Fiscal Stress & Inflation

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Overview

- Advanced economies face
  - small short-run fiscal stress
  - **large** long-run fiscal stress
- Profession has narrow perception of how fiscal policy affects aggregate demand & inflation
  - based on in-grained asymmetric treatment of monetary & fiscal policy
  - leads to misperceptions of fiscal effects
- Describe inherent symmetry: Regimes M & F
- Show that long-run fiscal stress can undermine monetary control of inflation
  - economy’s “fiscal limit”—taxes & spending no longer adjust to stabilize debt
  - at fiscal limit, policy effects topsy-turvy
Era of Fiscal Stress

- Short-run imbalances
of less ambitious fiscal restraint in some major emerging market economies (for example, China, India, Russia).

Gross-debt-to-GDP ratios will rise further in many advanced economies, with a particularly steep increase in the G7 economies, to about 130 percent by 2017. Without more action than currently planned, debt ratios are expected to reach 256 percent in Japan, 124 percent in Italy, close to 113 percent in the United States, and 91 percent in the euro area over the forecast horizon. In the G7 economies of the euro area, these ratios would be reached in 2013, after which they would fall, whereas in Japan and the United States the debt ratios are projected to rise through the forecast horizon, which extends to 2017. In a striking contrast, many emerging and developing economies will see a decline in debt-to-GDP ratios, with the overall ratio for the group dropping to below 30 percent by 2017. The April 2012 Fiscal Monitor provides more detail at the country level and discusses the role of growth and interest rate assumptions in driving the debt dynamics.

Volatile or Falling commodity prices

Oil prices rose sharply during 2010 and early 2011 to about $115 a barrel, then eased to about $100 a barrel, and now are back up to about $115 a barrel (Figure 1.3, panel 5). Production recovered in Libya but fell in various other Organization of Petroleum Exporting Countries (OPEC) producers, and non-OPEC output remained relatively weak. In addition, geopolitical risks—nally those centered on the Islamic Republic of Iran—have boosted oil prices. Projections for 2012–13 assume that oil prices recede to about $110 a barrel in 2013, in line with prices in futures markets, but in the current environment low stocks and limited spare capacity present important upside risks.

Other commodity prices have recently been given a temporary boost by better-than-expected macroeconomic results, but they continue to run much lower than in 2011. WEO projections assume a decline in the nonfuel commodity price index of 10.3 percent in 2012 and 2.7 percent in 2013 (see Table 1.1). An important factor here is improved prospects for the food supply during 2012. Shares of GDP. Source: IMF, WEO
Clueless Short-Run Policy Advice

- Policy institutions have added to the fiscal turmoil
- IMF flip-flops:
  1. In 2008–2009: urging fiscal stimulus
  2. In 2010–2011: urging fiscal consolidation
  3. In 2012: urging “growth & austerity” (growsterity)
- Many countries pursued austerity even in face of slow or negative growth
  - U.K., Ireland, Portugal, Greece, Spain, Italy
  - now facing new recessions
- Other countries paralyzed
  - U.S., Japan
  - now facing prolonged stagnation
- Outturn: countries have achieved neither growth nor consolidation
Era of Fiscal Stress

- Short-run imbalances
- Long-run imbalances
Long-Run Fiscal Stress: Aging Populations

Dependency Ratio: Population 65 and above relative to ages 15-64

Blue: 1960
Red: 2005
Green: 2050
U.S. “Unfunded Liabilities”

Source: CBO Long-Term Budget Outlook
U.S. “Unfunded Liabilities”

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## Spending Commitments to the Aged

<table>
<thead>
<tr>
<th>Country</th>
<th>Aging-Related Spending</th>
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<tbody>
<tr>
<td>Australia</td>
<td>482</td>
</tr>
<tr>
<td>Canada</td>
<td>726</td>
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<tr>
<td>France</td>
<td>276</td>
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<tr>
<td>Germany</td>
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<td>Italy</td>
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<td>United Kingdom</td>
<td>335</td>
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<tr>
<td>United States</td>
<td>495</td>
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<tr>
<td><strong>Advanced G-20 Countries</strong></td>
<td><strong>409</strong></td>
</tr>
</tbody>
</table>

Worldwide “Unfunded Liabilities.” Net present value of impact on fiscal deficit of aging-related spending, in percent of GDP. Source: IMF
the Government's fiscal strategy and a more gradual pace of ageing than previously expected. By constraining real expenditure growth, the fiscal strategy will be a first step in delivering the structural adjustments in government finances necessary to address the spending pressures of an ageing population. Expenditure restraint through the Government's fiscal strategy will result in a permanent structural improvement in spending of around 1 per cent of GDP.

