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What are the Effects of Tax Changes in the United Kingdom? New Evidence from a Narrative Evaluation

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Abstract

This paper estimates the effects of tax changes on the U.K. economy. Identification is achieved by isolating the 'exogenous' tax policy shocks in the post-war U.K. economy using a narrative strategy as in Romer and Romer (2010). The resulting tax changes are shown to be unforecastable on the basis of past macroeconomic data. I find that a 1 per cent cut in taxes stimulates GDP by 0.6 per cent on impact and by 2.5 per cent over three years. These findings are remarkably similar to the corresponding estimates for the United States. The results reinforce the view that tax changes do indeed have powerful, persistent and significant effects on the economy. Finally, 'exogenous' tax changes are shown to have contributed to major episodes in the U.K. business cycle.

JEL-Code: E200, E320, E620, H200, N100.

Keywords: fiscal policy, tax shocks, tax multiplier, narrative approach, business cycles.

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1 Introduction

Despite its importance for current macroeconomic policymaking, evidence of the macroeconomic effects of tax changes in the United Kingdom is sparse. Furthermore, there remains a distinct lack of consensus in the international evidence. Do tax cuts stimulate the economy? Will tax increases harm economic recovery? Answering these questions remains a contentious issue and one that is particularly pertinent at a time of intense disagreement about the macroeconomic consequences of a fiscal consolidation.

This paper helps fill the evidence gap, making three important contributions. First, I provide new, robust estimates for the macroeconomic effects of tax changes in the United Kingdom by constructing a new narrative dataset. I find that a 1 percentage point cut in taxes as a proportion of GDP causes a 0.6 per cent stimulus to GDP on impact, rising to 2.5 per cent increase over nearly three years. Second, this paper makes a direct contribution to the international evidence; my results are remarkably similar to the Romer and Romer (2010) narrative-based estimates for the United States. Third, this work (and the narrative paper itself, Cloyne (2010)) provides detailed new data for analysing the effects of U.K. tax policy and its history.

Microeconometric work has already used historical tax reforms in the U.K. for estimating changes in behaviour. For example, Blundell et al. (1998) use the 1980s tax reforms to estimate labour supply elasticities. Cummins et al. (1996) use the 1991 corporation tax cuts to examine the responsiveness of business investment using firm level data.[1]

However, few studies have examined the *macroeconomic* effects of tax changes in the United Kingdom. This gap is reflected in the U.K. Office for Budget Responsibility's report from June 2010. The tax multipliers used by the OBR are derived, in part, from an IMF survey paper from 2009. Of the nineteen studies reviewed by the IMF only two specifically examine the U.K. The OBR's other multiplier assumptions come from common large-scale macro-econometric forecasting models which often crucially depend on modelling assumptions.[2]

The academic literature has focused on the United States and cross country panel datasets. However, even for the U.S. there is no consensus. This reflects the difficulty of identifying tax policy shocks uncorrelated with, and uncontaminated by, other fluctuations. The basic problem is one of simultaneity. Changes in taxes are likely to contemporaneously affect GDP but commonly used tax variables such as tax revenues are also contemporaneously driven by GDP.

[1] Other examples are Blow and Preston (2002) who use the post-1979 tax reform period to estimate the extent of responsiveness in taxable earned income to rates of taxation and various papers which study the employment effect of the introduction of the Working Families' Tax Credit, such as Gregg and Harkness (2003) and Blundell et al. (2005)

[2] Indeed, Blanchard and Perotti (2002) argue "the evidence from large-scale econometric models has been largely dismissed on the grounds that, because of their Keynesian structure, these models assume rather than document a positive effect of fiscal expansions on output".

The recent literature has tackled the resulting identification problem in two ways. The first approach, initiated by Blanchard and Perotti (2002), seeks to identify the shocks to revenues that are contemporaneously uncorrelated with other fluctuations, from a structural vector autoregression (SVAR).[3] This is achieved by assuming that policymakers do not respond to shocks within the quarter. External information on the elasticity of revenue to output is then used to create cyclically adjusted revenues. For the U.S., the effect of a tax shock on GDP is typically around 1 per cent.[4] However, results vary across countries. For example, one of the few studies to consider the U.K., Perotti (2005), reports small negative effects of a tax cut on GDP.

The second method uses the narrative record to construct a direct measure of the policy shocks that are uncorrelated with current or projected economic fluctuations. So-called narrative approaches have been used to identify government spending shocks ((Ramey and Shapiro (1998); Ramey (2008)), monetary policy shocks (Romer and Romer (1989, 2004)) and, most relevantly, tax shocks in the U.S. by Romer and Romer (2010). Romer and Romer find a large and persistent effect of tax changes on GDP, reaching nearly 3 per cent over three years.

Identification in the SVAR approach crucially depends on the assumptions. Furthermore, the results can be quite sensitive to the elasticity used. This issue is a particular problem for the U.K. results in Perotti (2005). The narrative method offers a more direct approach and, in evaluating the state of current knowledge, Beetsma (2008) argues "the contribution that likely yields the most reliable results up to now is Romer and Romer".

However, the existing literature presents at least two puzzles. First, do the effect of tax changes vary across countries — in particular does a tax cut in the U.K. really lead to a decline in GDP? Second, is the effect as large in the U.S. as estimated by Romer and Romer? Without further narrative studies this is very difficult to establish.

This paper provides new estimates for the U.K. by pursuing a narrative-based approach. However, in doing so, I directly contribute to the international evidence. A number of factors make the U.K. an ideal country for a new study. Firstly, the U.K. has a long history of using tax policy and there were many policy changes. Secondly, the U.K. Budget process is ideal for the construction of a new narrative dataset. Tax policy is highly centralised[5] and since the Budget is a major annual event, tax changes are largely saved for this announcement with implementation taking place throughout the year. Furthermore, unlike in the United States, these announcements almost always become law. In addition, detailed revenue forecasts are provided for all the Budget measures and there is extensive political debate and discussion about the motivation for each change.

[3] See, for example, Perotti (2005, 2007), for a survey.

[4] Blanchard and Perotti (2002) conclude that the effects for the U.S. are small, often close to 1. Perotti (2005) finds a maximum effect on GDP for the U.S. of around 0.6 per cent.

[5] Adam et al. (2010) note that only 5 per cent of revenue is raised locally.

I therefore construct, from scratch, a new narrative dataset for the U.K. The detail can be found in a companion paper Cloyne (2010).[6] Having assembled data from official Budget sources on all the discretionary policy changes between 1945–2009, I employ the Romer–Romer (RR) identification strategy. I use the justifications given in the narrative record to isolate tax policy changes which were not responding to, or influenced by, current or projected economic fluctuations. I follow RR in calling these 'exogenous' tax policy changes (as opposed to 'endogenous').

In categorising each of the 2,500 discretionary policy changes I keep as close as possible to the stated motivation. This generates slightly different subcategories from those in RR. The 'exogenous' category contains actions to improve long-run economic performance, ideological changes related to party political or social causes, rulings from external bodies such as courts, and fiscal consolidation measures based on long-run considerations. The endogenous changes are actions to manage demand, to stimulate production, to offset a debt crisis and those to fund spending decisions.

Having constructed an 'exogenous' tax series, I then use it to consistently estimate the macroeconomic effects of tax shocks in the United Kingdom. Given the construction of the series, a relatively simple regression should, in principle, achieve this.

This paper is structured as follows. Section 2 describes the identification strategy and my new U.K. quarterly dataset, its construction and properties. I also show that the constructed series is unforecastable on the basis of past macroeconomic data. The companion paper, Cloyne (2010), contains more details and the narrative itself. Section 3 presents the baseline results using the new tax shocks. Section 4 runs a variety of robustness checks. Section 5 shows that both long-run economic and ideologically motivated tax cuts have similar stimulus effects. Finally, section 6 examines the contribution of the tax shocks to the U.K. business cycle. I show they contributed to several major episodes in the post-war period. Section 7 concludes that the macroeconomic effects of tax shocks are powerful, persistent and significant in the U.K.

2 The new U.K. post-war tax dataset

2.1 Identification

One of the key problems in identifying the macroeconomic effects of tax changes is simultaneity. Discretionary changes in taxes are likely to affect GDP contemporaneously, but aggregate fluctuations will also contemporaneously affect commonly used tax measures (such as tax revenues). Suppose output growth, Δy_t (where y_t is the log of real GDP), is related to changes in taxes as follows:

$$\Delta y_t = \alpha_0 + \psi \Delta \tau_t + u_t \tag{1}$$

[6] Available at: http://www.homepages.ucl.ac.uk/∼uctpjsc/

where α_0 is a constant and τ_t is a chosen measure of tax changes. Any measure τ_t which is a function of factors also contemporaneously affecting output, cannot be used to consistently identify the effects of tax changes. If $\tau_t = \tau(u_t)$ then the chosen tax measure would be contemporaneously correlated with the error term, violating the standard requirement for consistent estimation of the coefficients.

As a specific example, and to illustrate the popular Blanchard and Perotti (2002) identification approach, consider the following simple model. Suppose taxes are measured by (log of real) tax revenues, s_t. Also assume that the change in tax revenues is affected by movements in aggregate output and another shock, ξ_t:

$$\Delta y_t = \alpha_0 + \psi \Delta s_t + u_t \tag{2}$$

$$\Delta s_t = \eta \Delta y_t + \xi_t \tag{3}$$

where η is taken to be the elasticity of output with respect to revenues.

The Blanchard and Perotti (2002) approach seeks to identify ξ_t as the 'structural' shocks to revenues: those uncorrelated with other contemporaneous economic shocks. The method assumes policymakers are not informed about, or are unable to respond to, shocks within the same quarter. The method then uses external information to calibrate the elasticity η. A series for ξ can then be constructed. Under these assumptions the ξ series is interpreted as the discretionary policy decisions uncorrelated with other fluctuations.

There are at least three problems with this method. First, if the timing assumptions do not hold, then η does not simply reflect the *automatic* response of revenues to output. η would also be capturing any legislated changes in policy which are contemporaneously correlated with output. Second, we need to be confident that the specification (3) adequately captures the cyclical influences on revenues. Of course, we could add extra variables such as inflation or the interest rate to the right hand side but, as many factors are likely to affect revenues, it is unclear what a comprehensive list would be. Errors in the specification would lead to ξ incorrectly capturing the structural, policy-induced, shocks to revenues. Third, legislated tax shocks are not simply shocks to revenues; they alter rates and liabilities, which themselves are likely to affect the elasticity η.

Ideally we would like a direct measure of the policy innovations uncorrelated with other current or prospective shocks. Suppose we could construct such a series and that its past and present values were uncorrelated with other contemporaneous shocks. This is sometimes referred to as weak exogeneity or simply exogeneity.[7] Under this condition,[8] with an infinite sample and by appealing to the Wold decomposition theorem, we can estimate a simple infinite distributed lag model

[7] In contrast to strict exogeneity which requires that the whole tax series $t = 0, ..., T$ is uncorrelated with u_t.

[8] And the other standard conditions ensuring the consistency of OLS.

$$\Delta y_t = \mu + \sum_{j=0}^{\infty} \gamma_j d_{t-j} + \nu_t, \tag{4}$$

and consistently estimate the dynamic effects of the tax shock on output (the γ coefficients). d_t is the constructed 'exogenous' tax series. Note that the key identifying assumption is $E(\nu_t \mid d_t, d_{t-1}, ...) = 0$.

In this paper I adopt a narrative approach to identify such a series and, following Romer–Romer (RR), I call these 'exogenous' discretionary tax changes. Data on all discretionary policy decisions are collected from narrative sources (such as U.K. Budget documents). I then employ the RR strategy of classifying tax changes by motivation. This allows me to identify those decisions that were taken for reasons uncorrelated with current or prospective economic conditions. Actions which do not satisfy this criteria are referred to as 'endogenous'.

To make the discussion more concrete assume the discretionary policy decisions are observable from narrative sources and call these p_t. p_t is likely to be made up of an exogenous component x_t (in the sense discussed above) and policy changes that react to economic fluctuations — for example output, inflation, unemployment, fiscal deficits and so on, $f(y_t, \pi_t, u_t, b_t)$. Hence $p_t = x_t + f(y_t, \pi_t, u_t, b_t)$. Simply using p_t as a measure of d_t will lead to inconsistent estimates of the γ coefficients in equation (4) as $f(\cdot)$ is correlated with ν. However, assuming that we can construct an exogenous series from the narrative record, x_t (and its lags) should be uncorrelated with the error terms, allowing for consistent estimation of the effects of tax policy shocks.

It can also be seen from equation (4) that several common tax measures cannot be used in place of d_t. Using total revenues violates $E(\nu_t \mid d_t, d_{t-1}, ...) = 0$ as current shocks to output also affect revenues (equation (3)). The same is likely to be true of tax rates and the full discretionary policy change series p_t. As policy variables sometimes respond contemporaneously to other economic shocks, these are also correlated with ν_t. The narrative approach is so useful precisely because it isolates the policy changes for which the identifying assumptions hold.

2.2 Constructing the exogenous series

2.2.1 Data Sources

The centrepiece of the British tax process is the annual Budget. This is a traditional and grand occasion which attracts extraordinary media coverage in spite of its technical nature. Part of the attraction is the rhetoric and theatre of the Budget speech as well as the anticipation of surprises Chancellors invariably try to pull out of their hat. However, the Budget is more than pomp and circumstance; it is also the annual presentation of the Government's economic policy. The policy changes are — with the exception of emergency measures and recently a second Budget-type event

in the autumn (the Pre-Budget Report) — stored up for this performance. This process and the other features mentioned in the introduction make the U.K. ideal for a narrative study of tax changes.

To construct an 'exogenous' series, the starting point is to identify and collect revenue forecasts for all the discretionary policy changes. The source for the revenue estimates is the Financial Statement and Budget Report[9] (FSBR), commonly known as the Red Book, which is published alongside the Budget speech. For actions between Budgets (not already covered in the FSBR) I use estimates given by the Chancellor of the Exchequer to Parliament. The source for this is the official parliamentary record, Hansard.

Other sources are used to ensure that I have accounted for all the interim tax changes. Firstly, the Chancellor's Budget speech often mentions measures already taken. But secondly, I use the economic history literature; several major contributions contain chronologies which were of significant help.[10] Together all these sources identify nearly 2,500 non-negligible[11] tax changes.

Changes in Social Security contributions (National Insurance) are considered when they are part of the Budget process. In the earlier part of the sample, changes to National Insurance contributions were announced separately and closely followed changes in welfare transfers; this reflected the original 'Contributory Principle' behind National Insurance. I am therefore confident that these extra-Budgetary changes were spending-driven and therefore not 'exogenous' (see discussion below). In later years National Insurance became more like a tax (both in structure and use) and was brought into the Budget process. When included in the Budget process I make use of these changes. This is discussed in more detail in Cloyne (2010).

