Fiscal Policies in Booms and Busts

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Background of our research

• The central bank’s capacity to provide for monetary stimulus is limited because of zero lower bound (ZLB).
• In low interest environment, fiscal policies have to take over.
• How much fiscal space do countries have today given their debt levels and the level of the interest rate?
• I will use a behavioral macroeconomic model to analyze the issues
• I will derive trade-offs between output and debt stabilization.
Methodological Choice

We will not rely on mainstream Dynamic Stochastic General Equilibrium models (DSGE-models).

— Agents in these models have incredible cognitive abilities in understanding the complexity of the world and make forecast about the future.

— i.e. they can figure out the probability distributions of all the shocks that can hit the economy.

— In our model, agents have cognitive limitations and do not understand the whole picture (the underlying model).
Structure of the model

- The model (see De Grauwe and Ji, Behavioral Macroeconomics, OUP, 2019) consists of
  - aggregate demand,
  - aggregate supply
  - Taylor rule
  - Fiscal “Taylor rule” (government spending function of output gap and debt level)
  - government budget constraint, in simplified form

\[ \dot{b} = (r - g)b - s \]
Agents have cognitive limitations and do not understand the underlying model.

• Instead they only understand small bits and pieces of the whole model
• and use simple rules (fundamentalist rule or extrapolative rule) to forecast.

• Rationality is introduced through a selection mechanism in which agents evaluate the performance of the rule they are following
• and decide to switch or to stick to the rule depending on how well the rule performs relative to other rules.

• We analyze model under different interest rate regimes
Figure 4: Output Gap and Animal Spirits (rs=0.01)

A

output gap and animal spirits

B

Animal spirits and public debt

C

histogram animal spirits

D

histogram output gap
Results: time domain (top panel)

- Strong cyclical movements in the output gap, high serial correlation of 0.9.
- The model generates endogenous and cyclical waves of optimism and pessimism
  - Keynes’ “animal spirits” range between -1 and +1
  - Optimism and pessimism self-fulfilling
- Correlation output gap and animal spirits = 0.9
- Public debt to GDP is highly serial correlated.
- Negatively correlated with animal spirits/output gap
Results: non-normality distribution (frequency domain, bottom panel)

- Model produces non-normally distributed output gaps
  - Excess kurtosis
  - Fat tails
- These are produced by animal spirits
  - Most of the time: great moderation; market sentiments neutral
  - Regularly and unpredictably there is strong optimism (pessimism) that in self-fulfilling way creates boom (bust)
- It is also observed empirically
Impulse Response Functions (IRFs) fiscal stimulus: Great uncertainty
Fiscal multipliers are obtained by adding the output effects of the expenditure shock during the first 4 quarters after the shock.

The multipliers depend on initial conditions (state dependency).

They exceed 1 when animal spirits are extreme.

Consistent with empirical evidence Auerbach and Gorodnichenko (2012 & 2013)
Fiscal Tradeoffs

- Governments care about both output stabilization and debt sustainability.
- We construct tradeoffs for different interest rate regimes.
- Tradeoffs crucially depend on interest rate regime (defined as interest rate minus growth rate in steady state):
  - Dynamically stable rate $r-g<0$
  - Dynamically unstable $r-g>0$
What happens during a recession in two interest rate regime?

• Fiscal authorities increase spending in order to stabilize output. As a result, the deficit and government debt increase.

• When $r-g > 0$, debt is dynamically unstable except if the governments keep a sufficiently positive primary balance.
  — The counter-cyclical fiscal policy leads to a departure from this condition thereby destabilizing the debt.
  — The latter forces the fiscal authorities to reduce spending thereby offsetting the counter-cyclical policy stance.
—When $r-g$ is very positive, the underlying instability of the debt is very strong, and the need to reduce spending to stabilize the debt overwhelms the counter-cyclical policy stance.

—Fiscal policies as a whole become pro-cyclical.

—The use of fiscal policy to stabilize the business cycle can quickly lead to a “loss-loss” situation in which both the government debt and the business cycle are destabilized.

• In a regime when the interest rate is lower than the growth rate of the economy, $(r-g < 0)$ this problem does not arise.

—This is a regime that allows the fiscal authorities to follow counter-cyclical policies.
Conclusions and Policy implications

We use a behavioral macro model to analyse fiscal policies:

• When animal spirits are positive and the economy is booming, government debt tends to decline. And vice versa.

• The size of the fiscal multiplier depends on the state of the economy, which is consistent with recent empirical evidence. This justifies the use of fiscal policies in output stabilization.

• Trade-offs governments face: output stabilization and debt sustainability.
  — When the interest rate is lower than the growth rate of the economy, fiscal policy can be used to stabilize the economy.
  — When the interest rate exceeds the growth rate of the economy, the use of counter-cyclical fiscal policy can destabilize the system.
Is their fiscal space for stabilization purposes today?

Source: European Commission, AMECO
r - g (mean over 2016-18)

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Primary budget balances % GDP (2019)
<table>
<thead>
<tr>
<th>Country (2019)</th>
<th>Debt to GDP ratio</th>
<th>(r - g)</th>
<th>(r - g)/(1+g)* Debt</th>
<th>Observed primary balance</th>
<th>Fiscal stimulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>69,7</td>
<td>-3,3%</td>
<td>-2,3%</td>
<td>1,8%</td>
<td>4,1%</td>
</tr>
<tr>
<td>Belgium</td>
<td>101,3</td>
<td>-2,4%</td>
<td>-2,5%</td>
<td>0,8%</td>
<td>3,3%</td>
</tr>
<tr>
<td>Finland</td>
<td>58,3</td>
<td>-2,9%</td>
<td>-1,7%</td>
<td>0,5%</td>
<td>2,2%</td>
</tr>
<tr>
<td>France</td>
<td>99</td>
<td>-1,6%</td>
<td>-1,6%</td>
<td>-1,5%</td>
<td>0,1%</td>
</tr>
<tr>
<td>Germany</td>
<td>58,4</td>
<td>-3,1%</td>
<td>-1,8%</td>
<td>1,8%</td>
<td>3,6%</td>
</tr>
<tr>
<td>Greece</td>
<td>174,9</td>
<td>4,8%</td>
<td>8,4%</td>
<td>4,0%</td>
<td>-4,3%</td>
</tr>
<tr>
<td>Ireland</td>
<td>61,3</td>
<td>-6,4%</td>
<td>-3,9%</td>
<td>1,4%</td>
<td>5,4%</td>
</tr>
<tr>
<td>Italy</td>
<td>133,7</td>
<td>0,0%</td>
<td>0,0%</td>
<td>1,2%</td>
<td>1,2%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>49,1</td>
<td>-3,4%</td>
<td>-1,7%</td>
<td>2,2%</td>
<td>3,9%</td>
</tr>
<tr>
<td>Portugal</td>
<td>119,5</td>
<td>-1,2%</td>
<td>-1,4%</td>
<td>2,9%</td>
<td>4,3%</td>
</tr>
<tr>
<td>Spain</td>
<td>96,3</td>
<td>-2,3%</td>
<td>-2,2%</td>
<td>0,0%</td>
<td>2,2%</td>
</tr>
</tbody>
</table>

Note: the column (r-g)/(1+g)*Debt measures the primary balance that will keep the debt to GDP ratio at the level of 2019; the last column measures the size of the fiscal stimulus in each country that will keep the debt to GDP ratio fixed at the level of 2019, given (r – g) in 2019.