Fiscal Deficits and Unemployment Dynamics: The Role of Productivity Gains and Wage Rigidities

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\textsuperscript{1}The views expressed in this presentation are those of the authors and should not be attributed to the International Monetary Fund, its Executive Board, or its management.
"Advocates of austerity believe that mystically, as the deficits come down, confidence in the economy will be restored and investment will boom. For 75 years there has been a contest between this theory and Keynesian theory, which argued that spending more now, especially on public investments (or tax cuts designed to encourage private investment) was more likely to restore growth, even though it increased the deficit....multiple experiments have been conducted and almost all come to the same conclusion: the Keynesian prescription works. Austerity converts downturns into recessions, recessions into depressions."

Joseph Stiglitz, 2010
Introduction


A. GDP

B. Detrended GDP

C. Unemployment Rate

D. Primary Balance / GDP

E. Net Taxes / GDP

F. Government Consumption / GDP
Fiscal Adjustment and TFP
(Advanced Economies)

Source: AMECO, WEO, and Devries et al. (2011).
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"Besides being an important determinant of living standards and GDP, productivity growth also affects the fiscal outlook, because expenditures and revenues tend to move with GDP."

- *Effects of Low Productivity Growth on Fiscal Sustainability in the United States (Sheiner, 2018)*
Introduction

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- What are the effects of fiscal austerity in the absence of TFP growth?
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  - Take the model to the data and account for the Swedish fiscal consolidation of the 1990s (simultaneous reduction of fiscal deficits and unemployment).
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- In a calibrated neoclassical growth model with labor market search, we:
  - Analyze the impact of different fiscal consolidation strategies with and without productivity gains.
  - Take the model to the data and account for the Swedish fiscal consolidation of the 1990s (simultaneous reduction of fiscal deficits and unemployment).
  - Evaluate counterfactual scenarios of the Swedish fiscal consolidation episode.
Main Results

- In a neoclassical growth model a fiscal adjustment (increase in taxes or reduction in government spending) leads to an improvement of the fiscal balance at the expense of higher unemployment.

Gains in TFP, although expansionary, do not contribute much to reduce the unemployment rate.

In a scenario of TFP gains and wage rigidities, it is possible to simultaneously reduce the fiscal deficit and the unemployment rate (wage rigidities might be beneficial).

The model can account for the main facts of the Swedish fiscal consolidation episode. In particular, related to fiscal deficit and unemployment dynamics.

In a counterfactual scenario of constant TFP, fiscal austerity does not eliminate fiscal deficit having a large impact on unemployment.
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- In a counterfactual scenario of constant TFP, fiscal austerity does not eliminate fiscal deficit having a large impact on unemployment.
Outline

1. Related Literature
2. Neoclassical Growth Model with Search
3. Fiscal austerity and the trade-off between fiscal deficits and unemployment
4. Accounting for the Swedish Fiscal Consolidation Episode
5. Counterfactual Scenarios
6. Concluding Remarks
Related Literature

- **Fiscal Policy in Neoclassical Models:**
  - Ohanian (1997), McGrattan and Ohanian (2010), and Uhlig (2010).

- **Labor Market Search:**

- **Wage Rigidities:**
Neoclassical Model with Labor Market Search

- Neoclassical growth model.
- Labor market search as in Mortensen and Pissarides (1994).
- Real wage rigidities as in Shimer (2012).
- Distortionary taxation: consumption, labor, and capital.
- Preferences feature a complementarity between private and public consumption (consistent with empirical correlation between those two variables).
Neoclassical Model with Labor Market Search

**Labor Market Search:**

\[ m(u_t(s^t), v_t(s^t)n_t(s^t)) = \omega \pi(u_t(s^t))^{1-l}(v_t(s^t)n_t(s^t))^l, \]

\[ n_{t+1}(s^t) = \rho n_t(s^{t-1}) + \pi(\theta_t(s^t))(1 - n_t(s^{t-1})). \]

where:

\[ \pi(\theta_t(s^t)) = \frac{m(u_t(s^t), v_t n_t(s^t))}{u_t(s^t)} \]

\[ \theta_t(s^t) = \frac{(v_t(s^t)n_t(s^t))}{u_t(s^t)}, \]
Neoclassical Model with Labor Market Search

- **Production Function**

\[ y_t(s^t) = a_t(s^t)k^d_t(s^t)^{\alpha_p}(\Gamma_t(1 - \nu_t(s^t))n_t(s^{t-1}))^{1-\alpha_p}, \]

- **Firm’s Optimization Problem:**

\[
F(s^t, n) = \max_{k^d, \nu} \left\{ a_t(s^t)(k^d)^{\alpha_p}(\Gamma_t(1 - \nu)n)^{1-\alpha_p} - w_t(s^t)n - r_t^k(s^t)k^d + E_t \left[ \Lambda_{t,t+1}F(s^{t+1}, n') \right] \right\},
\]

subject to:

\[
n' = \rho n + q(\theta_t(s^t))\nu n,
\]

\[
q(\theta_t(s^t)) = \frac{m(1 - n, \nu n)}{\nu n}.
\]
Neoclassical Model with Labor Market Search