The next step is to split the series by motivation. For each change I primarily use the Chancellor's Budget speech and, since 1997, the Economic and Fiscal Strategy Report (EFSR) (which was specifically designed to explain and justify actions). Other documents also proved useful: the FSBR itself, the Economic Surveys in the early years, relevant White Papers (statements of government policy), technical notes and additional debates and speeches recorded in Hansard. The history literature was important in framing the context and highlighting additional events of relevance. However, as in RR, the policymakers' explanation is generally taken at face value. The intention is not to provide an exhaustive review of different commentators' perspectives but rather to provide a narrative of the stated justifications for action (and a sense of how policymakers saw their actions at the time).

[9] Before 1969 this was simply called the Financial Statement and in the early years a separate Economic Survey was published.

[10] Useful texts included Dow (1964), Cairncross (1992), Britton (1991) and Woodward (2004).

[11] The definition of a negligible action is made by Her Majesty's Treasury (HM Treasury) and no public figure is then given for these policy changes. In 2009 for example, this was a change amounting to less than 0.0002 per cent of GDP.

Implementation dates are usually given in the FSBR or the speech. For changes where this is not the case I also make use of the Finance Act itself (the legislation enacting the Budget measures) or relevant Statutory Instruments (secondary legislation) and technical notes. More detail on the legislative arrangements in the U.K. are described in Cloyne (2010).

2.2.2 Classifying the motivation

Following RR, I distinguish between endogenous and exogenous tax policy changes. Recall that an 'exogenous' policy decision is one that was taken for reasons uncorrelated with current or prospective economic conditions. This is the most important distinction given that the objective is precisely to isolate these changes.

As mentioned, I have attempted to keep as close as possible to the spirit of the motivation. I split endogenous changes broadly into four categories: those to regulate demand (demand management), those to boost production (supply stimuli), those to deal with a deficit crisis (deficit reduction) and those that financed spending decisions.

A demand management change attempts to adjust aggregate demand (or specific components) following contemporaneous or projected fluctuations in the economy. There are many examples from 1945 to 1979.[12] A classic example is a stimulus to aggregate demand to offset a negative shock to output. However, there are many cases where the policymaker was responding to curb inflation or rectify a balance of payments crisis. The crucial element is whether demand regulation via a tax change was the key mechanism to offset another shock.

Where a supply-side reform attempts to offset an immediate shock I classify this as a supply stimulus. A good example is the 1985 cuts to National Insurance contributions. As a consequence of the early 1980s recession, unemployment had been rising sharply to 1985 and this motivated policy action. The approach was, however, justified in terms of making it less costly to hire workers and policymakers specifically rejected a stimulus to demand.

I classify a policy as a deficit reduction action if it was specifically triggered by concern over current movements in the deficit (for example concerns about the government's credit rating) or a clear consequence of another shock. For example, the Government in 1993 argued the deficit was a direct consequence of the recession and was rising too fast: immediate action was required and taxes were increased. RR do not have this category but there is clear evidence in the U.K. narrative of policy contemporaneously responding to deficit changes.

Spending-driven changes explicitly finance a spending action. I only assign this category where there is a clear link between a tax change and a spending decision. A good example of a spending-

[12] Dow (1964) argues "there is probably no country in the world that has made a fuller use than the United Kingdom of budgetary policy as a means of stabilising the economy".

driven change was the 2002 increase in National Insurance contributions to fund expansion of the National Health Service.

The exogenous actions are split into four categories: measures taken to boost long-run economic performance, those motivated by ideological or political reasons, those enforced by external bodies and, less obviously, those to deal with an inherited deficit or for future deficit consolidation.

Although long-run economic actions are not designed to offset a current shock, these need not only be taken in times of calm. The 1979 Conservative Government made a number of supply-side reforms as part of their long-term economic strategy even during a recession. Such measures were not designed to offset the current recession. In cases where a supply-side action is intended to offset a shock, supply stimulus would be a more appropriate categorisation.

Ideological changes are those taken for political and philosophical reasons, not explicitly to influence economic performance. The Conservative Government's married couples' allowance (and the 1997 Labour Government's removal of it) is a clear example of this.

External changes are those imposed on policymakers by rulings from external bodies. Examples of external decisions are court judgements and the enforcement of European directives.

The previous three categories are more obviously exogenous: policy changes do not react to shocks. Policy actions in the fourth exogenous category, deficit consolidation, are likely to reflect past shocks (for example the effect of a previous recession). RR define a deficit-driven policy change as either dealing with an inherited deficit for long-run reasons (for example, a belief that it will support long-run growth) or a planned future consolidation to offset a current fiscal action. However, there are no examples in the U.K. where an incoming government decided to deal with a deficit independent of the current macroeconomic situation. There was always a sense of crisis and this led me to introduce the new endogenous deficit reduction category.

There are, however, some cases where deficit consolidations were planned for future years. This was a way of anchoring credibility while spreading the consolidation over time. For example, the fiscal stimulus designed to offset the 2008–09 recession was accompanied by planned tax rises several years later. In the sense discussed in section 2.1 these are still exogenous, being correlated only with past shocks. One still might worry that all deficit consolidations are in some sense endogenous. Indeed the RR deficit category has attracted some criticism on these grounds. To guard against this possibility, in section 5 I re-estimate the baseline model excluding the deficit consolidation category; I report that the results are largely unaffected.

It is useful to note the similarity with the RR categories. Their 'countercyclical' category closely relates to demand management and supply stimuli. 'Spending-driven' is the same category. The new endogenous category is 'deficit reduction' as there is sufficient evidence of contemporaneous influences on deficit actions. For the exogenous changes, long-run, ideological and external can be

matched to RR's 'long-run' category and 'deficit consolidation' is similar although more restrictive.

2.2.3 Specific issues in applying the categorisation

Budgets tended to have an overall motivation as well as providing specific justification for each measure. In the companion paper, Cloyne (2010), I individually classify all the discretionary policy changes and provide evidence for the categorisation. I carefully weigh up both the overall and specific comments to disentangle the primary motivation. In annex C two example Budgets are shown, taken from the companion paper: 1968 where almost all the measures were to limit demand and 1985 where the central theme was supply-side reform for long-term economic performance.

There is an important grey area that requires discussion. In a few cases the overall motivation appears in direct conflict with the specific objective for individual measures. Consider a simple example. In 1968 all but two changes were stated to limit demand (tax increases) but the other changes are designed to help the elderly (a tax cut) and this is clearly marked as delivering on a long-run social objective. In one sense the latter is exogenous but, if the Chancellor had a target for lowering demand in mind, then this cut had to be offset elsewhere. Furthermore, the measures often have different implementation dates and do not offset each other in the aggregate. Two actions may therefore be correlated if a seemingly exogenous action precipitates a larger endogenous one. It is usually very unclear the extent to which the Chancellor intended for some measures to offset others. In these more complicated cases I provide an alternative classification taking the whole Budget package together. In the 1968 example I classify all measures, including an ideological tax cut, as demand management. The 'alternative' series is then used as a robustness check below, with the results largely unaffected.

Another related but simpler issue is the treatment of packages of measures or actions designed to offset other actions. For example, between 1979 and 1997 there were considerable alterations in the balance of taxation from income tax to Value Added Tax (V.A.T.). It was argued that the V.A.T. rise was funding an income tax cut and the income tax cut was designed to stimulate long-term growth. Rather than categorise the income tax cut as 'long-run' and the V.A.T. rise as, for example, 'deficit reduction', it seems wise to categorise the package as 'long-run', even if a V.A.T. rise on its own might harm the economy.

2.2.4 Transforming the narrative into a quarterly dataset

The objective is to construct a quarterly time series from 1945 to 2009.[13] The resulting series will be the change in projected revenue (which most closely reflect changes in on-going liabilities) normalised by GDP and expressed as a percentage. In this sense the resulting series can be seen as changes in an average tax rate.[14]

I make use of revenue forecasts from the Budget documents but my focus is on the change in tax liabilities. In general, measures that simply alter the timing of existing taxes are excluded. Good examples of this are the introduction of quarterly payments of tax for small employers or where a reduction in Advance Corporation Tax was to be "balanced by an increase in the subsequent liability to mainstream corporation tax".[15] However, for some taxes, exclusion seems less appropriate. In the 2000s there were several examples of attempts to raise fuel duty but then, following volatility in the oil market or protests, this was deferred. In several cases the postponement was explicitly designed to support consumers' expenditure — a form of stimulus — and it seems prudent to leave these changes in the series. Cloyne (2010) discusses these cases in more detail.

In keeping with this focus on liabilities I make use of the 'full year' revenue estimate. This was the on-going annualised revenue effect (rather than any temporary revenue effect in the short run due to the timing of revenues reaching the Exchequer). I assign this figure to the implementation date, following Romer and Romer. I deal with possible anticipation effects below. In more recent years, estimates were given for several years ahead rather than as a 'full year' figure. However, the figures for the later years' forecast are usually very similar. It is clear what reflects the 'full year' estimate and where figures did not correspond to a 'full year' concept this is explained in the Budget documents. I therefore generally use the latest year of data, although carefully watch for changes in revenue which do not appear to follow the 'full year' concept. Each case is considered individually in Cloyne (2010).

Having assigned a motivation to a revenue change, I aggregate the tax series based on motivation and implementation date. This requires assigning the calendar dates to quarters. I follow RR by assuming that changes implemented in the second half of a calendar quarter have their economic effect in the next quarter. For example, a change implemented on 25$^{\text{th}}$ March is assigned to quarter two and not quarter one. In terms of announcement dates the appropriate dating method is the

[13] The final Budget I consider is April 2009. The December 2009 Pre-Budget Report (PBR) contained measures to be implemented in the 2010 Finance Bill but, with a General Election scheduled for the first half of 2010, it was unclear at the time of analysis which measures would actually become law. I do, however, use macroeconomic data up to and including 2009Q4; being in December, PBR measures would have been dated in 2010Q1 at the earliest — see below.

[14] As in both Romer and Romer (2010) and Mertens and Ravn (2010).

[15] FSBR 1988, page 47.

actual quarter of announcement.

The resulting aggregate series represents the forecast 'full year' change in revenues in each quarter, by motive. I follow RR and scale this by the annualised level of nominal GDP in each quarter. This is appropriate as the revenue figures are also annualised (hence quarterly revenue divided by quarterly GDP would generate the same ratio). UK GDP is not available quarterly prior to 1955 and so the consistent part of the sample must begin in 1955Q1. However, annual GDP is available from 1948 to 1955 and for these years I use the annual nominal GDP figure for the four quarters within that year.

There are a number of more specific technical issues and assumptions but for brevity I direct the reader to Cloyne (2010) for the detailed discussion. I simply flag the most important cases below.

The first is how to treat temporary changes. For a temporary change the appropriate revenue estimate is not the 'full year' cost but rather the value which most closely reflects the total yield or cost of the action. This is usually clear and I assign this figure to the implementation date, reversing it on the end date.

Secondly, there are a minority of changes which have retroactive elements (about 120 of the 2500). I follow RR in dealing with this issue. A tax change with a retroactive implementation date has two components, the future effect on revenues going forward (the non-retroactive element) and the outstanding liabilities for the period before the announcement. As in RR, the baseline dataset simply excludes the retroactive elements and I assign the 'full year' revenue estimate to the announcement date.[16] As a robustness check I derive a series which assigns the accumulated retroactive liabilities as a levy to the same date, removing this the following quarter.

Finally, a few policy actions are not included. These include personal income tax credits (the Treasury and the Institute for Fiscal Studies regard these as spending; they have to be claimed and are closer to a definition of welfare transfers) and statutory or pre-expected indexation of duties, allowances and thresholds (for example uprating of the personal allowance each year with inflation or simple inflation increases in excise duties). Inflation increases in certain taxes are recorded by the Treasury as zero-revenue changes against the indexed base and also contain no new discretionary policy information so are excluded.[17] For more detail and justification again see Cloyne (2010).

[16]There are several reasons for this. Firstly, many changes are passed by Budget Resolution and are implemented on Budget day anyway (see annex B). Secondly, few taxes are altered in debate and so this Budget announcement is often presented as the implementation (unless of course a later date is given). When an implementation date is in the past, the day the change becomes known seems the most appropriate 'implementation' for the non-retroactive element. See Cloyne (2010) for how this compares with RR.

[17]Romer and Romer do the same, arguing that these types of changes are basically an automatic uprating, containing no new policy information.

2.3 Properties of the new tax dataset

This section considers some of the features of the new dataset. Figure (1) illustrates the 'exogenous' policy changes which will be used in the later analysis. The series has a mean of -0.06 per cent of GDP, which is the same order of magnitude and sign as the RR series. There is also a fair amount of variation in figure (1) and the standard deviation is 0.25. The large positive and negative spikes in the middle of the series come from staggered timing in a move from direct to indirect taxes.[18] As a robustness check I correct for this later.

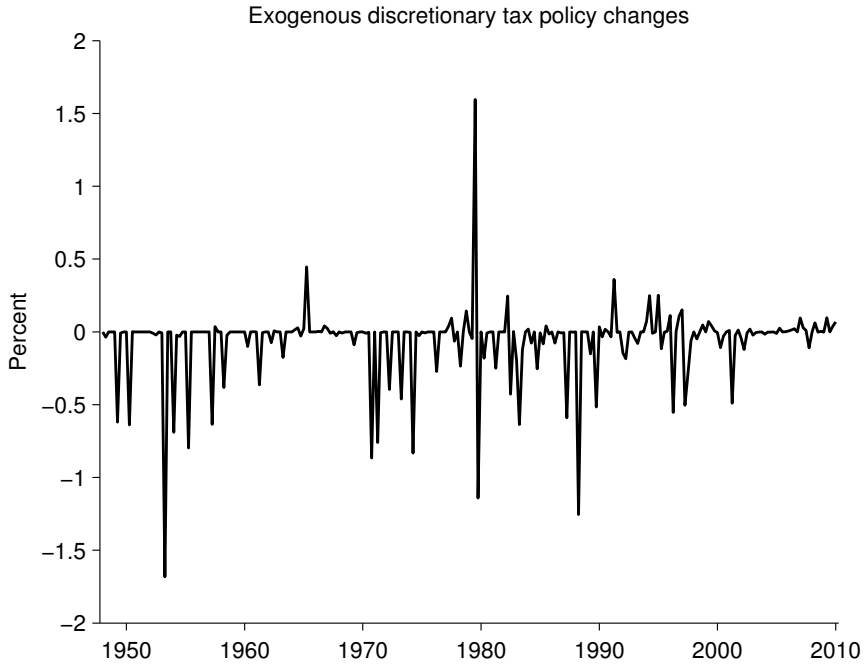

Figure 1: *Exogenous tax changes*

The full discretionary policy series (including exogenous and endogenous changes), shown in figure (2), is more volatile, largely reflecting the countercyclical actions (many of which were to deal with inflation). The mean is closer to zero at -0.014 but is more volatile with a standard deviation of 0.48.

