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# Estimating spending multipliers in Ireland using the narrative approach

Elliott Jordan-Doak<sup>1</sup>

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## Abstract

This paper contributes to the literature on fiscal multipliers in Ireland by using a new dataset on government spending shocks from 1987 to 2019. To remove the effects of anticipated policy changes and those related to the macroeconomic cycle, I derive this dataset using the narrative approach. In line with the existing literature employing top-down approaches, I find that spending shocks have limited statistically significant impacts on output in Ireland. I complement this analysis with two additional approaches to identify government spending shocks over the same period. Again, I find relatively little evidence of statistically significant impacts on output growth in Ireland from these shocks. These findings should be viewed in conjunction with the challenges surrounding data collection and classification of spending shocks using the narrative approach, both of which are underscored by this study.

Keywords: Fiscal policy, spending multiplier, local projections, narrative approach.

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## Summary

What is the fiscal multiplier in a country? Does it vary over time, and how does it depend on the type of fiscal lever being pulled? How can we accurately measure a fiscal multiplier when most discretionary changes in spending and taxation are a function of macroeconomic conditions at the time? This study is concerned with attempting to answer these questions and places Ireland at the core of its focus.

To do this, I employ the narrative approach and gather a new set of spending shocks measured in three different ways over the years 1987-2019. I combine these new shock measures with the increasingly popular local projections approach (LP) to estimate government spending multipliers in Ireland.

I find that spending shocks have mostly been concentrated in a few areas of policymaking, notably the provision of welfare and healthcare, and that spending shocks overall have typically been procyclical. Regarding the estimation of their impact on the economy, I find that in most specifications, government spending shocks have an insignificant impact on the cumulative change in output over a four-year horizon, although challenges related to endogeneity remain.

Lastly, as the only study to my knowledge that has attempted this approach with Ireland at the centre of its focus, I also illustrate for the benefit of future researchers the idiosyncratic challenges inherent in measuring and estimating spending multipliers in Ireland using the narrative approach.

# 1. Introduction

A confluence of factors including legacy effects of the global financial crisis, Covid-19, low global interest rates, and the onset of generational challenges such as climate change and an ageing society have stimulated a fierce debate over the size and role of government in the economy.

There is little doubt that some of these developments necessitated a strong government response, such as the fiscal response to the pandemic, while others like climate change mitigation will require considerable government spending in the years ahead. Proponents and policymakers that argue in favour of increased government spending have often noted that government spending will multiply to create further jobs, lead to higher taxes collected, and increase the size of the economy.

However, there is no general consensus on the size of such multipliers, or even how researchers should proceed in attempting to estimate them. This fact is particularly problematic considering the prevalence of shocks to both taxation and expenditure policies over the last number of decades.

In the Irish case, there has been much research produced on fiscal policy in and around the period of the global financial crisis. This is not surprising given the scale and complexity of the policy developments during that time. This fixation is mirrored internationally, particularly in the Eurozone.

Despite the interest in fiscal policy in Ireland, there are very few studies that have sought explicitly to model the impact of discretionary fiscal policy changes on output in the country. While the State has been the subject of numerous studies from a comparative international perspective, these have typically employed metrics that are either ill-suited to studying the Irish economy (e.g., GDP), or fail to take account of the way in which government accounting takes place in Ireland (e.g., exchequer, non-exchequer, EU funding).

Research on fiscal multipliers that has focussed explicitly on Ireland has helped considerably in adding to our collective understanding of the impact of fiscal

policy on the economy. However, these studies have typically relied on top-down structural techniques to isolate policy shocks, yielding inconclusive findings on the size of the multiplier and leaving much scope to further uncover the size, timing, and destination of spending shocks.

My paper attempts to help address these shortcomings through several innovations. First, to identify spending shocks in Ireland, I compile a new dataset of discretionary current and capital spending changes in the Irish economy. To do this, I calculate these shocks in three different ways.

In each case, I draw primarily on historical records from the website of the Oireachtas (Irish parliament). I consult the speeches delivered by the Minister for Finance in the Dáil on each budget day from 1987 to 2019. From this document, which contains details on projected outturns and estimates for the public finances, I record the size and motivation for each discretionary spending change over this period. I also create a new dataset on expected inflation and economic growth for the following year at the time of the budget from the same source.

I then follow the approach of Romer and Romer (2010), Cloyne (2013), and others by classifying each spending shock as being motivated or not by the contemporaneous and prospective economic conditions. This allows me to generate a new set of spending shocks that are judged to be exogenous to the point in the business cycle and should therefore allow for an unbiased estimation of the impact of spending on output.

The second calculation of spending shocks is less granular than the first. In this approach, I gather the estimates provided as part of the budgetary process each year in Ireland that assess the level of spending required to maintain a neutral expenditure stance the following year. I then take the overall level of spending targeted taking into account budget decisions when spending shocks have been incorporated into the projections. The difference between these two figures represents the spending shock in this framework. This method is more appropriate than using simple year-on-year changes in spending that do not take account of the baseline level of spending in the economy given price and demographic pressures.

Finally, I take an approach to calculate shocks that is more closely orientated to how expenditure policies in Ireland have been guided in recent years. Specifically, core spending growth in Ireland is currently built around an estimated growth rate of potential output of the economy. While this particular expenditure benchmark is a more recent phenomenon in Ireland, it serves as a useful framework for conceptualising spending shocks more generally. An amount over and above the potential growth anchor can be seen as a ‘shock’ to the economy. I therefore take the difference between year-on-year growth rates in core spending (overall current spending less that of the Department of Social Protection) and potential output growth year-on-year as the shock measure.<sup>2</sup>

I use each of these approaches as key variables of interest in a local projections framework (e.g., Jordá, 2005) that calculates impulse response functions while controlling for confounding macroeconomic conditions and prospective growth in output and inflation.

I attempt to contribute to the literature on this topic in two key ways. First, from a data perspective, I generate a novel set of spending shocks for Ireland using a bottom-up approach that takes account of three ways to conceptualise spending shocks. This provides important insights into how spending policy has evolved in Ireland over a period of highly volatile economic performance. I also show that there are numerous pitfalls in pursuing the narrative approach with respect to calculating spending shocks, a fact that has not been adequately acknowledged in previous work and suggest a range of advances that future research on this topic should target. This should aid future researchers to employ a framework to conceptualising spending shocks in Ireland and abroad.

Secondly, I show that despite both measuring spending shocks in a number of new ways, and using an empirical strategy in the LP approach that is more flexible and intuitive than previously employed methods, I find limited evidence for government spending shocks having statistically significant multiplier effects

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<sup>2</sup> To help smooth any volatility in the measurement of potential output, I employ a centred three-year moving average.

on output in the economy. This has particularly strong implications for the current debate on how best to deploy fiscal space in the face of several generational challenges in the forms of digitisation, climate change, and deteriorating demographics.

## 2. Literature review

Accurately measuring the magnitude and effectiveness of fiscal multipliers is crucial for attaining better macroeconomic outcomes. With better estimations of how much government spending and taxation leads to a broader expansion in economic activity, policymakers can make more reliable predictions of how the macroeconomy and public finances will evolve when they take decisions to adjust the fiscal stance. With government spending for example in the Eurozone in 2019 equivalent to around 47% of national income on average, the importance of reliably projecting the fiscal multiplier cannot be overstated from both a domestic and international economic perspective.

Given the importance of this aspect of macroeconomics, it should be unsurprising to find that there has been a wealth of research produced on this topic on both the taxation and expenditure side. While a comprehensive overview of this literature regarding even the spending side alone is beyond the scope of this paper, two main themes are evident. The first is that there is a considerable degree of uncertainty regarding the extent, persistence and even direction of fiscal multipliers from current and capital spending, with contextual factors such as the level of market development and economic structure (Colombo et al. 2022), openness to trade (Riguzzi and Wegmueller, 2013), and other dynamics (Koh, 2017) playing an effect in the transmission of the shock. The second highlights that there remains no clear consensus around how the multiplier should be measured and its impact quantified, leaving ample scope for further research.

### 2.1 The size and direction of the multiplier

Regarding the size of the fiscal multiplier for government expenditure, estimates in prominent studies have yielded multipliers as high as almost 3.0 for certain countries (see Batini *et al.*, 2014 for an overview of findings). However, many other studies have shown that the spending multiplier can be as low as zero or even negative to the tune of -0.3. There are possible intuitive and empirical candidate explanations as to why these estimates vary so significantly and as to why they imply even contradictory impacts of expenditure in the economy.



One significant determinant of the size and direction of a spending multiplier that has been demonstrated in previous research is the point in the cycle at which the multiplier is measured. For example, in Auerbach and Gorodnichenko (2012), the estimates for multipliers during recessions are considerably higher than during normal times, and further still from those seen when the economy is overheating. The range of these differences has been shown to occur at the economic peak and trough of the period in question (e.g., Batini *et al.*, 2014)

Intuitively, if labour markets have room to manoeuvre in terms of absorbing extra cash in the economy where unemployment is high and wages are low or falling, the spending multiplier has been estimated at approximately double that of a 'steady state' estimate.<sup>3</sup>

Correspondingly, where households have a larger marginal propensity to consume, such as when they are liquidity constrained, which is the focus in the analysis of Carreras *et al.* (2016), the multiplier is higher. Similarly on the monetary side, when countries are facing the effective lower bound of monetary policy, fiscal multipliers are far higher than when there is room for monetary policy to be more aggressively deployed (Bonam *et al.* 2022).

## 2.2 Multipliers for Ireland

A number of the studies detailed previously and referenced in the following sections of this paper have included Ireland in panel-based estimations. Yet it has been the subject of single country studies of the multiplier on relatively few occasions. Bénétix and Lane (2009) employ a considerably long time series extending back to 1970 and running to 2006 in their analysis of various government expenditure interventions and the impact on Ireland's GDP. They find varying degrees of significance and magnitude, conditional upon the type of spending measure.

Ivory *et al.*'s (2020) study represents one of the first on spending multipliers in Ireland that takes account of the extent to which standard macroeconomic

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<sup>3</sup> Shoag (2010) finds this to be a 3.0 multiplier versus 1.5.

metrics are distorted by the activities of foreign owned multinational corporations in the country. Their study focusses on domestic gross value added rather than gross domestic product as in previous studies such as Bénétrix and Lane (2009) and employs a battery of statistical approaches such as structural vector autoregressions (SVARs), expectations augmented vector autoregressions (EVARs), and a large-scale structural model. They find that effects on output from spending changes in the case of both consumption and investment tend not to be statistically significant beyond three years. Ireland's high propensity to import is cited as one potential reason for this, given that this can lead to net leakages of income.

### 2.3 The narrative approach

The second notable theme that emerges upon review of the relevant literature is that there have been a multitude of approaches used to uncover the spending shock and estimate the multiplier. While the majority of these papers have employed various types of VARs, including structural VARs (Blanchard and Perotti, 2002), expectations augmented VARs (Auerbach and Gorodnichenko, 2012) and sign restricted VARs (Uhlig, 2005) to identify spending shocks, many other studies have chosen to eschew these methods in favour of more bottom-up approaches designed to identify and measure fiscal shocks. This other loosely grouped set of papers that proceeds in this fashion can be described as using the 'narrative approach'.

These studies were motivated by a relative lack of consensus over the ways in which taxation and spending shocks can be captured. In conceptualising the fiscal shock through this lens, this approach seeks to directly measure the shock rather than assume the latent variable approach as in the majority of the structural framework papers.<sup>4</sup> This method, which relies on granular data and 'narrative records' has been used to uncover and estimate the effect of monetary policy shocks (Romer and Romer, 2004), changes to taxation (Cloyne, 2013; Cloyne et al. 2022; Romer and Romer, 2010), government expenditure shocks (Ramey and Shapiro, 1998; Ramey, 2011; Hussain and

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<sup>4</sup> This basic idea can be thought of in line with the Blanchard and Perotti (2002) line of inquiry which uses structural VAR estimations to uncover the shocks to revenues that are exogenous to other contemporaneous economic movements.

Liu, 2020), and overall fiscal consolidations (Guajardo et al. 2014). Through the latter, Alesina *et al.* (2019) employ an approach similar to my own, but focus only on consolidations, while Hussain and Liu (2020)'s work is the most closely related, theirs appears to pay little attention to some of the challenges related to employing the narrative approach on the expenditure side of fiscal policy.

