Discussion of 'Debt, Deleveraging, and the Liquidity Trap' by G. Eggertsson and P. Krugman

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Outline of discussion

- Brief review of the paper
- Comments on:
  - debt limits
  - the role of fiscal policy
  - some empirical issues

Why does the natural rate of interest decline below zero?

- Krugman (1998)
  - Exogenous
  - Declining working population; Low productivity growth; Equity premiums
- Jung, Teranishi, and Watanabe (2001)
  - Exogenous
  - Debt-overhang; Credit crunch
- Eggertsson and Woodford (2003)
  - Exogenous
  - Preference shock
- Some attempted to endogenize a drop in the natural rate of interest by using a variable capital model (Christiano 2005; Takamura, Kudo, and Watanabe 2006), but did not discuss the source of the drop.

Two inequality constraints

- Borrowing limit:

$$D_t^b \leq \bar{D}$$

- ZLB constraint:

$$i_t \geq 0$$

Two period endowment economy

- Two types of households: savers and borrowers
- Two periods: short-run and long-run
- No production
- Prices are fully flexible
- The model is identical to the one in Krugman (1998) except that the representative household was assumed there.

Short-run response to a deleveraging shock

$$C_S^b = \frac{1}{2}Y + \frac{D^{low}}{1+r_S} - D^{high}$$

$$C_S^s = \frac{1}{\beta}\frac{1}{1+r_S}C_L^s$$

$$C_L^s = \frac{1}{2}Y + (1-\beta)D^{low}$$

$$C_S^s + C_S^b = Y$$

$$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta D^{high}}$$

$$1 + i_S = (1+r_S)\frac{P_L}{P_S} \geq 1$$

Contribution of the paper: Fisherian debt deflation

Real debt ➡ $$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta D^{high}}$$

Nominal debt ➡ $$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta\frac{B^{high}}{P_S}}$$

Prices go down
⇒ Higher real burden
⇒ Borrowers consume less
⇒ Natural rate of interest falls **endogenously**
⇒ The ZLB constraint is more strongly binding
⇒ Further decline in prices