Figure (3) shows the different subcomponents of the exogenous category (except the external category as these changes are small). The larger changes clearly arise from the long-run economic actions. We can also see some key periods of supply-side reform. The most sizable attempts to use tax policy for stimulating long-term economic performance were in the early 1950s (the Butler supply-side reform and mid 1950's boom), the early 1970s ("less but better government"[19] and the

[18] V.A.T was increased in 1979Q3, income tax allowances were cut for the whole year 1979-80 and so the implementation date is taken as the announcement, but the accompanying income tax rate changes were not implemented until 1979Q4.

[19] Cairncross (1992), page 189.

Heath-Barber boom), throughout the 1980s (the Thatcher/Howe/Lawson supply-side reforms) and the 1996/97 Clarke income tax cuts.

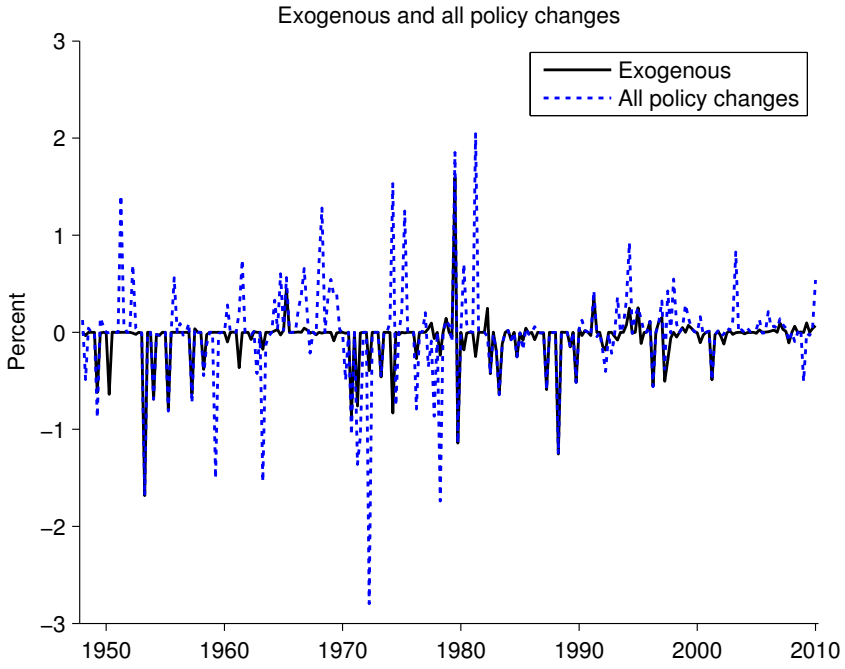

Figure 2: *Exogenous policy changes and all policy changes*

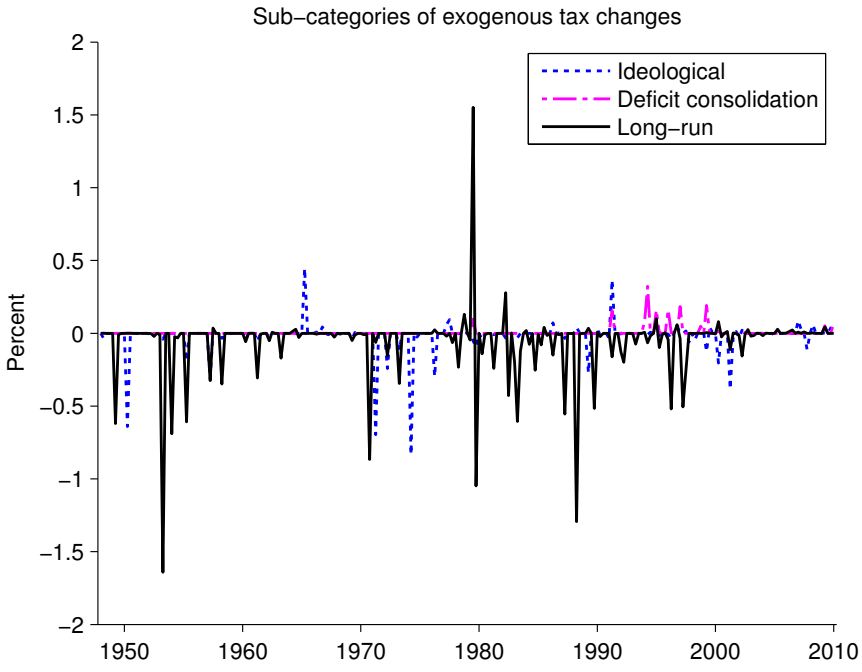

Figure 3: *Long-run economic, ideological and deficit consolidation exogenous policy changes*

There were some sizable ideologically motivated policy changes, although not on the scale or

frequency as the 1980s reforms aimed at long-run economic performance. There were also notable deficit consolidation measures throughout the 1990s following the recession.

It is also interesting to briefly look at the components of the endogenous series. These are illustrated in figure (4). There were few countercyclical tax policy actions (demand management or supply stimuli) after 1980 until 2008. The height of demand management policy was therefore between 1945 and 1979. This compares with a greater emphasis on the use of monetary policy for stabilisation after 1979. Sizable deficit reduction actions can also be seen, for example Geoffrey Howe's famously strict 1981 Budget. Measures to help fund increased expenditure on public services in the early 2000s are also visible.

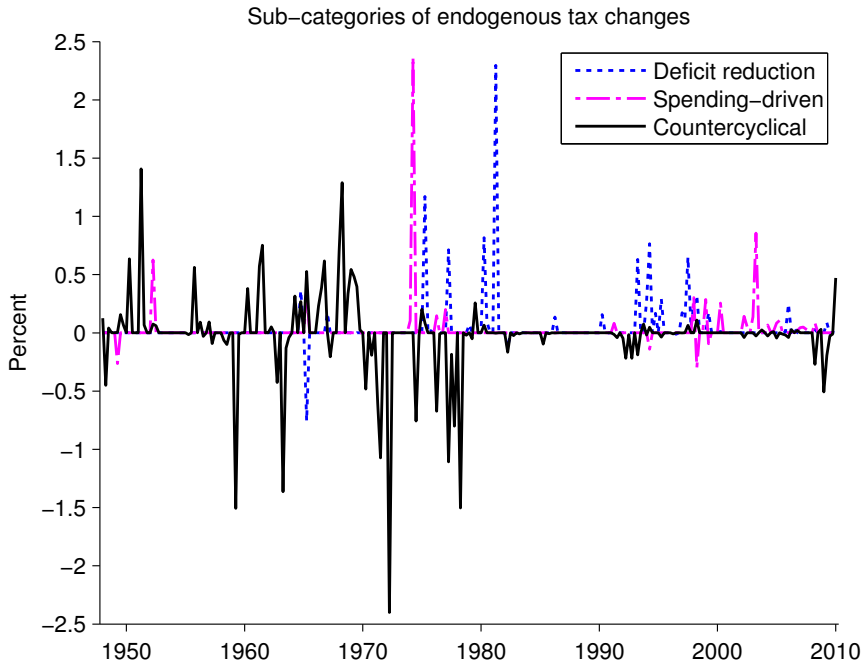

Figure 4: *Countercyclical, spending-driven, deficit reduction endogenous policy changes*

2.4 Testing the predictability of the 'exogenous' tax changes

The 'exogeneity' of the constructed tax series is the key identifying assumption. While we cannot test whether our 'exogenous' series is contemporaneously uncorrelated with other macroeconomic data,[20] it is still instructive to consider whether the new series is unforecastable on the basis of past information.

Following Romer and Romer, I first perform a simple Granger Causality test using output[21]

[20] Recall that the tax variable itself may simultaneously determine the independent variable, for example output.

[21] The series in this section are de-trended using the Baxter-King filter. However the results in table 1 are similar for growth rates and linear de-trending. In both cases using the exogenous series generated high p-values, using the countercyclical series generated low p-values.

and the exogenous tax series. The results are presented in table 1.[22] Table 1 shows that at all three lag lengths it was not possible to reject the hypothesis that GDP does not Granger Cause the tax series. The p-value was high, over 0.9, with 4, 8 and 12 lags. As a comparison, I check whether the endogenous countercyclical series can be forecast on the basis of output. The null hypothesis was clearly rejected with p-values well below 0.01 for all three lag lengths.

Table 1: Granger Causality and Ordered Probit Results

Series	Test statistic	P-value
Exogenous series		
Granger Causality: 4 lags	0.24	0.91
Granger Causality: 8 lags	0.35	0.94
Granger Causality: 12 lags	0.42	0.95
Ordered Probit	10.06	0.61
Countercyclical series		
Granger Causality: 4 lags	5	0.001
Granger Causality: 8 lags	3.2	0.002
Granger Causality: 12 lags	3.7	0.0001
Ordered Probit	27.50	0.007

Secondly, and perhaps more importantly, I check whether the decision to act itself can be forecast from past information. This method is suggested by Mertens and Ravn (2010). It requires re-aggregating the tax series using the announcement date rather than the implementation date and performing an Ordered Probit regression. The underlying latent process is the tax series itself, call this τ_t. Now define a 'policy action' indicator variable ω_t where:

$$\omega_t = \left\{ \begin{array}{c} -1 \text{ if } \tau_t < 0 \\ 0 \text{ if } \tau_t = 0 \\ 1 \text{ if } \tau_t > 0 \end{array} \right\}$$

The Ordered Probit model is then estimated as usual by Maximum Likelihood. As in Mertens and Ravn (2010), the independent variables are taken to be (lags 1 to 4 of) output, consumption and investment. This method addresses whether the decision itself is forecastable from past macroeconomic data. Of course, this does not consider the size of the announcement but should

[22] A high p-value for the Granger Causality test implies that we cannot reject the null hypothesis that output does not Granger Cause the tax shocks. A high p-value for the Ordered Probit implies we cannot reject the null hypothesis that all the coefficients on the various forecasting variables are zero.

give a sense of whether the policy decision was a product of economic conditions. In this sense it is a more meaningful test.

I test the null hypothesis that all the coefficients in the regression are zero. For the exogenous series, the p-value of the Likelihood ratio statistic was 0.61, implying that (at standard significance levels) we cannot reject the hypothesis that the variables in the regression contain no information for forecasting the exogenous series. By contrast the p-value for the countercyclical series was 0.007, clearly allowing us to reject the hypothesis that output, consumption and investment contain no information on which to forecast the countercyclical endogenous tax series.

These two tests suggest that the exogenous series is unforecastable on the basis of past information and add weight to our claim that the constructed tax series is indeed exogenous.

3 The macroeconomic effects of tax shocks: baseline specification

Having given weight to our claim that the newly constructed series is exogenous we are now ready to make use of these data for analysis. As discussed in section 2, with an infinite sample the estimation of equation (4) should yield consistent estimates of the effects of an exogenous tax shock. However, in truncating the number of lags and with the smaller samples in time series analysis, it has become standard practice to use vector autoregressions, although I compare these baseline results with equation (4) later.

The effects of a tax shock are estimated from the following vector autoregression (VAR):

$$\mathbf{X}_t = A_0 + A_1 t + B(L)\mathbf{X}_{t-1} + C(L)d_t + \varepsilon_t \tag{5}$$

where B and C are lag polynominals with P and $(Q+1)$ lags respectively. The narrative shocks d_t are included as an exogenous variable following the preceding discussion. This specification follows Mertens and Ravn (2010) and the inclusion of narrative shocks as an exogenous variable is in keeping with the narrative approach to government spending shocks, for example in Burnside et al. (2004). There is a trade-off between a long lag structure reflecting equation (4) and protecting degrees of freedom in a smaller sample. RR use 12 lags of d_t (and the contemporaneous value) and I follow this convention, in other words $Q = 12$. I take $P = 4$ which is common, although I experiment both with longer and shorter lag structures for $B(L)$ and the results are robust. Later I also show that the results are robust to estimating the model with the $\mathbf{X}$ vector in first differences.

As mentioned earlier, quarterly National Accounts data are not available for the United Kingdom before 1955Q1. I therefore take the sample to be 1955Q1 to 2009Q4. The baseline specification includes the log of real per capita GDP (y_t), consumption (c_t) and investment (i_t). Thus:

$$\mathbf{X}_t = [y_t \; c_t \; i_t]' .$$

Other variables of interest are then added as in Burnside et al. (2004) to preserve degrees of freedom. The other variables of interest will be: imports, exports, government consumption, government total managed expenditure, total revenues (all log of real per capita) as well as inflation, the nominal interest rate, real wages and hours worked per person. Precise description of the data is given in annex A.

The figures below report the baseline results for output, consumption and investment for $Q = 12$, $P = 4$, together with standard 68 per cent non-parametric, non-centred bootstrapped confidence intervals using 10,000 replications.[23]

3.1 Baseline results for output and its components

Figure (5)[24] illustrates the central result of this paper. A one percentage point cut in taxes as a percentage of GDP generates a large and persistent stimulus to output. A percentage point cut in the tax variable causes a boost of 0.6 per cent ($p = 0.02$) in output on impact. This effect then rises to nearly 2.5 per cent ($p = 0.001$) after about 3 years before receding.[25]

I now compare this result with the RR United States dataset. Figure (6) performs estimation of equation (5) using the Romer–Romer data.[26] The results in figures (5) and (6) are strikingly similar and reflect the actual findings in Romer and Romer (2010) — where the empirical specification is different — and Mertens and Ravn (2010) for an unanticipated tax cut. The close similarity with the United States is quite remarkable; all the more so given the very different tax history, policy framework and sources (and that the U.K. data are the result of aggregating nearly 2,500 classified changes).

[23]The method was as follows: (i) randomly draw residuals from the fitted residuals $\hat{\varepsilon}_t$ and use (5) to simulate an artificial time series $\hat{X}_t$ (ii) perform estimation of (5) using the simulated data (iii) construct impulse response functions for this simulated dataset and save the output (iv) repeat 10,000 times to construct an empirical distribution of impulse response functions (v) take the 16th and 84th percentile as the empirical confidence intervals.

[24]The Matlab software written to perform all the estimation and generate the graphical outputs is available from the author on request.

[25]As the figures are based on a simulation which sets $d_t = -1$ in $t = 1$ and 0 for all other time periods, we could equally have displayed a tax rise ($d_1 = 1$) with a large and persistent negative output effect.

[26]Available from their website.