By acting early, the Government's fiscal strategy will reduce the size of the adjustment costs required in the long run.

Note: The fiscal gap is total Australian government receipts minus total Australian government payments (excluding interest).
Source: Treasury projections.

Australian Fiscal Gap. Source: Intergenerational Report, Treasury
If a fiscal gap of 2¾ per cent of GDP were to develop, it is projected that net debt would re-emerge in the 2040s and rise to around 20 per cent of GDP by 2049–50 and continue to increase beyond this time (Chart 3.3).
Long-Run Fiscal Stress

Austria France Germany

0 50 100 150 200 250 300

Baseline scenario
Small gradual adjustment
Small gradual adjustment with age-related spending held constant

Greece Ireland Italy

0 100 200 300 400

Japan Netherlands Portugal

0 50 100 150 200 250 300

Spain United Kingdom United States

0 100 200 300 400 500 600

Debt-GDP. Source: BIS

Sources: OECD; authors' projections.
Long-Run Fiscal Stress

Graph 4
Public debt/GDP projections
Austria France Germany

Baseline scenario
Small gradual adjustment
Small gradual adjustment with age-related spending held constant

Japan

Netherlands

Portugal

Spain

United Kingdom

United States

Debt-GDP. Source: BIS

Sources: OECD; authors' projections.
Message in Long-Run Projections

- These projections cannot happen
- Some assumptions underlying projections cannot hold
  1. economies will grow out of projected deficits
  2. governments will default outright on debt
  3. fiscal policies will adjust surpluses to stabilize debt
  4. paths of inflation will turn out different from assumed
  5. some combination of the four
- Only Dr. Pangloss could believe 1
- Europe makes clear how onerous is 2
- Most central bankers hope for 3
  - what are the prospects for significant entitlements reform?
The level of public fiscal discourse in Europe
Prospects for Entitlements Reform

The level of public fiscal discourse in U.S.
Message in Long-Run Projections

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  5. some combination of the four
- Only Dr. Pangloss could believe 1
- Europe makes clear how onerous is 2
- Most central bankers hope for 3
- I’ll focus on ways that 4 might arise
Unresolved Fiscal Stress

- Spending promises without financing plans create unresolved fiscal stress
- Raises possibility economy will hit its fiscal limit—point at which surpluses can no longer adjust to stabilize debt
  - reach peaks of Laffer curves
  - meet societal demands for government services
- Many questions to address
- Here focus narrowly on:

1. How might unresolved fiscal stress affect inflation/aggregate demand?
2. Can central banks retain control of inflation/aggregate demand?
Monetary & fiscal policy have two tasks: (1) control inflation; (2) stabilize debt

Two different policy mixes that can accomplish these tasks

**Regime M:** conventional assignment—MP targets inflation; FP targets real debt (called active MP/passive FP)

**Regime F:** alternative assignment—MP maintains value of debt; FP controls inflation (called passive MP/active FP)

**Regime M:** normal state of affairs

**Regime F:** can arise in an era of fiscal stress
Monetary-Fiscal Interactions: Regime M

- In Regime M:
  - MP targets inflation by aggressively adjusting nominal interest rates when inflation away from target.
  - FP adjusts future surpluses to cover interest plus principal on debt.

- What is FP really doing?
  - Any shock that changes debt must create the *expectation* that future surpluses will adjust to stabilize debt’s value.
  - People must believe adjustments will occur eventually.
  - Eliminates wealth effects from government debt.

- For MP to target inflation, fiscal expectations must be anchored on FP adjusting to maintain value of debt.
An Equilibrium Condition

\[ \frac{M_{t-1} + Q_t B_{t-1}}{P_t} = \sum_{j=0}^{\infty} \beta^j E_t \left[ \tau_{t+j} - z_{t+j} + \frac{M_{t+j} - M_{t+j-1}}{P_{t+j}} \right] \]

Market value government liabilities =
Expected present value primary surpluses + seigniorage

- In Regime M...
  - MP delivers equilibrium inflation process—\( \{P_t, Q_t\} \)
  - taking prices as given, FP must choose compatible surplus policy
  - “compatible” means: stabilizes debt
  - imposes restrictions on \( E_t PV(\tau_{t+j} - z_{t+j}) \)
Anchored Fiscal Expectations?

