Chapter 14

Fiscal Policy — Web Appendix

14.1 Rules

Optimal policy: from budget constraint to prudent fiscal policy rule (PFPR)

It is useful to restate the government's budget constraint in terms of the change in the debt to GDP ratio focusing first on the role of the real interest rate (equation 14.2) and then on the role of the nominal interest rate and the rate of inflation (equation 14.4):

$$\begin{aligned} \Delta b &= d + (r - \gamma_y)b && (14.1)\\ &= (G/y - T/y) + (r - \gamma_y)b && (14.2)\\ \Delta b &= d + (i - \pi - \gamma_y)b && (14.3)\\ &= (d + ib) - (\pi + \gamma_y)b. && (14.4) \end{aligned}$$

Given the pre-existing level of the debt ratio, b, the second form (equation 14.4) highlights the fact that the debt ratio is raised by the budget deficit ($d + ib_{t-1}$) and reduced by the growth of nominal GDP ($(\pi+\gamma_y)b$). The first form (equation 14.2) highlights the fundamental determinants of the change in the debt ratio as the primary deficit (d) and the difference between the real interest rate and the real growth rate ($(r-\gamma_y)b$). It is also useful to write equation 14.4 in terms of the budget deficit:

$$\frac{\text{deficit}}{\text{GDP}} = (d + ib) = \Delta b + (\pi + \gamma_y)b. \quad (14.5)$$

Deriving a rule for prudent fiscal policy begins from the condition $\Delta b \leq 0$ for the debt ratio not to increase. This implies:

$$b \leq \frac{(T/y)^P - (G/y)^P}{r^P - \gamma_y^P}, \quad (14.6)$$

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where the superscript P refers to the long-run or 'permanent' value. Let us assume that there is a given public expenditure programme that entails a long-run ratio of government expenditure to GDP, $(G/y)^P$. The question is how should this best be financed? For the debt ratio not to increase, rewriting (equation 14.6) implies:

$$(T/y)^P \geq (G/y)^P + (r^P - \gamma_y^P)b.$$

A prudent fiscal rule is to set the share of tax in GDP at a constant level equal to the 'permanent' or long-run level required to satisfy the constraint:

$$\overline{(T/y)} = (T/y)^P \geq (G/y)^P + (r^P - \gamma_y^P)b.$$

Substituting the PFPR into equation 14.2 implies that the debt ratio moves as follows:

$$\Delta b \leq (G/y - (G/y)^P) + [(r - r^P) - (\gamma_y - \gamma_y^P)]b. \tag{14.7}$$

Sticking to the rule ensures solvency — although it relies on the government making public its forecasts about the real interest rate and growth rate and about expenditure programmes well into the future. The rule implies that if government expenditure is *temporarily* above its permanent level, borrowing should finance this — this entails a rise in the debt ratio and is consistent with the rule. This would be the case if there is a recession so that government transfers are higher than normal (i.e. the automatic stabilizers are working).

It would also be the case if a major programme of exceptional government infrastructure investment is planned that would take government spending as a share of GDP above its long-run level for many years (or decades). An example of this might be the investment requirements associated with German reunification in the 1990s. If the real interest rate is confidently known to be temporarily higher than its 'permanent' value or if growth is depressed relative to its long-run value, the rule says that the deficit can safely be allowed to widen (and the debt ratio to rise). Equally, the rule says that an expected rise in *permanent* government spending, for example, as a consequence of long-run government pension obligations must be funded by a rise in taxation.

Fiscal rules in practice: comparing existing fiscal rules with the PFPR

Existing fiscal rules tend to be expressed in terms of the *budget deficit* or the *cyclically-adjusted deficit*. In order to compare the PFPR with existing rules, it is helpful to express the government budget constraint in the form shown in equation 14.5:

$$\text{deficit/GDP} \;=\; (d + ib) = \Delta b + (\pi + \gamma_y)b.$$

We can then rewrite the PFPR (in terms of its implications for the deficit to GDP ratio) by substituting this into equation 14.7 and rearranging:

$$\text{deficit/GDP} \;\leq \left(G/y - (G/y)^P\right) + \left[(r - r^P) - (\gamma_y - \gamma_y^P)\right] b + (\pi + \gamma_y)b.$$

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This form of the PFPR brings out the fact that a higher deficit ratio is compatible with solvency if the growth rate of nominal GDP (i.e. $\pi + \gamma_y$) is higher.

We are now in a position to compare this with existing rules. We shall not investigate the reasons for the adoption of the rules at this point.

