

# Discussion of “Inflation and Interest Rates”

by John H. Cochrane

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John Cochrane’s excellent paper provides an intellectual framework to understand the following text in the Reserve Bank of Australia’s Statement on the Conduct of Monetary Policy:<sup>1</sup>

For its part the Government endorses the inflation objective and emphasises the role that disciplined fiscal policy must play in achieving medium-term price stability.

Specifically it gives content to the word ‘disciplined’ and the requirements that fiscal policy must satisfy for monetary policy to be able to achieve medium-term price stability. This discussion reiterates the central ideas laid out by the paper, employing slightly different language and points of emphasis. But it should be understood that formally the treatments are identical.

Before doing this, I should acknowledge that I will not do justice to the many ideas punctuating this paper. In some ways, the paper represents an overview of John’s extensive research on the topic and I encourage reading the broader corpus of work, including his recent book. Broadly the paper covers the following ground:

- i. Establishes monetary and fiscal policy jointly determine the price level. Formally this is a re-statement of the fiscal theory of the price level, developed by John and others, notably Eric Leeper, Michael Woodford and Chris Sims. Fiscal policy must satisfy certain requirements for monetary policy to have the conventionally understood effects in restraining aggregate demand and inflation. I will return to these requirements below.

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<sup>1</sup>This quote is taken from the 2016 agreement.

- ii. Provides suggestive evidence supporting the fiscal theory of the price level. Various time series are plotted for different periods of US economic history. These plots are consistent with the ideas of the fiscal theory, but equally consistent with the conventional account of policy because of a well-known observational equivalence result. This is not to dismiss John's view, but rather underscore further work must be done on this topic to carefully identify fiscal theory mechanisms—I think this will be a fruitful area of research and these plots highlight useful starting points for this effort.
- iii. Sketches a unified theory of interest-rate pegs. This final part of the paper seeks to put the theory of interest rate policy on equal footing to the quantity theory of money. The goal is to have a theory of monetary policy that doesn't require a fiscal response to explain: a) the conventional view of short-run aggregate demand management policy that higher nominal interest rates raise real interest rates and reduce inflation; and b) the long-run neutrality of monetary policy so that a permanent change in nominal interest rates implies a permanent change in inflation of equal amount. The fiscal theory of the price level can do this.

All these topics are of considerable interest and justify research programs of their own. Given the constraints of being a discussant let me focus on the first topic. Let's start with the conventional view of monetary policy. Economic models and policymakers typically assume that monetary policy can and does control inflation and that fiscal policy can and does ensure solvency of the government accounts. How is this achieved? Monetary policy implements a Taylor rule, for example, actively stabilising inflation by raising real interest rates. Monetary policy is then unconstrained or 'active' in the language of Eric Leeper. Fiscal policy takes monetary policy and private behaviour as given. It is therefore constrained or 'passive'. Fiscal policy then adjusts taxes to stabilise the public debt given the central banks' desired paths for inflation and nominal interest rates.

Does this make sense? In normal times, maybe. This characterisation of policy is embedded in almost all textbooks and research evaluating the monetary policy. But it tends to trivialise fiscal policy and grants monetary policy only precarious footing. Monetary economists tend to ignore that with rational expectations the Taylor Principle does not uniquely determine inflation. Hyperinflationary and deflationary paths are possible. And ruling them out requires specific assumptions about fiscal policy. Even should we ignore these 'pathologies' the conventional view requires appropriate fiscal backing. For higher interest rates to lower inflation, fiscal policy must eliminate positive wealth effects that those higher rates grant bondholders. Fiscal policy is central to price-level determination.

Perhaps we should not care, putting these observations down to a failure of economic

models. But as we will see the basic logic seems inescapable. Given the pervasive use of such models in policy analysis we should at a minimum seek to understand their implications. Even better, we should design fiscal rules and institutional frameworks that are immune to these concerns, particularly given emerging evidence that changes in fiscal backing constrains inflation policy.

To understand the conventional view of monetary policy and its fiscal requirements, consider a government that issues one-period nominal debt and collects lump-sum taxes. Private sector optimisation implies a valuation equation for government debt

$$b_{t-1} - \delta\pi_t = \beta E_t \sum_{T=t}^{\infty} \beta^{T-t} [s_t - \delta(R_T - \pi_{T+1})]$$

where  $b_t$  is a measure of the real market value of outstanding debt;  $\pi_t$  inflation;  $s_t$  the structural surplus, defined as a taxes in excess of government spending; and  $R_t$  the nominal interest rate. The parameters  $\beta = 1/R$  and  $\delta = \beta b/Y$  are the household's discount factor, equal to the inverse of the steady state interest rate, and the market value of debt to income ratio.