- Household’s Optimization Problem:

\[ H(s^t, n, k, b) = \max_{c, b', k'} \left\{ uf(c, n, g_t(s^t)) + \beta E_t [H(s^{t+1}, n', k', b')] \right\}, \]

subject to:

\[ (1 + \tau^c_t(s^t))c + inv + b' = (1 - \tau^n_t(s^t))w_t(s^t)n + tr_t(s^t) \]
\[ + \tau^k_t(s^t)\delta p_{k,t}(s^t)k \]
\[ + (1 - \tau^k_t(s^t))r^k_t(s^t)k + p_{k,t}(s^t)k + R_{t-1}(s^{t-1})b, \]
\[ n' = \rho n + \pi(\theta_t(s^t))(1 - n). \]
Wage dynamics:

\[ w_t(s^t) = (w_{t-1}(s^{t-1}))^{\chi_w} (w_t^*(s^t))^{1-\chi_w}, \]

where the parameter \( \chi_w \) controls the degree of wage rigidity and \( w_t^*(s^t) \) is the wage rate under Nash bargaining (Hosios Condition).
Neoclassical Model with Labor Market Search

- **Government budget constraint:**

\[
ps_t(s^t) = \tau^n_t(s^t)w_t(s^t)n_t(s^{t-1}) + \tau^k_t(s^t)(r^k_t(s^t) - \delta p_{k,t}(s^t))k_t(s^{t-1}) \\
+ \tau^c_t(s^t)c_t(s^t) - tr_t(s^t) - g_t(s^t),
\]

\[
ps_t(s^t) + b_{t+1}(s^t) = R_{t-1}(s^{t-1})b_t(s^{t-1}).
\]
Calibration:

- We consider five shocks \((a_t, g_t, \tau_t^c, \tau_t^n, \tau_t^k)\) that follow an AR(1) process.
- Tax rates were computed following the methodology of Mendoza et al. (1994).
- Complementarity between consumption and government spending
  \[
  uf_t = \frac{\chi_g}{\chi_g - 1} \log \left( (c_t)^{1-1/\chi_g} + (g_t)^{1-1/\chi_g} \right) - \xi N \frac{n_t^{1+\sigma_L}}{1+\sigma_L}
  \]
  and wage rigidities
  \[
  w_t(s^t) = (w_{t-1}(s^{t-1}))^{\chi_w} \left( w_t^*(s^t) \right)^{1-\chi_w}
  \]
  consistent with data moments.
- Replicate the empirical correlation between private consumption and government spending, and the correlation between real wages and TFP.
- We find that \(\chi_g = 0.21\) and \(\chi_w = 0.93\).
Fiscal austerity and the trade-off between fiscal deficits and unemployment (Spending cut)

- Less wage rigidity ($\chi_w = 0.75 \times 0.93$)
- Less wage rigidity ($\chi_w = 0.75 \times 0.93$) and prod gains
- Wage rigidity ($\chi_w = 0.93$) and prod gains
Fiscal austerity and the trade-off between fiscal deficits and unemployment (Labor tax hike)

![Graphs showing the relationship between GDP, unemployment, real wages, and primary balance to GDP deviation from steady state for different wage rigidity scenarios.]

- Blue line: Less wage rigidity ($\chi_w = 0.75 \times 0.93$)
- Red line: Less wage rigidity ($\chi_w = 0.75 \times 0.93$) and prod gains
- Green line: Wage rigidity ($\chi_w = 0.93$) and prod gains
Fiscal austerity and the trade-off between fiscal deficits and unemployment

**Key takeaways:**

- Fiscal austerity measures (raise in taxes or cut in government spending) improves the fiscal balance at the expense of higher unemployment.
- TFP gains can offset the impact on GDP but unemployment still would increase.
- However, under TFP gains and large real wage rigidities, fiscal deficits and unemployment rate can be reduced simultaneously.
Accounting for the Swedish Fiscal Consolidation Episode

- **Initial Conditions:**
  - Decline of 10 percent in detrended GDP during 1990-1993 (Worst recession since the Great Depression).
  - Increase in unemployment rate from 2 to 9 percent.
  - Fiscal balance declined from 4 to -12 percent of GDP

- **Fiscal Consolidation Episode:**
  - Tax reform that resulted in higher consumption, labor, and capital tax rates.
  - Decline in the ratio of government consumption to GDP (Expenditure ceiling).
  - Increase in the level of TFP of 20 percent during 1993-2000.
Accounting for the Swedish Fiscal Consolidation Episode

A. Unemployment Rate (%)

B. GDP (detrended, 1992=100)

C. Primary Surplus (% of GDP)

D. Government revenues (% of GDP)
We consider the following experiments:

- No fiscal austerity (constant tax rates and government spending).
- Constant TFP.
- Increase in wage flexibility.
Counterfactual Scenarios

A. Unemployment Rate (%)  
B. GDP (detrended, 1992=100)

C. Primary Surplus (% of GDP)  
D. Government revenues (% of GDP)
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Counterfactual Scenarios

A. Unemployment Rate (%)

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Key takeaways:

- In the absence of TFP growth, fiscal austerity measures reduce the fiscal deficit at the expense of higher unemployment.
- TFP gains and wage rigidities contributed to the simultaneous reduction of fiscal deficits and unemployment.
Concluding Remarks

- In a scenario of TFP gains and wage rigidities, fiscal consolidation measures can simultaneously reduce fiscal deficits and unemployment.

- **Policy Implication:** Fiscal austerity in a scenario of stagnant TFP might lead to modest fiscal deficit reductions and a large impact on unemployment. Benefits from relying on complementary policies that boost TFP ("structural reforms").

- Under some circumstances wage rigidities might be desirable (Galí and Monacelli, 2016).

- Extensions: Role of monetary policy, exchange rate, and credibility.