Stability and Growth Pact (European Union) The original Stability and Growth Pact of the European Union had two central rules: the budget deficit to GDP ratio should be less than 3% and the government debt to GDP ratio should be less than 60% (or declining towards it). We can write these as:

$$\text{deficit/GDP} \leq 0.03 \tag{14.8}$$

$$\text{debt/GDP} \leq 0.6. \tag{14.9}$$

The first rule places a rigid limit on the budget deficit ratio and hence on the scope for fiscal stabilization. However, the PFPR indicates that there is no economic reason for the deficit limit to be a fixed number. If the rise in G/y above $(G/y)^P$ in a deep recession is sufficient to push the deficit ratio consistent with the PFPR above 3%, the 3% fiscal rule of the Stability and Growth Pact would prevent the appropriate stabilization. Appropriate stabilization will be prevented even if the rise in the deficit is entirely due to the working of the automatic stabilizers (i.e. even if the cyclically-adjusted deficit is zero).

The second rule is aimed at ensuring that government debt is sustainable in the long-term. The debt ratio will typically increase when the government is running a budget deficit, so for countries close to the debt ceiling, this rule could again limit the scope for fiscal stabilization in a recession.

Another, less formalised, rule within the Stability and Growth Pact is that cyclically-adjusted budget balances must be "close to balance or in surplus". The aim of this is to ensure that governments do not run persistent deficits that might lead to unsustainable levels of debt in the medium-term. This rule allows for some small cyclically-adjusted deficits, but places a limit on the extent to which fiscal policy can be used for structural purposes, particularly in the long-term. As long as a government investment programme is worthwhile in the sense that the discounted present value of the expected social benefits exceeds the expected social costs, then consistent with the PFPR, current government spending may be above its permanent level ($G/y > (G/y)^P$), and the cyclically-adjusted deficit will rise. The SGP is much more restrictive than the PFPR in its allowances for public investment programmes.

The Stability and Growth Pact (SGP) is widely viewed as a failure, in both design and enforcement. Fig. 14.1 shows the number of breaches (by the 11 core Eurozone members) of the rules of the SGP; namely that the budget deficit cannot exceed 3% of GDP and government debt to GDP ratio cannot exceed 60%. In the figure, it is counted as a breach if the annual deficit or debt ratios exceed these levels.

We can draw a number of insights about the Stability and Growth Pact from Fig. 14.1 and its underlying data:

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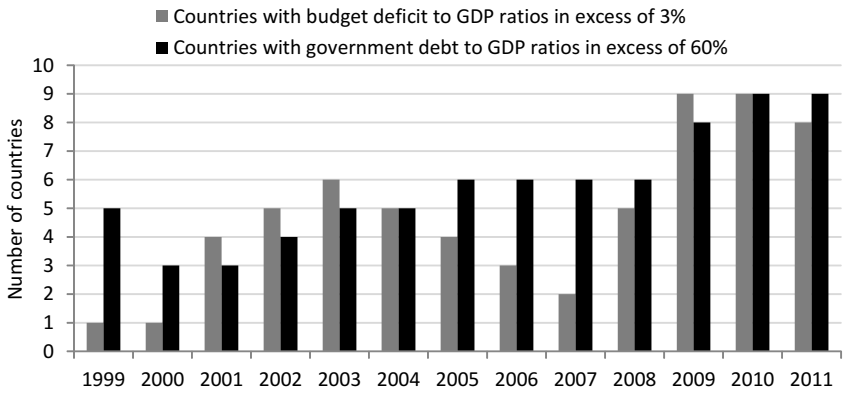

Figure 14.1: Breaches of the Stability and Growth Pact by core Eurozone members: 1999 - 2011

Source: Budget balance data from Eurostat (accessed June 2012). Public debt data from OECD Economic Outlook, June 2012

Note: The core Eurozone members are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain. The measure used for budget balances is net lending (+)/net borrowing (-) under the EDP (Excessive Deficit Procedure). The measure used for debt is gross public debt, Maastricht criterion, as a percentage of GDP. Greek data is included from 2001 onwards.