In words this equation says the expected present discounted value of structural surpluses must equal the real value of public debt in period  $t$ , which is given by the value of debt issued in period  $t - 1$  adjusted by the inflation rate in period  $t$ . It has the interpretation of a valuation or asset pricing equation because the value of the public debt is derived from the expected discounted value of taxes attached to that debt. Often the equation is referred to as the intertemporal budget constraint of the government, but it is important to note that it is an equation implied by private sector optimisation. The equation describes the conditions under which households will hold government debt.

For monetary policy to have the conventional effects on aggregate demand and inflation, fiscal policy must stabilise the public debt. To see this, consider a central bank that chooses a sequence of nominal interest rates to achieve a particular path for inflation. Denote these paths  $\{R_t, \pi_t\}$ . The details of the transmission mechanism of monetary policy which determines how a given interest rate path achieves a given inflation path need not concern us here. The reader can assume any theory of the transmission mechanism they so desire. So long as there is nominal public debt there will be some form of valuation equation of the type written above, with the following implications.

The valuation equation must hold for the central bank's choice of interest rate and inflation paths. Hence the fiscal authority must choose a sequence  $\{s_t\}$  to ensure that the expected present discount value of surpluses is exactly equal to the outstanding market value of public debt in period  $t - 1$ . In this way, fiscal policy provides the appropriate back-

ing for monetary policy. As the desired inflation profile changes and with it interest rate policy, fiscal policy must adjust surpluses to ensure satisfaction of the valuation equation.

The standard logic of conventional monetary policy therefore assumes that fiscal policy adjusts in the right way in response to interest rate changes. For example, as interest rates rise to restrain inflation, debt servicing costs also rise, reducing the present discounted value of surpluses. This generates a positive wealth effect for bond holders because the expected value of taxes attached to their debt holdings fall. Surpluses must rise to eliminate this effect, else the price level will rise. Increased wealth would otherwise increase demand and inflation. There is nothing that a central bank can do to prevent this. Further interest rate increases would further reduce fiscal backing, requiring higher inflation to re-value the public debt. Note that this is not a statement about the use of fiscal policy as a short-run stabilisation tool. Rather it concerns the properties of fiscal policy over the medium to long run.

Switching the assignments given to monetary and fiscal policy gives the unconventional view of stabilisation of policy, the fiscal theory of the price level. Fiscal policy stabilises the price level while monetary policy stabilises the public debt. Here fiscal policy chooses sequences of the surplus to achieve a particular path for the price level. That is  $\{s_t, \pi_t\}$ . The central bank must then ensure the valuation equation is satisfied by appropriate choice of interest rate sequence  $R_t$ . For example, by pegging the nominal interest rate the central bank caps nominal interest payments on debt. Rising inflation then causes real interest rates to fall, which stabilises the public debt.

Central then to the conventional view is that fiscal policy provides the right fiscal backing to interest rate policy. Changes in interest rate policy require a shift in the expected path of future surpluses. Expectations about future policy, both monetary and fiscal, are critical. Indeed, models of imperfect information and learning dynamics in which households have shifting expectations about the expected discounted value of surpluses predict wealth effects will matter even when monetary policy and fiscal policy are consistent with the conventional view.

Coming full circle to the initial quote, we are now better placed to appreciate what we should understand by “disciplined fiscal policy”. Fiscal policy should ensure that surpluses are adjusted to stabilise the public debt for all sequences of interest rates and inflation, to ensure that the expected present discounted value of the surpluses equals the current market value of the public debt. While I doubt the signatories to the Statement on the Conduct of Monetary Policy had this precise interpretation in mind, there can be no doubt that Australia has benefitted from a fiscal framework that has for the most part been prudent. But the past is no predictor of the future, and there are clearly reasons to be concerned

about the inflationary implications of projected structural deficits.

For this reason, John Cochrane's paper should be read as a call for a deeper understanding of what we mean by 'disciplined'. Central banks and fiscal authorities need more serious modelling of fiscal policy and its macroeconomic implications. We need better data, including market values of public debt and fiscal expectations. Exploring fiscal rules and institutional reforms that support disciplined fiscal policy would also be desirable, even should there ultimately be prohibitive political economy constraints. And effort to improve communication about fiscal policy with specific regard to the fiscal backing of monetary policy would be helpful. From this perspective, the RBA review recommendations about collaborative Treasury-RBA research on monetary-fiscal interactions is most welcome