THINKING ABOUT FISCAL SUSTAINABILITY

Eric M. Leeper

Department of Economics
Indiana University

Swedish Ministry of Finance

June 2009
**What Does “Sustainability” Mean?**

- If we start with a simple government flow budget constraint

\[ q_t b_t + T_t = G_t + b_{t-1} \]

- An **Intertemporal Equilibrium Condition** must hold

\[ q_t b_t = E_t \sum_{T=t+1}^{\infty} R_{t,T} S_T \]  \hspace{1cm} (IEC)

- The market value of government debt equals the expected present value of primary surpluses (including seigniorage revenues)

- This is a bond valuation equation: bonds derive their value from expected fiscal financing
What Does “Sustainability” Mean?

\[ q_t b_t = E_t \sum_{T=t+1}^{\infty} R_{t,T} S_T \] (IEC)

• Emphasize three aspects of this:
  1. on left: the **market value** of bonds
  2. on right: the **expected** present value of surpluses
  3. an **equilibrium condition**: not a constraint that policy choices must satisfy

• (IEC) can be made to hold through
  • adjustments in future policies
  or
  • market forces that change prices
The (IEC) does not hold

Point to long-term budget projections that display exploding debt

But exploding debt paths happen only in Latin American countries and banana republics

Surely they are not relevant for our countries
US Debt: CBO’s Optimistic View

US Government Debt: Optimistic Projection

% GDP

1960 1980 2000 2020 2040 2060 2080
US Debt: CBO’s Pessimistic View

US Government Debt: Pessimistic Projection

% GDP

1960 1980 2000 2020 2040 2060 2080
Are These Projections Useful?

- Not very
- Usually constructed under severe restrictions
  - current tax policies remain in effect
  - all future spending commitments are honored
  - maintained assumptions about non-discretionary & discretionary spending, economic growth, inflation rates, and so forth
- In long-run projections, small change in any of these restrictions can have large effects on path of debt
- But this isn’t the primary reason the projections are of limited value
- They are inconsistent with economic equilibrium
Exploding Debt

- Exploding debt cannot happen
- Something must adjust
- Exploding debt projections imply that

\[ q_t b_t \gg E_t \sum_{T=t+1}^{\infty} R_{t,T} S_T \] (IEC—not)

- Option #1
  - financial markets are crazy or ignorant
- Option #2
  - current policies will not persist
    - taxes will rise, spending will fall, government will renege on obligations, or all of the above
- Which of these people believe will happen matters a great deal to current economic conditions
Exploding Debt

\[ q_t b_t \gg E_t \sum_{T=t+1}^{\infty} R_{t,T} S_T \] (IEC—Not)

- Maintaining (IEC—Not) creates a quandary
- If future surpluses are not expected to back debt sufficiently, why is debt so valuable?
- (IEC—Not) is an off-equilibrium perspective on the economy
  - requires a game-theoretic explanation of the game of chicken being played among financial market participants, the fiscal authority, and the monetary authority
  - there might be a political economy game theory explanation, but no one has provided one
- Where does this leave us?
AN INTRINSIC FISCAL TENSION

• Optimal fiscal policy instructs to smooth tax rates in order to minimize distortions

• Government debt provides the means by which a variable stream of government spending can be financed while keeping taxes smooth

• Debt may also be used to finance infrastructure and other spending that offers a rate of return

• Some models imply debt should follow a random walk
  • this means debt can exceed any finite limit with positive probability

• No government follows the advice of optimal policy

• Why?

• Fears that financial markets will penalize large debt run-ups with risk premia
Fresh Perspective on “Sustainability”

- Model of debt default
  - try to explain the diverse experiences across countries with risk premia on government bonds
  - depends on a variety of factors that I’ll call the “fiscal environment”

- Leads to a new concept of fiscal “sustainability”
  - What class of fiscal (and monetary) policies are risk-free?
    - “risk-free” means policies with zero (or small) risk premia

- Due to work by Huixin Bi, IU graduate student

- Springs from the wide range of fiscal experiences across countries
SOME EUROPEAN EXPERIENCES

LT Interest Rate Spread over Germany

Gross Debt–GDP
IRELAND AND THE U.K.

LT Interest Rate Spread over Germany

Gross Debt–GDP
IRELAND AND SWEDEN

LT Interest Rate Spread over Germany

Gross Debt–GDP
ITALY AND BELGIUM

Net Debt–GDP Ratio: ITA vs. BEL

Italy (downgrade in 1992, 2003, 2005; negative watch in 1995, 1996) vs. Belgium (Stable)
JAPAN’S EXPERIENCE

Net Debt–GDP Ratio: Japan

Year


Net Debt–GDP Ratio: Japan
NEW ZEALAND’S EXPERIENCE

Net Debt–GDP Ratio: New Zealand

Year

Net Debt–GDP Ratio: New Zealand

5
10
15
20
25
30
35
40
45
50
55

Year

BOND RATING AGENCIES

• “Sovereign credit ratings reflect . . . the future ability and willingness of sovereign governments to service their debt obligations . . .”

• Fiscal flexibility: S&P defines it as: “. . . adjust tax bases and rates without serious constitutional, political, or administrative difficulties.” Also “. . . S&P recognizes that taxation and monetary powers unique to sovereigns . . . can permit governments to manage widely varying debt levels.”

• Fiscal transparency: “. . . The stability, predictability, and transparency of a country’s political institutions are important considerations . . . including how quickly policy shortcomings are identified and addressed.”