- Every year since the formation of the Eurozone (in 1999) at least one country has broken the rules set out by the SGP.
- The breaches have not been limited to the smaller peripheral economies — Germany and France broke the Pact as early as 2001 and 2002 respectively.
- The budget deficit rules set out by the Pact have proven to be too restrictive to allow for stabilization in a deep recession, as shown by nearly all the core Eurozone members breaching the deficit ceiling during the global financial crisis — Fig. 14.1 shows that 9 of the 11 core economies exceeded the deficit limits in 2009 and 2010.
- There have been several countries that have far exceeded the debt ceiling every year since the formation of the currency bloc (e.g. Belgium, Greece and Italy). This problem spread during the global financial crisis, when automatic stabilizers, fiscal stimulus and bank rescues pushed up government debt above the ceiling in the majority of core Eurozone economies.

We have shown that the rules of the SGP were persistently broken since 1999, which should have led to repercussions (e.g. fines) for those countries breaching the Pact. This did not happen. Enforcement of the SGP was weak between 1999 and 2011, especially as the two economies that wield the most political

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and economic power, Germany and France, failed to operate within the rules themselves. Other aspects of the Stability and Growth Pact are discussed in Chapter 12, such as the pro-cyclicality of fiscal policy in the first ten years of the single currency and the amendments to the Pact in light of its failures.

Golden Rule The so-called Golden Rule of fiscal policy states that the cyclically-adjusted deficit ratio must be no larger than is required to finance government investment spending (as a share of GDP):

$$\text{cyclically-adjusted deficit/GDP} \leq \frac{\widetilde{G^I}}{y},$$

where the tilde symbol ($\tilde{}$) indicates 'cyclically-adjusted' and G^I is government investment spending. This rule is less restrictive than the Stability and Growth Pact for two reasons: first, since it only refers to the cyclically-adjusted deficit ratio, it does not interfere with the operation of the automatic stabilizers or rule out stabilization policy, and second, it allows more scope for structural fiscal policy.

However the Golden Rule is not well designed if its objective is to keep the debt ratio low. It can condone borrowing to finance government investment programmes that a prudent fiscal policy would not and it can also forbid borrowing when it should be permitted. The logic behind the Golden Rule is that the salient difference between consumption and investment is that investment provides a rate of return in the future: since investment bears a return, this justifies borrowing to finance it. The problem with this argument is that it fails to distinguish between investment programmes that do and do not bring in a *cash* return to the government.

It is important to first make clear that the decision about whether the government should go ahead with an investment project depends on the comparison between the cost and the social rate of return on the project. The social rate of return can be decomposed into private returns and external returns; it can also be decomposed along a different dimension into cash returns and non-cash returns.

The decision to undertake the project is independent of the question of how it should be financed. But once a project is approved, its characteristics in terms of the cash and non-cash components of the return become relevant to the issue of whether it should be financed by taxation or by borrowing. A project that will not bring cash returns is, from the perspective of prudent fiscal policy, equivalent to consumption spending by the government and should be financed by a rise in taxation. The PFPR only approves higher borrowing to finance the investment project if the cash rate of return (in real terms) is at least equal to the real interest rate.

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14.2 Councils

In an attempt to do better than simple fiscal policy rules in addressing problems of deficit bias, many countries have introduced fiscal councils. The success of the monetary policy committees of independent inflation-targeting central banks during the 1990s and 2000s added to the support for fiscal policy councils in the years following the global financial crisis.

As we have seen, fiscal policy is not only inherently more political than monetary policy but it also more complex. There are more potential policy levers than in modern monetary policy and current fiscal policy measures have long term implications for the stock of debt. These characteristics of fiscal policy have meant that it has largely remained under the direct control of governments and that policy has tended to be more discretionary than rules-based.

The global financial crisis of 2008-09 marked the start of a period of rapid deterioration in the public finances in a large number of developed economies. This coincided with a resurgence of interest in fiscal policy councils (FPCs) from politicians, policy-makers and academics.[1] There are two central reasons for this; firstly, fiscal rules had proved insufficient to ensure prudent management of the public finances in the years preceding the global financial crisis and secondly, FPCs were seen as a tool for boosting the credibility of looming fiscal consolidation packages.[2] The credibility angle is particularly important if the consolidation is expected to be spread over a number of years. The party currently in power might not be able to credibly commit to a consolidation of this duration. In this case, a FPC can act as a commitment device for successive governments.

A fiscal policy council is an independent (or semi-independent) body whose main role is to be a *fiscal watchdog* — i.e. to make sure government fiscal policy is sustainable over the long-term.[3] Fiscal policy councils have been in operation in some countries many years, such as the Central Planning Bureau (CPB) in the Netherlands (established in 1947) and the Congressional Budget Office (CBO) in the US (established in 1975), but were not widespread before the global financial crisis. Sweden, Hungary, the UK and Slovenia have all set up FPCs since 2007, highlighting the renewed interest in fiscal watchdogs in the wake of the Great Recession.