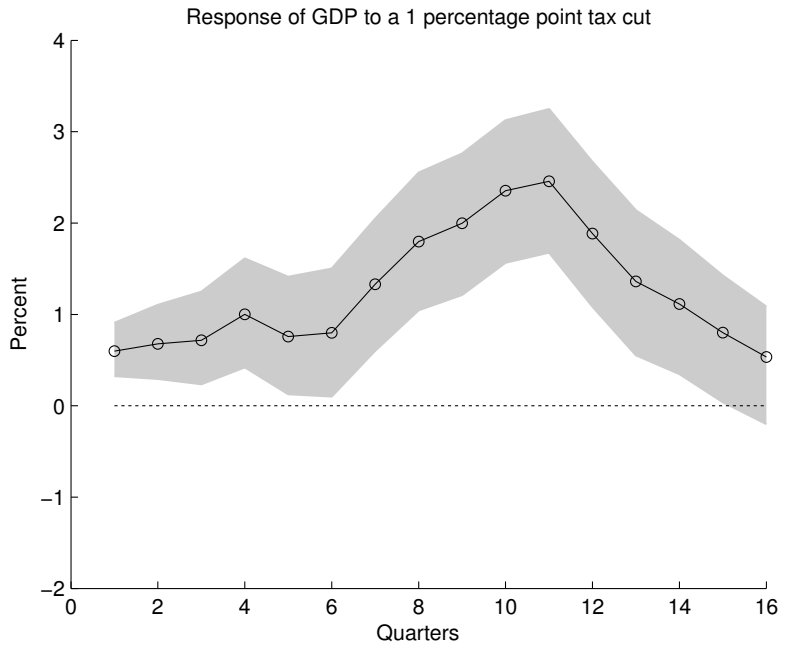

Figure 5: *Response of GDP to 1 per cent of GDP cut in taxes*

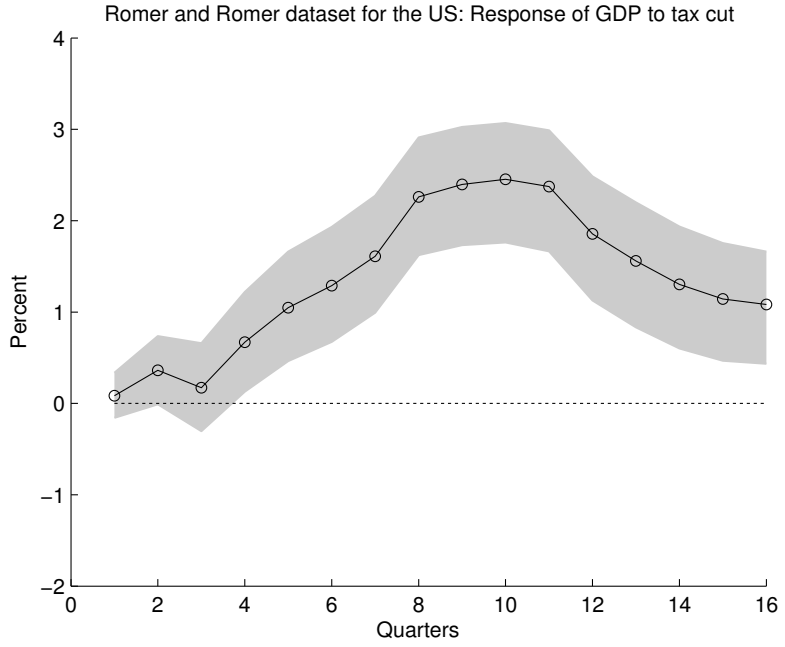

Figure 6: *Response of GDP using Romer–Romer U.S. data*

I consider the effect of the 1 percentage point tax cut on the other variables in the baseline VAR. Figure (7) illustrates the effect on household consumption and investment. For consumption the impact effect is larger at 1.3 per cent ($p \approx 0$) and has a maximum impact of 2.9 per cent ($p = 0.004$). This suggests that tax shocks have a slightly greater effect on household consumption

than on GDP, although the shape and order of magnitude are very similar. It is also interesting to note that the consumption response is smoother. The investment response is large and positive, again remarkably similar to the results for the United States. The impact effect is 1.2 per cent ($p = 0.07$) and rises to 4.5 per cent ($p = 0.02$).

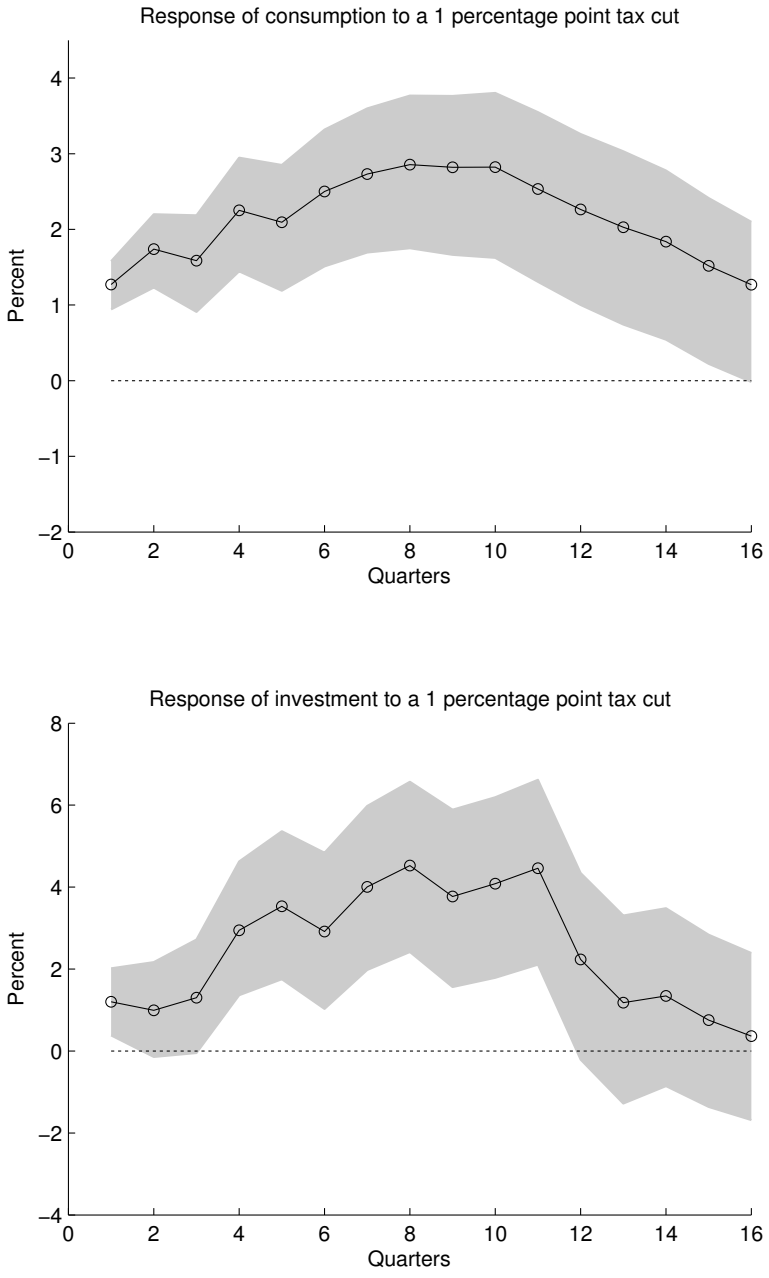

Figure 7: *Response of consumption and investment to 1 per cent of GDP cut in taxes*

Figure (8) illustrates the effect of the tax cut on imports and exports. One would expect a more immediate effect on imports than exports: the tax cut directly reduces the demand for imports by affecting domestic demand. The effect on exports may well be driven more — at least in the

short run — by the state of foreign demand (although this obviously depends on what happens to the real exchange rate). Figure (8) reflects this intuition. Imports increase significantly following the tax cut while the export response is largely insignificant. It is interesting to note the similar shape of the investment and the imports responses — suggesting that the volatility of investment is driven by volatility of imported capital goods.

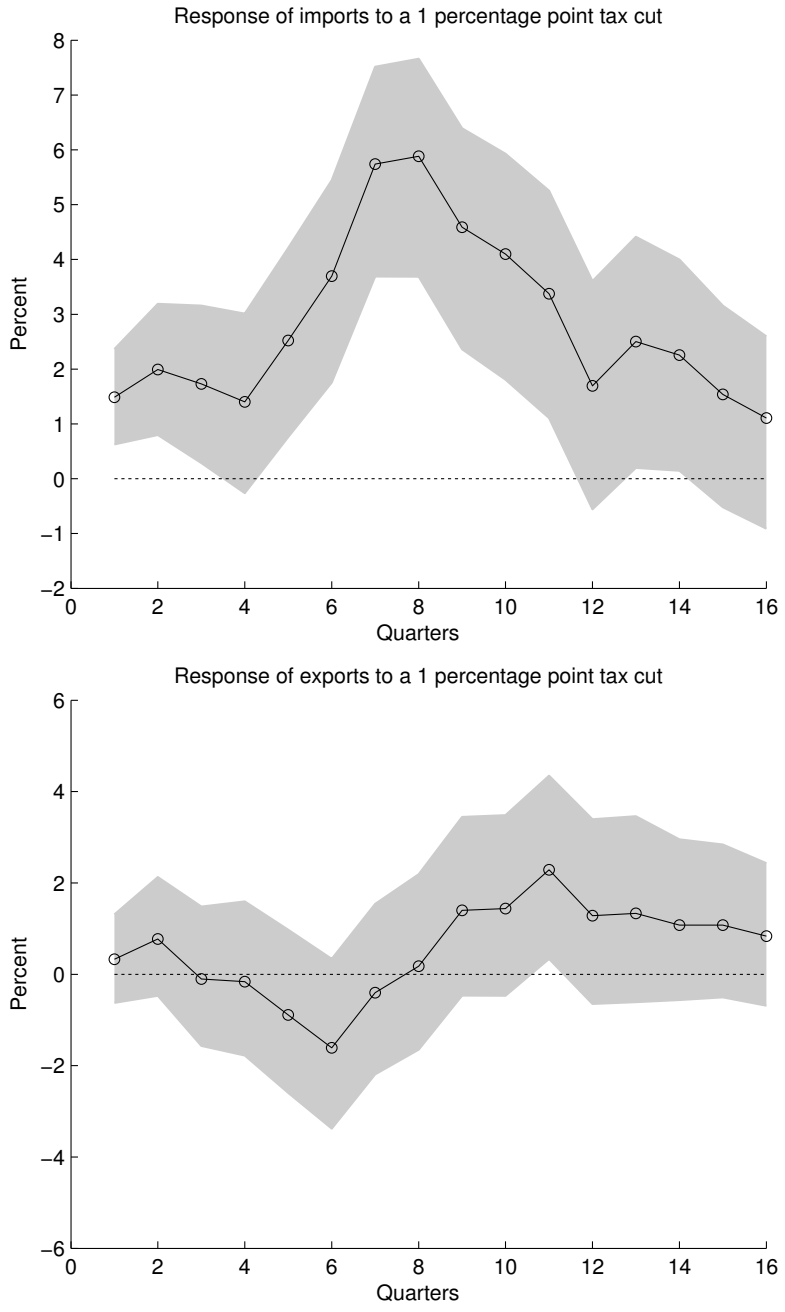

Figure 8: *Response of imports and exports to 1 per cent of GDP cut in taxes*

In short, this section demonstrates a striking result. Tax cuts (increases) have large, positive

(negative), significant and persistent effects on key macroeconomic aggregates in the U.K.

3.2 The labour market response

I now consider the effect on labour market variables of a 1 percentage point cut in taxes. Unfortunately, data for hours worked and the real wage are not available for U.K. over the whole period 1955–2009; I therefore use a restricted sample.

Hours worked are defined as average weekly hours worked per person and this series is only available from 1971Q1. The real wage is defined as the (nominal) Average Earnings Index divided by the GDP deflator. This series is available from 1963Q1 onwards. I first check that the GDP response to the tax shock is similar when the sample is restricted to these time periods: the GDP response is indeed very similar in shape, magnitude and persistence. I then add each of the labour market variables to the VAR.

Figure (9) illustrates the effect of the tax cut on the real wage and on hours worked. The impact effect on the real wage is sizable at 1.2 per cent and rising to 3.3 per cent after 11 quarters (both with p-values approximately zero).

Hours worked, however, exhibit a smaller response. This can be seen in the bottom panel of figure (9). The response is not statistically significant for much of the period and the size of the response is everywhere less than 1 per cent. This suggests that hours worked do not respond much in response to a tax shock. These results are similar to Mertens and Ravn (2010) who find, following a surprise shock, that hours worked are less significant and not as sizable as the other variables (although their hours response peaks above 1 per cent, which is higher than my estimate).

The labour market results are interesting: so far the GDP, consumption and investment broadly reflect neoclassical predictions (at least qualitatively and including features such as investment adjustment costs as in Christiano et al. (2005)). The hours response is qualitatively what one would expect from a typical theoretical model (given the substitution effects from distortionary taxes), although the real wage may well be too responsive. Further work is needed to explore how well theory can fit these facts.

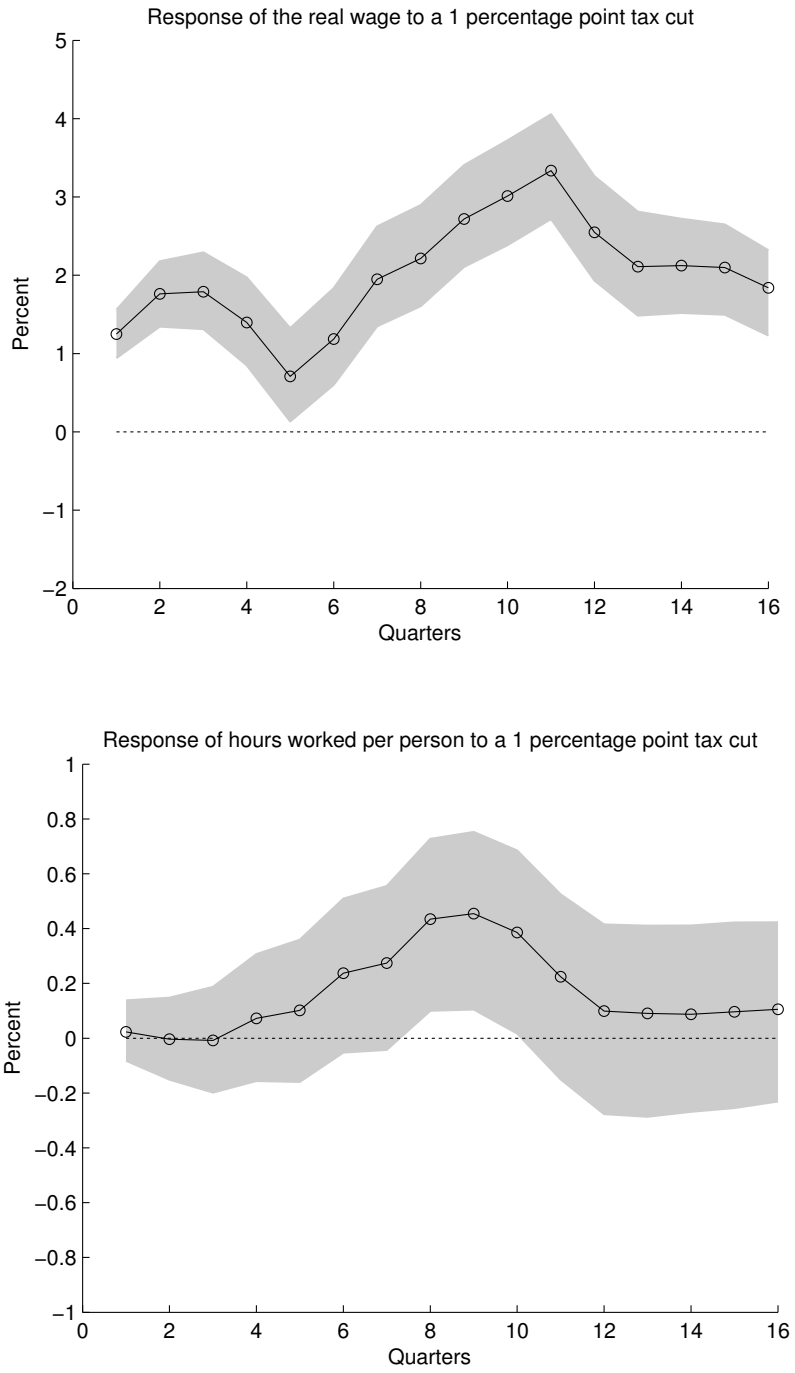

Figure 9: *Response of the real wage and hours worked to 1 per cent of GDP cut in taxes*

4 Robustness

4.1 Estimation of a first differences model

To guard against the possibility of spurious results deriving from unit roots in the output, consumption and investment series,[27] I also estimate a first difference version of the VAR with the endogenous variables as the growth rates.[28]

On impact the contraction is very similar at 0.65 per cent ($p = 0.02$) and the greatest impact is again at 11 quarters at 2.96 per cent ($p = 0.005$). The shape is very similar although the VAR in growth rates produces a more persistent response (but this is sensitive to the lag length Q). Certainly the short to medium term magnitudes and dynamics are very similar to the model estimated using levels. However, the first-differences model is less precisely estimated with wider standard errors, particularly at longer horizons. Given the focus on short to medium term effects in this paper, I continue to use the levels specification for the baseline results.

