Discussion of 'Debt, Deleveraging and the Liquidity Trap' by Eggersston and Woodford

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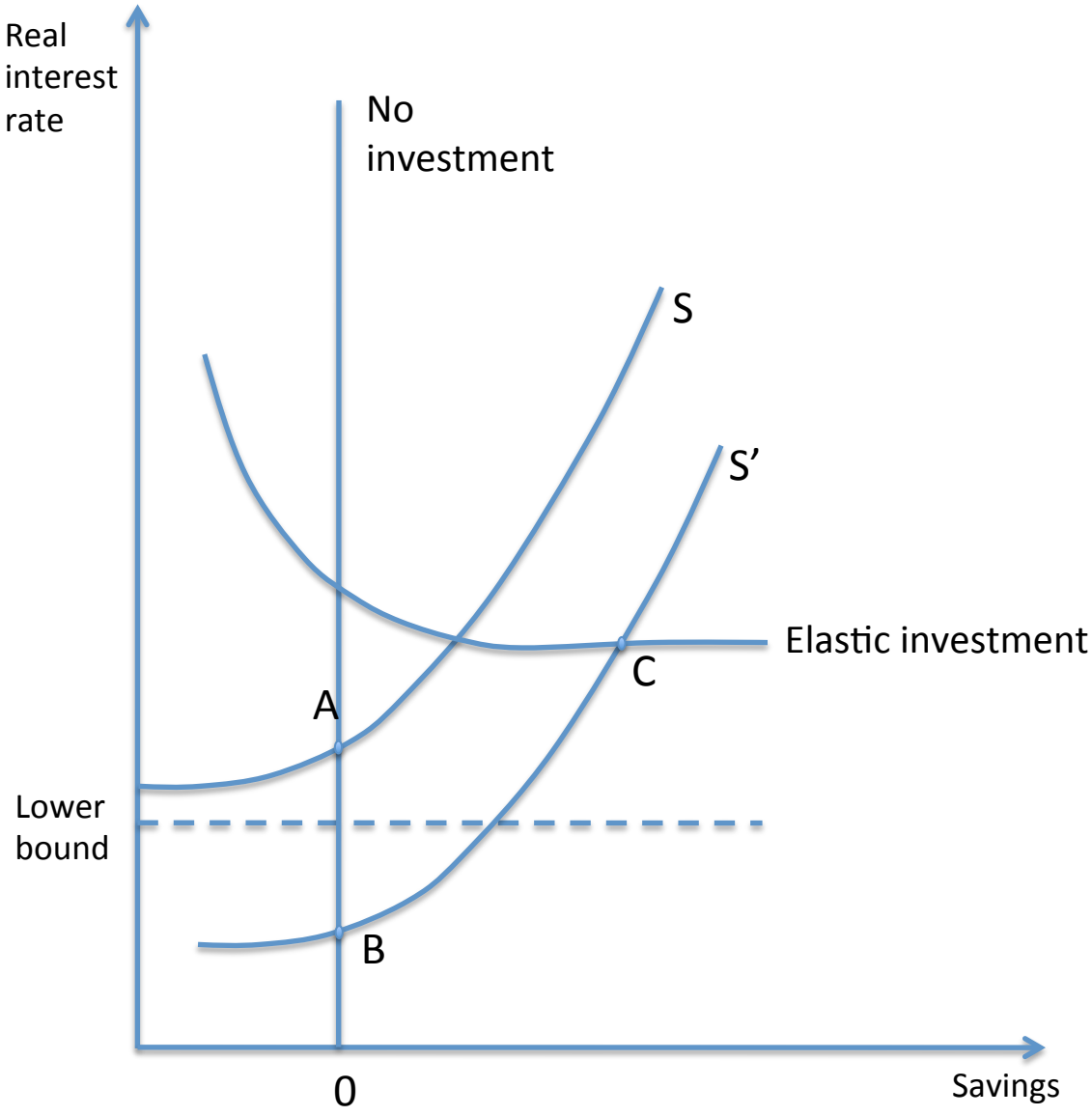
Three Contributions

- EK makes three interesting contributions to the ZLB literature.
- They propose *a new shock* that can trigger the ZLB.
  - An exogenous increase in the exogenous debt limit faced by an exogenously specified subset of households.
- They analyze *a new propagation mechanism* to magnify the ZLB scenario.
  - Fisherian debt dynamics that emerge from the interaction of nominally denominated debt constraints and deflation.
- They argue that *fiscal policy* is particularly powerful when the new shock occurs and the new propagation mechanism is operative.

Overview of discussion

- Briefly review EK's main results, reiterate the excellent intuition provided in the paper.
- Analyze whether EK's new shock and the debt deflation mechanism were important in the recent crisis.

Figure 1: Simple diagram.