The mandates of existing Fiscal Policy Councils

There is currently no consensus 'best-practice' framework for fiscal policy councils. The existing FPCs all perform a role as a fiscal watchdog, but beyond

[1] This subsection on fiscal policy councils relies heavily on the work of Lars Calmfors. See for example Calmfors (2010) and Calmfors and Wren-Lewis (2011).

[2] See Robert Chote's speech, given at the University of York on the 13th of June 2011, entitled *The Office for Budget Responsibility: can we make a difference?* Robert Chote is the current Chairman of the UK's Office for Budget Responsibility.

[3] For more information on fiscal policy councils (e.g. definitions, international examples and relevant academic literature) see Simon Wren-Lewis' website: http://www.economics.ox.ac.uk/members/simon.wren-lewis/fc/fiscal_councils.htm.

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that their remits differ widely and often reflect the recent history of fiscal policy problems in the country in question. At the same time as setting up the Office for Budget Responsibility (OBR), the incoming Conservative-Liberal Democrat coalition government in the UK adopted two targets to replace the Golden Rule: to have a cyclically-adjusted budget deficit of zero five years ahead and for the government net debt to GDP ratio to be falling by 2015-16. The OBR's mandate is to produce forecasts for growth, the output gap and the public finances on which the government's fiscal decisions conforming to their targets must be based.

In an interesting illustration of how practical policy-making diverges from the guidance that comes from economic theory, the government separated the OBR's job into two tasks: first, judging whether the government's plans are consistent with its fiscal targets and second, assessing the long-run sustainability of the public finances. As we have seen, in a fully coherent fiscal framework, these are two aspects of the same problem. However, the first task is another version of a fiscal rule that is not necessarily consistent with optimal policy. The second task could therefore point to the conclusion that existing fiscal policies that satisfy the first task are unsustainable in the longer run. We illustrate this with the following example.

Example: the UK's Office for Budget Responsibility and its tasks The OBR's analysis in their first Fiscal Sustainability Report (2011) can be used to answer the question of whether the government's fiscal plan (consistent with meeting its targets) is compatible with long-run sustainability. They find that it is not: the key reason is the prospective fiscal burdens (pensions and healthcare) associated with an ageing population.

Two common summary indicators highlight this result. The first is a measure of the intertemporal budget gap (reported by the European Commission as their S2 indicator). To calculate the intertemporal budget gap, which entails eliminating the government's debt over an infinite horizon, the analysis begins from the planned fiscal tightening over the course of the current parliament. From the debt dynamics equation, we know that the crucial ingredients in the calculation of sustainability are forecasts of the growth rate and real interest rate. They assume a long-run growth rate of 2.2% and a real interest rate of 2.4% and calculate that from 2016-17, i.e. the end of the task 1 fiscal forecast period, the government's primary budget surplus would have to increase by 3% of GDP.

The second and possibly more realistic, though ad hoc, indicator, which is called the fiscal gap (the European Commission's S1 indicator), assumes the stabilization rather than elimination of the public debt ratio over a finite horizon. On this basis, they find that to return the UK's debt ratio to its pre-crisis level of 40% by 2060, a tightening of 1.5% in the primary balance would be needed. If health costs were to rise at 3% per year rather than 2%, then a much larger tightening (3.9%) would be required. This analysis highlights the substantial long run fiscal challenges faced by the UK and directs the attention

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of current policy-makers (e.g. in relation to welfare entitlements, migration) to an awareness of their effects on fiscal sustainability.

The OBR is precluded from analysing any policy options outside of the government's existing policies. The emphasis on forecasting is likely a result of New Labour's over-optimistic macroeconomic and fiscal forecasts in the run-up to the financial crisis. These forecasts permitted a high level spending in that period, which turned out to be incompatible with the government meeting its deficit and debt targets in the medium-term.