Contribution of the paper: temporary liquidity trap

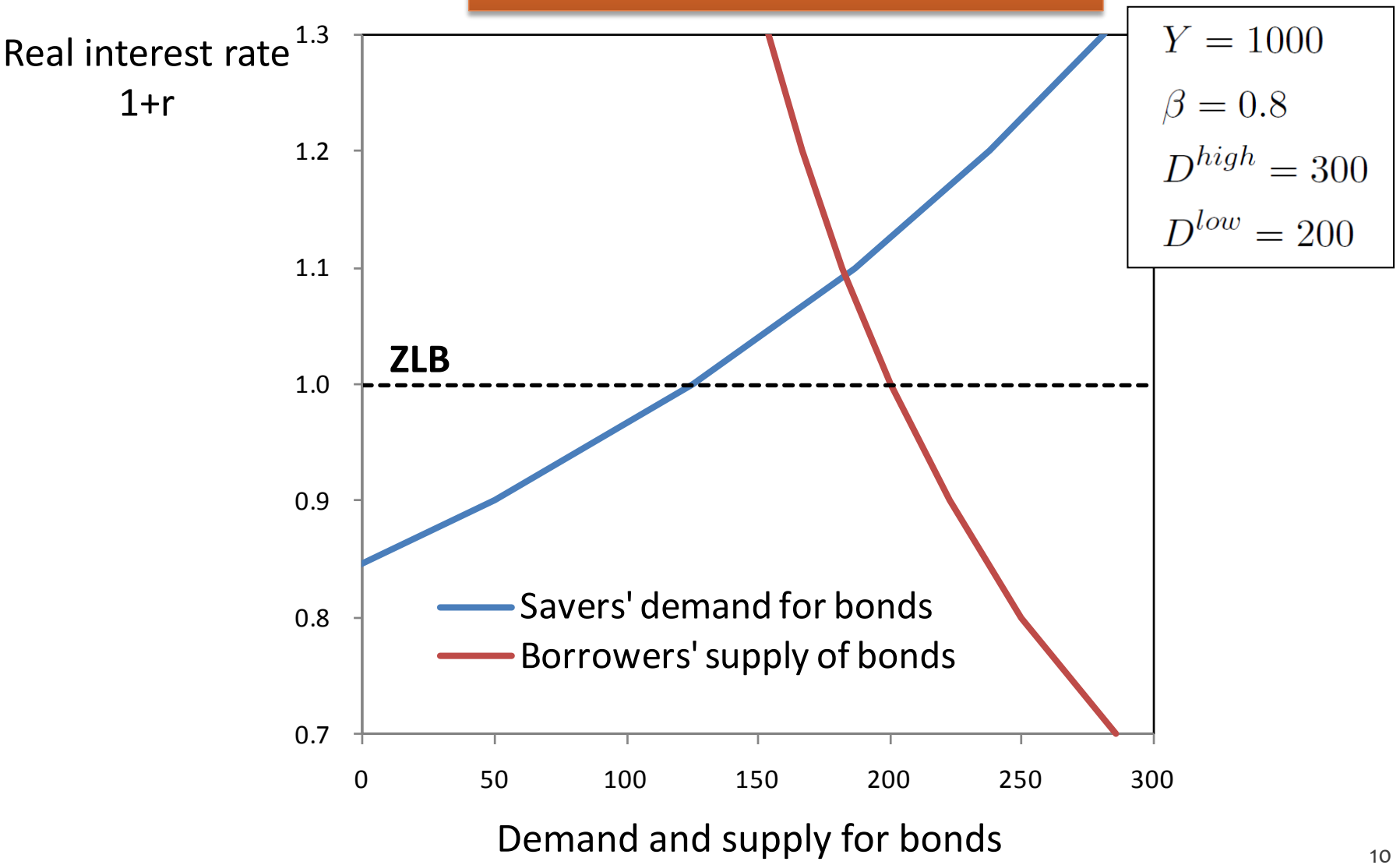
- Permanent versus temporary liquidity traps
  - Keynes (1936); Benhabib et al (2002)
  - Svensson (2001): "a **temporary** liquidity trap"
  - Woodord (2003) : "the problem of a country like Japan at present may not be so much as that it has fallen into a self-fulfilling deflationary trap, despite the existence of an equilibrium with stable prices if only expectations were to coordinate upon it, as that a **temporary** reduction in the equilibrium real rate of return has made stable prices incompatible with the zero bound on nominal interest rates"

- The paper gives a reason to believe that the trap is a temporary one: the natural rate of interest stays low only until debt is paid down to the new upper limit