• Economic structure and economic growth
**Bi’s Model of Exogenous Default**

- Best understood as the start on a deeper line of attack
- Government budget constraint:

\[
b_{t-1}(1 - \Delta_t) + g_t = b_t q_t + A\tau_t (1 - L_t)
\]

\[
\Delta_t = \begin{cases} 
0 & \text{if } b_{t-1} < b_t^* \\
\delta & \text{if } b_{t-1} \geq b_t^*
\end{cases}
\]

where \( \delta \geq 0 \) and \( b_t^* \sim N(b^*, \sigma_b^2) \)

- When \( 0 < \delta < 1 \), there is partial default
- Think of \( b_t^* \) as a “fiscal limit”
  - for now, \( b_t^* \) is exogenous; important to endogenize it
- Fiscal rule:

\[
\tau_t - \tau = \gamma (b_{t-1}(1 - \Delta_t) - b)
\]
Bi’s Model of Exogenous Default

- Combine with a standard specification of private sector
- Household’s problem:

$$\max E_0 \sum_{t=0}^{\infty} \beta^t u(c_t, L_t)$$

subject to

$$b_{t-1}(1 - \Delta_t) + A(1 - \tau_t)(1 - L_t) = c_t + b_t q_t$$

- Shock process:

$$\ln \frac{g_t}{g} = \rho \ln \frac{g_{t-1}}{g} + e_t$$

where $$e_t \sim N(0, \sigma^2)$$
GOVERNMENT SPENDING SHOCK: NO DEFAULT (BI)
GOVERNMENT SPENDING SHOCK: NO DEFAULT (Bi)
**Government Spending Shock: Default (B1)**

- **Government Spending**
- **Output**
- **Debt**
- **Net Interest Rate**
- **Default Probability**
- **Default Index**

*Graphs showing the impact of government spending shock on different economic indicators.*

- **Default Index**
  - No Default
  - Stochastic Defaulting Threshold

*Legend for Default Index graphs.*
Government Spending Shock: Default (B1)
IMPlications of Possibility of Default

- Risk-premia have a self-fulfilling aspect to them:
  - as premium rises, debt service rises
  - this pushes debt higher, raising the probability of default
  - this increases the risk premium, and so forth

- Creates a Default Intertemporal Equilibrium Condition

\[ b_t E_t (1 - \Delta_{t+1}) = E_t \sum_{T=t+1}^{\infty} R_{t,T} S_T \quad \text{(DIEC)} \]

- Value of debt gets scaled by the expected default
  - higher expected loss from default, lower is value of debt
  and higher is risk premium

- Idea is that this introduces an additional mechanism that allows the (IEC) to be satisfied
A Surplus Target

- A target for the surplus may suffice to deliver “risk-free” fiscal policy

- But there are many issues to consider
  
  - definition of surplus: net vs. gross? include seigniorage? flexible or strict? current or capital spending?
  
  - given both the typical and extreme macro shocks, how much do automatic stabilizers make the surplus fluctuate?
  
  - is there any latitude for discretionary policy actions?
  
  - over what horizon is the target intended to be hit?
  
  - will reestablishing the target surplus be done by taxes, spending or both? which taxes? which spending?

- These are the easy questions
THE HARDER QUESTIONS

• How do you determine the appropriate target level?

• How do you determine the class of risk-free policies?

• Return to the rating agencies’ most common criteria
  1. fiscal flexibility: latitude and fortitude to adjust taxes and
     spending as needed
  2. fiscal transparency: can outsiders examine fiscal state? is
     the fiscal authority corrupt?
  3. economic growth
  4. political stability

• I’ll discuss 1 and 2
Fiscal Flexibility

- Necessary condition is that you are not near the country’s “fiscal limit”

- Limit can be political or economic
  - political: tolerance of the public for high taxes/low spending
  - economic: there is some maximum revenue that can be raised

- Dynamic Laffer curves can be estimated to serve two purposes
  1. compute, for each type of tax rate, where the maximum revenue occurs and then what the maximum revenue is for the country
  2. determine which side of the Laffer curve each tax is on
  3. may even compute a “politically adjusted” Laffer curve
Figure 5: Shifts of Laffer curves over time. C-D utility.
Figure 8: Individual European country labor and capital tax Laffer curves (C-D utility, steady state). The upper two panels show the distance to the peak of Laffer curves measured either in tax units or tax revenues in percent of baseline GDP. The lower panel depicts the slope of the Laffer curves measured as the change of tax revenues in percent of baseline GDP in response to a 1 percent steady state tax increase.
Aspects of Fiscal Transparency: I

• When governments announce policy plans and associated forecasts of the impacts of the plans, how do they do this?

• Obama administration issued forecasts that may be reasonable, but we can’t tell
  • where do the numbers come from?
  • given that the multipliers depends on expected future policies, what future was assumed?

• If the public cannot scrutinize forecasts, it cannot make informed decisions about the efficacy of the plans

• This can easily undermine public support for fiscal policy
Aspects of Fiscal Transparency: II

- Fiscal authority cannot manage expectations unless it discusses future spending and tax plans

- Credible forecasts require specifying policies well beyond the lifetime of the current government

- How can this be done when the current government cannot commit future governments?
  - to ask the question is to misapprehend the issue
    - in any forecast based on forward-looking behavior, such a specification is necessary
    - central banks face the same issue when they use formal models to produce forecasts

- May require significant institutional reform to achieve fiscal transparency