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Second Discussant Comment on "Fiscal Policy as a Stabilization Tool"

Gauti B. Eggertsson*

*Federal Reserve Bank of New York, gauti.eggertsson@ny.frb.org

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This paper addresses two broad questions. First, what are the stylized facts about fiscal policy across countries and time? Second, does fiscal policy attenuate the business cycle or stabilize it? These are big and ambitious questions, and I suspect they will be high on the agenda in coming years. This is partly because fiscal policy is back in vogue today now that many central banks find their attempts to stimulate the economy frustrated by the zero bound on the short-term nominal interest rate.

I first want to summarize two of the authors' basic empirical findings. Then I want to interpret these findings within the context of a slightly different model than the authors present. Let me be clear that the authors touch on many issues that I do not review here. As a discussant I will take advantage of being able to cherry-pick what to concentrate on in responding to their paper.

At the risk of oversimplifying, one thing I take out of the paper's empirical work is that fiscal policy, as a positive matter, can roughly be described as

$$G_t = \overline{G} \text{ even if } \downarrow Y_t \qquad (1)$$

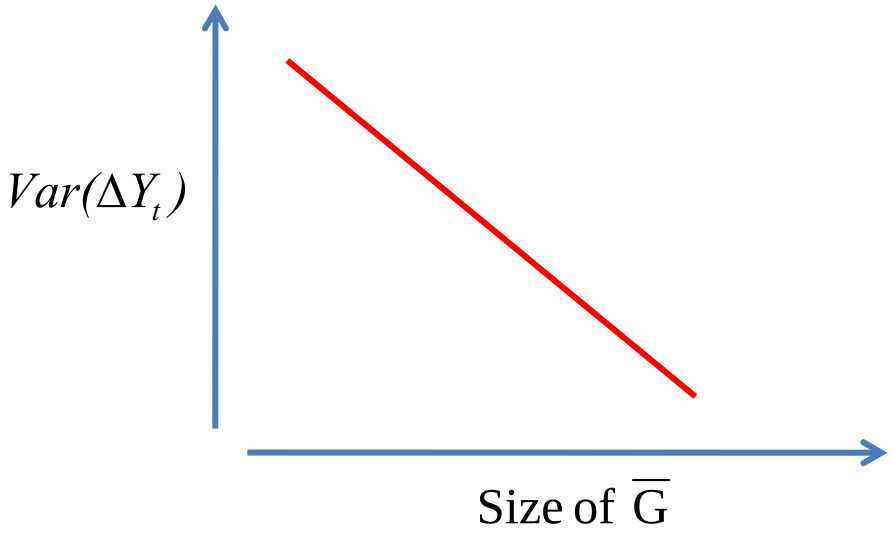
$$T_t = \lambda Y_t \text{ where } 0 < \lambda < 1, \qquad (2)$$

where G_t is government spending, T_t taxes, and Y_t output. These relationships say that over the business cycle (as Y_t varies), then as an empirical matter, G_t stays roughly constant, while taxes move proportionally with output. This, then, implies a countercyclical fiscal policy since the proportion of output that goes into government spending increases as Y_t goes down, and similarly the deficit increases in a downturn as tax revenues drop without any offsetting drops in spending. Thus government spending as a share of GDP, as well as the deficit spending, is countercyclical.

An interesting finding by the authors is that the extent to which fiscal policy for a given country reacts to business cycles can be roughly approximated by the size of the government. Thus the main reason why a given country can be said to use fiscal policy to counteract the business cycle is driven by the fact that government spending is relatively stable over the cycle as given by the above empirical relationship. The larger the government's steady-state size, then, the more countercyclical fiscal policy is.

But does countercyclical fiscal policy stabilize output? Given the paper's empirical findings, the degree to which fiscal policy works as an automatic stabilizer is to a large extent determined by the size of the government. One should then expect a relationship across countries and time as seen in figure 1, if fiscal policy is indeed stabilizing. Those countries with higher steady-state government should expect lower output volatility, while those with small

governments should be experiencing more volatile business cycles. We should see this working across time in a given country to the extent there is trend growth in the size of the government (thus a similar shock hitting the U.S. economy 50 years ago should have had a bigger effect at the time than today, given that the government is bigger today), but also through the cross-section of countries. A given shock hitting multiple countries should have a bigger impact on those countries with a smaller government than those where the government is bloated.



Interestingly the authors do report suggestive evidence that the patterns in the data are roughly consistent with figure 1 (see figures 4 and 5 in the main paper). Moreover, the authors cite some related literature that also seems consistent with this pattern.

But this raises an obvious question: should we expect a relationship like in figure 1 given a reasonable theory of how the economy works? A key contribution of the paper is to show that if one imposes an empirical specification such as in equations (1) and (2) then one should expect a relationship such as seen in figure 1 in a simple model. To make their case, the authors analyze a two-period model from Mankiw and Weinzeri (2011). In doing so they make several specific assumptions, such as that the business cycle is driven by productivity shocks, that prices are set only one period in advance, that capital is the only variable input of

production, and so on. Here I want to clarify the conditions under which this result obtains in the standard New Keynesian model. There are, as we shall see, conditions under which government size is irrelevant, but there are also cases in which a larger government can either be stabilizing or destabilizing in that model. As a general matter, and for plausible parameters, I will suggest that the authors' main conclusion survives: as the government's steady-state size increases, we should expect lower output volatility due to the automatic stabilizing effect of government spending.