Example: the UK's OBR and the difficulties of fiscal forecasting The UK government set a new fiscal target in 2010 of ensuring the cyclically-adjusted budget was in balance five years ahead. This is one of the targets monitored by the OBR. The extent of tightening that the government had to undertake to achieve this target depended heavily on the OBR's estimates of potential output and the output gap. The output gap is the difference between actual and potential output (i.e. what is captured in the model by $(y_t - y_e)$) as a percentage of potential output. Its calculation relies on having an estimate for potential output. These estimates are extremely uncertain, as potential output cannot be observed. For example, in a survey of 16 other forecasters, the OBR found the estimated output gap for 2011 varied between -0.5% to -4%.[4]

The OBR carried out an exercise to show whether (under the then current plans) the government would achieve their aim of a cyclically-adjusted budget deficit of zero by 2016-17. This involved using a number of different scenarios for the size of the output gap at the end of 2011.[5] This exercise highlights the major impact the estimate of the output gap had for the government's fiscal policy over the period of the parliament to May 2015.

In the scenario where the output gap at the end of 2011 was -0.5%, the government would fail to meet their target because the cyclically-adjusted budget deficit would only shrink to a deficit of 1% by 2016-17. On the other hand, if the true output gap was -3.5%, then the government would comfortably make their target, the cyclically-adjusted budget deficit moving to -1.2% (i.e. a surplus) by 2016-17. In the former scenario, it could be argued that the government would have to pursue additional fiscal tightening over the five years ahead and in the latter scenario the government would have room to further stimulate the economy. This shows the real economic impact the OBR's estimate of the output gap.

The OBR itself is very aware of the uncertainty of their estimate of the potential output (and therefore the output gap). In testimony to the Treasury Committee of the UK parliament, Robert Chote, the Chairman of the OBR, highlighted the difficulties associated with the OBR's forecasting responsibilities:[6]

[4] See the OBR Economic and Fiscal Outlook, March 2012. Other forecasters include the OECD, the IMF, the EC, NIESR, the CBI and a selection of private sector companies.

[5] See the OBR Economic and Fiscal Outlook, March 2012. In this exercise, the output gap is assumed to close by 2017-18.

[6] These excerpts are taken from the Minutes of Evidence to the Treasury Committee that

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> "Necessarily, you have to place a lot of weight on measures of the output gap, because we have been tasked with policing a fiscal target that has been set in cyclically adjusted terms....Needless to say, it is an extremely hard thing to measure. There is enormous uncertainty about it....The big difficulty with the output gap is that there is never a final, correct answer to compare it to, because it is not a directly measured variable."

We can see from the quote that one of the complications with forecasting potential output is that it cannot be measured, even for periods for which we have macroeconomic data. In the period before the financial crisis, the government overestimated potential output. These over-optimistic forecasts allowed them more room to boost spending. The subsequent collapse of the financial and housing markets led to estimates of potential output being reduced for the pre-crisis period, but by that point the damage to the public finances had already been done.

At the end of 2011, the OBR faced a related problem. It needed to decide if the financial crisis had permanently reduced the UK's potential output. We have seen above that this judgement would have serious macroeconomic consequences. Martin Wolf of the Financial Times summed up the gravity of the situation. He highlighted that the UK's economic outlook was dependent on the OBR's forecast of an inherently uncertain variable by setting out the implications should the OBR wrongly reduce their estimate of potential output:[7]

> "Yet suppose the OBR was wrong. That would have costly results. Lost output can become a self-fulfilling prophecy. Fearing higher inflation, monetary and fiscal policy would be tighter than they needed to be. That would mean lower investment, lower creation of new businesses, lower employment and lower acquisition and preservation of skills. It would mean a diminished economy, for ever."

The OBR has a narrower remit than other fiscal policy councils. The CBO in the US and the CPB in the Netherlands carry out *positive* policy analysis — i.e. they assess the fiscal cost of different policies, but have to remain objective and non-partisan. This rules them out of providing policy recommendations, but their analysis can still prove highly influential. An example is the CBO's analysis of Obamacare, President Obama's controversial healthcare reforms. In the Netherlands, it is typical for the CPB to provide an analysis of the fiscal sustainability of policies proposed by both incumbent and opposition political parties in the run-up to elections.[8]

A number of fiscal policy councils have a wider scope for policy analysis, such as the Swedish Fiscal Policy Council and the Economic Council in Denmark. These institutions can make *normative* recommendations based on the

took place on Monday the 26th of March 2012.

[7] Excerpt taken from Martin Wolf's FT article on December 8th 2011 entitled *Mind the gap: the perils of forecasting output.*

[8] See Bos and Teulings (2010).

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government's stated economic objectives. This means the FPC is more actively involved in public debate, but can lead to conflict between the government and the FPC, as shown by the disagreement in Sweden over the optimal size of fiscal stimulus during the global financial crisis (the SFPC argued in favour of a larger stimulus package).

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