## 3. Data and methodology

### 3.1 Testing the impact of government spending on output

I calculate impulse response functions of the relationship between spending shocks (the calculation of which I return to in the next section) and output in line with Jordá's (2005) method of local projections. This method continues to grow in popularity for researchers interested in empirical questions of this nature and has emerged as one of the leading ways in which structural macroeconomic shocks can be estimated (Miranda-Agrippino and Ricco, 2021). There are a number of reasons as to why the approach is particularly suited to estimating fiscal multipliers.

The more commonly used technique in earlier studies was that of VARs or SVARs. First, from a data generation process standpoint, the dynamics of the macroeconomic variables do not necessarily lend themselves to this kind of approach, with the LP approach likely to produce less biased estimates in a macroeconomic application (Li et al. 2022). Second, as Ramey (2016) notes, weaker assumptions on the data allow for more adaptable and robust impulse response estimations compared to orthodox VARs.

Similarly, the LPs have been shown to be unconstrained by dimensionality, a central feature of VARs (Ramey, 2016), while also having an ability to more accurately capture non-linearities in the relationship between the variables of interest (Auerbach and Gorodnichenko, 2012). Relatedly, and of central importance for a study such as this, the local projections approach helps to avoid the problem of misspecification leading to cumulative errors over the impulse response period. Finally, the process allows for the incorporation of state dependency in the variables (e.g., Kopecky, 2022; Cloyne et al, 2020; ).<sup>5</sup>

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<sup>5</sup> An intuitive example with respect to this study would be calculating the average effect of fiscal policies such as government spending. In this vein, future studies might seek to exploit the finding from this research that outlines the predictability of regularised spending shocks based on some degree of fiscal space.

The main specification I run takes the following form:

$$Y_{t+h} - Y_{t-h} = \alpha_1(Y_t) + \alpha_2(Y_{t-h}) + \beta_1(Shock_t) + \beta_2(Shock_{t-h}) + \mu_1(X_t) + \varepsilon_{t+h} \text{ for } h = 0, \dots, H \quad [1]$$

Here on the left-hand side, I measure the  $h$  horizon cumulative change in the outcome variable at time  $t$ .<sup>6</sup> The two outcome variables I am interested in measuring are the cumulative change in the natural logarithm of modified gross national income (GNI\*) and the cumulative change in the government balance as a share of GNI\*. By calculating both I will scale the multiplier as the ratio of the two and allow for estimations in line with Cloyne et al. (2020), Uhlig (2010), Kopecky (2022). I choose a four-period horizon window, including time  $t$ , with two lagged inclusions of the policy shock variable.<sup>7</sup> Given that GNI\* in Ireland is only available from 1995, I extend back this series to 1987 by splicing in line with overall gross national income in the economy.

On the right-hand side, I use lagged values of the outcome of interest, along with the three different calculations of spending shocks I have calculated (in three different estimations), scaled by GNI\*, along with a vector of control variables in  $X_t$ . Regarding this last set, I draw on an experimental dataset on long-run spending by Barbieri and Bewley (2022) to complement expenditure data publicly available on the Department of Public Expenditure and Reform's databank, which extends back only to 1995 on an annual basis.

The other control variables I use in each of the specifications, along with the robustness exercises to test the predictability of spending shocks, are the output gap in Ireland, as employed by the Irish Fiscal Advisory Council's gross value added based approach, expected inflation and economic growth

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<sup>6</sup> Here the multiplier is measured at time periods  $t$  to  $t_{+3}$ , where  $t_{-h}$  allows us to measure the change year on year, for example measuring output changing from  $t_{-1}$  to  $t$ .

<sup>7</sup> This follows convention in the narrative literature as in Guajardo et al. (2014), Cloyne (2013), and others.

sourced from budget documentation, the natural logarithm of the overall level of core spending, and revenues as per Conroy (2020).<sup>8, 9</sup>

The intuition regarding the necessity to control for revenues is described elsewhere in this paper, yet it is not a trivial step to generate a reliable dataset for this purpose. Conroy's (2020) series is ideally suited as it adjusts revenue performances in Ireland for discretionary policy changes from 1987 to 2018.<sup>10</sup> While the main motivation of his work relates to the estimation of tax elasticities, it also serves as a novel dataset that measures the cost/yield of tax policy changes for each revenue source in Ireland in each year of the sample. I use this overall figure as a control variable for changes in taxation policy each year.

All data are at an annual frequency.

### 3.2 How to measure the spending shock?

This section outlines the conceptual framework surrounding the measurement of the spending shock that I model in (1) above.

I am interested in the extent to which discretionary changes in government spending impact the economy in Ireland. In a very basic framework, one would simply measure this as:

$$\Delta Y_t = a_0 + \beta \Delta g_t + \varepsilon_t \quad [2]$$

Where  $\Delta g_t$  represents the change in a government spending variable of interest, consider for simplicity this as total government expenditure. However, there are confounding factors that relate government spending to output and to other changes in the domestic and international environment. Running [2] would return biased estimates. We can see this through thinking about what

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<sup>8</sup> The output gap, overall level of spending, and the value of discretionary policy changes to revenues are measured as a share of GNI\*.

<sup>9</sup> The influence of monetary policy is not tackled explicitly in this research, but naturally, an exploration of the interactions between monetary and fiscal policies on the multiplier would represent an important extension to the literature on this topic.

<sup>10</sup> I use his approach to extend this to 2019.

drives government spending, and generalise this problem simply as 'simultaneity':<sup>11</sup>

$$g_t = z_t + E_{t-1}[Y_t] + f(y_t, u_t, b_t, \pi_t, i_t \text{ etc}) \quad [3]$$

Here, government spending is a function of contemporaneous economic conditions,  $f(\cdot)_t$ ; output, unemployment, debt, inflation, interest rates and so on. It is also a function of government and household expectations of economic developments, formed in the previous year, which is when the budget is formulated,  $E_{t-1}[Y_t]$ . Each of these also likely imply that  $f(\cdot)_{t-1}$  and  $E_{t-1}[Y_{t-1}]$  are also important given the timing of budgets. The above expression also shows us that we cannot use, at least in Ireland's case, expenditure measures that explicitly incorporate GDP based measures of the position of the economy in the cycle.<sup>12</sup> By using standard measures of the output gap to extract a structural component of spending that attempts to adjust for the economy's position in the cycle, we would fail to rule out capturing the procyclical, or endogenous component in spending detailed above (e.g., Casey, 2019). Finally, we can also see from [3] that there is an exogenous component that is unrelated to the other right hand side variables and represents the spending shock we are attempting to uncover,  $z_t$ .

As mentioned, there remains no broad consensus on how to extract this component of spending. Earlier research that focussed on spending multipliers more generally employed identification restrictions in SVAR specifications. The justification in using such an approach is typically that spending shocks themselves are difficult to measure, and that as in [3], the relationship between spending and other variables is complex. In some of the most notable studies, for example Blanchard and Perotti (2002), granular information on administrative tax records is combined with more generalised sign restrictions to estimate responses to fiscal policy shocks. In this case, it is assumed that spending does not respond contemporaneously to shocks in the economy. Fatás and Mihov (2001) follow similarly but leave the contemporaneous

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<sup>11</sup> Strictly speaking, this simultaneity relates to macroeconomic dynamics around the budget time, not just in the current year.

<sup>12</sup> The Structural balance for example is calculated as  $SSB_t = GGB_t - (OG_t \times \varepsilon_t)$  where the component related to the elasticity of spending when output is above or below capacity is subtracted from the budget balance.

relationship between revenue shocks and the outcomes of interest unrestricted and employ Cholesky ordering to estimate the response of standard macroeconomic variables to government spending.<sup>13</sup>

On the other hand, the narrative approach in its most general sense, where I use the term as a generalised effort that combines elements of both data collection and analysis, seeks to circumvent both of these problems. Regarding the first, the narrative approach has typically been employed to measure the motivation, timing of implementation, and estimated cash impact of tax changes. By applying this approach to spending and using artefacts such as budget speeches and newspaper articles, these “narrative records” can shed light on the reasons why discretionary expenditure measures are introduced, when they are set to take place, and how much they are expected to cost the exchequer.

Of course, the eventual cost and timing may vary from what was intended, but these details are very seldomly provided ex-post by government.<sup>14</sup> While spending outturns and projections are usually available at the aggregate, departmental level in Ireland on a regular basis, there is little available data on individual spending measures. Ad-hoc responses by Ministers during parliamentary questions or sporadic press releases by government departments may serve to provide reliable point in time estimates but would be difficult to use in empirical research. From this perspective, the narrative approach offers one of the few conceivable ways in which the cost of discretionary spending changes in the economy can be measured with accuracy in Ireland at least.

The second challenge discussed above is more difficult to resolve and leads to the following step in attempting to identify  $z_t$  in [3]. The narrative approach also outlines a way in which this problem can be navigated. The most relevant for Ireland from previous efforts comes from Cloyne’s (2013) classification structure to identify spending measures that are either exogenous or endogenous to contemporaneous or prospective macroeconomic conditions,

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<sup>13</sup> Government spending is ordered first in their VAR specification.

<sup>14</sup> Of course, the actual motivation behind each spending measure may be different to what is conveyed publicly by politicians, but I take such statements at face value.



as guided by narrative records for each year.<sup>15</sup> The intuition behind this approach is to sort spending measures into eight broad categories, four of which constitute exogenous motivations for implementing spending shocks, and four are related to macroeconomic conditions and other budgetary decisions. If a spending decision, for example a change to welfare provision, is motivated by reasons that are uncorrelated with the business cycle, we can in theory return to [2] and estimate its effects on our outcome of interest.

The Cloyne and Romer and Romer approach buckets discretionary endogenous tax changes into measures associated with:

- Demand management
- Supply stimulus
- Deficit reduction
- Offsetting spending changes

Measures deemed as exogenous to macroeconomic conditions are oriented towards:

- Long-run growth potential
- Ideological motivations
- Consolidation of an inherited deficit
- Externally enforced reasons

Clearly, the dynamic nature of spending changes is at the core of distinguishing between measures that are either exogenous or endogenous. Loosely speaking, three of the four endogenous categories can be seen as containing measures that are designed to, or are influenced by,

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<sup>15</sup> As outlined by the author, the budgetary process in the UK is in a similar vein to that of Ireland's framework, this is unsurprising given the close historical political and institutional links between the two.

contemporaneous conditions. Stimulating or constraining the economy in the short run and managing short-term developments in the public finances. On the other side, measures to lift long-term growth, ideologically motivated changes to fiscal policy, and efforts to consolidate chronic deficits can be seen to reflect long-term horizons.<sup>16</sup>

It is undeniable that the ability to enact certain reforms, introduce spending measures, and legislate for tax cuts is always a function of current macroeconomic conditions to some extent. However, identifying changes in fiscal policy using the narrative approach applied to Ministerial speeches provides us with what in the policymaker's mind is a change unrelated to the state of the economy and the public finances. If this series of spending shocks fulfils our orthogonality requirement, then we should theoretically be able to insert it for  $\Delta g_t$  in [2] and run a simple OLS that would return unbiased estimates of the relationship between government spending and output. This is the spirit in which I proceed in this research.

The process described above is designed to provide an accurately calculated series of exogenous spending shocks. However, given that I am interested in the impact of government funding entering the macroeconomy, it should follow that spending by policymakers other than on my series of expenditure shocks could have an additional effect on output. In this situation, the exogenous series of spending shocks could be capturing other flows of spending in the economy.

An obvious example of such a situation is one in which spending reacts contemporaneously to output and revenues, along with the series of spending shocks described previously:

$$\Delta g_t = \varphi \Delta y_t + \eta z_t + \varepsilon_t \quad [4]$$

As to whether  $\varphi = 0$  is essentially an empirical question (e.g., Blanchard and Perotti, 2002), but has some plausibility for being non-zero. The effect of

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<sup>16</sup>An important consideration for future research that seeks to explore the categories used in this paper in greater detail is that with a sufficiently long-term horizon, short-run endogenous measures could be seen by economic agents including bond markets as forward looking.

automatic stabilisers and where projected spending deviates from the eventual outturns are intuitive examples. Previous research (Perotti, 2002; Cloyne, 2013) has often augmented for the elasticity of revenues to output using instrumental variables approaches to estimate  $\varphi$  and  $\eta$  in [3].<sup>17</sup>

Other than taking decisions on the level of spending and where it is targeted in the economy, the other main lever of fiscal policy available to policymakers is that of taxation. As noted above, the Romer and Romer approach directly accounts for the possibility that tax/spending measures are endogenous by virtue of the extent to which they are designed to offset changes in the other. However, given [3], it is clear too that exogenous tax changes and overall revenue effects could impact on both spending and output contemporaneously.

