Public debt and functional finance

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Reinhart & Rogoff 2010

- Threshold
  - “debt to GDP over 90 percent have … mean levels of growth almost 4 percent lower”

- Herndon et al. correction
  - No threshold
  - Still negative correlation

Real question: causation

- Basu (2013), Dube (2013), Irons and Bivens (2010)
  - slow growth leads precedes rise in debt

- But can short-run patterns reveal long-run causation?

Preview

- Aggregate demand policy may be needed to maintain full employment in the long run

- Robust results:
  - Low growth *causes* high long-run debt
  - Austerity policies *raise* long-run debt

- Misguided policy debates and misguided austerity policies

Closed, mature economy

- Not Greece, Detroit, or NYC 1975
  - Also misguided policies, but not addressed here
- Dual vs mature economies
  - Exogenous growth rate
- Main focus on fiscal policy
  - Income distribution, competition policy, labor markets, financial regulation …

FUNCTIONAL FINANCE

Debt paradoxes

- Based on empirical correlations
  - Reinhart-Rogoff and others
- What about the Lucas critique?
  - correlations vs invariant parameters
- Ricardian equivalence

Sustainability

- Simple calculations

$$\dot{b} = (r - g)b + x$$

- But why assume constant primary deficit?

Approach

- Don’t ask “is this exogenous path of primary deficits sustainable”?
- Ask “what paths of taxes and debt can maintain full employment at the optimal capital intensity?”
- Intrinsically debt is neither good or bad

Functional finance

"first, the adjustment of total spending (by everybody in the economy, including the government) in order to eliminate both unemployment and inflation …; second, the adjustment of public holdings of money and of government bonds … to achieve the rate of interest which results in the most desirable level of investment"

Lerner (1943)

A simple model

- Leontief technology and full-employment growth

$$Y = \min\{k, L\}$$

$$\hat{Y} = \hat{k} = \hat{l} = n$$

- Equilibrium condition

$$n + \delta = \frac{I}{K} = \frac{Y - G - C}{K}$$

- Consumption

$$C = cY^D + c_v A$$

$$Y^D = (1-\tau)(Y + rB)$$

$$A = K + B$$

- Government consumption

$$G = \gamma K$$

- Tax rate as fiscal instrument

- Government budget constraint

$$\dot{B} = rB + G - \tau(Y + rB)$$

- Implication:

$$\frac{d}{dt}\left(\frac{B}{Y}\right) = \frac{(1-c)(1-\gamma)-c_v-n-\delta}{c} - \left(\frac{c_v}{c} + n\right)\frac{B}{Y}$$

- Stable differential equation:
  - A rise in *B* has both wealth and income effects on consumption
  - Consumption is kept constant by higher taxes

Comparative statics

- Stationary solution

$$\left(\frac{B}{Y}\right)^* = \frac{(1-c)(1-\gamma)-c_v-n-\delta}{cn+c_v}$$

- Debt ratio depends
  - inversely on the natural growth rate
  - inversely on government consumption
    - Austerity policies
  - directly on the saving rate
    - Income distribution

Intuition

- Equilibrium condition

$$1 = \frac{Y}{K} = \frac{C}{K} + \frac{G}{K} + \frac{I}{K}$$
$$= \frac{C}{K} + \gamma + n + \delta$$

- With higher *n* or *γ*, full-employment consumption needs to get squeezed

  → higher taxes

Restrictive assumptions

- Leontief technology
- Fiscal policy as the only instrument
- Primitive monetary/ financial side

MONETARY POLICY

- Short-run effects of interest rates on investment

- Long-run effects of interest rates (the cost of capital) on capital intensity

Choice of technique

- Cost minimization

$$\min_{L,K} \quad wL + (r + \delta)pK$$

$$s.t. \qquad F(K,L) = Y_0$$

- Choose *r* to get the required capital intensity

$$s\frac{Y}{K} = n + \delta$$

- Problem: *r* may be negative

Implications

- Without fiscal policy, positive inflation is necessary for ‘full employment’: no NAIRU!

- Dynamic inefficiency and structural liquidity traps

Skott (2001), Nakatani and Skott (2007)

Japan

- Japanese stagnation
  - "can be explained by a combination of high saving rates and slow population growth. This combination, we argue, produces a structural liquidity trap … the proximate problem of the Japanese economy in the 1990s may be one of aggregate demand, but the demand deficiency is structural."