Comment #1: Exogenous debt limits

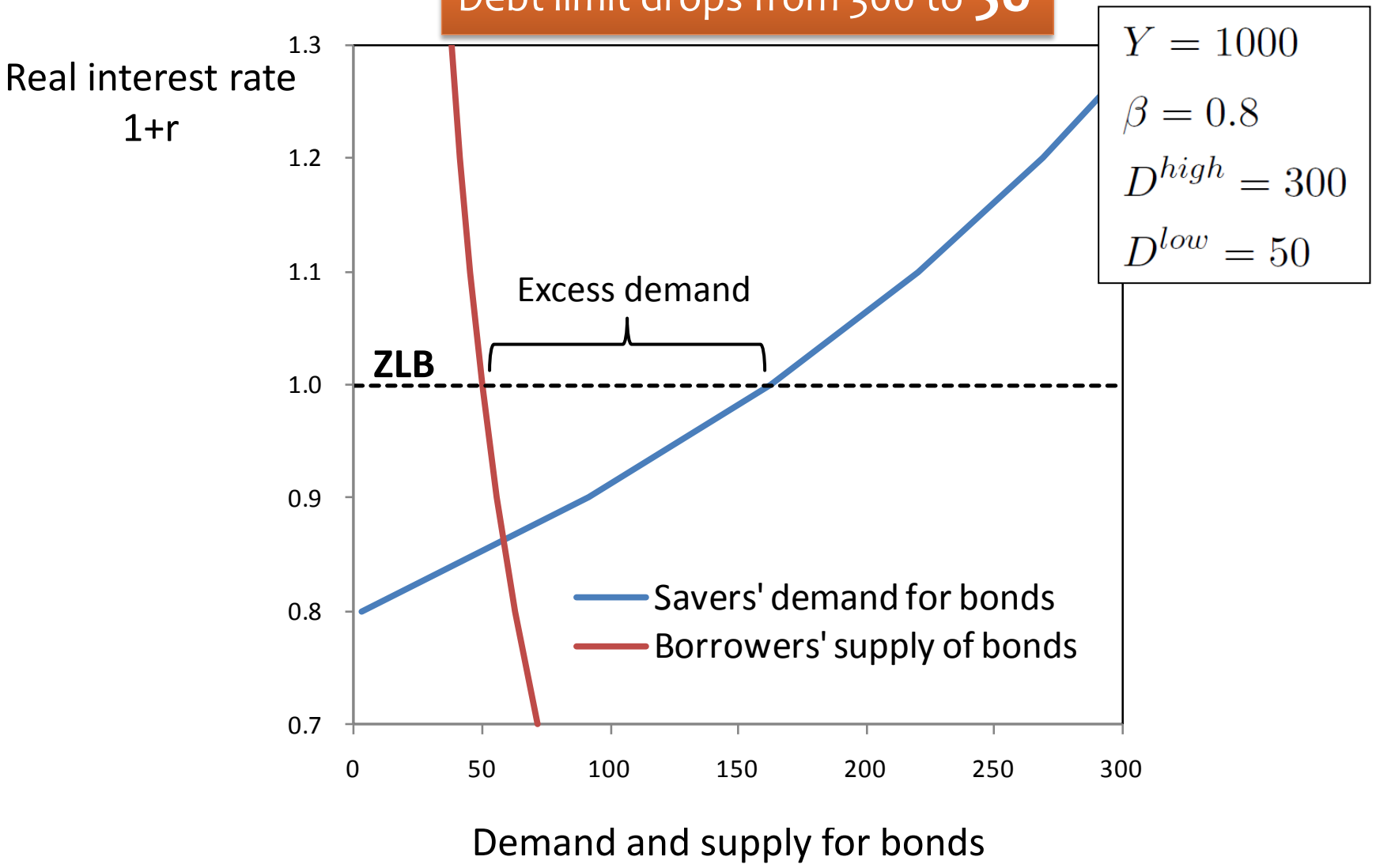
Demand and supply in the bond market

Debt limit drops from 300 to **200**