### 3.3 Calculating spending shocks: Three approaches

Given these complexities, I estimate spending multipliers using three different measures of spending ‘shocks’ in the Irish economy. This section outlines each of these approaches in turn and illustrates the motivation behind them.

#### **Shock #1: The Romer and Romer approach – granular estimates of spending deviations**

The manner in which fiscal policy in Ireland has been conducted since the formation of the state lends itself quite well to these kinds of studies and this approach to calculating shocks. With little emphasis on medium-term planning and discretionary changes to spending usually kept secret until budget day, Finance Ministers in Ireland were allowed to be “Santa Claus” or “Judge Dredd” on Budget-day.<sup>18</sup> While this is not regarded as the optimal way to configure spending policies in an economy, it allows researchers a relatively seldomly seen opportunity to gather accurate measurements of discretionary

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<sup>17</sup> In this research, due to resource constraints, I control for the possibility that  $\varphi \neq 0$  by employing overall spending as a control variable. This in itself is not particularly straightforward in the Irish case due to a lack of data availability.

<sup>18</sup> Mentioned in Budget 1998 speech delivered by Minister for Finance Charlie McCreevy, 3 December 1997.

changes to government expenditure and the contemporaneous estimates of their costs.<sup>19</sup>

The process for extracting these 'shocks' through using the Romer and Romer/Cloyne approach transpires in the manner below for Ireland.

Estimates of the following year's spending levels in Ireland are typically released towards the end of the year and should provide a reasonable baseline for the level of spending required to maintain the levels of services and supports in the economy in the coming year. The Irish constitution requires these estimates be produced each year and they assume a 'no policy change' basis. In theory, these figures, known as the 'White Paper Estimates', should allow for measuring a neutral policy stance in the economy. If there are no spending adjustments to these levels, real rates and services should remain unchanged.

In reality, successive governments in the earlier years of this study for example typically worked from a post-White Paper baseline upon which budgetary decisions were layered. This entailed often only small revisions to the White Paper estimates, based predominantly on lower or higher outturns towards the end of the year. From this eventual outturn the White Paper could be adjusted up or down to more realistically reflect a neutral policy stance.

As is demonstrated below in this paper, spending shocks to this neutral stance are a common in occurrence over the sample period. Usefully, the area in which these shocks are concentrated, and their associated cost estimates, are provided in the annual budget day speech delivered by the Minister for Finance in the Oireachtas (Irish parliament). Incidentally, tax changes are also detailed in this document. From these releases, which are freely available on the website of the Oireachtas, I gather and sum each set of spending 'shocks' in every year from 1987-2019 as the additional budgetary measures taken that deviates overall spending from the levels contained in the White Paper estimates.<sup>20</sup> These documents provide useful details on the measures to be

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<sup>19</sup> By the same logic, it might be argued that such a short-term approach might also actually lead to spending 'shocks' which are in reality, predictable features of fiscal policy in the country.

<sup>20</sup> See the Appendix for an illustrative example.

taken, their expected costs, and the associated department to which the spending is accruing. The spending shock is provided in nominal terms in Irish pounds prior to 2001 when Ireland joined the single currency, I therefore convert these amounts at a fixed rate of £1 : €1.27, in line with Barbieri and Bewley (2022).

As can be seen below from Table 3.1 below, the breakdown of spending in each budget is typically dominated by costs associated with maintaining the existing levels of services, a figure which each annual set of White Paper estimates provides. These estimates are calculated based on the assumed costs arising from demographic and price pressures in the following year on a 'no policy change' basis.

Importantly, spending increases such as increases in the public sector wage bill are often layered on top of these estimates on budget day where there is no pre-existing agreement in place between unions and Government, while increases in social welfare payments such as pensions and unemployment assistance are determined by discretion on budget day.

The underlying assumption of this approach therefore is that with price, demographic, and other pressures accommodated by the spending levels outlined in the White Paper projections, the amount either added to or deducted from this can be conceptualised as the discretionary spending shock each year.

**Table 3.1: The composition of spending in Budget 2022**

€bn	
Summer Economic Statement (SES) Baseline	75.9
Add – Existing Levels of Services costs	1.6
Add – Pre-committed Capital increases	1.3
Add – Covid-19 expenditure	6.8
Add – Brexit Adjustment Reserve funding	0.5
White Paper	86.1
Add - Budgetary Measures	+1.45
Budget 2022	87.6

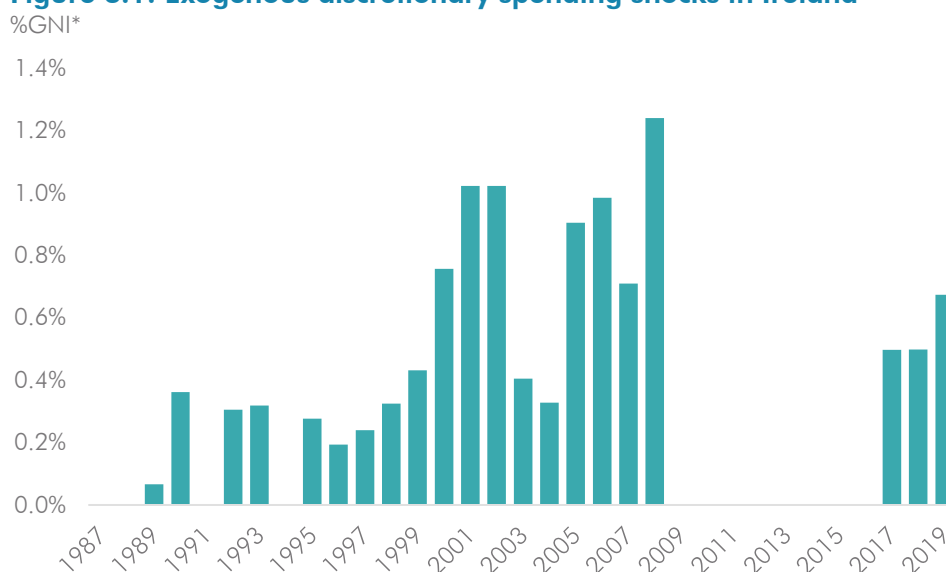
Source: Budget 2022

Following this and in line with Romer and Romer, Cloyne, and others, I use the same speech as the main tool to extract the motivation behind each change

and use these to classify the measure as either exogenous or endogenous. However, given the relative uniformity and ambiguity of budget speeches, I often relied on the Irish Times newspaper archives to supplement these releases.<sup>21</sup> I also consulted OECD Economic Surveys of Ireland, along with various books on the Irish economy and IMF Article IV reports. As described above, I classify each of the measures into one of the eight buckets discussed previously, four of which are considered endogenous: demand management, stimulus, deficit reduction, tax driven. The remaining four are classified as exogenous: long-run measures, ideological measures, deficit consolidation measures and externally enforced measures.

In total, I identify 21 instances in which a discretionary spending change was implemented that was deemed to be exogenous to current and prospective macroeconomic conditions at the time (Figure 3.1).<sup>22</sup>

**Figure 3.1: Exogenous discretionary spending shocks in Ireland**



Source: CSO and own workings.

Notes: Endogenously determined measures have been omitted.

While this approach is intuitive and accessible for both researchers and policymakers alike, it rests upon some ambitious assumptions and appears broadly less applicable to analysing spending changes relative to taxation. As one of the few studies I am aware of that attempts to use this approach in an

<sup>21</sup> While such uniformity is useful from a research design perspective, greater detail was often required to more accurately classify measures taken by policymakers.

<sup>22</sup> An illustrative example of this process is contained in the appendix.

expenditure framework, I provide a brief overview of the related challenges in the findings section of this paper for the benefit of future researchers.

## **Shock #2: Overall deviations in spending from White Paper estimates**

The second approach I employ to measure spending shocks is less granular than the first and departs somewhat from the generalised Romer and Romer line of inquiry. I retain the use of both budget day documentation and the White Paper estimates as a baseline and as a record to uncover discretionary changes in spending by governments. However, in this specification I simply use the overall deviation from the White Paper estimates as the total spending shock each year.<sup>23</sup> To do this I gather each year's White Paper estimate for  $t+1$  spending on a net current basis and calculate the overall difference between the post-budget spending level and this White Paper projection. While this loses some of the granularity associated with the department-by-department approach in line with Romer and Romer, it helps to ensure that spending shocks as presented in the aggregate numbers are more harmonised over time and are therefore less likely to suffer from being polluted in the same vein as departmental vote calculations, for example.<sup>24</sup>

The necessity for this method arrives from the variation in how government spending projections are presented over time. For example, in the earlier years of the sample, estimates for spending were typically presented in a basic tabular format with few supporting documents and only the Minister's speech for background. While other contemporaneous documents were produced, there is no record of these available online. Over time and influenced in part by Ireland's greater development and integration into European fiscal and economic policy frameworks, greater volumes of research, analysis, and detail were produced and released publicly by the Department of Finance. While a welcome development, the spending shocks extracted in the Romer and Romer

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<sup>23</sup> An example of the data used to calculate spending shocks using this approach is located in the appendix.

<sup>24</sup> Clearly, this approach does not attempt to overcome the endogeneity problem at the core of estimating a fiscal multiplier, but rather serves as a useful measurement of the total spending shock each year and therefore a benchmark against which the granular approach can be measured.

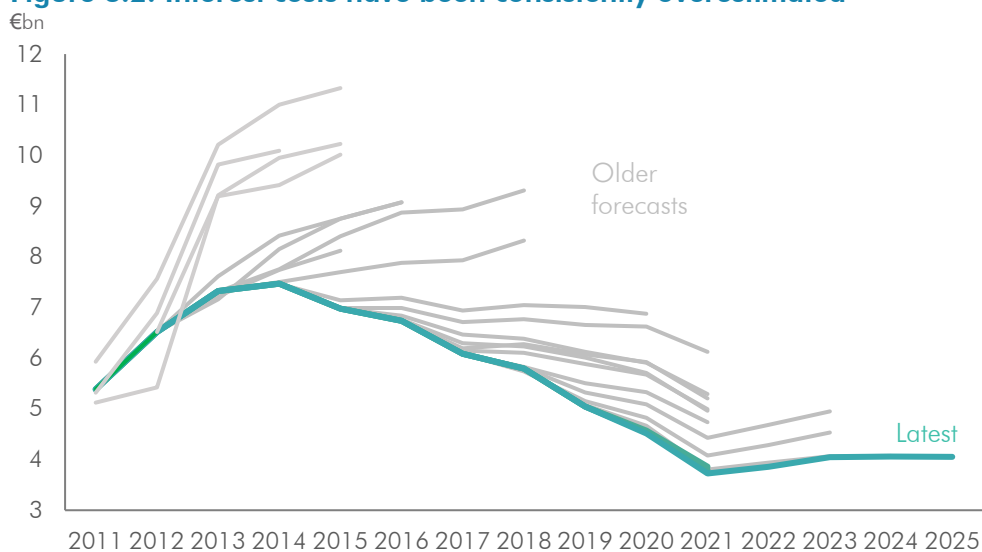
approach as detailed above became less relatable to the way in which spending provisions were detailed in later years.

For example, capital plans became more complicated as European cohesion funding entered the economy and multi-year plans began to overlap. This complicated mix of exchequer-only based capital spending, the overall public capital programme, gross and net exchequer-based capital spending, EU funded capital spending, and overall general government gross fixed capital formation has been presented in a number of different ways over time. To complicate matters further, extracting the shock component of these spending areas is made even more difficult by revisions to multi-year capital plans.

A good example of this is the government's current capital plan - a 10-year framework composed of fixed nominal spending allocations annually distributed. Revisions to this plan might include additional expenditure on budget day, or the allocation of funding to investment projects already identified as policy priorities but yet to receive specific spending allocations. Furthermore, just as in the case of current expenditure, higher-than-expected inflation would imply a lower real level of capital spending, implying that a spending increase 'shock' might often simply just keep volumes as expected in real terms.



**Figure 3.2: Interest costs have been consistently overestimated**



Source: Irish Fiscal Advisory Council

On the current spending side, government plans here also have been subject to strong revisions, unrealistic baseline projections and opaque adjustments. As can be seen in Figure 3.2 and Figure 3.3, spending forecasts were often made on the basis of fixed nominal spending assumptions, implying some combination of unrealistic projections or planned real cuts in supports and services.<sup>25</sup> Interest cost vintages also illustrate the persistent deviations between projections of spending and outturns.