Nakatani and Skott (2007)

Functional finance

- Set interest rate to get ‘optimal’ capital intensity (“ … the most desirable level of investment”)
  - Leontief technology
- Use fiscal policy to maintain full employment

EXTENSIONS AND ROBUSTNESS

Financial assets

- ‘Stock-flow consistent’ model of a ‘corporate economy’
  - Financial behavior
  - Multiple tax rates

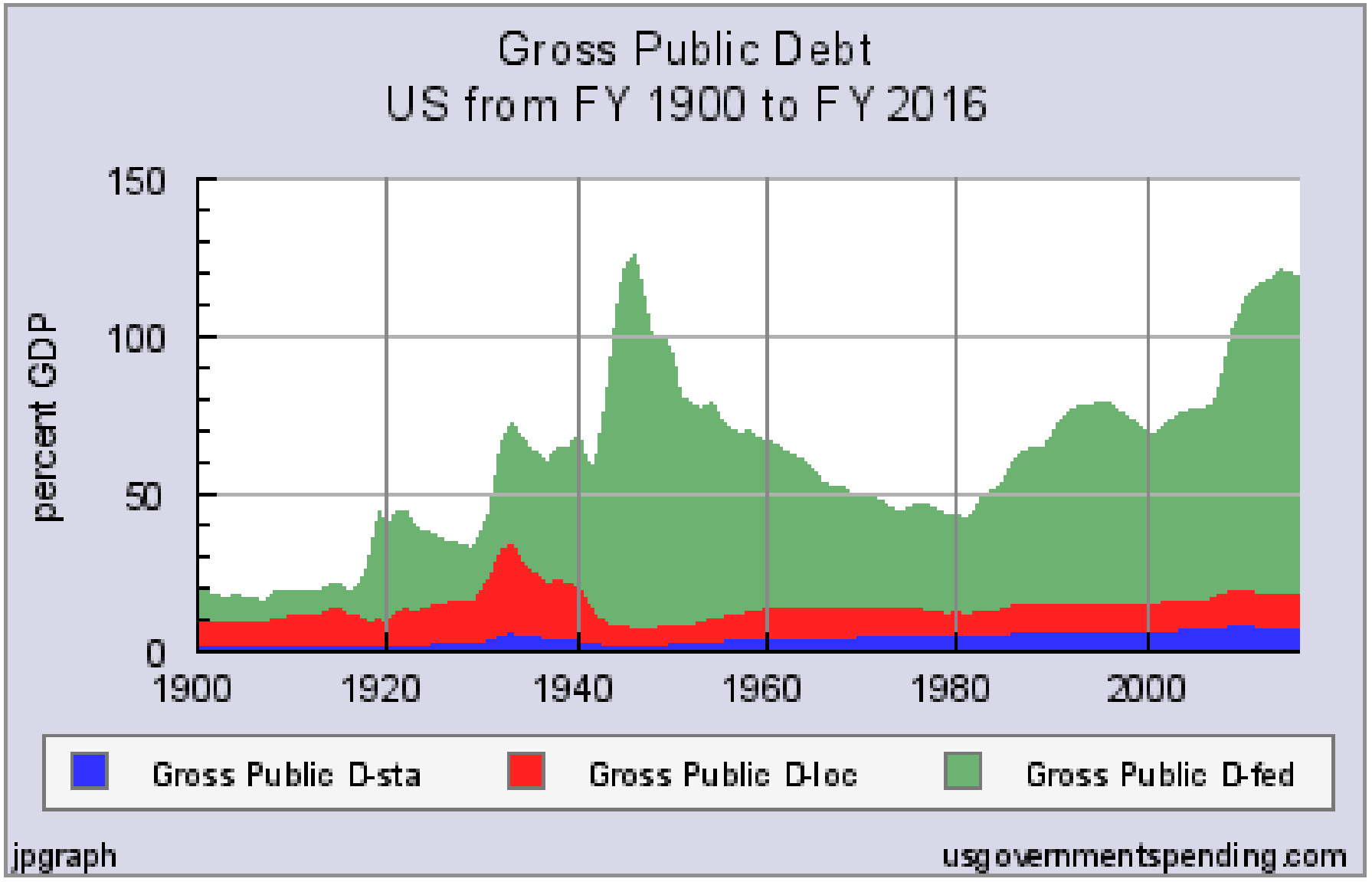
- Implications
  - Tax structure affects debt ratio
  - Reduced taxation of capital income raises debt
  - Debt divergence possible

Ryoo and Skott 2013

OLG models

- Crowding out is possible
  - negative effect of public debt comes via higher interest rates and induced reduction in capital (and output) per worker
  - desirable if dynamic inefficiency
- Is ‘dynamical inefficiency’ empirically relevant?

- Does evidence support crowding out?