Demand and supply in the bond market

Debt limit drops from 300 to **50**



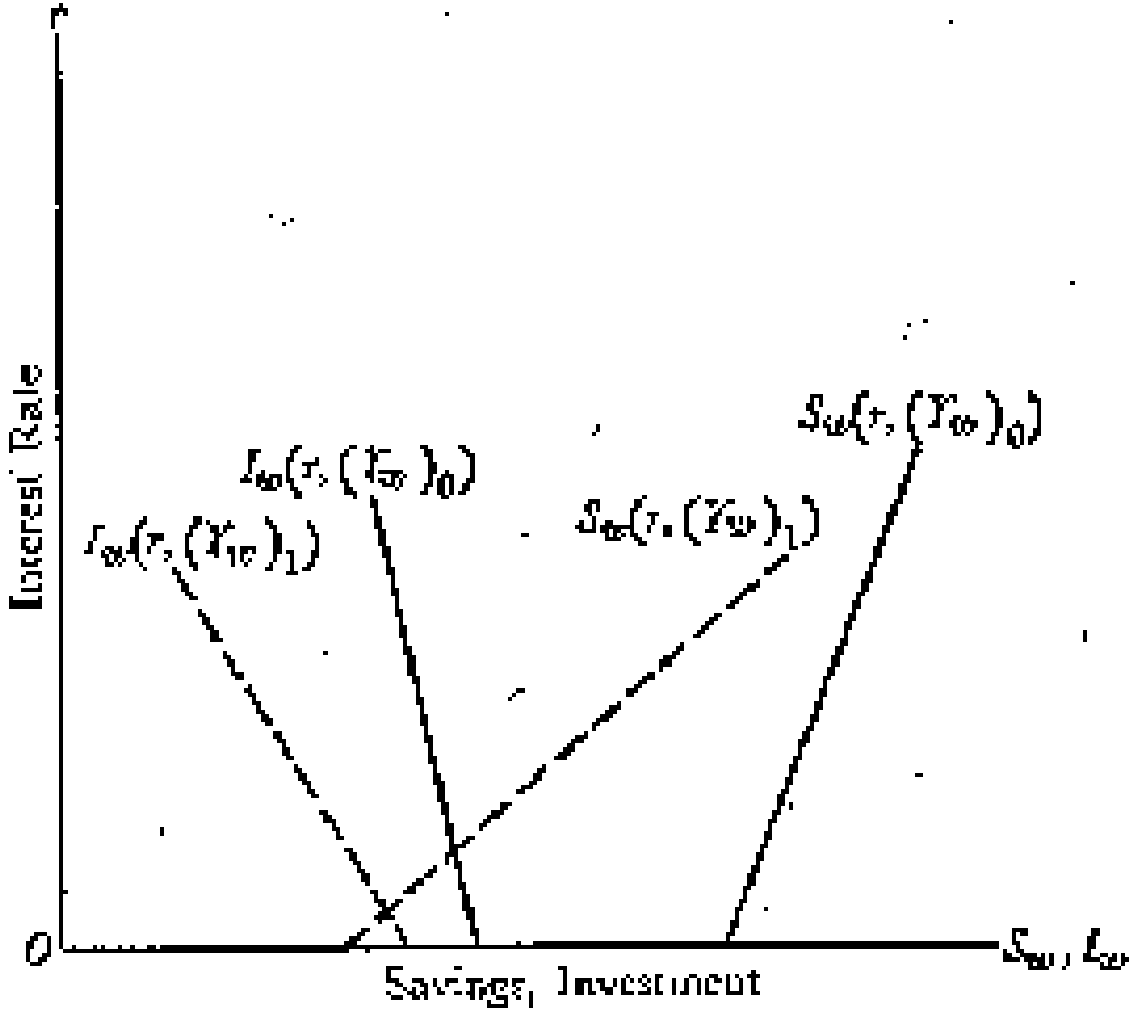
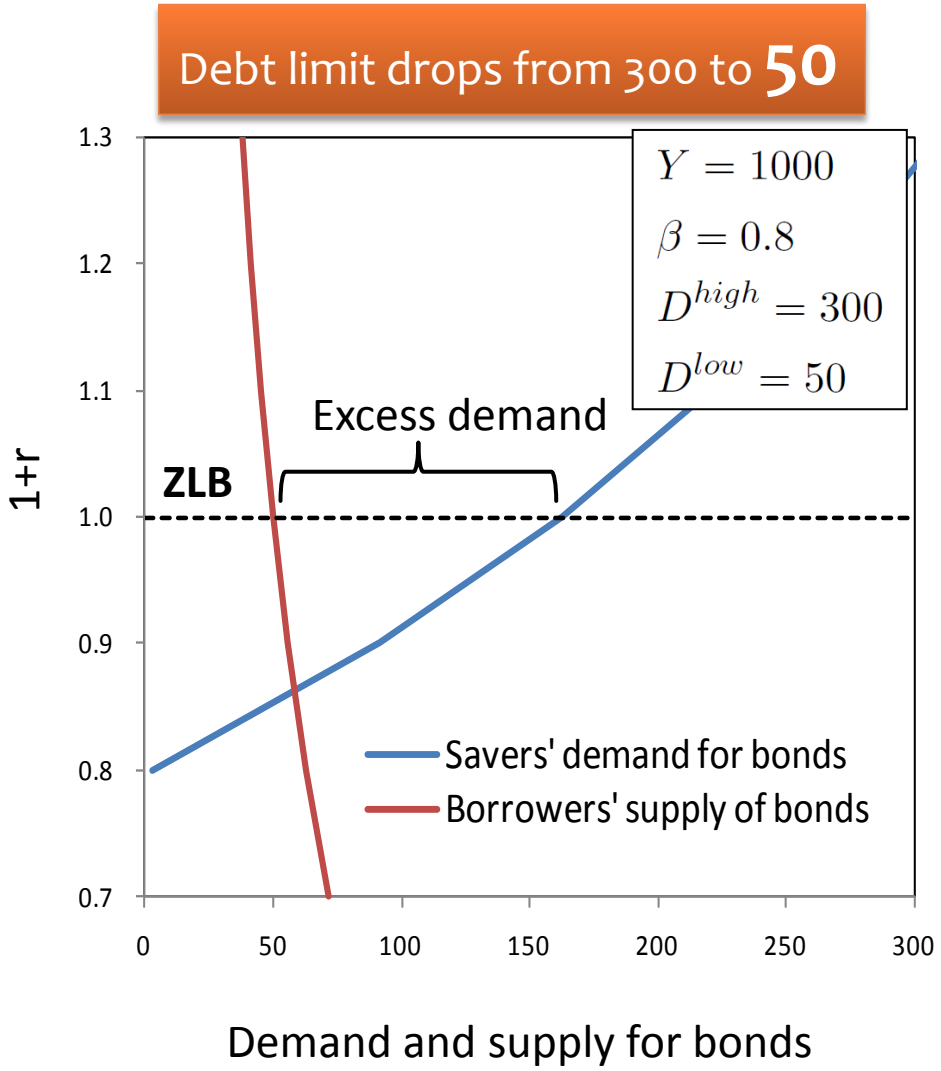