4.2 Controlling for other shocks to revenues

Perotti (2010) argues that one needs to control for the possibility that changes in revenues have an additional effect on output other than via changes in d_t (for example, the effects of the automatic stabilisers). In general — and illustrated below — Perotti's argument implies one needs to control for other shocks to revenue to consistently estimate the effects of the exogenous taxes. Suppose that (log of real) revenues (s_t) is described by the follow relationship:

$$\Delta s_t = \eta \Delta y_t + \chi d_t + \epsilon_t^s \tag{6}$$

where ϵ^s can be thought of as a shock to revenues and picking up influences other than the cyclical changes due to output growth or policy.[29] Perotti argues that estimating a model such as (5) ignores the effect of other changes in revenues. For consistent estimation we must implicitly maintain the assumption that revenues (or in his setup, specifically $\Delta s_t - \chi d_t$) do not affect the endogenous variables other than via d_t.

However, the problem is more general and applies even if we include revenues in equation (5). Consider the following regression model:

$$\Delta y_t = \alpha_1^y \Delta y_{t-1} + \beta_0^y \Delta s_t + \beta_1^y \Delta s_{t-1} + \gamma_1^y d_t + \gamma_2^y d_{t-1} + \epsilon_t^y \tag{7}$$

[27] Augmented Dicky Fuller tests fail to reject the null hypothesis of a unit root in these log real per capita series.

[28] This specification is used by Perotti (2010). However, it is very common to find VARs estimated in levels, especially in the fiscal shocks literature.

[29] Note that Perotti assumes $\chi = 1$ but this is an inappropriate restriction as the RR shocks are the nominal change in revenues to GDP, not the change in log real exogenous discretionary taxes.

$$\Delta s_t = \alpha_0^s \Delta y_t + \alpha_1^s \Delta y_{t-1} + \beta_1^s \Delta s_{t-1} + \gamma_1^s d_t + \gamma_2^s d_{t-1} + \epsilon_t^s \tag{8}$$

where equation (8) nests equation (6). We can always rewrite this model in the Perotti form with the new regressor being $\Delta s_t - \chi d_t$. Write this system as:

$$\begin{bmatrix} 1 & -\beta_0^y \\ -\alpha_0^s & 1 \end{bmatrix} \begin{bmatrix} y_t \\ s_t \end{bmatrix} = \begin{bmatrix} \alpha_1^y & \beta_1^y \\ \alpha_1^s & \beta_1^s \end{bmatrix} \begin{bmatrix} y_{t-1} \\ s_{t-1} \end{bmatrix} + \Theta(L) d_t + \epsilon_t \tag{9}$$

were $\Theta(L)$ is a $(Q+1)$ lag polynomial.

Defining the left hand side coefficient matrix as $\mathbf{A}$, the coefficient matrix on the lagged terms Ξ and Z_t as the vector of endogenous variables, the reduced form of this model can be written as:

$$Z_t = \mathbf{A}^{-1} \Xi Z_{t-1} + \mathbf{A}^{-1} \Theta(L) d_t + \mathbf{A}^{-1} \epsilon_t \tag{10}$$

which implies a relationship between the reduced form residuals u_t of:

$$u_t^y = \beta_0^y u_t^s + \epsilon_t^y \tag{11}$$

$$u_t^s = \alpha_0^y u_t^y + \epsilon_t^s, \tag{12}$$

requiring $n(n-1)/2 = 1$ restriction on the $\mathbf{A}$ matrix to identify the structural shocks ϵ_t. Given that we are including contemporaneous d_t it does not make sense to then restrict $\beta_0^y = 0$ and equation (6) implies that we should not restrict $\alpha_0^s = 0$ either. In short, there is a standard identification problem unless we are willing to assume that the only way revenues affect output contemporaneously is through shocks to d_t ($\beta_0^y = 0$).

The consequences of this are twofold. First, and more obviously, excluding revenues from the model may lead to inconsistent estimates. But secondly, even when we include revenues in our VAR specification as an additional endogenous variable, we cannot consistently estimate the coefficients. To see this more clearly, substitute the revenues equation into the output equation. To simplify the exposition and enhance the comparability with (6), I restrict the coefficients as follows: $\gamma_2^s = \alpha_1^s = \beta_1^s = 0$, $\gamma_1^s = \chi$ and $\alpha_0^s = \eta$. We can now write the reduced form, single equation model as:

$$\Delta y_t = \frac{\alpha_1^y + \eta\beta_1^y}{1 - \beta_0^y \eta} \Delta y_{t-1} + \frac{\gamma_1^y + \chi\beta_0^y}{1 - \beta_0^y \eta} d_t + \frac{\gamma_2^y + \chi\beta_1^y}{1 - \beta_0^y \eta} d_{t-1} + \frac{\beta_0^y}{1 - \beta_0^y \eta} \epsilon_t^s + \frac{\beta_1^y}{1 - \beta_0^y \eta} \epsilon_{t-1}^s + \frac{1}{1 - \beta_0^y \eta} \epsilon_t^y \tag{13}$$

and note that if $\beta_0^y \neq 0$ then shocks to Δs affect Δy contemporaneously. This implies that the lagged ϵ^s terms are correlated with the lagged y terms.

As can be seen from (13), the problem is that we need to control for potential other shocks to revenue. However, we cannot simply include a fitted residual ϵ^s in (13): as shown above, ϵ^s is not identified without restrictions on the $\mathbf{A}$ matrix. Obviously one restriction that would work is

$\beta_0^y = 0$ but this was ruled out above. Additionally we could impose the restriction $\eta = 0$, allowing us to construct ϵ^s from (11) and (12).[30] But again this was ruled out.

Equation (13) illustrates the two problems mentioned above. If we exclude revenues and they do exert an independent effect on output our estimates will be inconsistent. Furthermore, including s_t does not solve the identification problem.[31]

Perotti pursues an instrumental variable approach which solves the identification problem without requiring restrictions on the **A** matrix. We cannot directly estimate (6) as ϵ^s is correlated with Δy_t. The solution is to use lagged values of Δy_t as instruments and then estimate the parameters η and χ. This allows us to construct a fitted value of ϵ^s which can be used in the regression (13).

As a robustness check I implement this method. Given the specification of equation (6), it is more straightforward to directly use the model with the **X** vector in first differences:

$$\Delta \mathbf{X}_t = \tilde{A}_0 + \tilde{A}_1 t + \tilde{B}(L)\Delta \mathbf{X}_{t-1} + \tilde{C}(L)d_t + \tilde{D}(L)\hat{\epsilon}_t^s + u_t \tag{14}$$

I first estimate (6) with the lags 1 to 4 of Δy_t and lags 0 to 4 of d_t as instruments for Δy_t and construct $\hat{\epsilon}^s$. I then estimate equation (14) using $\hat{\epsilon}^s$ and its lags.[32] Having corrected for other shocks to revenues the results are very similar. The effect on impact is 0.57 per cent ($p = 0.026$) and the maximum effect is 2.2 per cent ($p = 0.012$). Interestingly, the estimate of η (the elasticity of revenues to GDP) is 1.47, which is higher than the constructed elasticity of 0.76 in Perotti (2005) and closer to his figure for the United States of 1.85.[33]

4.3 Controlling for other structural shocks

If the tax series is truly exogenous there should be no need to control for other structural shocks such as monetary policy or government spending shocks. However, in a smaller sample, there may be chance correlation and in this section I control for that possibility.[34]

4.3.1 Monetary policy shocks

To control for monetary policy shocks I include extra monetary variables in the VAR (5). **X** now includes the inflation rate and the Bank of England policy interest rate. The Bank of England

[30] Note that this discussion works the other way round if we had substituted the output equation into the revenues equation.

[31] Of course, in the special case where all the β coefficients are zero or where $\epsilon_t^s = 0$, $\forall t$ neither problem arises.

[32] As $\hat{\epsilon}^s$ is a generated regressor the two step estimation procedure needs to be repeated when bootstrapping in order to take account of the sampling distributions of η and χ.

[33] Perotti (2005) argues that the low elasticity for the U.K. might be due to some of the components being underestimated. He therefore augments the baseline value by 0.5. It is interesting that we estimate a higher value.

[34] Mertens and Ravn (2010) argue that one should control for both monetary and spending shocks. Romer and Romer (2010) also control for spending shocks, concluding that their results are robust.

policy rate is available from the Bank of England website, although this series contains all the changes in the rate on a specific day. I therefore convert this into a quarterly series using the rate prevailing at the end of the quarter. The inflation rate is the annualised Retail Price Index — a series which is available for the full sample (unlike the Consumer Price Index).

To avoid similar identification issues to those described in section 4.2 we need to impose some identifying assumptions. The interest rate is allowed to be affected contemporaneously by all the other endogenous variables and the tax shocks. Following Christiano et al. (1996), I employ a Cholesky decomposition of the covariance matrix of ε_t to identify appropriately the monetary policy shock as an innovation to the Bank of England nominal policy rate.

The results of this exercise are presented in figure (10) which shows the effect on output, consumption, investment, the Bank of England interest rate and inflation. We can see that the effect on output, consumption and investment is extremely close to the baseline case. The effect on GDP on impact is 0.59 per cent ($p = 0.02$) and rises to 2.67 per cent ($p = 0.0004$) after about 3 years. It is also interesting to note the effect on the other variables. On impact the tax cut lowers inflation slightly, perhaps reflecting that consumption taxes were often used in the U.K. However, over time the effect on inflation is significantly positive — as one would expect given the overall stimulus to the economy. The central bank's policy rate follows a similar path to inflation, again as would be expected from a simple interest rate rule; the policy instrument eventually becomes positive as inflation goes above target.

4.3.2 Fiscal policy shocks

While the tax shocks have been constructed as exogenous from the spending decisions it is still instructive to control for spending shocks as a robustness check. First, there is always the possibility that the categorisation is not perfect. Secondly, as mentioned above, it makes sense given the smaller sample. $\mathbf{X}$ will now include log of real government spending on goods and services per capita.

Without a better way (for example a spending narrative dataset) to identify spending shocks, I employ standard identifying assumptions on the timing of government spending shocks as in Blanchard and Perotti (2002). I order spending first in the VAR. A Cholesky decomposition of the covariance matrix of the ε_t is therefore sufficient to identify the government spending shock.

The results are shown in figure (11) and are again very similar. For example, output increases 0.62 per cent ($p = 0.02$) on impact and the largest effect is at 2.3 per cent ($p = 0.002$) after about 3 years. The Government spending response is statistically insignificant for the first two years before rising — a result consistent with Romer and Romer (2009).[35]

[35] I also control for government total managed expenditure net of debt interest payments (as in RR) rather than government spending on goods and services (as above). The results are very similar.

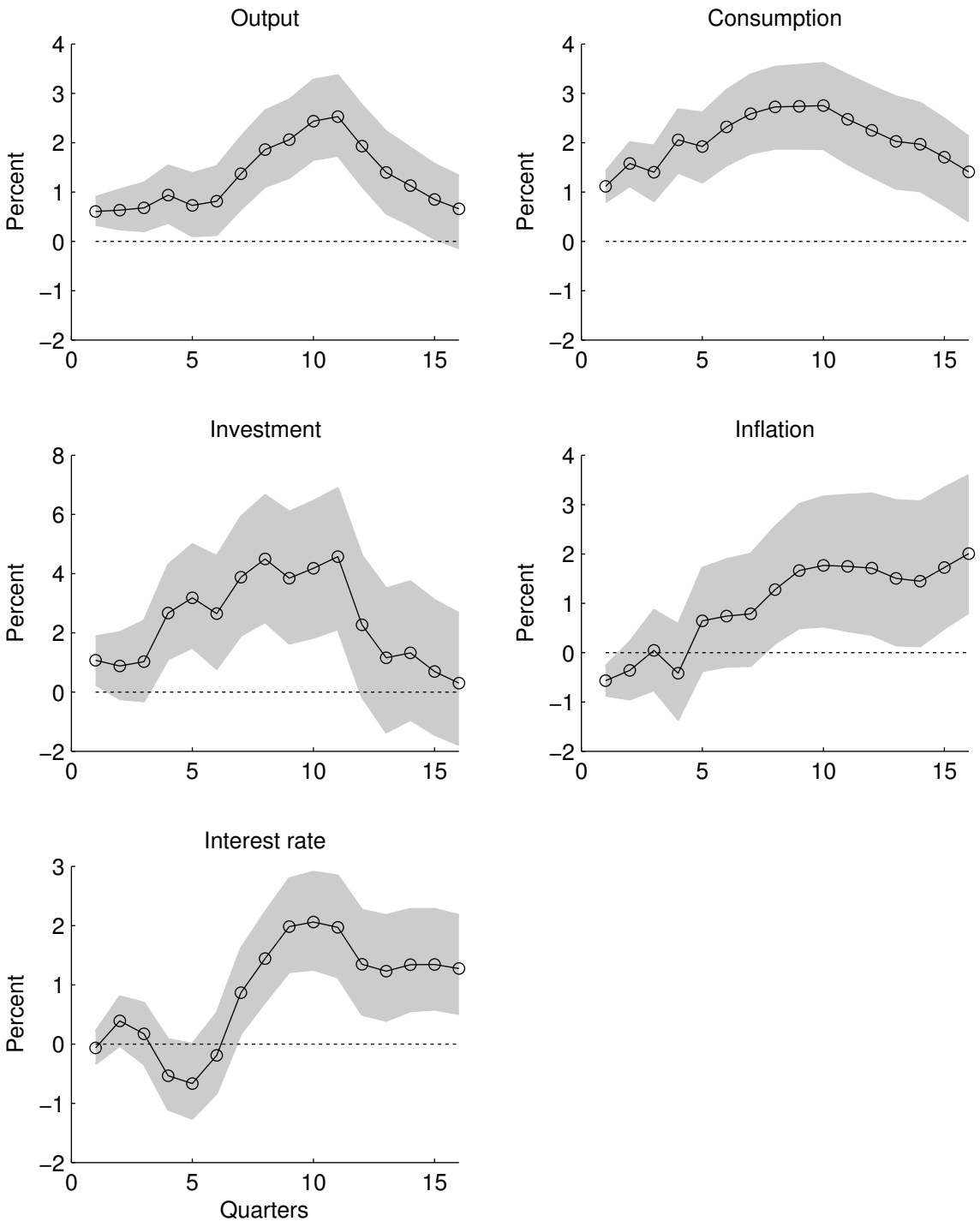

Figure 10: *The effects of a tax cut after controlling for monetary policy shocks*