Gross Public Debt
US from FY 1900 to FY 2016
percent GDP
150
100
50
0
1900
1920
1940
1960
1980
2000
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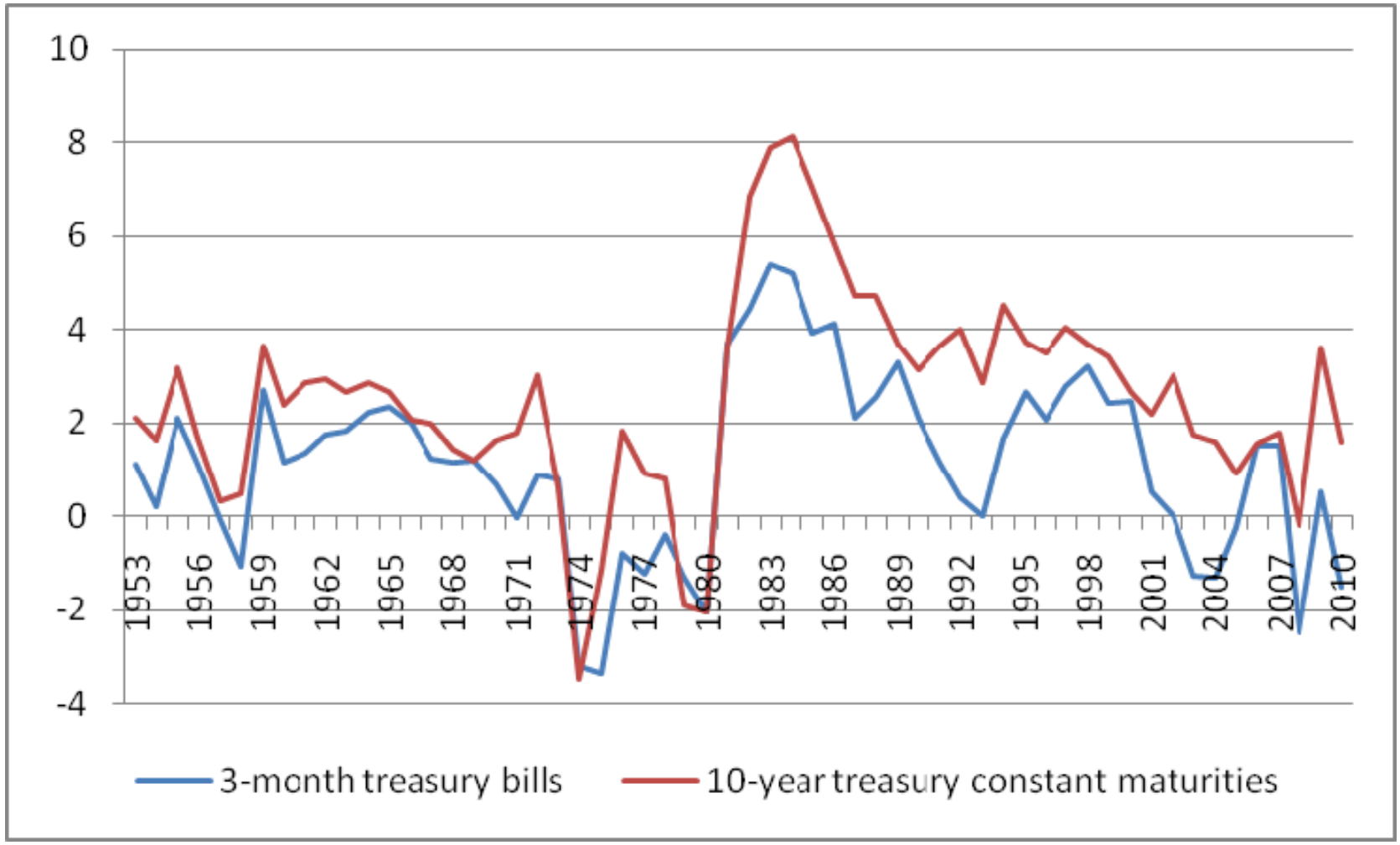
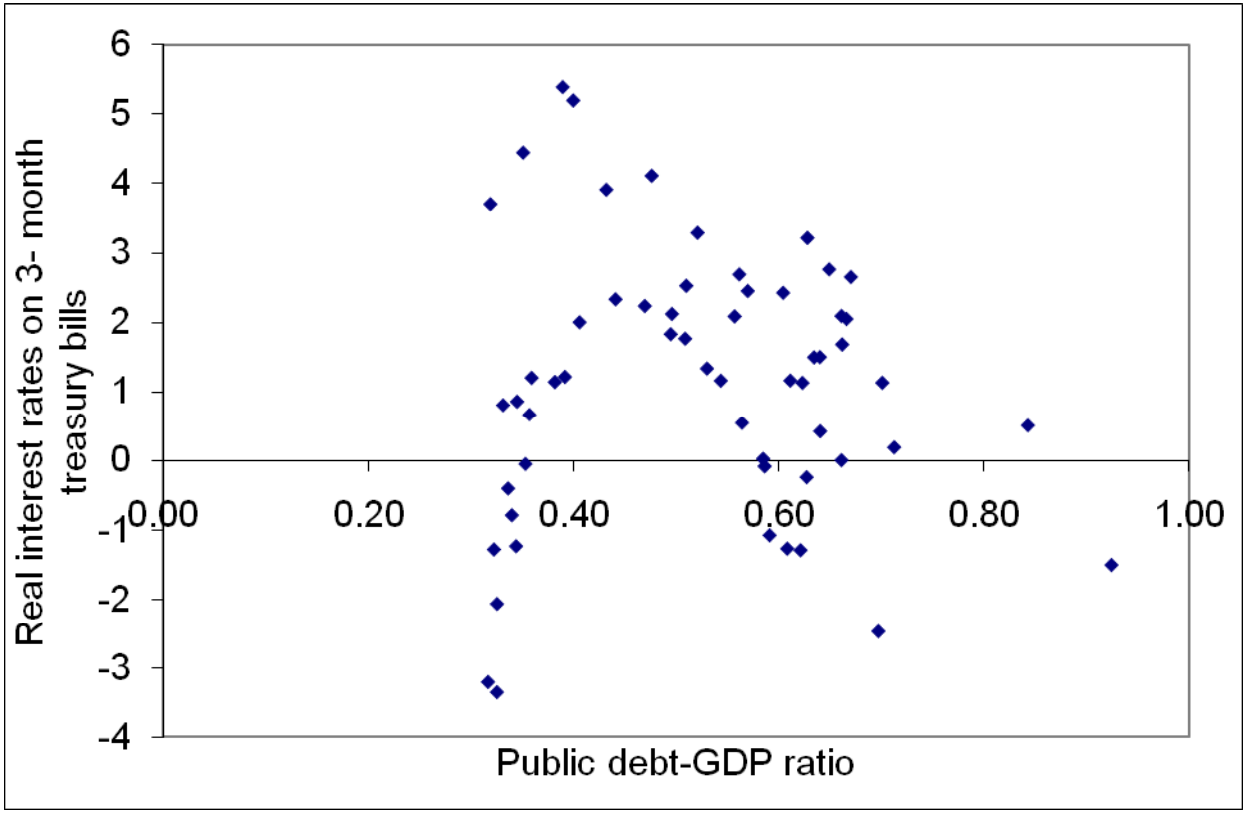
Real Interest Rates on U.S. Public Debt