Figure 4.

Klein, L. R., *The Keynesian Revolution*, 1947

Demand and supply in the bond market



Demand and supply for bonds

- The analysis starts with the assumption that the new debt limit for borrowers is 50
- It turns out that, savers want to lend 160 in equilibrium
- Excess demand in the bond market, implying excess supply in the goods market
- The amount the savers are willing to lend in equilibrium is **not** consistent with the debt limit initially set by someone
- This implies that debt limit is **not** determined by the savers. It must be someone else that determine the debt limit. Who? Banks? Regulators?

Comment #2: Fiscal policy

The role of monetary and fiscal policies

- Monetary policy can deal with a deleveraging shock by creating a rise in expected inflation. One way to achieve this is to raise the inflation target temporarily
- This would only work if the higher target is credible. However, "achieving such credibility isn't easy" (p.20)
- The authors argue that fiscal policy is still effective, and more effective that standard models suggest

A.3 Government

Fiscal policy is the purchase of G_t of the Dixit-Stiglitz aggregate and the collects taxes T_t^s and T_t^b. For any variations in T_t^b or G_t we assume that current or future T_t^s will be adjusted to satisfy the government budget constraint. Monetary policy is the choice of i_t. We assume it follows the Taylor rule specified in the text.

Page 34 of the paper

An important, but implicit assumption of the paper is that the government is a special borrower in the sense that there is no debt limit for the government

No debt limits for the government

$$C_S^g = D_S^g$$

$$D_S^b \leq D^{low}$$

$$C_S^b = \frac{1}{2}Y + \frac{D^{low}}{1+r_S} - D^{high}$$

$$C_S^s = \frac{1}{2}Y - \frac{D^{low}}{1+r_S} + D^{high} - C_S^g$$

$$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta D^{high} - C_S^g}$$

No debt limits for the government

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$$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta D^{high} - C_S^g}$$

