
1975	28963	106717	27.1	45	14.8	-0.6	4.2	26.6
1976	33538	126274	26.6	47	14.5	2.6	5.7	15.3
1977	35423	146973	24.1	48	10.5	2.4	6.2	13.8
1978	39512	169344	23.3	49	12.3	3.2	6.1	11.7
1979	45704	199220	22.9	46	11.8	2.7	5.7	14.7
1980	56666	233184	24.3	43	12.1	-2.1	7.4	19.3
1981	62528	256279	24.4	46	13.9	-1.3	11.4	11.3
1982	67533	281024	24.0	44	10.2	2.1	13	7.6
1983	74271	307207	24.2	43	9.9	3.6	12.2	5.4

	Public Expenditure £ million	Nominal GDP £ million	Expenditure as share of GDP %	Public debt % GDP	Interest rate	Real GDP growth	Unemploy –ment rate	GDP deflator growth
1984	79317	329913	24.0	45	10.0	2.7	11.5	4.5
1985	83862	361758	23.2	45	9.9	3.6	11.7	6.0
1986	90387	389149	23.2	46	10.1	4.0	11.8	3.2
1987	96391	428665	22.5	46	9.4	4.6	10.5	5.5
1988	102418	478510	21.4	43	9.1	5.0	8.3	6.3
1989	113277	525274	21.6	39	9.7	2.3	6.3	7.2
1990	127018	570283	22.3	35	10.4	0.8	5.8	7.8
1991	138023	598664	23.1	34	9.8	-1.4	8	6.4
1992	145431	622080	23.4	35	8.6	0.1	9.8	3.8
1993	147423	654196	22.5	39	6.6	2.2	10.3	2.9
1994	152998	692987	22.1	46	8.5	4.3	9.4	1.6
1995	157621	733266	21.5	49	7.8	3.1	8.6	2.6
1996	160626	781726	20.5	52	7.7	2.9	8.1	3.7
1997	161139	830094	19.4	53	6.4	3.3	6.9	2.7
1998	168400	879102	19.2	49	4.6	3.6	6.2	2.3
1999	182251	928730	19.6	47	4.9	3.5	6	2.1
2000	194199	976533	19.9	45	4.7	3.9	5.4	1.1
2001	208117	1021828	20.4	43	5.1	2.5	5.1	2.2
2002	228029	1075564	21.2	42	4.8	2.1	5.2	3.0
2003	253328	1139746	22.2	41	5.0	2.8	5.1	3.1
2004	274333	1202956	22.8	43	4.5	3.0	4.8	2.5
2005	275179	1254058	21.9	***42***	4.1	2.2	4.9	2.0
2006	308854	1325795	23.3	***43***	4.3	2.9	5.4	2.8
2007	320255	1398882	22.9	***44***	4.5	2.6	5.3	2.8
2008	346528	1448391	23.9	***52***	4.1	0.5	5.7	3.0
2009	368089	1396474	26.4	***61***	4.6	-5.0	7.6	1.5