- Regime M requires appropriately anchored fiscal expectations

- Fiscal expectations anchored on stabilizing debt allow monetary policy to work

- Suppose FP does not stabilize debt

- Consider an open-market sale of bonds to raise nominal interest rate (a MP contraction)
  - more bonds in hands of public & higher interest payments
  - with no expectations of higher future taxes, public feels wealthier
  - higher wealth increases aggregate demand & inflation
  - MP “contraction” raises inflation & economic activity

- Fiscal anchors aweigh undermines Regime M
Primer on Monetary-Fiscal Interactions

- Monetary & fiscal policy have two tasks: (1) control inflation; (2) stabilize debt
- Beautiful symmetry: two different policy mixes that can accomplish these tasks

**Regime M:** conventional assignment—MP targets inflation; FP targets real debt (called active MP/passive FP)

**Regime F:** alternative assignment—MP maintains value of debt; FP controls inflation (called passive MP/active FP)

- **Regime M:** normal state of affairs
- **Regime F:** can arise in an era of fiscal stress
- Regime F arises in two ways
  1. Sargent & Wallace’s unpleasant monetarist arithmetic
Conventional Perception of Fiscal Inflation

- Arises from unpleasant arithmetic mechanism
  - hit fiscal limit; surpluses unresponsive to debt
  - seigniorage adjusts to stabilize debt
  - produces high & volatile inflation

- A central banker’s take on this:
  
  “...the proposition is of little current relevance to the major industrial countries. First, seigniorage is very small relative to other sources of revenues. Second, governments have become increasingly committed to price stability.... This sea change in the conventional wisdom about price stability leaves no room for inflation to bail out fiscal policy.”

  —Mervyn King (1995)

I agree
An Equilibrium Condition

\[
\frac{M_{t-1} + Q_t B_{t-1}}{P_t} = \sum_{j=0}^{\infty} \beta^j E_t \left[ \tau_{t+j} - z_{t+j} + \frac{M_{t+j} - M_{t+j-1}}{P_{t+j}} \right]
\]

Market value government liabilities = Expected present value primary surpluses + seigniorage

- In Regime F unpleasant arithmetic...
  - MP delivers equilibrium inflation process—\( \{P_t, Q_t\} \)
  - taking surpluses as given, MP must choose compatible seigniorage policy
  - “compatible” means: stabilizes debt
  - imposes restrictions on \( E_t PV \left( \frac{M_{t+j} - M_{t+j-1}}{P_{t+j}} \right) \)
Misperceptions Underlie Policy Institutions

- A deeply ingrained misperception: CB independence & inflation targeting insulate inflation from FP
- Stems from belief that
  - unpleasant arithmetic is the only way FP can be inflationary
- Beliefs underlie monetary reforms without corresponding fiscal reforms
  - assumes MP reform can force FP reform
  - Europe shows us how well that works
- There is another channel through which fiscal policy can affect inflation and aggregate demand
Primer on Monetary-Fiscal Interactions

- Monetary & fiscal policy have two tasks: (1) control inflation; (2) stabilize debt

- Beautiful symmetry: two different policy mixes that can accomplish these tasks

**Regime M:** conventional assignment—MP targets inflation; FP targets real debt (called active MP/passive FP)

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- Regime F arises in two ways
  1. Sargent & Wallace’s unpleasant monetarist arithmetic
  2. fiscal theory of the price level
Governments issue mostly nominal (non-indexed, local currency) bonds

- 90% U.S. debt; 80% U.K. debt; 95% Euro-area debt; most of Australian, Japanese, Korean, New Zealand, & Swedish debt
- Increasing important in Latin America: Chile (92%), Brazil (89%), Colombia (77%), Mexico (75%)

In Regime F:

- FP sets primary surpluses independently of debt
- MP prevents interest payments on debt from destabilizing debt (as many central banks have been doing)