Savers set the debt limit on the sum of private and public debts

$$C_S^g = D_S^g$$

$$D_S^b + D_S^g \leq D^{low}$$

$$C_S^b = \frac{1}{2}Y + \frac{D^{low}}{1+r_S} - D^{high} - D_S^g$$

$$C_S^s = \frac{1}{2}Y - \frac{D^{low}}{1+r_S} + D^{high}$$

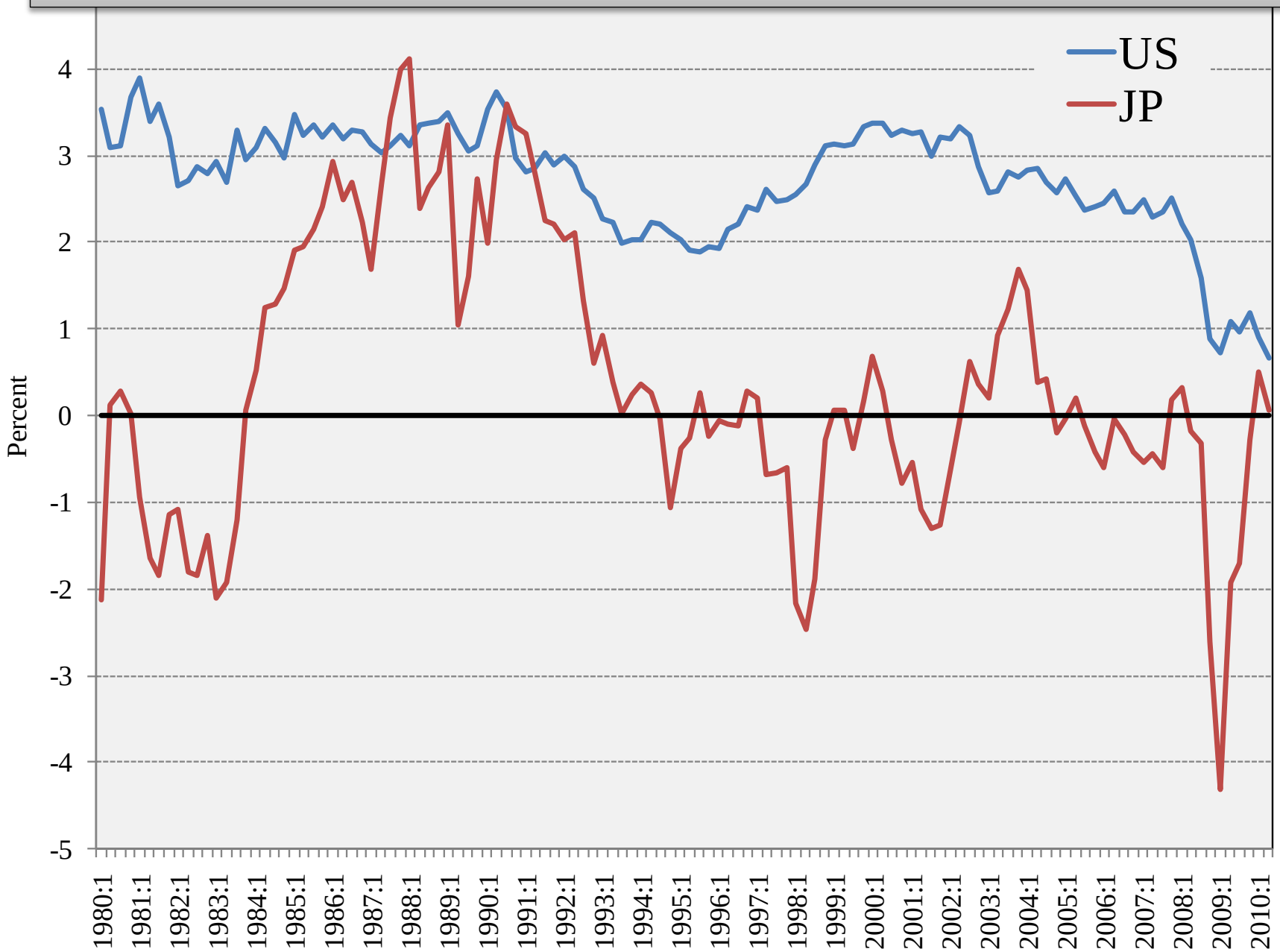
$$1 + r_S = \frac{\frac{1}{2}Y + D^{low}}{\beta\frac{1}{2}Y + \beta D^{high}}$$

