Fiscal Consolidation in a Currency Union: Spending Cuts Vs. Tax Hikes

Christopher J. Erceg and Jesper Lindé

Federal Reserve Board

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Motivation
Deteriorating public finances has spurred fiscal consolidation plans

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  - Between 2007 and 2011, debt/GDP ratios climbed by 25 to 30 percent in many industrial countries; e.g. United Kingdom, France, and Spain

- Concerns about high and rising debt levels, especially in the wake of the runup in borrowing costs for many European sovereigns, has spurred efforts to implement sizeable fiscal consolidation plans
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Effects of fiscal austerity in current environment uncertain

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In designing a fiscal consolidation plan, policymakers must make a number of key decisions including:

- size of the desired improvement in debt/GDP ratio
- composition between spending cuts and tax increases
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An important open question is the extent to which it is desirable to tailor the structure of fiscal consolidation to the economy in question by taking account of monetary constraints imposed by CU membership and ZLB.
What we do
Instruments and model environment

- *Positive* analysis of the effects of *large* spending- and revenue-based fiscal consolidations on output and *government debt* using a dynamic general equilibrium model
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- Two regions in CU, South (PIGIS) and North (Rest of EA) who share a common currency and monetary policy
- Sticky prices and wages
- Duration of liquidity trap endogenously determined
What we do

Two different monetary environments

- We study South consolidation under two alternative assumptions about monetary policy
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- We study South consolidation under two alternative assumptions about monetary policy.
- First, we assume that CU monetary policy is unconstrained, so monetary accommodation by CU central bank feasible.
- Second, we study the effects when CU is in a liquidity trap.
  - A liquidity trap is a situation where policy rates cannot be lowered for a prolonged period due to the zero bound.
Presentation outline

- Model
- Parameterization
- Effects of South consolidation in normal times
- Effects of South consolidation in a liquidity trap
- Mixed strategies
- Concluding remarks
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P_{C,t} (1 + \tau_{C,t}) C_t^{HM} (h) = (1 - \tau_{N,t}) W_t (h) N_t (h) + TR_t (h)
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The Hand-to-mouth (HM) households set their wage at the average wage of the optimizing households, and since they face same labor demand curve they work the same amount as optimizing households in equilibrium
Spend $g_t$ on the final consumption good (leakage); make lump-sum net transfers ($tr$) to “O” and “HM” households.
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• Monetary policy follows rule

$$i_t = \max \{-i, (1 - \gamma_I) (\gamma_\pi \tilde{\pi}_t + \gamma_x \tilde{x}_t) + \gamma_i i_{t-1}\}$$

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- Perfect foresight solution; Hebden, Linde and Svensson (2009)
Parameterization of model

- South 1/3 or currency union

Import shares inspired by intra-Euro trade data for 2006-08 for PIGIS. South import share of output 14%, while North import share 7%, respectively. Import intensity of consumption 3/4 that of investment.

Fiscal flows; $G/Y = 0.23$, Net transfers $\tau_C = 0.2$, capital $\tau_K = 0.3$, $b_G = 0.75$, implying $\tau_N = 0.42$ and a spending/revenue share of 0.44.

Other deep parameters taken from literature on estimated DSGE models ("Sophisticated Calibration"), with the following exceptions:

- About 50% of households are Keynesian (conduct sensitivity analysis w.r.t. this parameter)
- Slope of pricing and wage schedules on the low side (0.007, slope in often-cited papers in empirical literature 0.009-0.014)
- Policy rule more aggressive to inflation than standard Taylor rule ($\gamma_\pi = 2.5$)

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Assume South debt target $b^*_{Gt+1}$ follows

$$b^*_{Gt+1} - b^*_{Gt} = \rho_{d1}(b^*_{Gt} - b^*_{Gt-1}) - \rho_{d2}b^*_{Gt} + \varepsilon_{d^*,t},$$
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By setting $\rho_{d_1} = 0.935$ and $\rho_{d_2} = 0.0001$, this specification implies that distance to new target level is reduced by half after 3 years, and reached after 10 years.
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By setting $\rho_{d_1} = 0.935$ and $\rho_{d_2} = 0.0001$, this specification implies that distance to new target level is reduced by half after 3 years, and reached after 10 years.

Govt use either $g_t$ or $\tau_{N, t}$ to implement $b_{Gt+1}^*$. The fiscal rule is (for $f_i = [g_t, \tau_{N, t}]$)

$$f_{it} = \nu_{f_{i0}} f_{i,t-1} + (1 - \nu_{f_{i0}}) \left[ \nu_{f_{i1}} (b_{Gt} - b_{Gt}^*) + \nu_{f_{i2}} (\Delta b_{Gt+1} - \Delta b_{Gt+1}^*) \right]$$
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Govt acts to keep $b_{Gt} - b_{Gt}^*$ and $\Delta b_{Gt+1} - \Delta b_{Gt+1}^*$ small.
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Results are reported in Figure 1 in the paper.
Effects of South consolidation in normal times
Comparing the effects in a currency union with monetary independence