Adjustment must occur via a fall in income

- In standard NK model, prices don't adjust instantaneously and output is demand determined.
- High desired savings means low consumption demand.
- Output and income fall.
- Households like to smooth their consumption over time.
- So a *transitory* fall in income reduces households' desire to save.
- Other things equal, this fall helps equate the supply and demand for savings.

Problem: other things aren't equal

- The fall in output just discussed leads to lower marginal costs.
- With staggered pricing, the fall in marginal costs leads to a drop in π^e_{t+1}.
- Because the ZLB is binding, the drop in π^e_{t+1} generates a *rise* in r_t.
- But a rise in r_t leads to a *rise* in desired savings and partially undoes the effect of the initial fall in output.
- The fall in spending initiates another round in a vicious cycle.
- Net result: a *large* fall in output.

What's the shock that increases desired savings?

- Classic ZLB shock: a rise in agents' discount rate (Eggertsson - Woodford, 2003).
- Some other candidates (non - exhaustive):
  - Sharp rise in volatility of real shocks could lead to a sharp rise in precautionary savings.
  - Agents decide they don't really understand the world they live in (Knightian uncertainty).
  - Fall in wealth (bust in housing prices?)
- All of these shocks are consistent with Ricardian equivalence, although they have potentially different implications for other policies.

The Eggertsson Krugman Shock

- Two classes of consumers: savers and borrowers who are constrained by how much they can borrow.
- Type of agent is determined by his / her discount rate.
- Case 1: debt is denominated in real terms

$$(1 + r_t) D_t^s \leq \bar{D}_t$$

- Case 2: debt is denominated in nominal terms

$$(1 + r_t) \frac{B_t^s}{P_t} \leq \bar{D}_t$$

A Minsky moment and a new shock

- Embed case 1 and 2 in a simplified NK Model.
- A fraction $(1-\lambda)$ of firms, set prices one period in advance, remaining firms set prices flexibly.
  - As in standard NK model, deflation is associated with a decline in output.
- Start from a SS where constrained agents are at their exogenous debt limit.
- Then there's a Minsky moment (Hyman, not Billy!)
- Poetry aside, this just corresponds to an exogenous fall in $\bar{D}_t$.

Effect of the new shock: case 1

- Intuition is the same as it would be for any positive shock to desired savings.
- Unanticipated decline in $\bar{D}_t$ leads to a fall in consumption of constrained consumers.
- By assumption, these consumers must de-lever in one period.
- Suppose the shock is very 'big' and a lot of (income-weighted) consumers are at initially at their debt constraint level.
- Then the shock can lead to a large rise in desired savings and potentially trigger the ZLB.

Case 2: a new propagation mechanism

- Intuition is same as above with one extra wrinkle.
- As deflation occurs, the amount by which the consumption of constrained agents falls becomes larger.
- So they have to de-lever by even more and the increase in 'desired' savings is even larger.
- This leads to an additional propagation mechanism which reinforces the standard mechanism I just discussed.
- So the fall in output is associated with a given initial shock to savings is even larger.

Policy implications

- The EK setup assumes the failure of Ricardian equivalence.
- Unlike the 'standard' ZLB model, there's a tax rebate multiplier if tax cuts are aimed at constrained agents.
  - True whether or not debt is nominally denominated.
- When Fisherian debt deflation mechanism is operative, government sending multiplier is larger because the effects of the ZLB are larger.
  - Consistent with the 'divine coincidence' principle in CER (2011).
  - The larger is the damage from the ZLB, the larger is the multiplier.

Was the EK shock important in the recent crisis?

- Issue 1: what's the evidence for the *massive* failure of Ricardian equivalence?
- Issue 2: what's the evidence that there was massive *exogenous* decrease in debt limits of constrained households *before* the financial crisis.
- The personal savings rate certainly went up in the crisis: from roughly two percent in 2007 to a level that stabilized at around 5.5 percent.
- Was this rise a cause of the crisis or a reaction to it?

Shocks and Minsky moments

- My own view is that if there was a 'Minsky moment', it probably didn't *originate* in the household sector.
- It probably originated in the financial sector.
- Surely the concrete nature of origin of the Minsky moment matters for policy
- Examples: the design of regulations to prevent the next crisis and the effectiveness of certain types of fiscal policy (e.g. tax rebates).