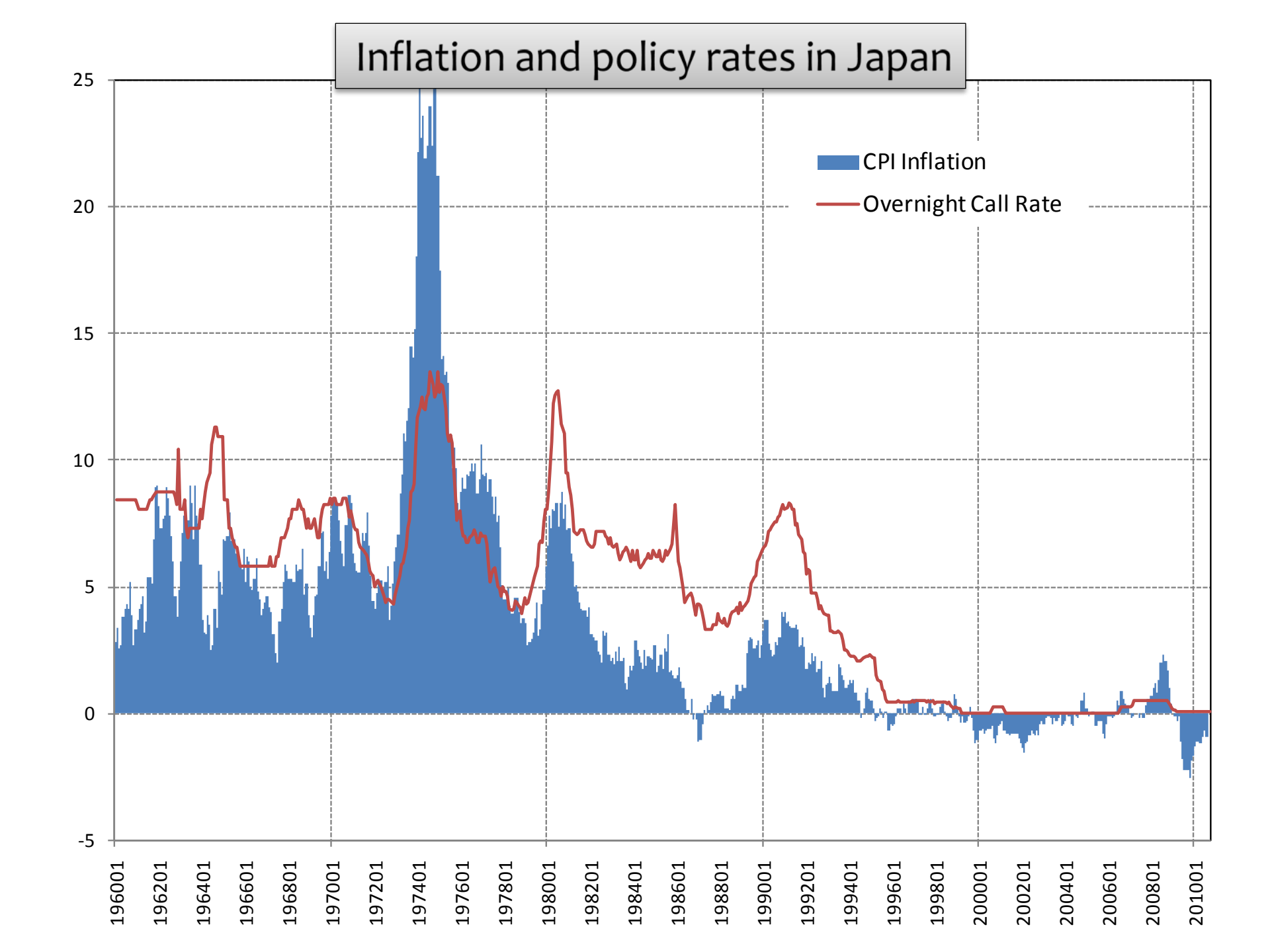
The role of monetary and fiscal policies

- Monetary policy can deal with a deleveraging shock by creating a rise in expected inflation. One way to achieve this is to raise the inflation target temporarily
- This would only work if the higher target is credible. However, "achieving such credibility isn't easy" (p.20)
- The authors argue that fiscal policy is still effective, and more effective that standard models suggest
- **Fiscal policy is effective only when the government has high credibility so that there is no debt limit for the government**
- **However, this may not be true. "Every economy faces a *fiscal limit*—a point beyond which tax collections can no longer rise and government expenditures cannot be further reduced" (Davig and Leeper 2010)**

