A Review on the Effectiveness of Fiscal Policy

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General topic

- Question: what are the effects of a fiscal stimulus package?

$$Y_t = C_t + I_t + G_t + NX_t$$

- Definition: It works when the output multiplier is larger than one
  - Consumption response is positive
  - Investment response is not too negative (crowding out)
  - Leakages abroad are not too large

- Strong disagreement in the profession on the effects of fiscal policy

Road map

- The debate in theory: Keynesian models vs DSGE models
- Extensions of baseline DSGE models
- State dependent fiscal multipliers

The theoretical debate: the IS-LM model

- Keynesian multiplier

$$\frac{\Delta Y}{\Delta G} = \frac{1}{1 - c_1 (1 - t) + m}$$

- Three leakages: savings (c_1), taxes (t) and imports (m)
- Limited by the endogenous response of monetary policy: crowding out of investment
- More effective in a situation of liquidity trap and with fixed exchange rates
  - no endogenous response by monetary policy (no crowding out)

The theoretical debate: the Real Business Cycle model

- **Intertemporal** perspective, dynamic optimization, rational expectations
- Ricardian equivalence: agents are rational and forward looking. An increase in government spending today must be followed by an increase in taxation
- Therefore they start saving today to pay for future taxes (negative wealth effect)

  Moreover, they work more (wealth effect on labor supply)
- Consumption and investment decrease. The output multiplier is much lower than one (and could be even negative!!)

The theoretical model: the New Keynesian model

- Built around the RBC model (Ricardian model)
  - Monopolistic competition in goods and labor market
  - Sticky prices and sticky wages
  - Monetary policy rule (Taylor rule)

- Limited implications for fiscal multipliers
  - Output multipliers lower than one
  - Negative consumption response

Expansionary fiscal shocks in RBC models

- **Productive government spending**

$$Y_{j,t} = K_{j,t}^{\alpha} N_{j,t}^{1-\alpha} G_t^{\theta} \tag{1}$$

$$MC_t = \frac{\left(R_t^k\right)^{\alpha} W_t^{1-\alpha}}{\alpha^{1-\alpha}\left(1-\alpha\right)^{\alpha}} \frac{1}{G_t^{\theta}} \tag{2}$$

If the cost alleviating effect is large enough, decline in prices, interest rate, increase in consumption

- **Complementarity** between consumption and government spending

$$U_t = \left[\phi C_t^{\frac{v-1}{v}} + (1-\phi) G_t^{\frac{v-1}{v}}\right]^{\frac{v}{v-1}} - ... \tag{3}$$

Complementarity effect that pushes-up private consumption.

Expansionary fiscal shocks in NK models

- **Complementarity between consumption and labor**

$$U_t = \frac{1}{1-\sigma}\left[\left(C_t\right)^a\left(1-N_t\right)^{1-a}\right]^{1-\sigma} \tag{4}$$

hours have a positive effect on the marginal utility of consumption if $\sigma > 1$

- **Liquidity constrained consumers**
  - Some consumers do not have access to financial markets and cannot smooth consumption
  - Fiscal policy effects are larger (Gali, Lopez-Salido and Valles, 2007), (Mankiw, 2000)

$$c_t^{OPT} = E_t c_{t+1}^{OPT} - \left(i_t - E_t \pi_{t+1}\right)$$

$$c_t^{LC} = rw_t + n_t - t_t$$

Modern business cycle models and expansionary fiscal shocks

- Modern business cycle models and expansionary effects from fiscal shocks are not incompatible
- Intertemporal optimization still at the center of the picture but the wealth effect is not the only driving force
- Reasonable not to expect output multipliers not much larger than 1 in normal times

The Great Recession and fiscal multipliers

- Multipliers are large in Recessions and small in booms (Auerbach and Gorodnichenko, 2012)
- The empirical work for fiscal policy when the interest rate is positive is not relevant in a liquidity trap
- Extensions of New Keynesian models to model state dependent fiscal multipliers (importance of non linearities)
  - Zero-lower bound (Christiano, Eichenbaum and Rebelo, 2011), (Woodford, 2011)
  - Financial frictions (Canzoneri, Collard, Dellas and Diba, 2011)
  - Sovereign debt risk (Corsetti, Kuester, Meier and Muller, 2013)
  - Search frictions (Michaillat, 2012)

Fiscal policy and monetary policy interactions

- The stance of monetary policy is essential to study the effects of fiscal policy (even when the zero lower bound is not binding)
- Woodford (2011): policy of constant real interest rate

$$c_t = E_t c_{t+1} - (i_t - E_t \pi_{t+1})$$

- Output multiplier is equal to one (in a closed economy)
  Consumption does not move
- Similar to the IS-LM model: shift of the IS curve for a given LM curve

Fiscal policy and the zero lower bound

- Government spending is much more effective when monetary policy is ineffective (zero-lower bound)
- In that case the nominal interest rate does not rise and fiscal policy can lower real interest rates

$$c_t = E_t c_{t+1} - (i_t - E_t \pi_{t+1})$$

- The effects can be large and are amplified by capital accumulation and sources of inertia in aggregate demand but...
  - The zero-lower bound must be binding for sufficiently long time
  - The stimulus must be withdrawn once the zero-lower bound is not binding anymore
  - Some degree of nominal rigidity in prices and wages

Fiscal policy and the zero lower bound

- In a liquidity trap output multipliers can be very large (Christiano, Eichenbaum and Rebelo, 2011)
  - 1.3 if the zero lower bound is expected to bind for only one quarter
  - 3.7 if the zero-lower bound is expected to bind for five quarters
- Importantly, in a liquidity trap situation the aggregate demand curve has a positive slope: inflation is good for output!
  - Avoid any cut on labor and capital taxes. Deflationary effects and even larger contraction in output!! You do not want people to work more! (Eggertsson, 2010)
  - Productive government spending is bad: deflationary effects (Bouakez, 2013)

Fiscal policy and the zero lower bound

- The effects are larger when sovereign risk is low (Corsetti, Kuester, Meier and Mueller, 2013)
- The effects are larger if credible spending reversals (Corsetti, Meier, Mueller, 2009)

State dependent multpliers: other sources

- Countercyclical Financial frictions (Canzoneri, Collard, Dellas and Diba, 2011)
  - Firms and consumers are more credit constrained in Recessions

- Procyclical Search frictions in the labor market (Michaillat, 2012)
  - Search frictions matter little in Recessions: large effects of public employment expansions
  - Limit effects on wages and limited crowding out on private employment (even when the zero lower bound is not binding)

Conclusions

- Modern business cycle models are compatible with positive fiscal policy multipliers
  - Small effects in normal times (productive government spending, liquidity constrained agents, preferences, spending reversals)
  - Larger effects in a Recession
- Good theoretical reasons to believe that fiscal policy in a crisis period works differently than in normal times
- Norway: multipliers are lower in an open economy (old models still very intuitive and relevant!!)
- Norway: low sovereign risk favors larger multipliers