Additionally, in certain years idiosyncratic changes to how spending and tax measures were classified led to considerable year-on-year distortions in spending projections. A clear example of this was the government Health Levy, which at one stage, as a spend by households on public health services, qualified as a 'receipt' to the Department of Health. This therefore acted to reduce net expenditure by the Department as it could be offset against gross voted spending. When the levy was replaced by the Universal Social Charge in 2011, which acted as general taxation, it served to increase net current expenditure by the Department of Health. This took place in the context of government policy implementing a nominal year-on-year reduction in spending on health.

<sup>25</sup> This study is current with current primary expenditure shocks, interest cost vintages as shown in Figure 3.2 are illustrative in nature and are not included in the 'shock' measurements employed in this paper.

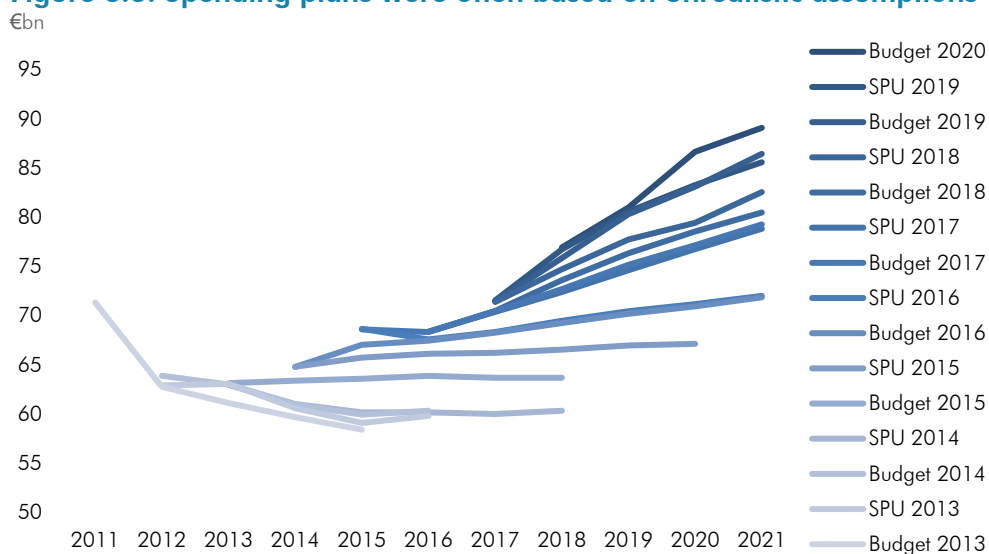
Related to this, spending announcements by various Ministers, and the associated budget day documentation pertaining to these measures often present, for example, welfare increases on both a gross and net basis. An example of this might be where the cost of a newly introduced scheme implemented by the Department of Social Protection is presented in gross terms (where a certain portion of funding is drawn from already available resources), while only the net measure illustrates the amount of 'new' spending in the economy.

The treatment of taxes more generally also presented something of a problem when attempting to establish the change in spending relative to the neutral baseline. For example, the earlier years of the sample saw pay related social insurance (PRSI), which is a contribution made by employers and employees to the Social Insurance Fund (where social security benefits are drawn from), treated as a tax expenditure measure where changes were made. These changes entered positively or negatively on the spending side of the government balance equation, a practice which has no comparison with contemporary presentations of the public finances.

Taken together, these factors often led to a degree of uncertainty in evaluating governmental spending plans and particularly the extent to which the details contained in Ministerial speeches accurately reflected changes in spending that would represent meaningful impacts on the economy or deviations from previous plans or a neutral stance. It also casts doubt on how reliable presentations of the public finances are over time in Ireland, with this especially acute in relation to the spending 'shock' element of fiscal policy.

This cursory analysis itself illustrates a number of important policy implications from both research and public service perspectives. It is clear that the presentation of the public finances, particularly as it relates to expenditure should follow a pre-defined framework from which reliable measures of spending and discretionary changes in policy can be observed. Capital expenditure and non-exchequer spending requires greater scrutiny, while the overall bulk of the analysis should move towards a general government basis, in line with the EU fiscal rules and other member state practices.

**Figure 3.3: Spending plans were often based on unrealistic assumptions**



Source: Irish Fiscal Advisory Council

These issues are also reflected in the way in which capital spending shocks are estimated in this paper. Given the relatively scant amount of information available on capital spending changes relative to plans in the earlier years of this sample, I rely on the overall changes outlined relative to plans in the speeches of the Minister in earlier years. Later in the sample as the volume of publications increased, I continue this method to allow for a harmonised approach. While this does not allow me to pinpoint with the same accuracy the areas in which spending shocks to capital are targeted, it allows at least for a consistent estimation throughout the sample. I use this shock measure of capital as a share of GNI\* in all three specifications. This series of capital shocks is added to each measurement of the current expenditure shock in each year to calculate the total spending shock in each year.<sup>26</sup>

### **Shock #3: When spending growth deviates from potential output growth**

The final approach that I use to capture spending shocks in the Irish economy is again further from the methodology used by Romer and Romer. It is motivated by the concerns I have detailed above, while it also serves as a more generalised framework for thinking about how government spending evolves in the economy. This final approach considers both the fact that spending shocks in an economy reflect fundamentally different priorities than

<sup>26</sup> In some earlier years of the sample, it is not possible to ascertain the change in capital expenditure relative to plans, so the annual changes are used.

those on the revenue side, and that the period in which this sample is drawn from was one of volatile growth for Ireland. This has important implications for conceptualising spending shocks in the economy.

Regarding the latter - the broad factors that led to Ireland's 'accelerated convergence' path towards a services exporting, investment driven advanced economy in Europe are well known. Demographic developments, strong external demand, increased labour force participation with higher levels of human capital all contributed to this ascent. These factors meant that while revenues were growing strongly through higher output in the economy [5], spending growth was relatively less burdensome in areas like pensions payments, welfare, and on interest through subdued inflation, high productivity gains, and growth in factor inputs [6].<sup>27</sup>

$$T_{t+1} = T_t + (\Delta f(GOS, W, \pi, etc)) \quad [5]$$

$$\Delta T = \Delta GNI^*$$

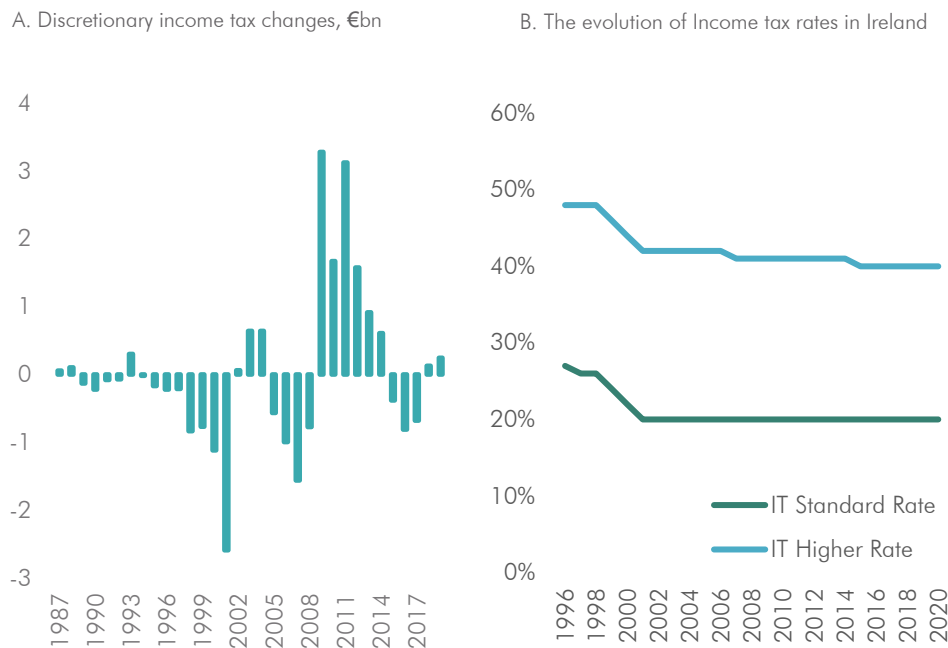
$$\Delta G_t = \Delta f(N, W, \pi, etc) \quad [6]$$

This growth dividend allowed for taxes to be steadily cut while the real level of services increased (Figures 3.4 and 3.5). On one hand therefore, both revenue and spending shocks were persistent features of fiscal policy in Ireland over the sample period, but on the other were effectively dwarfed by generalised increases in the size of the economy. While spending increased and taxes were cut, revenue buoyancy ensured that the headline budget balance remained favourable.

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<sup>27</sup> GOS refers to gross operating surplus, W to wages,  $\pi$  represents inflation, N represents the labour force numbers.

**Figure 3.4: Revenue shocks were comprised of reduced rates and foregone taxes**



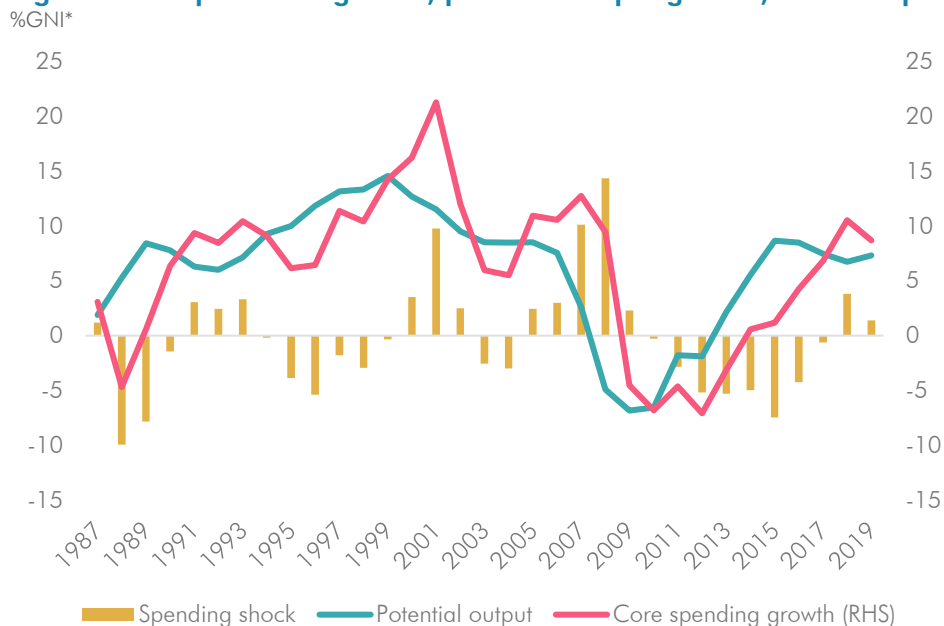
Source: Conroy (2020) and Department of Finance.

Such developments, coupled with the fact that the majority of discretionary budgetary spending decisions in Ireland over the sample relate to real social welfare increases, would yield a series of spending shocks that are seemingly exogenous in nature if applying a blunt application of the Romer and Romer approach. Yet as noted, even a graphical overview of spending and output trends indicate procyclicality in discretionary expenditure shocks. While spending has almost never fulfilled the Romer and Romer classification of endogenous as being designed to ‘offset growth moving away from normal’, it has very clearly been a function of the business cycle in Ireland.<sup>28</sup>

I attempt to navigate this challenge with a final calculation of spending shocks in Ireland as the difference in the change in non-interest, non-social protection spending relative to potential output (Figure 3.5).

<sup>28</sup> In reality, fiscal policy in Ireland has historically been more procyclical in nature (e.g., Cronin and McQuinn, 2018).