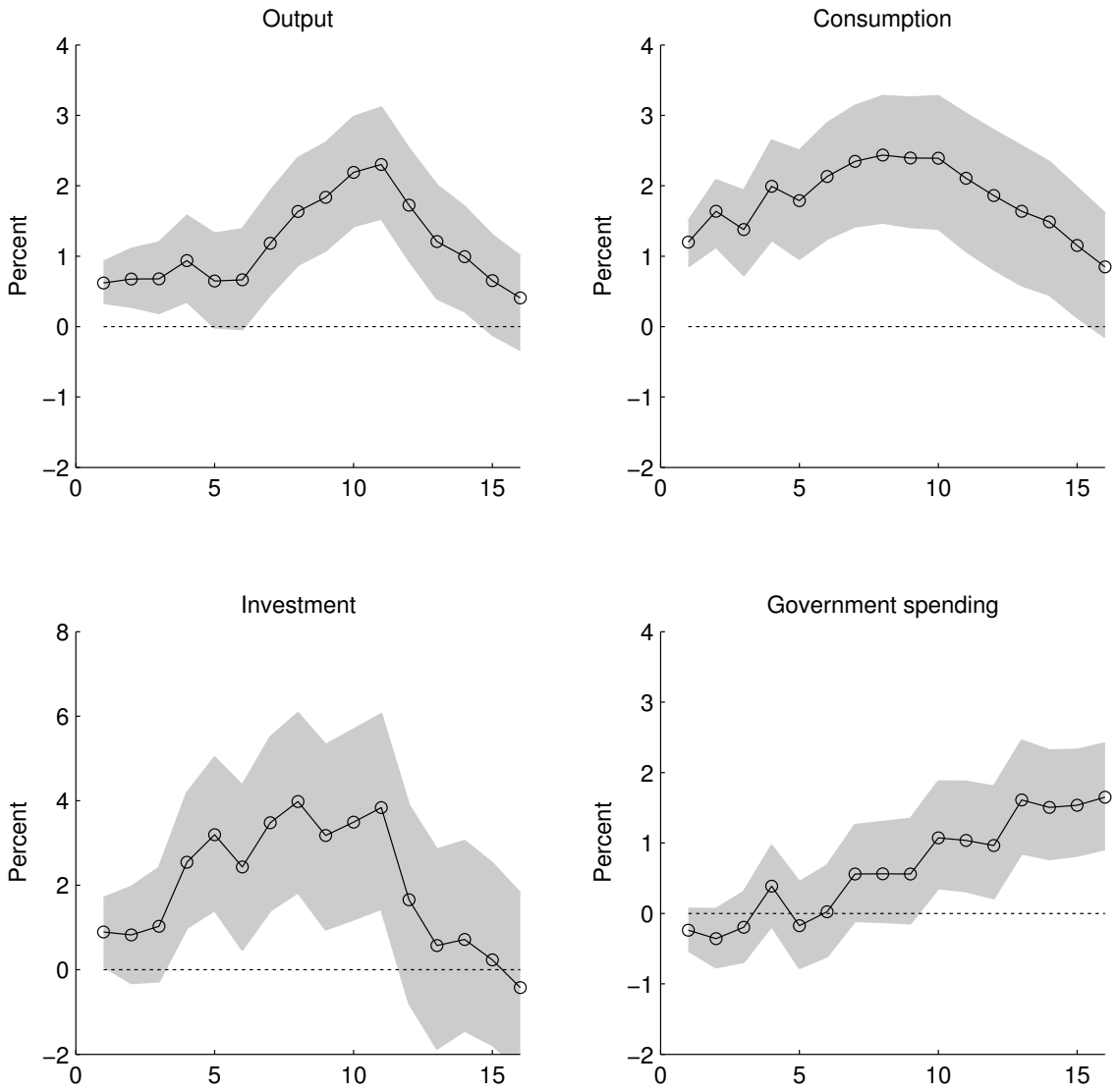

Figure 11: *The effects of a tax cut after controlling for fiscal policy shocks*

4.4 Excluding anticipated shocks

By assigning the liabilities change to the implementation date we are implicitly assuming that agents react to the shock when implemented and not before. However, the implementation date is sometimes later than the announcement date and we may be concerned that agents anticipate the implementation. I therefore examine the possibility that the results are being influenced by anticipation effects.

Following Mertens and Ravn (2010), I define a surprise shock as one which is implemented within one quarter (90 days) of the announcement date. The sample is therefore split into discretionary actions whose announcement and implementation dates are the same quarter and those which may be anticipated. Figure 15 in annex B provides a histogram of the implementation lags, the time

between announcement and implementation. We can see that the overwhelming majority of actions are surprise actions, being implemented within one quarter of announcement (and many of these are actually implemented on or around announcement). This suggests a straightforward check: I simply exclude the potentially anticipated changes, that is I only use the surprise shocks.

The first panel in figure (12) illustrates the effect of a surprise tax shock on output. The shape of the response and magnitude are again broadly similar although the largest fall in output is slightly deeper at over 3 per cent, still occurring between 10 and 12 quarters.

4.5 Comparison with the Romer and Romer method

Romer and Romer's baseline results come from the estimation of (4) directly. To repeat this here, they estimate:

$$\Delta y_t = \mu + \sum_{j=0}^{Q} \gamma_j d_{t-j} + \nu_t \tag{15}$$

taking $Q = 12$.

The purpose of this subsection is to compare the results gained from this simpler approach to the baseline VAR results above. The second panel in figure (12) reports the results from the single equation (darker line, crosses and long dashes) and the single equation modified by lagged GDP (lighter line, circles and short dashes). Firstly, these two are very close, with both point estimates falling within the other's confidence intervals. Secondly, the magnitudes and shapes are very similar to the baseline VAR results: an impact multiplier between 0.5 and 1 per cent, rising to around 2.5 per cent after 10-12 quarters.

4.6 Using all discretionary policy changes

Having constructed the exogenous tax series, it is instructive to ask whether the results are actually different when using the full discretionary policy decision series (endogenous and exogenous). The third panel of figure (12) shows that the response using all discretionary policy changes is much closer to zero. Interestingly, this magnitude is closer to the Blanchard–Perotti type estimates — suggesting that the identified shocks from this approach are biased downwards. The split between exogenous and endogenous does again appear to be an important and meaningful distinction in identifying the effects of tax shocks.

4.7 Retroactive components and the alternative classification

Until now I have made use of the series which excludes retroactive components and which has not used the 'alternative classification' method I outlined in section 2. It is worth checking that the results are robust to these assumptions.

First I include the retroactive elements. As discussed in section 2, these are handled by assigning a levy of the accumulated liabilities from the retroactive implementation date to the announcement date. As a levy this is then withdrawn in the following quarter. The results are very similar to figure (5). The impact multiplier is 0.5 ($p = 0.07$) and the maximum effect is 2.3 ($p = 0.002$). Given the complications of adding retroactive components in this way, the purpose is really to check that the broad result is not distorted, which it is not.

Secondly, I consider the impact of using the alternative classification for the tax changes. Recall that this treats in the same way all changes within Budgets that had specific overall objectives. This means that seemingly exogenous tax cuts in an otherwise endogenously deflationary Budget would be classified demand management. This robustness check is designed to ensure there is not correlation between the seemingly exogenous changes and some of the endogenous ones within the same Budget. Again the results are very similar to (5) in magnitude and dynamics.

4.8 Outliers

In section 2 it was noted that the timing of the income tax cuts in 1979Q4 (and income tax allowance changes for the whole fiscal year), which were to be counteracted by the V.A.T. rise in 1979Q3, lead to two large outliers in the exogenous series (which can be seen visually in the figures in section 2). Obviously these changes may be important but we want to ensure that the timing properties do not unduly drive the overall results in section 3. The income tax allowance increases were for the whole year, which means there was a retroactive element dating back to 1979Q2. Given our way of dealing with retroactive elements, the implementation date was therefore taken to be 1979Q3 — the same date as the V.A.T. rise. For consistency, I bring the implementation date for income tax cuts (due in October) forward one quarter from Q4 to Q3. Once these three changes are considered together (the original intention in the Budget), the spikes in 1979 are removed. This seems a more sensible way of dealing with the timing issue than simply excluding all three changes as outliers. Again, we are checking that the overall magnitude and dynamics are not being distorted. The magnitudes and dynamics are once again very similar to the baseline case, again rising to 2.3 per cent ($p = 0.003$) after 11 quarters.

4.9 Making use of observations back to 1948

Although the narrative in Cloyne (2010) dates from the first post-war Budget in 1945, the relevant quarterly National Accounts data are only available from 1955. However, as our tax shock series goes back to 1948 (and 1945 in revenue changes), it is desirable to use all the data. Before 1955 the U.K. did publish the Index of Production which, in the contemporary editions of Economic Trends, was presented as an aggregate production measure. To make use of the dataset from 1948Q1, I

run the single equation model (15) using the quarterly Index of Production growth rather than quarterly real GDP growth as the dependent variable.

As can be seen in the fourth panel of figure (12), although the magnitudes are slightly greater, the thrust of the main result remains — a sizable impact multiplier increasing to several per cent after 10-12 quarters.

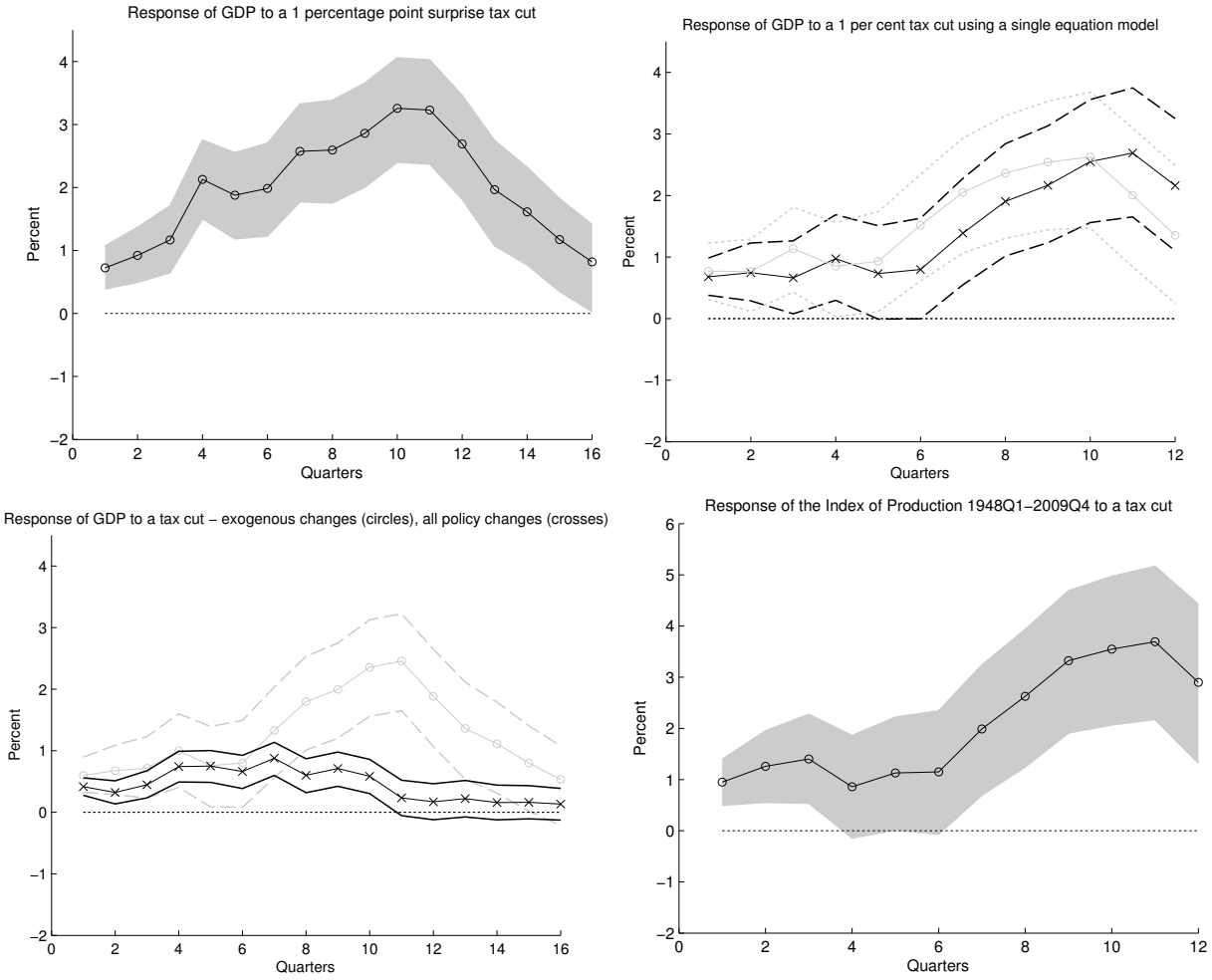

Figure 12: *Robustness checks: (1) only considering surprise shocks, (2) comparison with RR single equation baseline, (3) using all discretionary policy changes, and (4) using data back to 1948*

5 Effects of differently motivated shocks

Given that I have subcategories for the exogenous group of tax measures, I am able to ask other interesting questions:

- Do shocks specifically aimed at improving economic performance have more effect than ideologically motivated changes?

- What are the effects of a tax shock aimed at deficit consolidation?

To answer these questions I replace the d_t series with a subset: either long-run, ideological or deficit consolidation.[36] For ease of economic interpretation, I continue to consider tax cuts for long-run economic and ideological reasons but consider a tax *increase* for deficit consolidation.

The first panel of figure (13) illustrates the effect of a tax cut based on considerations of long-run economic performance (crosses). The shape of the response is very close to the baseline estimates. This confirms the view that long-run economic tax cuts do indeed stimulate GDP. The figure also illustrates the effect of a tax cut based on ideological considerations (diamonds). An example of this type of tax cut is an increase in the personal allowance designed to help the poorest. While the effect is larger, the first panel of figure (13) shows that the overall shape and magnitudes are broadly consistent with the aggregate baseline series.