Nominal debt is revalued to align market value of debt with expected surpluses
Fiscal Transmission in Regime F

\[
\frac{M_{t-1} + Q_t B_{t-1}}{P_t} = \sum_{j=0}^{\infty} \beta^j E_t \left[ \tau_{t+j} - z_{t+j} + \frac{M_{t+j} - M_{t+j-1}}{P_{t+j}} \right]
\]

- Increase in current or expected transfers
  - no offsetting taxes expected, household wealth rises
  - lower expected path of surpluses reduces “cash flows,” lowers value of debt
  - individuals shed debt in favor of consumption, raising aggregate demand
  - higher current & future inflation and economic activity
  - long maturity bonds can shift inflation into future

- Demand for debt ⇔ aggregate demand
An Equilibrium Condition

\[ \frac{M_{t-1} + Q_t B_{t-1}}{P_t} = \sum_{j=0}^{\infty} \beta^j E_t \left[ \tau_{t+j} - z_{t+j} + \frac{M_{t+j} - M_{t+j-1}}{P_{t+j}} \right] \]

- In Regime F fiscal theory...
  - FP delivers equilibrium inflation process—\( \{P_t, Q_t\} \)
  - taking prices as given, MP must choose compatible interest rate policy
  - “compatible” means: stabilizes debt
  - imposes restrictions on \( P_t \) & \( Q_t \)
Topsy-Turvy Policy Effects

- In a fiscal theory equilibrium...
  - neither monetary nor fiscal policies have the “usual” effects
  - and non-policy shocks can have unusual consequences

- Examples
  1. relevance of maturity structure of debt
  2. higher deficit & monetary stance
  3. economic implications of “flight to quality”
Absent financial market frictions, debt maturity irrelevant for inflation & output

- taxes assured to adjust as needed
- timing of taxes and, therefore, maturity structure irrelevant

In Regime F, this is not the case

- even in a frictionless world
One- and two-period nominal debt: $B_t(t + 1), B_t(t + 2)$

Equilibrium condition

$$\frac{B_{t-1}(t)}{P_t} + \beta B_{t-1}(t+1)E_t \frac{1}{P_{t+1}} = E_tpV(\text{surpluses, seigniorage})$$

FP determines total inflation

MP determines the timing of inflation

- stabilize expected inflation: forces adjustment in $P_t$
- lean against current inflation: forces adjustment in $E_t(1/P_{t+1})$

Tradeoff depends on maturity structure,

$$\frac{B_{t-1}(t + 1)}{B_{t-1}(t)}$$

richer maturity structure $\Rightarrow$ any pattern of inflation

Message: MP not impotent, but it cannot control both actual & expected inflation
Dynamic Impacts of Deficit Shocks

► Consider a conventional sticky-price model with
  ► consumption-Euler equation (IS)
  ► Phillips curve (AS)
  ► government budget constraint
  ► exogenous primary deficit process
  ► interest rate rule for MP

\[ R_t = R^* + \phi_\pi (\pi_t - \pi^*) + \phi_Y Y_t \]

\( \pi \): inflation; \( Y \): output gap

► Vary MP choices of \( \phi_\pi \) and \( \phi_Y \)

Pegged interest rate: \( \phi_\pi = \phi_Y = 0 \)
Weak lean against wind: \( \phi_\pi = \phi_Y = .3 \)
Aggressive stance: \( \phi_\pi = .9, \phi_Y = .5 \)
Impacts of Deficit Shocks: Pegged Rate

\[ \phi_{\pi} = \phi_Y = 0 \]

\[ \phi_{\pi} = \phi_Y = 0 \]

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\[ \phi_{\pi} = \phi_Y = 0 \]
Impacts of Deficits: Pegged Rate

\[ \phi_\pi = \phi_Y = 0 \]

Inflation

Debt–Output

Money Growth

Deficit

\[ \phi_\pi = \phi_Y = 0 \]

\[ \phi_\pi = \phi_Y = 0 \]

\[ \phi_\pi = \phi_Y = 0 \]

\[ \phi_\pi = \phi_Y = 0 \]
Impacts of Deficits: More Hawkish

\[ \phi_{\pi} = \phi_{\gamma} = 0 \]
\[ \phi_{\pi} = \phi_{\gamma} = 0.3 \]