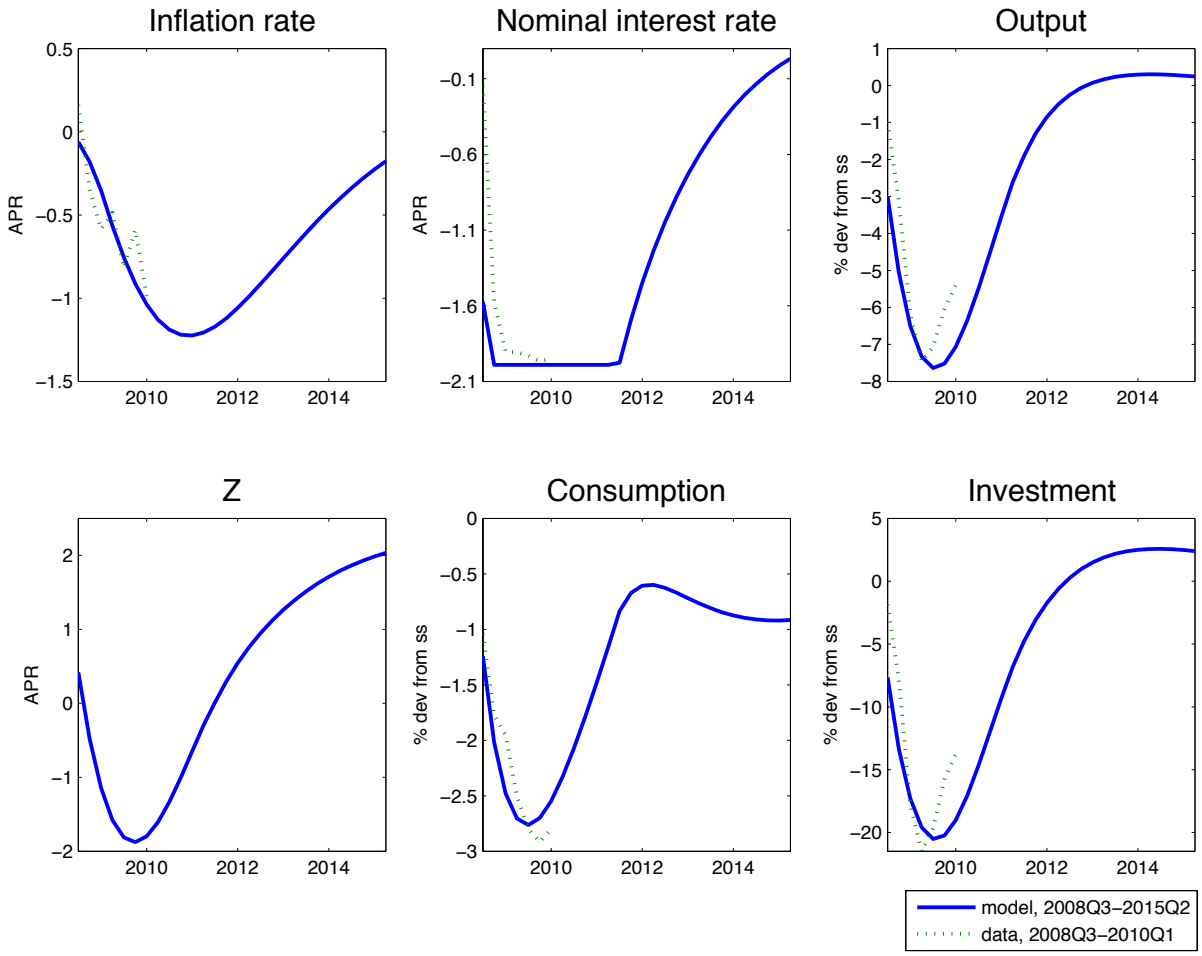
What about the propagation mechanism?

- The Fisherian debt deflation couldn't have been very important in this crisis because there wasn't a very large fall in the rate of inflation.
- Two ways to make this point
  - By how much did inflation fall in response to the shocks that caused the crisis?
  - Do traditional NK models without the debt deflation mechanism capture, quantitatively, the effects of the crisis on inflation?

Impulse Response Functions

- Suppose we construct forecasts of macro aggregates as of 2008Q3 (beginning of the crisis).
- CER (2011) do this using simple univariate methods.
- Impulse response functions to the shocks that precipitated the crisis
  - The difference between actual and forecasted values of macro variables.

Figure 7: Data and model impulse response functions.



The Debt Deflation Mechanism

- Inflation only fell by about 1 percent is response to shocks that caused the crisis.
- So debt deflation just can't be a big part of the story.
- This inflation inertia fact is stressed in Hall (2011).

How do structural models without debt deflation perform?

- CER (2011) consider performance of ACEL model using a shock to the financial sector and household discount rate

$$\beta = \frac{1}{1+\rho}$$

- In their experiment ρ falls to -2.2% APR.

Financial sector shock in ACEL

- Each dollar passing between households and firms goes through the financial system.
- In normal times, every dollar transferred between households and firms uses up τ dollars' worth of final goods (costs of intermediation).
- At the onset of the financial crisis, agents learn that the costs of intermediation have risen.
- $\tau > 0$ for t corresponding to first period of the crisis until the last period of the crisis (12 quarters later).
- A rise in τ_t is equivalent to a rise in the interest rate spread.