Comment #3: Empirical issues

Laubach-Williams Estimates of the Natural Rate of Interest in Japan and US




Inflation and policy rates in Japan
CPI Inflation
Overnight Call Rate
25
20
15
10
5
0
-5
196001
196201
196401
196601
196801
197001
197201
197401
197601
197801
198001
198201
198401
198601
198801
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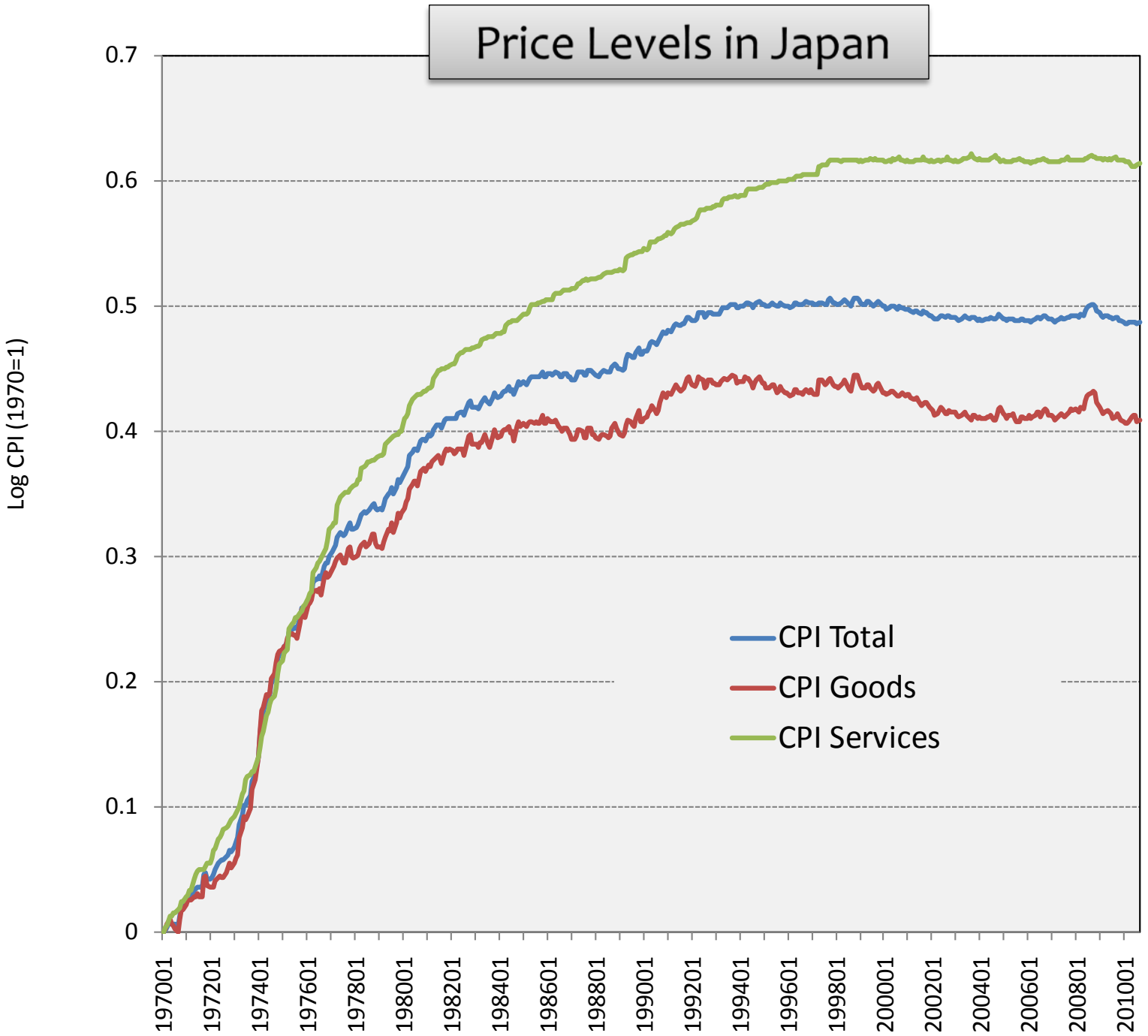
199601
199801
200001
200201
200401
200601
200801
201001


Price Levels in Japan
Log CPI (1970=1)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
197001
197201
197401
197601
197801
198001
198201
198401
198601
198801
199001
199201
199401
199601
199801
200001
200201
200401
200601
200801
201001
CPI Total
CPI Goods
CPI Services