Consider the standard New Keynesian model (see, for example, Woodford 2003) given by the investment–savings (IS) equation and the New Keynesian Phillips curve. Denoting $\hat{Y}_t$ as percentage deviation of output from steady state, i_t as deviation of the short-term nominal interest rate from steady state, π_t as inflation, $\hat{G}_t$ as percentage deviation of government spending from steady state over steady-state output, and r_t^e and $\hat{Y}_t^e$ as exogenous disturbances, we can write

$$\hat{Y}_t = E_t\hat{Y}_{t+1} - \sigma(1-\gamma_G)(i_t - E_t\pi_{t+1} - r_t^e) + \hat{G}_t - E_t\hat{G}_{t+1}$$

$$\pi_t = \kappa(\hat{Y}_t - \hat{Y}_t^e) + \beta E\pi_{t+1} - \delta\kappa\hat{G}_t,$$

where $\sigma > 0$ is the intertemporal elasticity of substitution, $\gamma_G \equiv \frac{\overline{G}}{\overline{Y}}$ is the share of government spending of output in steady state, and $\kappa \equiv \frac{(1-\alpha)(1-\alpha\beta)\omega}{\alpha(1+\omega\theta)} + \frac{(1-\alpha)(1-\alpha\beta)\sigma^{-1}}{\alpha(1+\omega\theta)(1-\gamma_g)}$ where $0 < \alpha, \beta, \delta < 1, \quad \theta > 1, \omega > 0$ are various structural parameters described in Woodford (2003). Note that $\frac{\partial\kappa}{\partial\gamma_G} > 0$. The two key points here are that, first, a bigger steady state government reduces the sensitivity of output to the interest rate and, second, a larger steady state government makes inflation respond more strongly to movements in output from $\hat{Y}_t^e$.

Consider now the following policy,

$$i_t = r_t^* + \phi_\pi \pi_t + \phi_y \hat{Y}_t,$$

where $\phi_\pi > 1$ and $\phi_y > 0$ and r_t^* is a possibly time-varying coefficient. Let us assume that fiscal policy follows the empirical specification (1) so that

$$\hat{G}_t = 0.$$

Observe that the standard New Keynesian model features Ricardian equivalence; thus, the time pattern of taxes is irrelevant. First consider the case in which r_t^e is the only shock so that $\hat{Y}_t^e = 0$. Also consider a policy setting so that $r_t^* = r_t^e$. In this case it is easy to verify that the unique bounded solution of the model is $\hat{Y}_t = 0$ and the variance of output is zero and *independent of the size of the government*. We can think of two simple ways of breaking this irrelevance. First, suppose that monetary policy does not fully offset variations in r_t^e. It is not difficult to imagine this being the case—for example, if the central bank follows a standard Taylor rule with a constant intercept, i.e. $r_t^* = \bar{r}$. Second, suppose that there are shocks that create a tradeoff between inflation and output: in other words, shocks $\hat{Y}_t^e$. Then there will be some variations in output and the degree of this variability will depend on parameters. Let us treat each case in turn.

Consider first $r_t^* = \bar{r}$, in which case the central bank follows the standard Taylor rule. Then, using a method of undetermined coefficient, and assuming the shock is independent and identically distributed (i.i.d.), the unique bounded solution is given by

$$\hat{Y}_t = \frac{\sigma(1-\gamma_g)}{1+\sigma(1-\gamma_g)(\phi_\pi \kappa + \phi_y)}(r_t^e - \bar{r}) = \psi_r (r_t^e - \bar{r}),$$

where it can now be shown that the coefficient ψ is decreasing in γ_g and thus the variance of $\hat{Y}_t$ is also decreasing in γ_g. Intuitively what is going on is that the output volatility here is created by the fact that the nominal interest rate does not perfectly track the shock r_t^e, which means that output will deviate from steady state in proportion to the gap $i_t - r_t^e$. As seen in the IS equation, the strength of this effect depends on how much demand depends on the interest rate's elasticity of output. And this elasticity depends directly on γ_G. To take an extreme example

imagine that all output is purchased by the government. Then the variations in interest would have no effect on output and this channel is shut down since all output is determined by government planning.

Consider now the effect of a shock $\hat{Y}_t^e$ and suppose it is i.i.d. Again using method of undetermined coefficients we have

$$\hat{Y}_t = \frac{\sigma(1-\gamma_g)\phi_\pi\kappa}{1+\sigma(1-\gamma_g)(\phi_\pi\kappa+\phi_y)}\hat{Y}_t^e = \psi_Y\hat{Y}_t^e,$$

where ψ_Y is again decreasing in γ_g. Here there are two forces: on the one hand an increase in γ_G increases the response of inflation to output deviation from $\hat{Y}_t^e$, yet at the same time the increase in the size of the government dampens the interest rate elasticity of demand, thus reducing any destabilizing effect of the inflation volatility. Thus in principle the comparative static could go both ways, but I've found when inputting standard parameter values that the volatility of output tends to be decreasing in γ_g.

Taken together, these results support the authors' conclusion: in the New Keynesian model it is also the case—at least under the specifications above—that an increase in steady-state government tends to reduce output volatility. This is not to say, of course, that increasing the size of steady-state government is optimal. If these results hold up to further scrutiny, figuring out the optimal government size would be the next logical step. If it remains a robust fact that the size of government has a stabilizing effect on output volatility, then this may have some implications for the optimal size of the government on the margin, although my suspicion is that this effect will be of second order.

References

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