Key assumptions

- Rise in τ implies interest rate spread on 3-year bond jumps by 3.6 percentage points (APR), then declines linearly back to zero after three years.
- G_t increases by 2 percent for as long as ZLB binds.
- CER use firm specific capital version of ACEL where firms set their prices once a year.
- Coefficient on marginal cost in NK Phillips curve is 0.0026.

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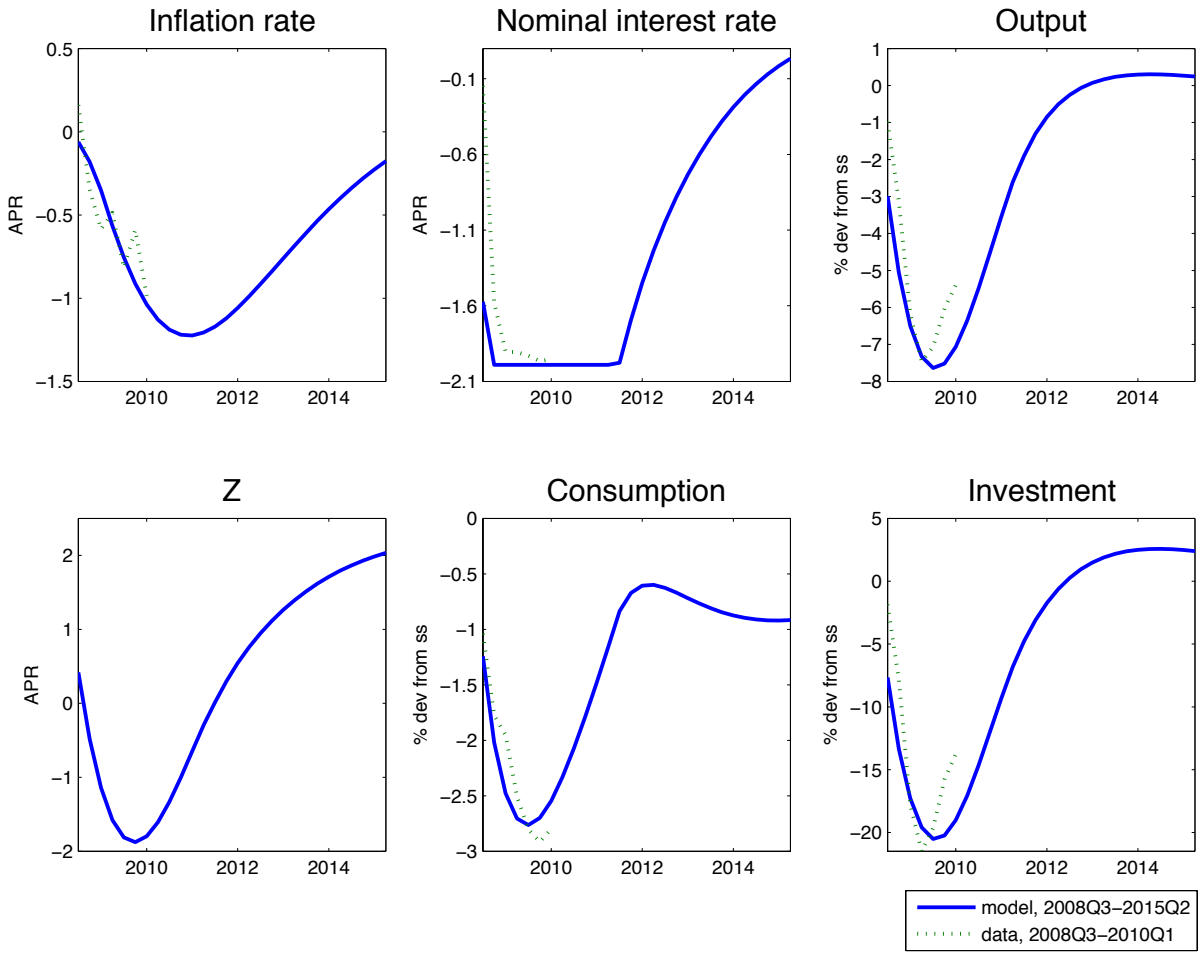

Conclusion

- EK is a provocative, interesting paper that adds in important ways to the ZLB literature.
- The EK shock is one way to capture the sharp rise in household saving that occurred during the crisis.
- The authors need to persuade us that there's a massive failure of Ricardian equivalence to convince us that this shock is quantitatively important.
- The debt deflation which EK stress may have played an important role in episodes like the Great Depression.
- But it seems of very limited applicability in the current crises.