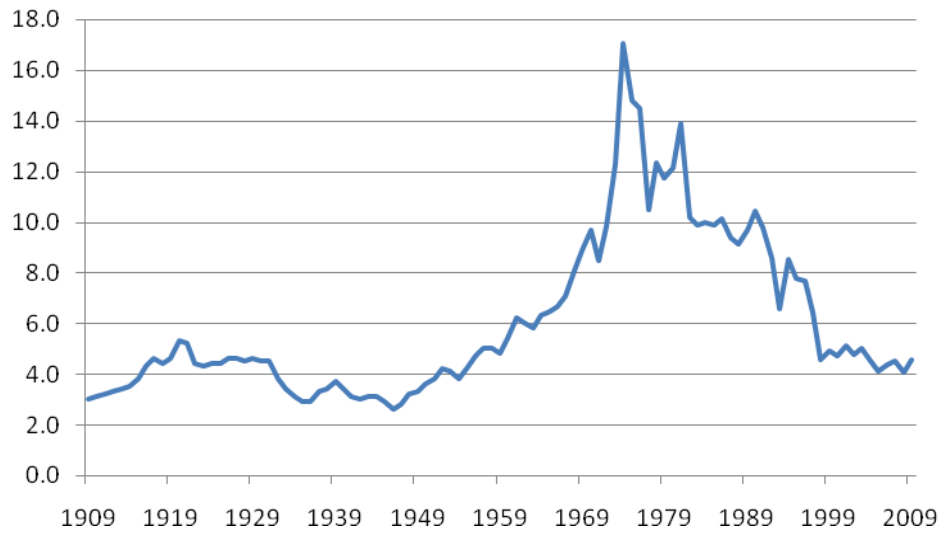
Public expenditure, % GDP



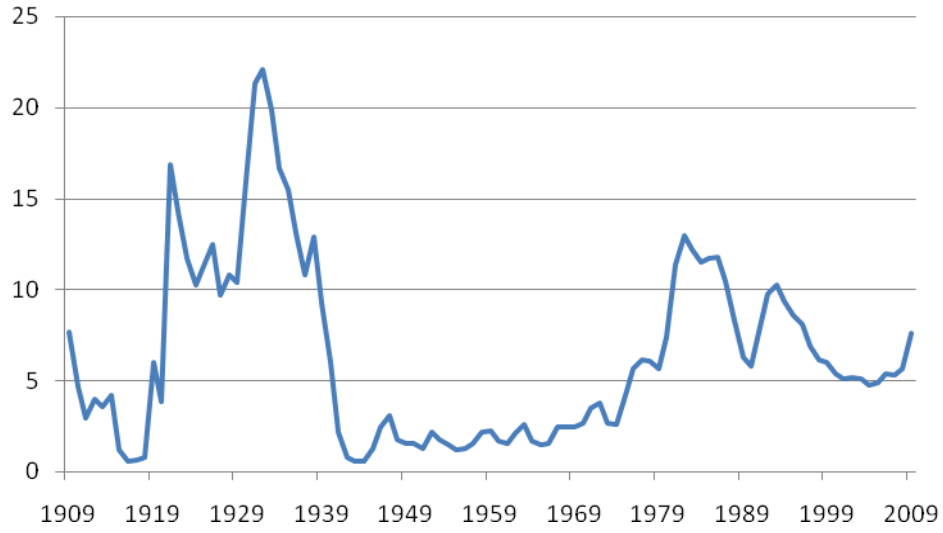
Public debt, % GDP



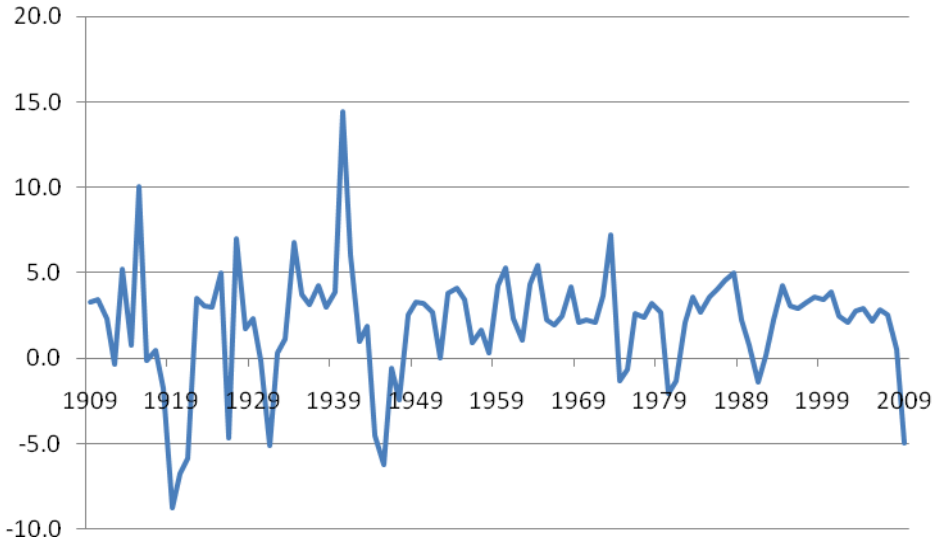
Interest rate



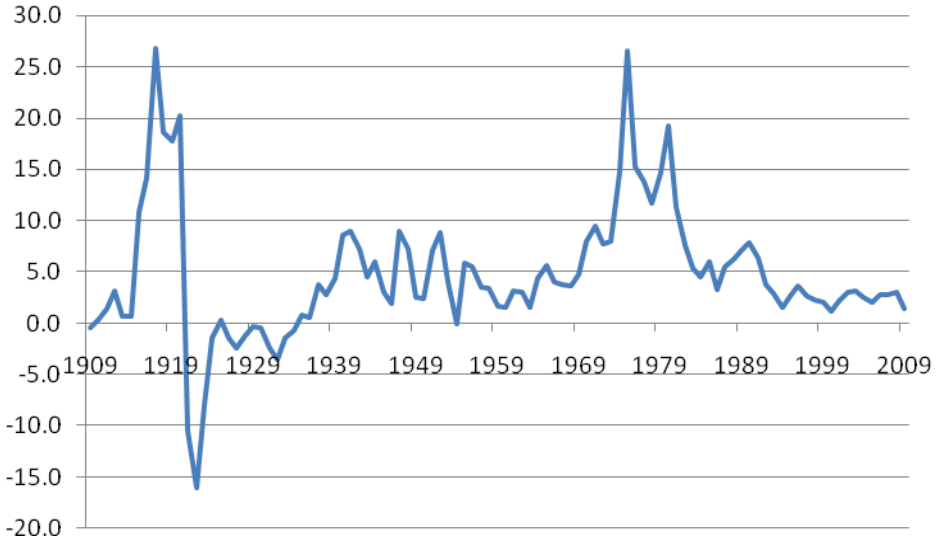
Unemployment rate



GDP growth



GDP deflator, growth



Annex 2: Debt and government expenditure, further discussion

The charts below show figures for changes in debt and expenditure for decades and individual years, both excluding 1914-18 and 1939-44. Simple correlations are as follows:

	Correlation coefficient	Slope	Intercept
Years	-0.5	-0.8	5.1
Decades	-0.5	-1.0	4.2

Note that not grouping the datapoints into episodes leads to larger negative estimate of the slope, and hence an implied greater impact of public expenditure in terms of reducing debt. It is surely reasonable to suggest that grouping should help to reduce rather than increase potential sources of error.