**Figure 3.5: Expenditure growth, potential output growth, and the spending shock**



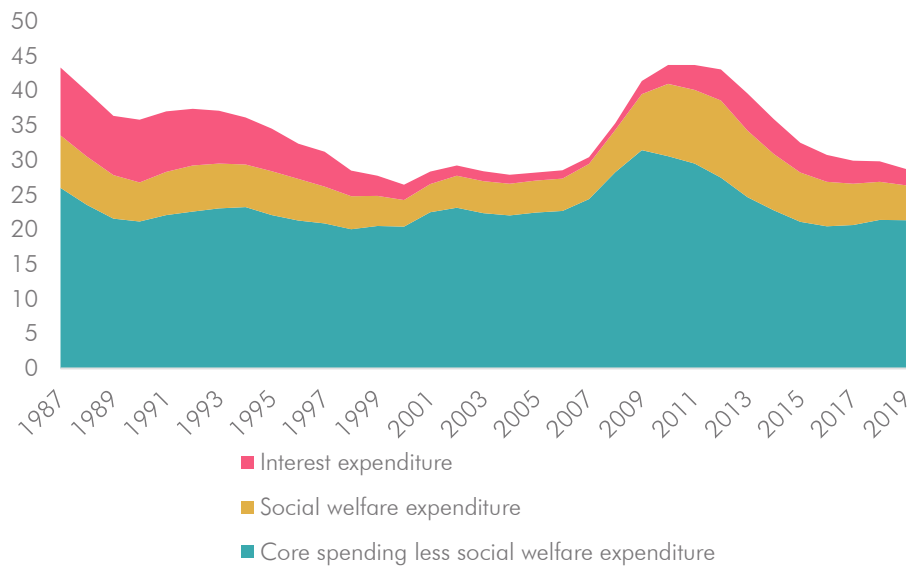
Source: Department of Finance, CSO, Irish Fiscal Advisory Council, and own workings.  
 Notes: Core spending is defined as current primary expenditure less temporary spending measures such as funding for Covid-19 contingencies, Brexit adjustment costs, and other one-offs.

The intuition behind this approach is that it is in line with how expenditure policy in the country evolves more generally. For example, the government’s current spending rule for core expenditure (which excludes one-off measures and non-voted spends such as interest) is based on growing spending in line with a 5% annual increase. This amount is estimated to be the nominal growth in potential output for Ireland based on recent data by the Department of Finance. While it does not constitute a perfect estimation of a neutral policy for each year, it speaks more generally to a policy-based spending baseline in the state. By taking the difference between potential output and core spending growth, the ‘shock’ is broadly consistent with spending being above or below trend. To accommodate for the large swathes of funds typically made available on budget day to maintain existing levels of services, expenditure on social protection is excluded from this measurement of the spending shock. This helps to further isolate the spending shock and attempts to remove the impact of cyclical factors on spending.<sup>29</sup>

<sup>29</sup> As seen in Figure 3.6, expenditure on social protection has fluctuated considerably a share of national income over the sample period, while it has also contributed to spending revisions where the projected costs of automatic stabilisers deviated from outturns.

**Figure 3.6: Disaggregated current spending in Ireland**

%GNI\*



Source: Department of Finance, Irish Fiscal Advisory Council and own workings.

## 4. Findings

### 4.1 Descriptive statistics and overview of spending shocks in Ireland

I first provide a brief outline of my findings regarding the regularity, magnitude, and subjects of discretionary changes to spending policy from 1987-2019. I turn first to the size and regularity of these changes.

A persistent feature of budgetary policy in Ireland over the sample period is the consistency of spending shocks. Using all three calculations of non-neutral spending, there are few years in which spending was not above or below what would be implied to maintain spending at a constant level. Strikingly, this is true both in terms of holding spending constant as a share of national income, or where spending simply tracks the level required to maintain existing levels of services at their budget time level. As can be seen in the appendix, the total range of spending shocks when aggregating the summary statistics from all three measures of spending, has moved from cuts of around 4% of GNI\* to increases to the value of around 3%.<sup>30</sup>

Figure 4.1 displays the cyclical nature of these shocks when calculated using the Romer and Romer approach, with a clear relationship between the direction and size of spending shocks and the point in the cycle for the economy – positive spending shocks have typically taken place during periods of expansion, while resources have been plentiful, and cuts have taken place during contractions and when capacity is underutilised.<sup>31</sup> This in itself shows that policy has typically followed growth rates, where a neutral policy would simply have held spending at its baseline levels.<sup>32</sup>

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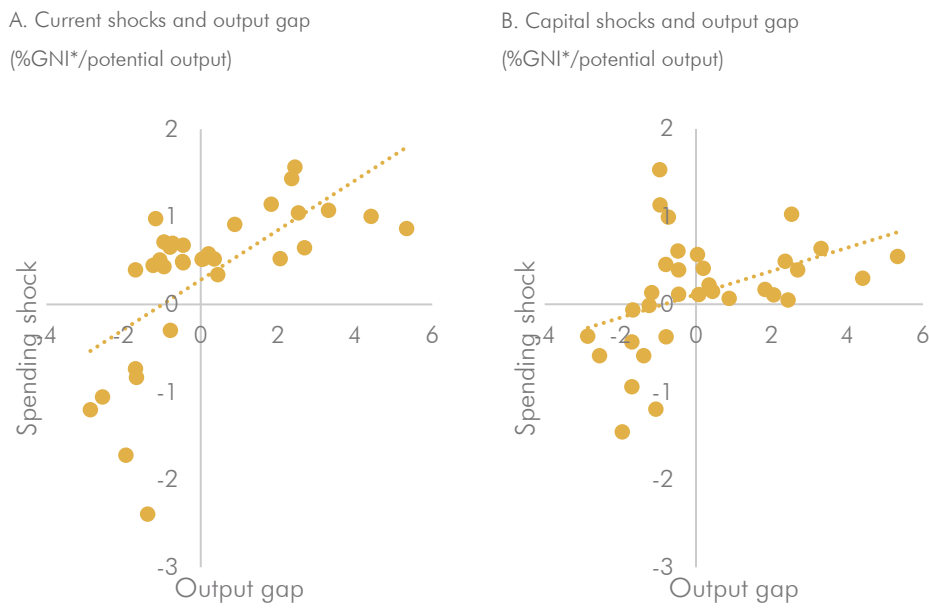
<sup>30</sup> Calculations using the potential output approach are far wider (see Appendix).

<sup>31</sup> Procyclicality of capital spending would be greater not for large injections of EU cohesion funding throughout the sample period.

<sup>32</sup> This poses particular problems for the Romer and Romer approach in classifying exogenous shocks, a feature I return to later.



**Figure 4.1: Spending shocks have been procyclical**



Source: CSO, Irish Fiscal Advisory Council and own workings.

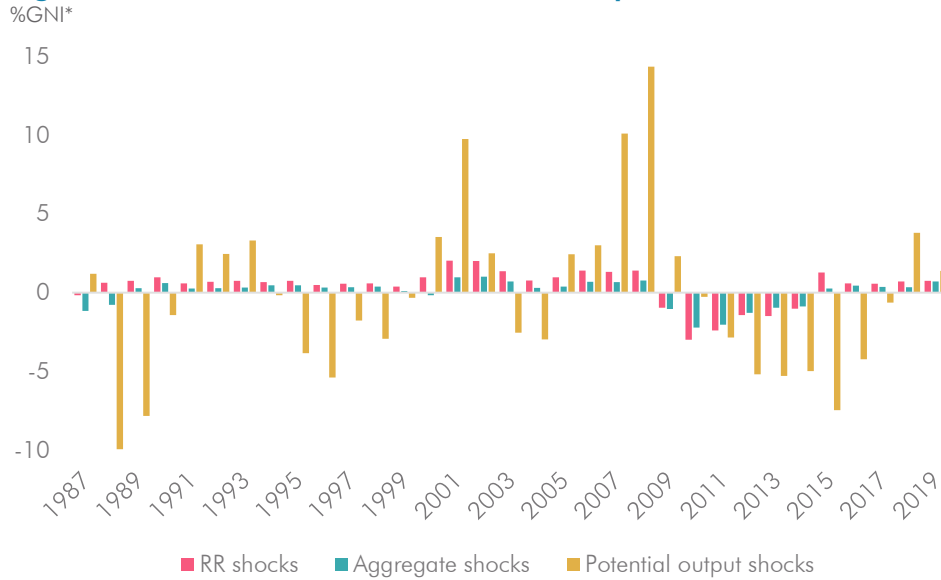
Notes: Panel A displays spending shocks using the Romer and Romer approach of building total spending shocks as a share of national income from individual policy spending decisions (in this case by summing up Departmental spending shocks). Both panels include spending shocks classified as both endogenous and exogenous.

The size of these packages has not been inconsequential. For context, a spending shock of around 3% of national income would equate to around €9.6 billion in cash terms today.<sup>33</sup> This is equivalent to almost 90% of the entire budgetary package of spending and taxation in Budget 2023.

Endogenous cuts possess a wider range on average, and often have fallen during the contractionary budgets enacted after the great recession. Spending shocks are smaller on average when using both the aggregate spending deviations and potential output deviations measurements but demonstrate considerable variation over time (Figure 4.2).

<sup>33</sup> Using current price GNI\* for 2021.

**Figure 4.2 Three measurements of current expenditure shocks**



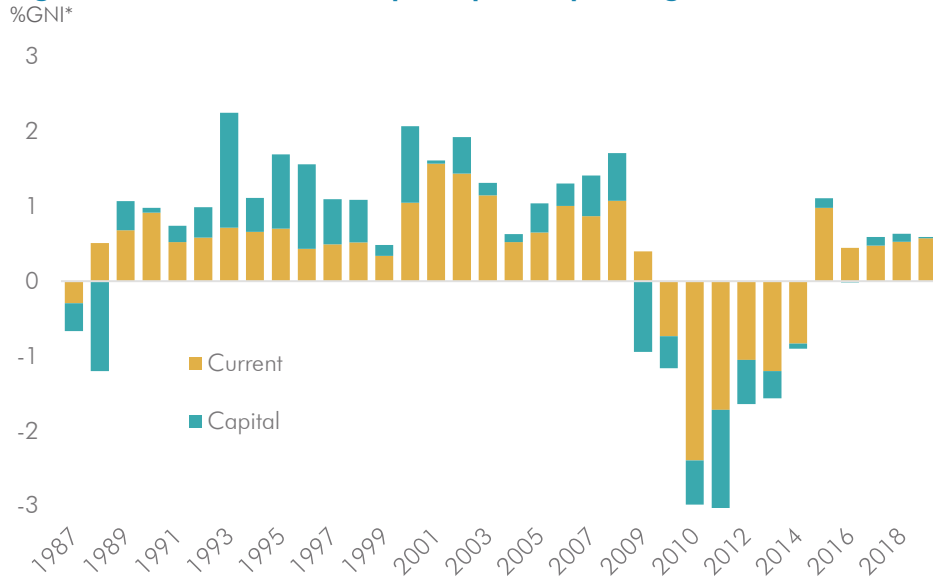
Source: CSO, Department of Finance, and own workings.

Note: This figure displays shocks categorised as both endogenous and exogenous in the “RR shocks” series I have generated.

The areas in which these spending shocks are concentrated offers some important insights into fiscal policy in Ireland over this period and has significant implications for researchers interested in estimating fiscal multipliers for Ireland. Figure 4.3 displays where discretionary spending amounts have been allocated each year since 1987 in terms of current and capital spending, while Figure 4.4 shows the breakdown for current spending by department.<sup>34</sup>

<sup>34</sup> The labelling of departments is not consistent with current government department remits as these have changed several times over the course of the sample period (e.g., Department of Health and Children to Department of Health).

**Figure 4.3: The Current / Capital split of spending shocks**

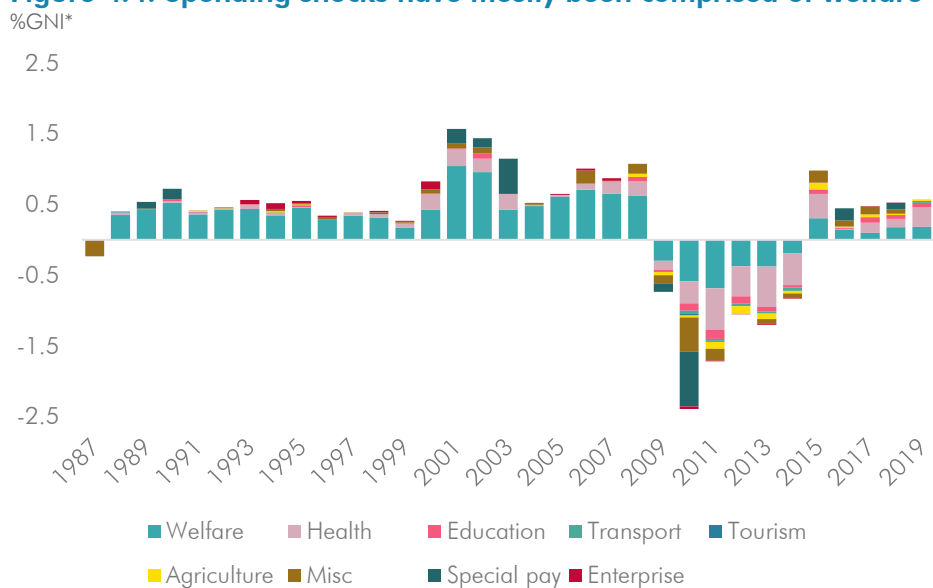


Source: CSO, Department of Finance, and own workings.

