Monetary and Fiscal Policies: Fiscal Multipliers in Recessions

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A Growing Literature

- Most of the existing theoretical and empirical research on stabilization policy has relied on linear(ized) models.

- Our only defense is that non-linear setups are hard to handle in policy applications with realistic features.

- A growing literature explores the potential importance of non-linearities.

- The most active research area on this front has focused on the cross-country comparability of fiscal multipliers in a liquidity trap and on what makes fiscal policy in a liquidity trap different from fiscal policy in a currency union (another situation in which the interest rate may not adjust to close the output gap).

- There is also some work on how fiscal multipliers may be state-dependent even when the zero-bound on the nominal interest rate is not binding.

- In particular, recent work has explored how the GDP gap, financial frictions, and the debt-to-GDP ratio may matter for the effects of fiscal policy.
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  - In particular, recent work has explored how the GDP gap, financial frictions, and the debt-to-GDP ratio may matter for the effects of fiscal policy.

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Liquidity Trap

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- Cogan, Cwik, Taylor and Wieland (2010) argue against the large-multipliers result more forcefully
  - they argue, using the ECB’s (Smets&Wouters) estimated NK model, that a realistically calibrated fiscal expansion has an impact multiplier just below one, and multipliers well below one after a year or two
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- Assume government purchases are constant except as a policy response to the trap equilibrium (during the period from $t$ to $T$).
- Calculate the consumption gap relative to an equilibrium with flexible prices AND constant government purchases.

$$c_t = \frac{1}{T} \sum_{j=t}^{T} r_j \pi_j + 1$$
The Consumption Gap in a Liquidity Trap

The log-linear Euler equation of the representative household with logarithmic utility is

\[ c_t = c_{t+1} - (i_t - \pi_{t+1}) - \log(\beta) \]

We will set \( i_t = 0 \) for the trap equilibrium and compare it to an equilibrium with flexible prices and constant government purchases. The Euler equation in the latter equilibrium is

\[ c_t^* = c_{t+1}^* - r_t^* - \log(\beta) \]

The consumption gap is governed by

\[ c_t^* - c_t = c_{t+1}^* - c_{t+1} - r_t^* - \pi_{t+1} \]

Assume the exit date is at \( T \) (i.e., \( c_t^* - c_t = 0 \) for \( t \geq T \)) and iterate this equation forward to get

\[ c_t^* - c_t = \sum_{j=t}^{T-1} -r_j^* - \pi_{j+1} \]
Mechanical Intuition

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- The consumption gap is the shortfall of actual consumption ($c_t$) relative to the benchmark with flexible prices ($c_t^*$)

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The Trap Equilibrium

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  - causing inflation is the only way a fiscal expansion works in this context: the inflation lowers the real interest rate which raises consumption, which leads to more inflation, which ... (starts another round of a multiplier process)
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- causing inflation is the only way a fiscal expansion works in this context: the inflation lowers the real interest rate which raises consumption, which leads to more inflation, which ... (starts another round of a multiplier process)
- the fiscal multiplier has to be above one as long as the fiscal expansion is not extended beyond the duration of the trap equilibrium
Farhi and Werning’s (2012) solution to the linearized model confirms Woodford’s (2011) argument that the fiscal multiplier for an expansion within the liquidity trap is larger than one.
Non-linearities

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But the results in Erceg and Lindé (2011) show that non-linear effects may be quite important if we want to think about realistic policy experiments:

- A fiscal expansion can expedite the exit from the trap equilibrium.
- The timing of the expansion and implementation lags can play a critical role.
- The multiplier for a large fiscal expansion may be much smaller than the one for a marginal change in government purchases.
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Currency Union

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- The trap equilibrium is different because the price increase caused by the fiscal expansion will not be reversed later. The trap equilibrium is the forward-looking solution to a model with a stable eigenvalue; expected future shocks can have large effects in this case.
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  - The fiscal multiplier in a currency union is below one (as in the case of the closed-economy NK model).
  - A fiscal expansion in, say, France raises the price of French goods relative to other goods in the Eurozone—this crowds out net exports.
  - The relative price must eventually fall back to the long-run equilibrium level—expected decrease in price raises the real interest rate in France, which crowds out consumption.
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Empirical Evidence
Auerbach and Gorodnichenko [2010]

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- And the maximum multiplier (peak effect on output over time) is larger than 2 during recessions, according to these estimates.
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Auerbach and Gorodnichenko [2010]

<table>
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<th></th>
<th>$\max{y_h}$</th>
<th>Value</th>
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<td>Expansion</td>
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<td>0.57</td>
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<tr>
<td>Recession</td>
<td></td>
<td>2.48</td>
<td>0.28</td>
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### Empirical Evidence

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<th>Value</th>
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[A Financial Friction?](#)
Consumption Multipliers

Benchmark Experiment

Cumulative Multiplier (Borrowers’ consumption)

Cumulative Multiplier (Savers’ consumption)

Cumulative Multiplier (Aggregate Consumption)

Expansion  Average  Recession
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- It remains to be seen how these theoretical results and the empirical results of Auerbach and Gorodnichenko (2012), both based on non-linear models, affect future research.