The lower panel of figure (13) illustrates the effect of a tax *rise* for deficit consolidation. The point estimate is interesting as it differs from the shape of the other responses. Initially there is a large contractionary effect, bottoming out around 7 quarters. From then on the effect becomes increasingly positive until, by year four, the tax increase has a positive effect on GDP. One might postulate that this is in keeping with common views about deficit consolidations — the contraction in demand in the short run may cause a slowdown but, in the long-run, establishing sound public finances has a positive effect on GDP over the medium term (although it does tend back to zero eventually).

However, we must be cautious not to over-interpret these results: much of the response is insignificant. As can be seen in section 2, the deficit consolidation series has far fewer observations than the other series — mostly occurring after 1980. The fewer observations may also explain the imprecision of the estimates.

Finally, it is worth briefly mentioning how excluding the deficit consolidation measures affects the results. Section 2 explained one might be concerned that all deficit actions are actually endogenous. As a check, I estimate the baseline VAR using the standard shock less the deficit consolidation measures. The result looks almost identical to the baseline case with an impact effect of 0.6 ($p = 0.02$), peaking at 2.66 ($p = 0.001$) after 11 quarters.

[36] As a robustness check I include the full d_t series less the subset in question as the first endogenous variable in the VAR. This allows for contemporaneous changes in the overall exogenous tax series from changes in a specific subcomponent. The results are largely unaffected.

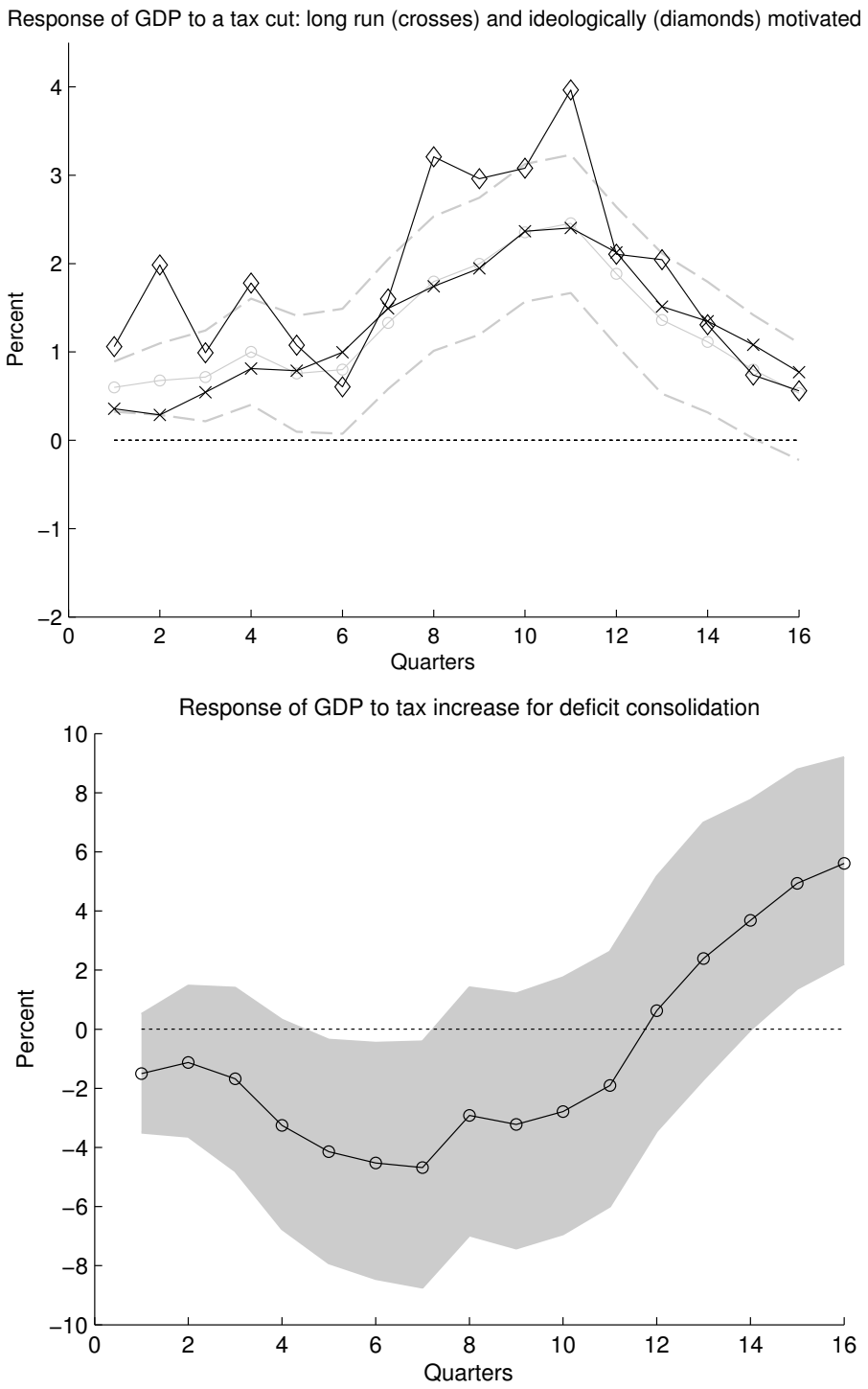

Figure 13: *Effect on GDP of long-run and ideologically motivated tax cuts (baseline in grey), together with the effect of a tax* ***rise*** *for deficit consolidation*

6 Tax shocks and the U.K. business cycle

Finally, having established the response of key variables to tax shocks, I now consider the effect of these shocks on the U.K. business cycle. King and Rebelo (1999) argue that "changes in labour and capital income taxes have effects that are similar to productivity shocks. However, these taxes change infrequently making them poor candidates for sources of business cycles fluctuations". However, as I have discussed, in the United Kingdom taxes were changed frequently. Furthermore, it has been argued that tax shocks do play an important role in the United States business cycle. This is one of the conclusions of McGrattan (1994) and shown more recently by Mertens and Ravn (2010).

In this section I simulate the estimated model from section 3 using the point estimates, the identified tax shocks and assuming all other shocks are zero (that is the fitted residuals $\hat{\varepsilon}_t = 0$, $\forall t$). To control for other policy variables as in section 4 the $\mathbf{X}$ vector will include (in this order) government spending, output, consumption investment (all log of real per capita), the rate of inflation and the central bank policy interest rate. The resulting simulated data series is then HP-Filtered with the standard smoothing parameter of 1600 and compared against the actual (again HP-Filtered) series. This comparison is shown in figure (14).

Dow (2000) identifies three major recessions between 1945 and 1995: 1973–75, 1979–82 (although unemployment continued rising until 1986) and 1989–1993. He also identifies two major 'fast growth' periods: 1972–73 (often referred to as the Heath–Barber boom) and 1985–88 (the Lawson boom). To these episodes of interest we might also add the volatility in the 1960s leading to the 1967 devaluation and very tight Budgets of the late 1960s; the turbulent years in the run up to the 1979 General Election; the late 1990s boom; the early 2000s world slowdown and the recent overheating and crash. All of these episodes can, to some degree, be seen in the actual series.

To what extent did our tax policy shocks contribute to the U.K. business cycle? In the narrative, four clear episodes of supply-side reform can be identified: the 1950s, the early 1970s, the 1980s and the mid-1990s. These can be seen in the figures from section 2.

In the 1950s, while still embracing demand management, successive Conservative Chancellors attempted to liberalise the economy. Taking the post 1955 period, in 1957 and 1958 Chancellor Peter Thorneycroft remitted considerable sums in taxation to achieve his goals of: "greater industrial efficiency and competitiveness", "the provision of better incentives and opportunities for initiative and effort" and "the easing of the pressure of the tax system where this bears most hardly on individuals and families".[37] Examining the counterfactual simulation in figure (14) it appears that these cuts played a major role in stimulating growth in the early 1960s.

There were also considerable tax cuts and reforms from 1970 to 1973 by Chancellor Anthony

[37] Hansard, HC Deb 09 April 1957 vol 568 c988

Barber — hence the term the 'Heath–Barber boom' (Edward Heath was Prime Minister). Actual annual GDP growth rose from around 2 per cent in 1970/71 to 3.7 per cent in 1972 and 7.2 per cent in 1973. The 1972 Budget in particular made wide-ranging reforms to the tax system, including changes to Corporation Tax and the introduction of V.A.T. Woodward (2004) argued that the Government "did not only engineer a major boom, but the stimulus was applied over a relatively short period".[38] All three panels in figure (14) imply that tax policy contributed to the boom.

As the economy recovered from the early 1980s recession Chancellor Nigel Lawson also carried out major supply-side reform and sizable cuts in taxes. In 1983 there were major cuts to income taxes, in 1984 there were wide-ranging reforms to income, capital and business taxation. These changes over predict growth in the mid 1980s. There was a pause in the magnitude of cuts in the mid-1980s Budgets, resuming in 1987 and 1988. Many commentators came to believe these giveaways overstimulated an overheating economy by the end of the decade. The delayed effects of these show up as contributing to the end of the Lawson boom in figure (14). It is worth noting that, while Dow dates the end of the boom as 1989, GDP did not start falling until the third quarter of 1990.

Following the 1990–91 recession, by the middle of the decade Chancellor Kenneth Clarke was able to cut income taxes again. This is the fourth major episode of supply-side reform. Still aiming at a 20 pence basic rate of income tax, the major cuts came in the 1995 and 1996 Budget, where the Chancellor argued "low direct taxes are the most effective way to encourage enterprise and hard work".[39] From figure (14) these appear to have fuelled what the incoming Labour Government of 1997 saw as overheating.[40]

In short, these exogenous tax shocks do appear to have played an important role in key episodes in the U.K. business cycle.

[38] Woodward (2004), page 141.

[39] Hansard, HC Deb 26 November 1996 vol 286 c170.

[40] Hansard, HC Deb 25 November 1997 vol 301 c773.

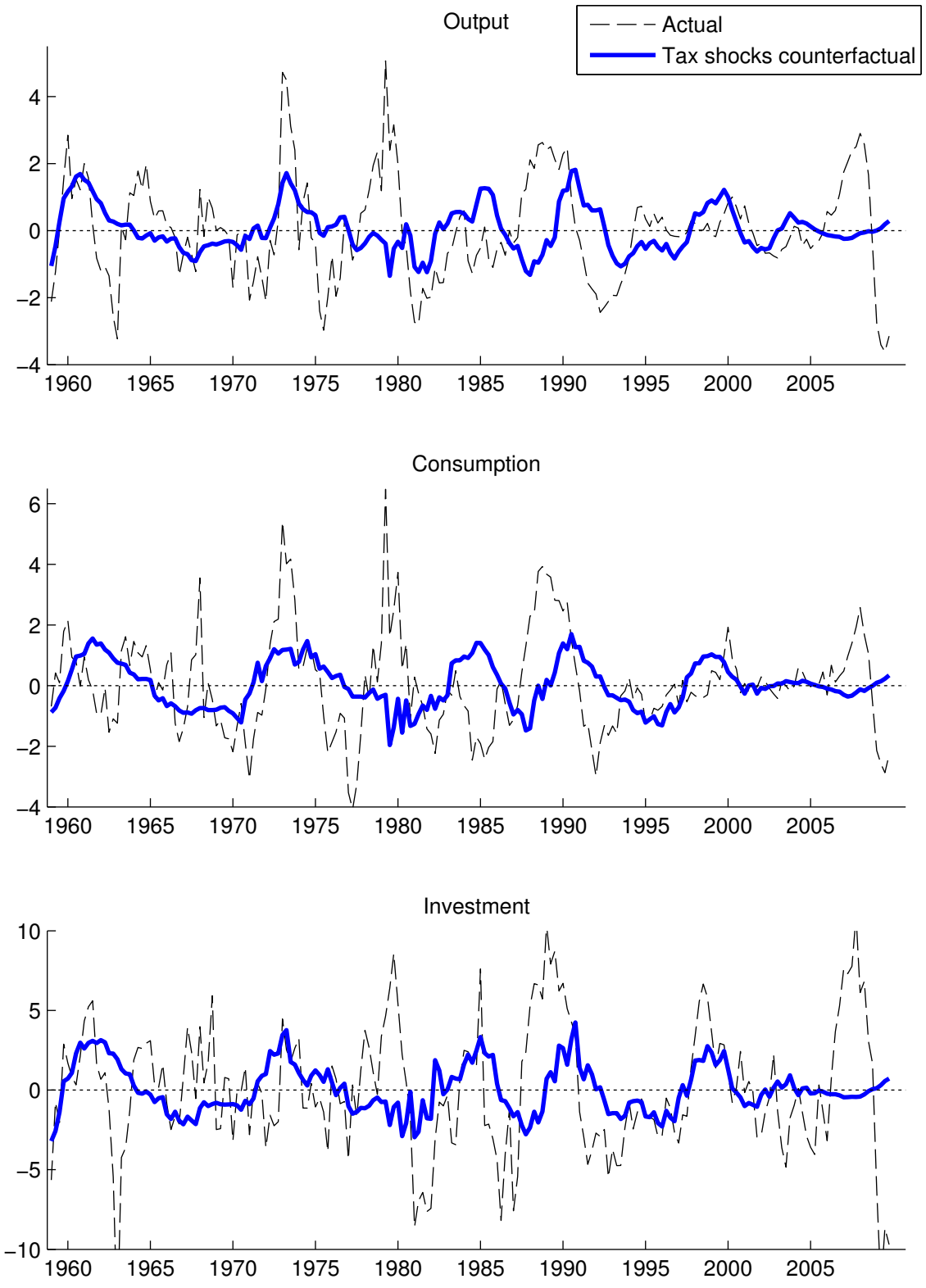

Figure 14: *Simulated output, consumption and investment based on tax shocks vs actual*

7 Conclusion

This paper has shown powerful, persistent, positive and significant effects of a tax cut on GDP, consumption, investment, hours worked, the real wage and imports in the United Kingdom. Inflation and the policy interest rate also become positive, as one would have expected. Output increases by around 0.6 per cent on impact, rising to 2.5 per cent over 3 years. This implies that tax cuts stimulate above trend growth for over three years.

There are two important implications of the results in this paper. Firstly, that 'exogenous' tax cuts (increases) have important stimulus (contractionary) effects on the U.K. economy and have played a role in key episodes in the U.K. business cycle. Furthermore these findings are more robust than existing U.K. results. Secondly, in providing new narrative-based estimates I contribute directly to the international evidence. The Romer–Romer results for the U.S. have attracted much attention, in part because the effect is so large. It is quite remarkable that my U.K. results are so similar to those for the United States. This commonality is not found in the SVAR literature and this striking congruence reinforces the Romer–Romer findings. The similarity is all the more important given how the data were constructed. The two datasets (U.K. and U.S.) are not, for example, based on standardised National Accounts revenue series; they are derived from Budget processes, histories and administrative sources, which are all quite different.