Notes: As in Figure 4.1, each spending shock displayed above is calculated granularly using the Romer and Romer approach, with all exogenous and endogenously classified shocks displayed here.

In terms of the size of shocks, discretionary changes to current spending dominate the budgetary decisions made over this period. On one hand, this is not surprising given the relative shares for current and capital spending of total expenditure in any given year. However, this also demonstrates that rather than being in line with orthodox stabilisation policies, both current and capital likely fuelled expansions in good times and further dampened economic growth in bad times.

**Figure 4.4: Spending shocks have mostly been comprised of welfare increases**



Source: CSO, Department of Finance, and own workings.

As Figure 4.4 shows, the overwhelming majority of current spending shocks, both in terms of the sheer number of these changes and also their magnitude has been concentrated in the areas of welfare and health to a lesser extent.<sup>35</sup> On average, improvements to the welfare system represented around 58% of the total budgetary package ‘shock’ in each year, with this Figure around 71% in the pre-crisis period. The second largest component of each shock has typically been the Department of health, which has been the subject of around 17% of each shock in the annual budget.

This is somewhat out of line with the overall allocations these departments hold as part of total gross voted spending in Budget 2023 for example. Expenditure on Social Protection represents the largest vote in government, while health is the second largest but with both holding similar shares of overall core current spending at around 30%.

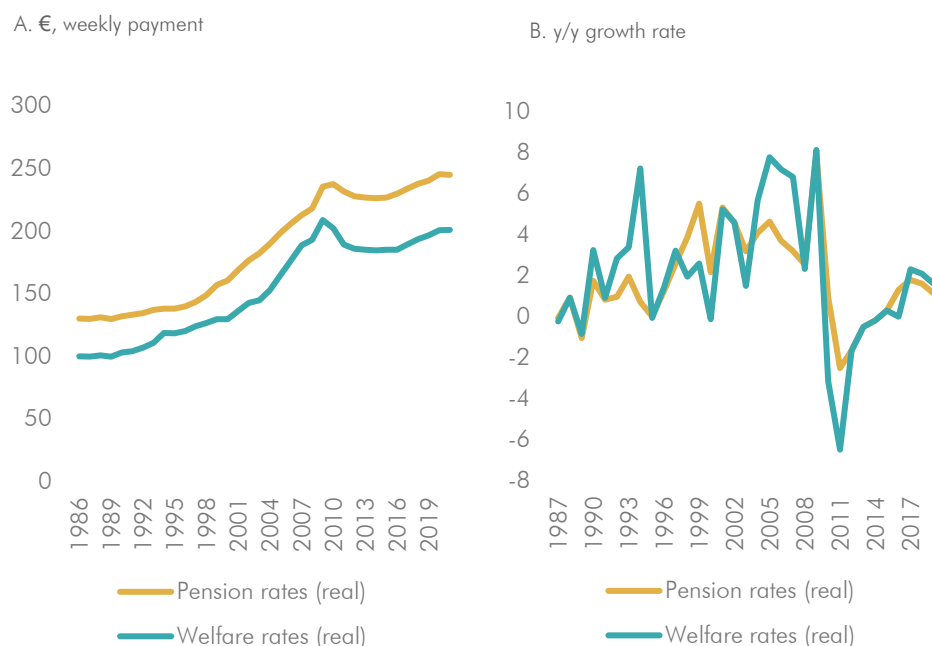
To illustrate where these welfare expansions have been implemented, I complemented these findings by reviewing publications from the Department of Social Protection. From these I gather the weekly rates of payments for pensions and jobseeker’s allowances. These highlight the expansions made to the welfare system over the sample period, where the real rates for pensions and welfare were around 94% higher on average in 2019 than 1987 (Figure 4.5). By consulting these kinds of publications, the presence of persistent, real spending shocks in areas such as welfare can be observed. Such documentation could also prove beneficial to future researchers helping to facilitate an estimation of the neutral cost of simply matching inflation would have been.<sup>36</sup>

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<sup>35</sup> Certain improvements to welfare supports and services have been reduced costs and the extension of grants for health services.

<sup>36</sup> A type of ‘stand-still’ analysis could be extended backwards by future researchers in line with the methodology employed by Fiscal Council (2018) for example.

**Figure 4.5: Spending shocks consistently raised real rates of services and supports**



Source: CSO, Department of Social Protection, and own workings.

From the perspective of accurately measuring the fiscal multiplier, future research that models the expenditure multiplier should take account of the concentration of shocks in welfare. This is important from both an anticipatory perspective for both firms and households, and also for researchers that are concerned with measuring spending shocks accurately in the absence of a fully indexed welfare system. For example, if an automatic indexation of the welfare system seen in many countries was in place in Ireland, a large sum of the spending shock each year that I have gathered would simply be eliminated.<sup>37</sup>

## 4.2 Empirical Findings on fiscal multipliers

Overall, I find limited evidence of a statistically significant effect of the fiscal shocks I have measured on output growth in Ireland over the sample period. Furthermore, I also find limited evidence of a comprehensive substantive effect of the fiscal shocks on output – the coefficients are typically small and oscillate between positive and negative. One of the curious findings in this respect is that both exogenous and endogenous forms of spending shocks return

<sup>37</sup> On the other hand, simply omitting or controlling for this element in a regression risks removing a large aspect of the discretionary spending shock itself.

relatively little statistical significance over the four-period horizon using the local projections method.

This is seen by the lack of significance with respect to spending shocks generated under the narrative method and the aggregate shock method for three of the four time horizons (Table 4.1), and under all horizons for the potential output growth method. For almost all estimations, none of these measurements are statistically significant at the 5% or 1% level at any horizon. There is also limited evidence of any clear, substantive effect.

The only exceptions to these findings come from two results. First, the contemporaneous multiplier effect of the Romer and Romer approach to calculating shocks. Under this specification, the fiscal shock demonstrates a positive and statistically significant effect at the 5% level on output, with this losing significance in the following period. Second, the overall spending deviation from White Paper estimates levels is significant at the fourth time period ahead. However, given the sign on the returned coefficient is negative, this finding should be treated with caution.

**Table 4.1: Summary of output responses to spending shocks**Coefficients at each time horizon:  $t - t+3$ 

	(t)	(t+1)	(t+2)	(t+3)
RR shocks	0.62** (.14)	-1.81 (1.36)	5.17 (8.65)	1.84 (6.43)
Aggregate shocks	-0.46 (.36)	-1.33 (.81)	-1.70* (.97)	-2.37** (.99)
Potential output shocks	-0.066 (.08)	-0.26 (.21)	-0.046 (.29)	0.31 (.41)

Notes: Robust standard errors in parenthesis. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

In many specifications, the impact of the spending shock is largely overwhelmed by the statistical and substantive significance of the other variables in the estimation, particularly expected growth, which is likely to be correlated with actual growth, and the output gap, which addresses the procyclicality of the spending shocks. While the results still point to positive multiplier effects, they can be driven by negative coefficients on both the output and balance side, where the numerator remains stronger. This essentially would indicate that positive spending shocks lead to both growth and the government balance falling.<sup>38</sup> Furthermore, given the statistical insignificance of the spending shock across most estimations, these should be treated simply as guides in respect of the way in which shocks are measured and how these feed into the magnitude of the multiplier.

The magnitude of the multipliers varies widely, peaking at around 6 under the narrative approach, 0.8 under the aggregate deviations from White Paper approach, and 2.5 under the spending-potential output growth differential (Figure 4.5).

Most notably, the contemporaneous multiplier effect for the narrative approach is the only one which proves statistically significant, with a multiplier of 1.7. While the number of observations used in this approach is lower than for the aggregate shock or potential output shock measures, the multiplier is somewhat intuitive. Recall that the very nature of the Romer and Romer approach for example is to remove instances where the business cycle is a key determinant of policymakers deciding to increase or decrease spending. As

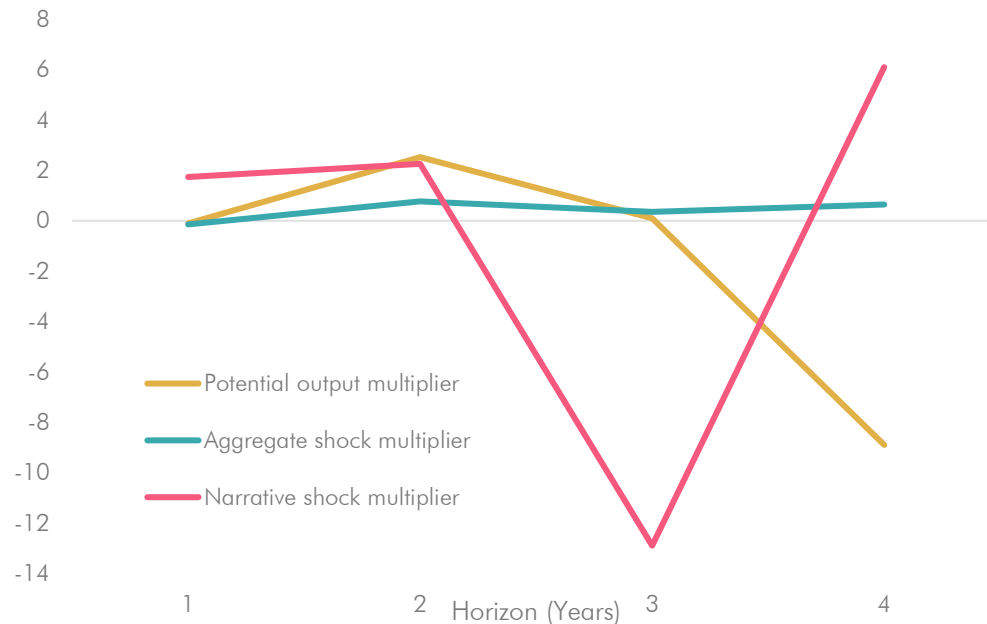
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<sup>38</sup> See the Appendix for the full set of output tables and associated impulse responses.

described earlier, this should therefore in theory reduce observations where the multiplier could be strongest.

**Figure 4.5: Comparing the multipliers over time**

Scaled multiplier



Note: This chart displays the results of the multiplier derived from each shock measurement over a four-period horizon when scaled as described in the methodology section.

While the way in which the shocks have been measured represents an advance, by using the full sample of shocks I am still capturing shocks that occur during times of rapid expansion and severe contraction within the economy and the public finances. These confounding factors will require further attention in future research.

These concerns are not assuaged by the negative relationship returned between spending shocks and both output growth and the budget balance. It is of course conceivable that during times of pronounced uncertainty in the economy, increases in spending could result in further deteriorations in confidence from firms and households, damaging growth even more. However, this would be broadly inconsistent with both previous literature and intuition regarding the pattern in which spending shocks have occurred in Ireland (see Figure 3.1).

The statistical significance returned under the narrative approach estimation provides some promise for future research that seeks to explore this avenue in



greater detail. Given the relatively small sample size, a natural way to advance this study would be simply to increase the sample size by following on with the methodology employed in this paper, and also to focus on a way in which quarterly data could be integrated. While annual data allows to offset any uncertainty around the timing effects of spending shocks, it means that the year-on-year changes as in the local projections method are capturing broad swings in the economy.

### 4.3 Findings on the Romer and Romer approach in the Irish context

This section is intended to describe some of the findings with respect to undertaking the narrative approach to measuring spending shocks in the Irish economy. Given the scant volume of research on this topic, this is intended to benefit future researchers that may wish to build upon this approach. The findings are likely to be applicable to other countries that follow similar budgetary processes and systems of accounting.

A first concern is the extent to which the Romer and Romer approach accurately measures spending shocks at all. In the Irish case, it is unclear whether the White Paper spending estimates fully reflect the costs of maintaining existing levels of services.<sup>39</sup> While more recent budgetary documents have provided greater detail on the expected costs for meeting pressures such as deteriorating demographics, earlier documents contain very little information in this regard. For example, public sector pay deals, which are negotiated between unions and the government have been costed in the past on either a no-policy-change basis (no allocation for the following year where a deal is not in place) or with a technical assumption that is unlikely to be realised. This artificially suppresses the level of expected spending in the economy in the following year and would overestimate the spending shock.