Output

Inflation

Nominal Rate

Real Rate
Impacts of Deficits: More Hawkish

Inflation

Debt–Output

Money Growth

Deficit

\[ \phi_\pi = \phi_Y = 0 \]

\[ \phi_\pi = \phi_Y = .3 \]

\[ \phi_\pi = \phi_Y = .3 \]

\[ \phi_\pi = \phi_Y = 0 \]
Impacts of Deficits: Even More Hawkish

\[ \phi_\pi = .9, \phi_Y = .5 \]

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Impacts of Deficits: Even More Hawkish

\[ \phi_\pi = .9, \phi_Y = .5 \]

\[ \phi_\pi = .9, \phi_Y = .5 \]

\[ \phi_\pi = .9, \phi_Y = .5 \]
Real Discount Rates

\[
\frac{M_{t-1} + Q_t B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \frac{1}{r_{t,t+j}} s_{t+j}
\]

- \( r_{t,t+j} \) is \( j \)-step-ahead real discount rate
- Adjustments to eqm need not occur through \( s_{t+j} \)
  - price rigidities make future \( r \)’s important source of financing
- Changes in \( E_t PV(s) \) need not occur through \( s_{t+j} \)
  - variations in expected \( r \)’s can have big effects on \( E_t PV(s) \) with no change in \( s \)’s
- Leads to dramatic re-interpretations
Flight to Quality

\[
\frac{M_{t-1} + Q_t B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \frac{1}{r_{t+j}} s_{t+j}
\]

- Flight to quality in financial crises and recessions
- Investors hold debt at lower expected returns
- As demand for debt rises, demand for goods falls
- Lower demand reduces inflation
- Intertemporal equilibrium condition’s role
  - lower \( r \)'s raises \( E_t PV(s) \) if surpluses unresponsive
  - higher \( E_t PV(s) \) raises value of debt
- Fluctuating discount rates can be a source of business cycles in Regime F—not in Regime M
- MP response: raise rates to increase aggregate demand
Putting a Sharp Point on the Message

- As the world economy recovers, inflation will rise
- To combat inflation, central banks will raise rates to, say, 6% (as in 2006/07 or 2000/01)
- This will have big impacts on fiscal deficits
  - 6% of $15 trillion in U.S. debt is $1 trillion in interest expenses
  - about doubles current fiscal deficit
- For the MP action to lower inflation, government must raise future surpluses by $1 trillion (in PV)
- How likely is this? (Think Super Committee; Think Europe)
- Without this fiscal backing, higher interest rates create higher inflation
Why does fiat currency have value?
Because the government accepts currency—and only currency—in payment of taxes.
Inflation arises when government prints more currency than it eventually absorbs in taxes.
- People try to get rid of currency & buy things.
- Pushes up prices & wages.
Government can soak up currency by selling bonds.
- Does this when it spends more—handing out currency—than it taxes—soaking up currency.
Nominal bonds—like fiat currency—are promises to pay back more currency in future.
If government doesn’t soak up bonds with taxes... inflation.
General Points About Inflation

- Just as money gets its value from taxes...
- Monetary policy gets its power from fiscal backing
- When fiscal backing is assured, MP operates as taught in textbooks
  - MP can control inflation
  - higher interest rates—open-market sale of bonds—reduce consumption & inflation
- But only if future taxes rise to soak up bonds
  - higher taxes eliminate the wealth effects of higher interest payments on government debt
- Otherwise, higher rates...
  - raises wealth, reduce value of bonds, increase aggregate demand & inflation

- It’s all about fiscal backing
Take Aways

- In a world where FP cannot be relied on to adjust surpluses as needed to stabilize debt...
  1. it is impossible for MP to stabilize the economy
  2. fiscal disturbances will always affect output, inflation & interest rates
  3. more aggressive MP will exacerbate the instability
  4. fluctuations in “confidence” that affect real interest rates will transmit into fluctuations in output & inflation
  5. sudden flights to quality or away from junk can have real effects
  6. tighter MP raises debt service, wealth, aggregate demand, and inflation
1. Conventional perceptions of inflation miss a channel for fiscal inflation
   ▶ channel may be important in times of fiscal stress
2. Perception that MP can always stop an inflation that breaks out assumes the necessary fiscal backing will always be forthcoming
   ▶ when fiscal limit possible, the assumption breaks down
3. If inflation has fiscal roots, MP cannot offset it
4. Two policy options:
   i. impose enforceable rules on fiscal behavior
   ii. give different mandates to central banks