1. South Nominal Interest Rate (APR)

2. South CPI Inflation (APR)

3. South Output

4. South Potential Output

5. South/North Real Exchange Rate

6. South Govt Debt as Share of GDP
   - Spending Cut, CU
   - Spending Cut, IMP
   - Labor Tax Hike, CU
   - Labor Tax Hike, IMP

7. South Govt Spend (trend GDP share)

8. South Labor-income Tax Rate
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As a result, the currency union enters into a liquidity trap that is expected to last 2-years absent any fiscal austerity measures.
Effects of South consolidation in a liquidity trap
Baseline scenario which drives currency union into a liquidity trap

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- We assume that South and North are hit by common negative consumption demand and technology shocks in period 0 which induces a symmetric persistent decline in output with a low of about \(-10\%\) relative to trend.
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- As a result, the currency union enters into a liquidity trap that is expected to last 2-years absent any fiscal austerity measures.
  - Symmetric calibration and shocks \(\Rightarrow\) baseline identical for South and North.
Baseline Scenario in model
Paths when interest rates are unconstrained and subject to ZLB

[Graphs showing the nominal interest rate, inflation, output, and government debt as a share of GDP over time.]
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- Compute impact of lower debt target as scenario (baseline shocks + austerity) minus baseline (baseline shocks only)
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- To quantify the impact of the ZLB, we also report results when CU monetary policy is unconstrained (but South is still a CU member) in the figure, labeled “Normal”
Effects of South consolidation in a liquidity trap

Effects in a liquidity trap and in normal times when South is a CU member

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Contributions to South debt dynamics

Debt dynamics in normal times and liquidity trap for spending cuts in CU

Panel A: Spending Cuts When CU Monetary Policy Is Unconstrained

Panel B: Spending Cuts When CU is in a Liquidity Trap
In our framework with endogenous liquidity trap duration, the impact of austerity importantly depends on its size (Erceg and Lindé, 2010)
In our framework with endogenous liquidity trap duration, the impact of austerity importantly depends on its size (Erceg and Lindé, 2010).

To show this, we study differently-sized debt target reductions; -5%, -15% and benchmark (-25%).
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- As a result, the large spending-based consolidation extends the liquidity trap duration by 4 quarters, and is much more contractionary in the near-term than a corresponding tax-based consolidation which only extends LT duration by 1 quarter
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- Marginal multipliers reported in Figure 6 in the paper
Effects of South consolidation in a liquidity trap
Output and gov’t debt marginal multipliers as function of liquidity trap duration

Benchmark Calibration

Output

Government Debt to Actual GDP

Multiplier (3-year)

Zero Lower Bound Duration

Multiplier (3-year)

Zero Lower Bound Duration
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Specifically, we study:

1. A strategy which adds front-loaded and temporary labor tax hike the spending-based consolidation.
2. A strategy which adds gradual and very persistent spending cuts to the tax-based consolidation.

Compare against the pure spending- and tax-based consolidation strategies studied earlier.
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Mixed Strategies

Assessing the effects of consolidations involving both spending and taxes

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Mixed Strategies
Effects of “Mixed Strategies”

1. South Nominal Interest Rate (APR)

2. South/North Real Exchange Rate
   - Only Spending, Benchmark
   - Only Taxes, Benchmark
   - Spending Cut, Taxes adjust
   - Tax Hike, Spending adjust

3. South Output

4. South Potential Output

5. North Output

6. South Govt Debt as Share of GDP

7. South Govt Spend (trend GDP share)

8. South Labor-income Tax Rate
Concluding remarks

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- Spending based approach preferable in the long-run, but can be self-defeating in the short-run.
Concluding remarks

Our analysis points towards an important short- and long-term trade-off between spending- and tax-based consolidations in CU, especially when a large subset of members undertakes large consolidations in a long-lived liquidity trap.

- Spending based approach preferable in the long-run, but can be self-defeating in the short-run.
- Mix of front-loaded *temporary* tax hikes and *gradual* spending cuts offers an effective route to reduce debt in the near- and long-term at low output cost in a liquidity trap (but are contractionary, in contrast to Eggertsson, 2010).
Concluding remarks

Our analysis points towards an important short- and long-term trade-off between spending- and tax-based consolidations in CU, especially when a large subset of members undertakes large consolidations in a long-lived liquidity trap.

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Overall, results underscore importance of structuring fiscal consolidation to take account of constraints on interest and exchange rate adjustment.
So far, we have assumed that government and banks borrow at the same rate \( i_t \) in both South and North.
Sensitivity analysis
Assessing the effects of endogenous sovereign spreads

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- We now explore the consequences of assuming that government and banks in South is subject to the following premium

\[ i_t^S - i_t = \psi_b (\tilde{b}_{Gt+1} - \tilde{b}_G) + \psi_d (\tilde{b}_{Gt+1} - \tilde{b}_G), \]

where $\psi_b = 0.025$ and $\psi_d = 0.05$
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- In figure below, we consider the effects of spending and tax austerity measures in *Small South* with and without endogenous sovereign risk-spreads.
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- We maintain the assumption of full credibility.
Sensitivity analysis
Effects of endogenous sovereign spreads when Small South consolidates