It is also unclear how price pressures enter into these forecasts. This problem is particularly acute in areas such as health spending, where inflation in the sector has greatly outpaced price generalised price increases in the economy

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<sup>39</sup> As discussed, a form of discretionary, quasi-indexation has been adopted over most of the sample period in areas such as social welfare payments. Even excluding this fact however, there are relatively few details available on how White Paper estimates have compared historically to required spending on Existing Levels of Services.

over recent years (see Casey and Carroll, 2021 for example). Underestimation of these amounts leads to overestimation the extent of the spending shock expected, while also presenting more difficult questions about how to conceptualise nominal spending shocks when inflation is running high. While I do attempt to account for these possibilities by controlling for expected inflation in the following year at the time of the budget release, the differential nature of price increases across the economy means that a more comprehensive approach to this problem may be required in future research.

These problems are particularly acute in the earlier years of this study and when surveying budget day documentation more generally. It is expected that politicians will seek to portray the allocations being made to each sector of society to be as large a number as possible, but this tells us little about how much of a real increase each beneficiary receives. In some earlier years (prior to the sample period of this study), there are no full White Paper estimate documents provided in the budget day releases, while in later years these required considerable time to locate. This problem is clear in some of the most prominent literature on this topic. For example, Alesina *et al.* (2019) appear to have encountered these difficulties – an examination of their background data for Ireland shows spending cuts in 1987 as relative to the OECD’s ‘constant services’ estimate, while the 1988 cut is simply the year-on-year nominal spending difference. This mixing of approaches serves to either underestimate the extent of the cut in 1988 or overestimate those taken in 1987, and illustrates the broader challenges around data collection in this area.

Similarly, as mentioned, the majority of spending shocks in Ireland over the sample period are related to the uprating of welfare payments such as jobseeker’s benefits and pensions payments. From a Ricardian perspective, there is likely to be an anticipatory effect from households where real increases in welfare and social protection rates are consistently seen annually. Alesina *et al.* (2019) for example formalise this idea and write the budgetary process as something akin to:

$$e_{t,t+j}^a = \varphi e_t^u + \eta_j \quad [7]$$

Where announced changes in spending or taxation are a function of unexpected announcements  $\varphi e_t^u$  and an idiosyncratic parameter that relates to how the budgetary process is conducted in the state, for example previous announcements. From a purely technical perspective however, the majority of these shocks are simply inflation-matching spending increases rather than net injections into the economy. The absence of automatic indexation of state pensions and welfare payments means that the government has total flexibility as to where it wishes to set the real rate for these services in the following year, conditional on expected inflation. This also means that the White Paper estimates still do not contain any expected costs for increases in these provisions.

This approach in its current form also says very little about how unexpected deviations from post-budget spending plans, spending in non-exchequer areas, and one-off measures taken during the period between budgets impact the economy. For example, as Figure 3.3 shows, spending projections were consistently exceeded every year in Ireland after 2014, with these overruns of a similar magnitude to the pre-crisis period. Breaking these 'soft ceilings' served both as extra spending entering the economy, while also casting doubt on the reliability of overall spending plans and the costing of budget day spending measures. Relatedly, non-exchequer spending, which involves funding in areas such as universities, semi-state bodies such as the ESB, and approved housing bodies, is traditionally more opaque than the exchequer based White Paper and budget day spending shock areas of government expenditure. With limited data availability in these areas, it is difficult to fully control for expected spending in the economy overall in this kind of research.

Finally, an overview of spending projections in recent years shows that certain government spending, such as capital expenditure and as noted, non-voted expenditure in areas such as interest repayments has been subject to persistent underspends (Figure 3.2). This has often meant that in the area of capital spending for example, underspends from one year are carried over into the next, with additional budget day funds or new capital plans layering extra spending on top of these residual allocations. This means that both the overall level of spending, and the spending 'shock' from budget day can be distorted.

#### 4.4 Testing the reliability of judgement calls

Turning to the predictability of spending shocks. I test whether a particular spending announcement was in fact unrelated to the economic conditions at the time in an empirical sense. This is performed by employing a basic ordered probit regression that regresses the occurrence of a spending shock on the set of control variables described above in my main specifications. This approach is standard in related literature on the topic, and while it cannot fully test for the contemporaneous exogeneity of the spending shock, it serves to estimate the predictability of a shock on past information. I perform this test of exogeneity for all three shocks.

One of the contributions I make in this respect is the use of a series of expected inflation and output growth by governments in  $t + 1$  from budget day documentation. The intuition behind including these variables is straightforward. With spending for the following year specified in nominal terms, the expected strength of price increases will serve to dictate where the real level of spending is set given a nominal budget. Similarly, by accounting for how policymakers expect output to evolve in the economy, we can control for the expected 'growth' dividend that relates to the spending shock.

Given the relatively small sample size in this study, it is difficult to draw strong inferences from tests of exogeneity on the series of shocks calculated by the Romer and Romer approach. I therefore test whether the size of the spending shock is forecastable based on a range of standard macroeconomic outturns and the series of expectations described earlier.

$$z_t = \alpha_t + E_{t-1}[Y_t] + E_{t-1}[\pi_t] + f(\cdot)_{t-1} \quad [8]$$

Here,  $z_t$  is the series of spending shocks,  $E_{t-1}[Y_t]$  is the expected growth of the economy in the year of the budget's implementation (usually the following year),  $E_{t-1}[\pi_t]$  captures expected inflation as projected by the government for the following year in the budget, and  $f(\cdot)_{t-1}$  represents the set of macroeconomic conditions discussed in [1]. I order the probit model between

-1 and 1 according to whether  $z_t$  is negative (spending cuts), neutral, or 1, where the shock is positive (increases in spending).<sup>40</sup>

I find that two of the three measurements of spending shocks are forecastable on the basis of the variables I have outlined. Both the aggregate approach to calculating shocks as deviations from White Paper estimates, and those related to expenditure growth differences from potential output are predictable. Exogenously classified spending shocks have no statistically significant relationship with the regressors I have outlined. The extent of the relationship between the variables is not as strong as one might expect, with only the output gap in one specification showing significance at the 1% level. Most variables are insignificant at any conventional level. While these tests generally represent curious findings for this research, they are largely promising for future studies and particularly those that would wish to extend the sample used in this paper by employing the narrative approach.

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<sup>40</sup> I judge that a shock worth less than 0.5% of GNI\* is balanced, and therefore enters as a 0 in the ordinal specification.

## 5. Conclusions

Accurately measuring fiscal multipliers is of crucial macroeconomic importance but is notoriously difficult. Problems of endogeneity have plagued reliable estimation in the area and led to a lack of consensus amongst researchers as to the extent, direction and magnitude of the impact that discretionary changes to spending and taxation have on the economy.

The narrative approach to uncovering fiscal shocks has offered scholars in this area a new and exciting avenue of research to explore in recent years. Most of the studies that have employed this approach have focussed on the taxation lever in large economies such as the US and UK, with little work having been produced on the effect of spending changes in small open economies.

I argue that Ireland's short-term fiscal focus and budget production process allows the country to serve as an ideal case study in which spending multipliers can be measured and their impacts estimated.

I generate a new dataset that measures current and capital government spending shocks in Ireland in three ways over the period 1987 to 2019. I gather the first set of spending shocks to my knowledge for Ireland that employs the narrative approach to classify discretionary spending changes above or below a 'neutral' policy.

To do this, I consult budget day documentation, primarily the budget speech delivered in the Dáil, to gather information on the size and motivation of spending shocks. I then proceed to classify, based on judgement, whether a move is motivated by current or prospective macroeconomic conditions. I complement this with a new series that logs at the time of the budget, the expectations of government around growth and inflation in the following year.

One of the key findings of my study is that, in contrast to the taxation side, the narrative approach is very difficult to perform for changes in expenditure. Government accounting practices, shifts in how the public finances are presented in budget day documents, and the relative uniformity of spending

'motivations' discussed by Ministers makes both measurement and classification of spending shocks challenging.

The second key finding I present is that while spending shocks are often of considerable size and regularity, they largely prove statistically insignificant in terms of their impact on output. The most notable exception to this is contemporaneous spending shocks using the narrative approach. These exogenous shocks are also shown to be unrelated to a range of macroeconomic variables that test whether they are forecastable. Collectively, these findings indicate promise for future researchers interested in further developing this approach to measuring fiscal multipliers.

Finally, I detail a broad range of other improvements that could be made to this study regarding both data collection and estimation of spending shocks, with ample scope for future research to draw upon some of the findings made in this paper.

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## Appendix

### An illustrative example of classifying spending measures

As discussed in the body of this paper, the majority of spending shocks in Ireland over the sample period have typically been concentrated in the area of welfare spending. This serves as a useful illustration of an area in which ideology rather than economic management has been the driving factor behind changes. I use policymaker's narratives at the time of the budget to classify these shocks typically as being in line with ideological motivations:<sup>41</sup>

"The government have a strong commitment to the poor and the disadvantaged in this country. This budget, like our last three, continues to give effect to that caring philosophy... This (above inflation increase) is in line with the basic pay increase for the first year of the programme, and ensures a fair deal for those dependent on welfare payments" – Albert Reynolds, 30th Jan 1991

Other observations that do not classify as exogenous are often clearly describing as being a function of current macroeconomic conditions:

"In the prevailing economic circumstances the natural preference should be to leave expenditure and taxation as they stand. This is not an option for this government or this House because of the scale of the deterioration of the public finances." – Brian Lenihan, 7th April 2009

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<sup>41</sup> The full set of justifications used and budget speeches are available upon request (see also the accompanying data spreadsheet).

## Measuring spending shocks: Aggregate deviations from the White Paper estimates

The table below provides a typical example of the way in which the budget day documents present the overall level of spending to be undertaken in the next year as part of the new budgetary package. One of the measurements of the spending shock that I use takes the difference between the White Paper estimates on a net voted current expenditure basis and the following year's budgetary level.<sup>42</sup> In the case below the 'shock' would therefore be  $43,375 - 42,690 = 685$ . I repeat this process throughout the sample period.

**Table A1: Budget 2018 Deviations from the White Paper Estimates**

€bn

	White Paper	Budget 2018
<b>Current expenditure</b>		
Net voted current expenditure	42,690	43,375
Non-voted current expenditure	9,705	9,695
Net current expenditure	52,395	53,070

Source: Budget 2018

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<sup>42</sup> Gross voted estimates of expenditure shocks are not provided for earlier years of the sample.

## Measuring spending shocks: Granular deviations from the White Paper estimates

The table below provides another example of the way in which the budget day documents present the overall level of spending to be undertaken in the next year as part of the new budgetary package. I use this table to sum the measures that add or subtract to the White Paper estimates. Below for example I would add:

$8+3+2+1+4+2+0.5=20.5$ . I repeat this process throughout the sample period.

**Table A2: Budget 1992: Granular spending additions to White Paper estimates**

£m				6
3. Deduct:		3. Social Welfare improvements		8
Income Tax reliefs:				
Rate reductions, extension of standard band, and increased exemption limits		- 168.0	4. Other PESP-related Provisions:—Health: Mental handicap	3.0
			Childcare	2.0
Excise reliefs:		-52.1	Elderly	1.0
			—Education (PTR, etc.)	4.0
		-220.1	—Agriculture (Headage)	2.0
4. Add:			—Other	0.5
Other Income Tax measures:		37.7		

Source: Budget 1992.