Crowding out?



“we find that countries with a public debt overhang by no means always experience either a sharp rise in real interest rates or difficulties in gaining access to capital markets”

Reinhart et al. 2012, p. 70

Metrics?

- Engen and Hubbard (2005, p.83)
  - “some economists believe there is a significant, large, positive effect of government debt on interest rates, others interpret the evidence as suggesting that there is no effect on interest rates".

- Consistent with ‘imperfect functional finance’

Keynesian OLG

- Intergenerational distribution
- Medium-run shifts in ‘confidence’
- Link between dynamic inefficiency and Keynesian aggregate demand problems

Robust results

- Low growth causes high debt ratio
- Austerity raises the debt ratio

DEMAND POLICY IN AN UNSTABLE ECONOMY

Short-run stabilization?

- Monetary policy (and automatic fiscal stabilizers)
- Fiscal policy rules
  - Supercharged fiscal stabilizer

Formal model

- Harrodian instability
- Taylor rule
- Fiscal policy rules
  - Keynesian rule
  - Austerity rule

Results

- Automatic stabilizers fail to remove Harrodian instability
- High debt
  - Monetary policy loses effectiveness
  - Induced fiscal effects
- ‘Keynesian fiscal policy rule’ is stabilizing
- ‘Austerity policy rule’ is de-stabilizing

CONCLUSIONS

Structural liquidity traps / secular stagnation

- Don’t ignore long-run aggregate demand problems
- Full-employment growth may require fiscal policy and public debt

Functional finance

- Don’t ask “is this exogenous path of primary deficits sustainable”?

- Instead: “what paths of taxes and debt can maintain full employment at the optimal capital intensity?”

Debt implications

- Low growth causes high debt
- Austerity leads to high debt

Broader points

- Defense of theory
  - Empirical regularities not enough
- Defense of formal models
  - Specific results
    - Tax structure effects
    - Monetary-fiscal interaction effects

THANKS!