The results were shown to be robust to a variety of different checks and specifications, the effect on impact was similar to the baseline and the response increased to around 2.5 per cent after about three years. The other variables were similarly affected. I am therefore confident of the robustness of the overall magnitudes and dynamics.

The identification of tax shocks is extremely challenging — possibly explaining why uncovering their effect has proven so controversial. Identification is achieved by constructing a new narrative dataset for the U.K. and employing the Romer and Romer (2010) approach. The dataset contains nearly 2,500 tax changes. These were all carefully classified by motivation to separate the decisions correlated with current and prospective economic shocks from those that could be regarded as exogenous. Full details can be found in the companion paper, Cloyne (2010). I hope this will provide a useful new resource for further research as well as an interesting contribution to U.K. post-war economic tax history.

In short, this paper finds robust evidence that tax changes had important macroeconomic effects in the United Kingdom and contributed to the post-war business cycle. Results for the U.K. are much scarcer (and more anomalous) than for the U.S. and this paper fills that gap. That the results are so similar to the Romer–Romer findings is remarkable and lends strong weight to the argument that tax cuts do indeed have large, positive and persistent effects on the macroeconomy. Finally, the unique new U.K. dataset provides a fascinating resource for further research.

Appendices

A Data appendix

Specific data definitions can be found in table 2. Per capita variables are the real chained volume measures, seasonally adjusted, divided by population. Log variables are multiplied by 100 so that the log change in a variable is a growth rate expressed in per cent (the tax variable is a percentage).

Revenues are the only variable not cyclically adjusted at source. It is therefore cyclically adjusted using the X-12 ARIMA software from the United States Census Bureau.

B Implementation lags in the UK data series

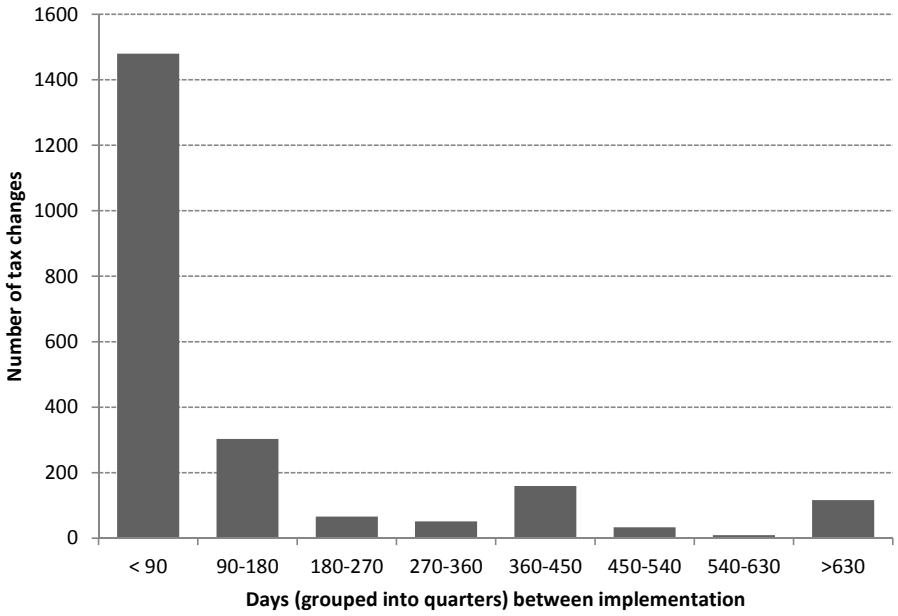

Figure 15: *Distribution of implementation lags, grouped by quarters (90 days)*

Table 2: Data sources

Series	Source	Description	Series
Output	ONS	GDP	ABMI
Consumption	ONS	Final household consumption expenditure	ABJR
Investment	ONS	Gross Fixed Capital Formation	NPQT
Imports	ONS	Trade in Goods and Services: Total Imports	IKBL
Exports	ONS	Trade in Goods and Services: Total Exports	IKBK
Real Wage	ONS	Average Earnings Index divided by GDP deflator	LNMQ/YBGB
Hours	ONS	Weekly hours worked per worker	YBUS/MGRZ
Inflation	ONS	Change in Retail Price Index	CZBH
Index of Production	ONS	Covers manufacturing, mining and quarrying and energy supply	CKYW
Interest rate	Bank of England	Bank Rate/ Minimum Lending Rate/ Repo Rate / Official Bank Rate	"Official Bank Rate history"
Population	Eurostat	UK Total Population (Datastream)	
Total government expenditure	ONS	Nominal total managed expenditure minus debt interest divided by GDP deflator	(EBFT-NMFX)/YBGB
Revenues	ONS	Total receipts divided by GDP deflator	ANBV/YBGB
GDP deflator	ONS	Implicit price deflator for GDP	YBGB
Nominal GDP	ONS	GDP in current prices	YBHA

C Extracts from the narrative[1]

1. Budget 19th March 1968

Chancellor: Roy Jenkins; *Prime Minister:* Harold Wilson (Labour)

Context

The economy grew strongly through the first half of 1967. However, as the year progressed GDP growth was slowing down.[2] Export growth, by contrast, had either been low or negative through 1967. In May the Government announced Britain's intention to join the EEC. Suspicion arose that joining may be accompanied by devaluation. The Six Day War in the Middle East, an oil embargo and the closure of the Suez Canal occurred in June. Interest rate relaxations were also reducing the incentive to hold sterling. By the end of the year the balance of payments was showing a significant deficit. Cairncross (1992) notes that at some stage in 1960, almost regardless of government policy, devaluation was perhaps inevitable, the UK's competitive power had simply failed to keep up in the post-war period.[3] Devaluation occurred on 18th November 1967 and Callaghan [the previous Chancellor] resigned on the 29th. A deflationary package of measures accompanied the devaluation (dealt with below). In January the new Chancellor Roy Jenkins announced large expenditure cuts of £500 million (1.1 per cent of GDP) in 1968-9 – reversing the trend of growth in public expenditure.[4] Still, in the first quarter of 1968 real household consumption was 7 per cent higher than it had been in the first quarter of 1967.[5] Speculative pressure on sterling was to continue all the way to March 1968.

Overall Budget Objectives and Motivation

The Chancellor set straight to work in the Budget speech: "this Budget is concerned with the structural changes in the pattern of economic demand and activity that are required to enable us to take full advantage of devaluation and establish a substantial and continuing balance of payments surplus… These measures are in themselves severe".[6] On the external position the Chancellor was frank "we are still in a position of great difficulty", although mediated by "but also of great opportunity".[7] In his budget judgement, Jenkins explained "we must check the growth of public expenditure and private consumption, which were the main expansionary forces last year, and release the resources necessary to sustain as large an increase in exports and industrial investment as possible".[8] Succinctly, "the vital thing this year and next is to put the balance of payments into substantial surplus. This can only be done by sacrificing the normal claims of home demand on our resources."[9] Jenkins decided he needed to raise a "very large sum of additional taxation".[10] In total this amounted to £923 million (2.1 per cent of GDP) in a full year and was in addition to significant cuts in expenditure and a tough incomes policy. Blackaby (1978) described this as "perhaps the most formidable deflationary budget since the war". All but two of the tax measures in the 1968 Budget were a tax rise and there can be no doubt that all of these were *endogenous, demand management*.

Pre-Budget Measures

First I deal with the deflationary measures which accompanied the devaluation on the 18th November 1967. These were an increase in the Bank Rate, a limit on bank advances, increase in hire purchase deposits on cars, an increase in Corporation Tax to 42.5 per cent (although this justified in the 1968 Budget speech and FSBR), abolition of the export rebate and withdrawal of some of the Selective Employment Tax (S.E.T.) rebates. As these measures accompany the devaluation I classify them as

[1] Part of the longer companion paper, Cloyne (2010), available at http://www.homepages.ucl.ac.uk/~uctpjsc/
[2] ONS (2010)
[3] Cairncross (1992), p.164.
[4] Ibid.
[5] ONS (2010)
[6] HC Deb 19 March 1968 vol 761 c253
[7] HC Deb 19 March 1968 vol 761 c258
[8] HC Deb 19 March 1968 vol 761 c259
[9] HC Deb 19 March 1968 vol 761 c261
[10] HC Deb 19 March 1968 vol 761 c273

endogenous, demand management. The removal of the export rebate and the changes to the S.E.T. appear in the data series.

1968 Budget Tax Measures

All the tax rises follow the Chancellor's statement about the need to raise a considerable sum of money. Income tax allowances were reduced from 6th April 1968. From 6th April 1969, a child's investment income was to be considered together with the parent(s). There were very heavy increases in consumption taxes having concluded "that I ought to look for obtaining the bulk of my additional revenue from indirect taxation, but that it should be levied in as selective and non-regressive a way as possible".[11] Purchase Tax went up from 20th March 1968; duties on spirits and wine also went up on the same day. Hydrocarbon duties rose from 19th March 1968. Betting and gaming duties rose from 25th March 1968 and motor vehicle duties from 20th March 1968. In all, these duty increases raised £440 million in a full year (1 per cent of GDP).

On the business tax front, as announced in November 1967, Corporation Tax rose to 42.5 per cent – raising nearly £100 million. This was applied retrospectively, as was typical, from 1st April 1967. There was also a significant rise in the Selective Employment Tax on 2nd September 1968, although accompanying rebates also rose leaving the net revenue increase at just over £150 million in a full year.

A significant amount of revenue was raised from the one year 'special charge': "it is right, in the context of this uniquely rigorous Budget, to propose a special charge to be calculated and expressed as a charge upon investment income".[12] This was implemented on 6th April 1967 retrospectively and for one year only, raising £100 million (0.2 per cent of GDP). But there were also a number of other capital and capital income tax measures, together raising £13 million in a full year and implemented on a variety of dates.

Based on the overall objectives of the Budget I classify all these tax increases as *endogenous, demand management.*

There were two concessions. On income tax the age exemption limit was increased "I believe that when what I hope will be a relatively short-term stringency has to be applied the elderly are entitled to some special consideration".[13] Second, having ruled out an increase in Capital Gains Tax, the Chancellor announced "certain limited changes in the incidence of the tax which I propose. In making these proposals I have particularly in mind the need to simplify the tax wherever possible".[14] On face value these final two measures I classify as *exogenous* – the first as *ideological*, the second as *long run*. These remissions were very small compared with the increases. However, to ensure that these were not sums needing to be offset by the increases, I assign an alternative justification of *endogenous, demand management*.

2. Budget 19th March 1985

Chancellor: Nigel Lawson; *Prime Minister:* Margaret Thatcher (Conservative)

Context

The Chancellor faced a familiar environment in 1985: 1984 had been another year of decent growth at 2.7 per cent. This was 1 percentage point slower than the previous year but may well have been affected by the miners' strikes. Inflation was edging up, but still comparatively low at 5 per cent in 1984. Unemployment was again around 100,000 higher than the previous March. Britton (1991) noted that the PSBR presented a problem but was disguised by increased revenue from various privatisations - a key ideological objective of the Government.[15]

Overall Objectives and Motivation

From the outset unemployment was acknowledged as a problem: "my Budget today has two themes: to continue the drive against inflation and to help create the conditions for more jobs".[16] However, a demand

[11] HC Deb 19 March 1968 vol 761 c277
[12] HC Deb 19 March 1968 vol 761 c299
[13] HC Deb 19 March 1968 vol 761 c295
[14] HC Deb 19 March 1968 vol 761 c298
[15] Britton (1991), page 71.
[16] HC Deb 19 March 1985 vol 75 c783

stimulus was not the answer. The Government published an employment White Paper in March as well – unemployment was viewed as a microeconomic problem: "boosting demand without the necessary improvements to the performance of the economy would only generate higher inflation".[17] In short, "The Government's economic strategy has two key components: a monetary policy designed to bring down inflation and a supply-side policy designed to improve the competitive performance of the economy".[18] The higher PSBR was justified by the cost of the coal strike but this year Lawson planned to keep to his previous plans; there were to be no giveaways "for the coming year, a substantial reduction in the PSBR must take precedence over our objectives for reducing the burden of tax".[19] However, the Chancellor argued "this Budget carries forward the theme of tax reform I set out last year… reform designed to improve our economic performance over the longer term, on which the jobs of the future will depend"[20] and almost all the tax changes were, in the end, *exogenous long run* changes.

Major Budget Tax Measures

The Chancellor continued the switch from personal income tax to indirect consumption taxes: "My Budget last year shifted some of the burden of personal taxation from earnings to spending. Today I propose to make a further move in this direction".[21] As a consequence, the Chancellor sought the revenue required from excise duties. Alcohol, fuel, tobacco and vehicle excise duties all rose on the 19th March 1985. In choosing which taxes to cut, the Chancellor argued "this year, a Budget for jobs and for enterprise has to give high priority to raising the tax thresholds".[22] The main, additional and age allowances all increased by more than indexation. There were indexation increases in the basic rate limit and the further higher rate thresholds. All these changes took place from 6th March 1985. Based on the comments here, those above and those from the previous year I classify this package of measures as *exogenous, long run*.

There were also a number of changes to VAT which, the Chancellor explained, (combined with the excise duty increases) "will help me to lighten the burden of income tax".[23] VAT was extended to magazines and newspapers from 1st May 1985; changes to VAT on credit cards and similar payment cards also raised revenue from 1st May 1985; and "I propose to include in this year's Finance Bill legislation to implement most of the recommendations of the first two volumes of the Keith report on the enforcement powers of the revenue departments, including measures to deal with the problem of the late payment of VAT".[24] I classify these changes together with the excise duties as *exogenous, long run*.

There were also reforms to capital gains tax. The Chancellor explained "I have a number of other important proposals for tax reform to announce today, which will both simplify the system and encourage enterprise".[25] These took the form of changes to indexation relief from 6th March 1985. In terms of revenue there were more minor remissions; however, they followed a change, announced on 28th February 1985, that prevented the converting of income into less heavily taxed capital gains. As reforms to capital gains tax, I classify these changes as *exogenous, long run*.

Finally the Chancellor announced significant cuts and reform of National Insurance: "I want to do more to improve job prospects for young people and the unskilled, among whom the problem of unemployment is most severe…I have concluded that an effective response to this problem must include direct action in two related areas — to cut the costs of employing the young and unskilled, and to sharpen their own incentive to work at wages which employers can afford to pay… They tackle the problem of unemployment where it is most acute".[26] I classify this measure as *endogenous* (related to current unemployment levels), *supply stimulus*.

These changes account for 95 per cent of the increases and nearly 90 per cent of the remissions.

[17] Britton (1991), page 73. A point reiterated in the 1985 Budget speech (c785)
[18] HC Deb 19 March 1985 vol 75 c784
[19] HC Deb 19 March 1985 vol 75 c786
[20] HC Deb 19 March 1985 vol 75 c790
[21] HC Deb 19 March 1985 vol 75 c795
[22] HC Deb 19 March 1985 vol 75 c797
[23] Ibid.
[24] HC Deb 19 March 1985 vol 75 c798
[25] HC Deb 19 March 1985 vol 75 c791
[26] HC Deb 19 March 1985 vol 75 cc798-800

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