## Forecasting spending shocks

**Table A3: Shocks: Aggregate White Paper Granular shocks**

Shock	Coef.	St.Err	t-valu	p-value	[95% Con	Int]	Sig
Output gap	30.25	22.81	1.33	.185	-14.45	74.95	
expected_growth	27.48	25.69	1.07	.285	-22.88	77.84	
expected_i~n	72.48	36.28	2.00	.046	1.37	143.58	**
Current_spending	-9.59	14.38	-0.67	.505	-37.77	18.59	
Revenue_Shocks	0	.001	-0.60	.55	-.002	.001	
Mean dependent var			0.30	SD dependent var			0.85
Pseudo r-squared			0.50	Number of obs			33
Chi-square			32.85	Prob > chi2			0.000
Akaike crit. (AIC)			47.36	Bayesian crit. (BIC)			57.83

**Table A4: Shocks: Above/Below Potential Calculation**

Shock	Coef.	St.Err.	t-val	p-val	[95% Con	Int]	Sig
Output gap	76.87	28.77	2.67	.008	20.48	133.27	***
expected_g~h	-18.34	16.06	-1.14	.254	-49.809	13.14	
expected_i~n	-9.71	20.48	-0.47	.636	-49.845	30.43	
Current_spending	16.97	13.94	1.22	.224	-10.36	44.30	
Revenue_Shocks	-.001	.001	-1.37	.172	-.002	0	
Mean dependent var			-0.09	SD dependent var			0.98
Pseudo r-squared			0.30	Number of obs			33
Chi-square			17.54	Prob > chi2			0.004
Akaike crit. (AIC)			54.23	Bayesian crit. (BIC)			64.71

**Table A5: Shocks: Narrative approach**

Shock	Coef.	St.Err.	t-val	p-val	[95% Conf	Int]	Sig
Output gap	83.25	42.21	1.97	.049	.533	165.97	**
expected_growth	-30.57	33.91	-0.90	.367	-97.024	35.89	
expected_i~n	34.26	41.48	0.83	.409	-47.035	115.55	
Current_spending	-48.1	27.13	-1.77	.076	-101.275	5.075	*
Revenue_Shocks	0	.001	0.42	.672	-.001	.002	
Mean dependent var			0.455	SD dependent var			0.869
Pseudo r-squared			0.571	Number of obs			33
Chi-square			28.807	Prob > chi2			0.000
Akaike crit. (AIC)			35.686	Bayesian crit. (BIC)			46.161

**Table A6: Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
RRshock	33	.004	.009	-.024	.016
Aggregate shocks	33	.000	.008	-.022	.010
Shock above Potent~l	33	-.002	.053	-.099	.144
Capital shocks	33	.002	.006	-.015	.015
Revenue Shocks	33	-.000	.01	-.025	.025

## Impulse responses to spending shocks

### A1: Impulse responses to Narrative shocks

A. Output

B. Output/Balance

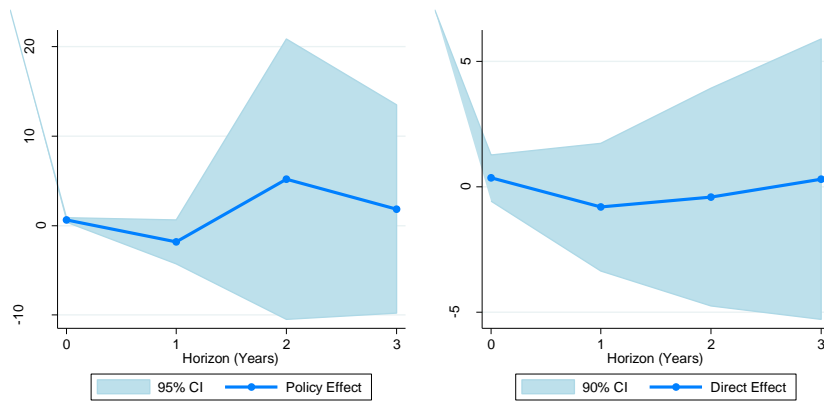
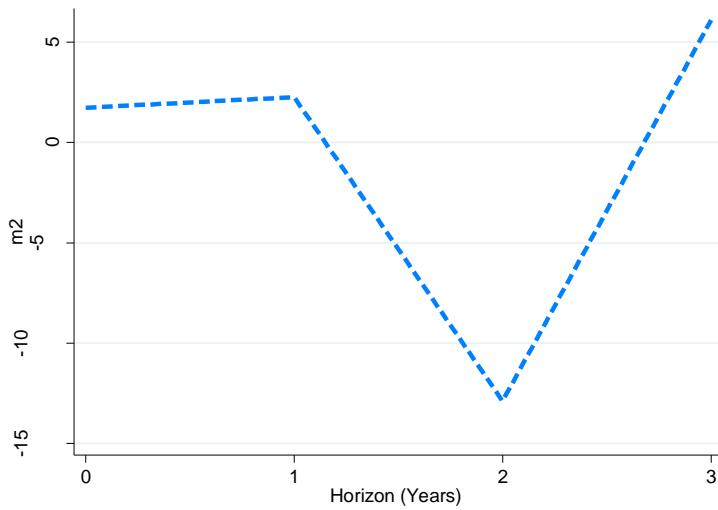
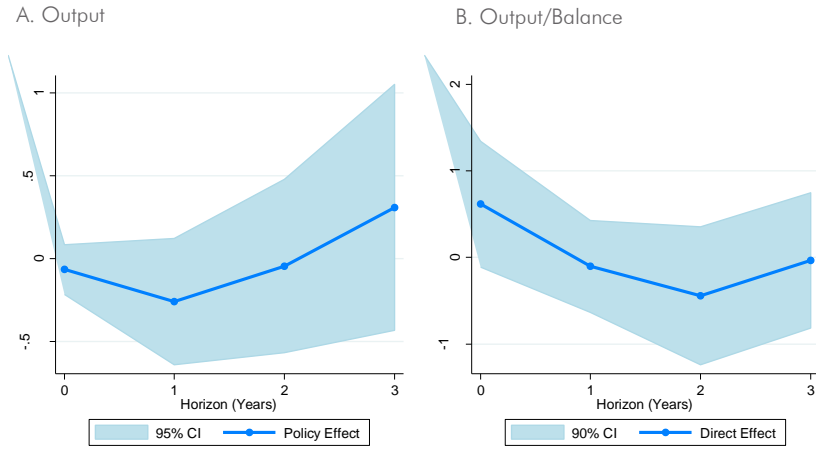


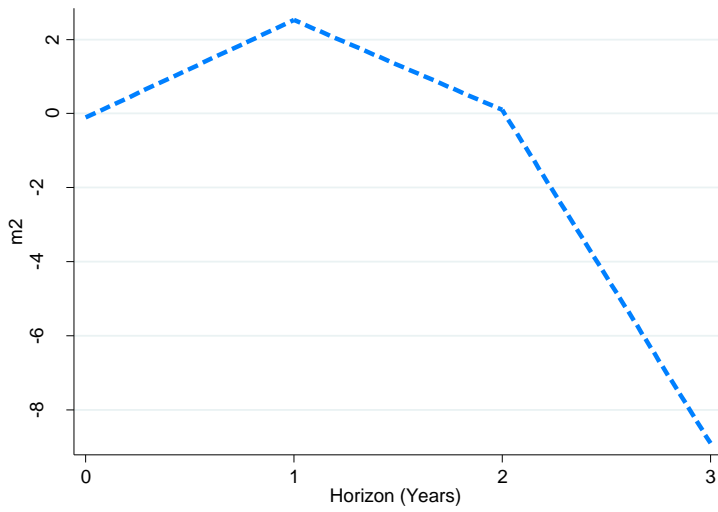
Figure A2: The Persistence of the multiplier: Narrative Shocks



**Figure A3: Impulse responses to 'above/below potential' shocks**

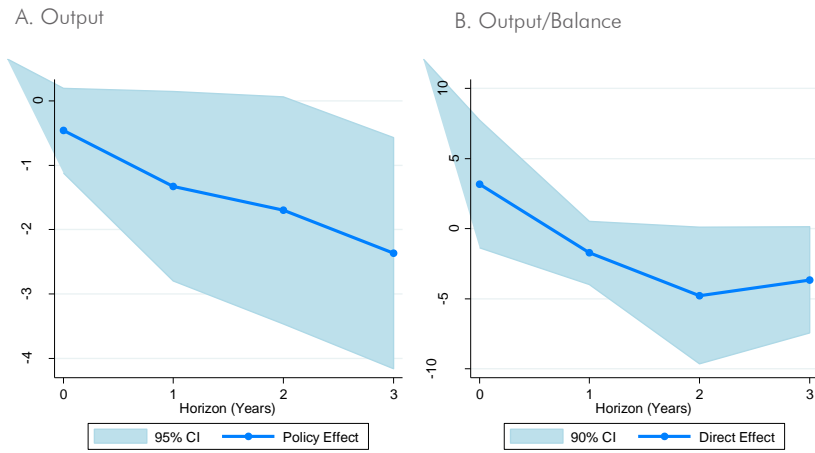


**Figure A4: The Persistence of the multiplier: 'above/below potential' shocks**

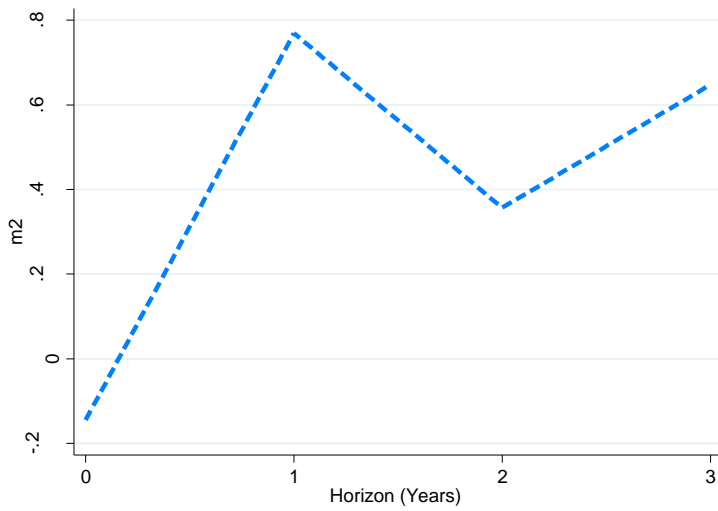




**Figure A5: Impulse responses to aggregate deviations from White Paper**



**Figure A6: The Persistence of the multiplier: Aggregate deviations from White Paper shocks**



## The Significance of spending shocks for Economic Output: Local projections output

**Table A7: Results from the 'above/below potential' calculation of spending shocks**

Coefficients at each time horizon: t – t+3

	(t)	(t+1)	(t+2)	(t+3)
Pot_shock	-.0658791	-.2604973	-.045618	.3084352
One-lag GNI	-.1350561	-.2307255	-.1144726	-.2856034
Two-lag GNI	.1298952	.2194995	.1071097	.2751113
One-lag Potshock	-.0776764	.016509	.0082944	-.0642007
Two-lag Potshock	.0383897	.0699567	.1439274	.2869029
Current spend	-.3130884***	-.7370174**	-1.202264**	-1.660214**
Outputgap	-.1694893	-.7827834*	-2.281499***	-4.018284***
Expected inflation	.3406441**	.62164*	1.145054**	1.653884***
Expected growth	.3407659***	.5725836***	.922926***	1.243131***
Revenue Shocks	-7.90e-07	1.50e-06	.000017	.0000275

**Table A8: Results from deviations of spending from White Paper estimates spending shocks**

Coefficients at each time horizon: t – t+3

	(t)	(t+1)	(t+2)	(t+3)
Aggregate shocks	-.4612221	-1.325184	-1.700398*	-2.366917**
One-lag GNI	-.1833756	-.1103164	.2911733	.3416305
Two-lag GNI	.1732375	.0934013	-.3058092	-.3634436
One-lag Agg_shock	-.2832718	-.4342299	-.6067574	-.4310803
Two-lag Agg_shock	.0213594	.435249	1.268752*	2.2609***
Current spend	-.50505***	-1.03799***	-1.232042***	-1.28118***
Outputgap	-.2466957	-1.038294***	-2.32412***	-3.7859***
Expected inflation	.351466*	.825966***	1.584455***	2.53545***
Expected growth	.323225***	.4760353**	.6018717**	.6563906*
Revenue shocks	-3.67e-07	4.54e-06	.0000124	9.64e-06

**Table A9: Results from the Narrative approach calculation of spending shocks**

Coefficients at each time horizon: t – t+3

	(t)	(t+1)	(t+2)	(t+3)
RR_shock	.6212255**	-1.811138	5.165088	1.843356
One-lag GNI	-.9536577***	-1.902107	-.7949248	1.541488
Two-lag GNI	.9109453***	1.789286	1.244939	-1.640162
One-lag RRshock	1.374974**	.6936164	4.301828	-3.36584
Two-lag RRshock	-.390922	-.3062603	-.3709771	7.29442
Current spend	-1.094217***	-2.0796**	-3.853181	-1.874904
Outputgap	.2251751**	-.001918	-5.431285	-3.527539
Expected inflation	-.2248234	1.210066	-1.014928	2.532515
Expected growth	.142132**	.4095151	.4629668	-.8968285
Revenue Shocks	-2.30e-06	-5.37e-06	-.000011	-.0000207