Discussion of "A Model of Secular Stagnation: Theory and Quantitative Evaluation" by Gauti Eggertsson, Neil Mehrotra and Jacob Robbins

Adrien Auclert

Stanford

AEA meetings, Philadelphia
January 7, 2018

This paper

1. Presents the first theoretically consistent model of *secular stagnation*
   - $Y < Y^*$ because $r = i - \pi > r^*$ in a **steady state**
   - Overcomes significant theoretical challenges from previous literature
   - Eggertsson and Mehrotra (2014)

2. Explores the quantitative importance of factors behind r^* decline since the 1970s
   - Major role of fertility, mortality, and productivity [-2% each]
   - More minor role for markup rise and P^I decline [-0.5% each]
   - Counterbalancing: govtt debt and deeper credit markets [$+2.5\%$]
   - Overall, baseline OLG model can account for entire -4% decline

My assessment of the paper

- This is already a very influential paper
  - Quantification will only increase its already large impact
- My discussion:
  1. Explain mechanisms in asset supply/demand framework
  2. Suggest one route to discipline magnitudes empirically

Key theoretical innovations

- Before EM, 2 significant challenges to modeling secular stagnation.
- Want to achieve, in a *steady state*,

$$i - \pi > r^* \qquad \text{and} \qquad x = \frac{Y - Y^*}{Y^*} < 0$$

Key theoretical innovations

- Before EM, 2 significant challenges to modeling secular stagnation.
- Want to achieve, in a *steady state*,

$$i - \pi > r^* \qquad \text{and} \qquad x = \frac{Y - Y^*}{Y^*} < 0$$

1. At the ZLB, $i = 0$, and if on target $\pi = \pi^* > 0$
   - **Standard models**: dynamic efficiency $\Rightarrow r^* > g > 0$
   - **EM**: OLG model $\Rightarrow$ dynamic inefficiency, $r^* < -\pi^*$ possible

Key theoretical innovations

- Before EM, 2 significant challenges to modeling secular stagnation.
- Want to achieve, in a *steady state*,

$$i - \pi > r^* \qquad \text{and} \qquad x = \frac{Y - Y^*}{Y^*} < 0$$

1. At the ZLB, $i = 0$, and if on target $\pi = \pi^* > 0$
   - **Standard models**: dynamic efficiency $\Rightarrow r^* > g > 0$
   - **EM**: OLG model $\Rightarrow$ dynamic inefficiency, $r^* < -\pi^*$ possible
2. In NK model, $\pi = \frac{\kappa}{1-\beta} x$: long run Phillips curve near vertical
   - **Standard models**: π diverges in a secular stagnation
   - **EM**: Downward nominal wage rigidity $\Rightarrow$

$$\pi \simeq -(1-\gamma) + (1-\gamma) \frac{1-\alpha}{\alpha} x$$

π is bounded in secular stagnation, consistent with Japan experience

Quantitative findings

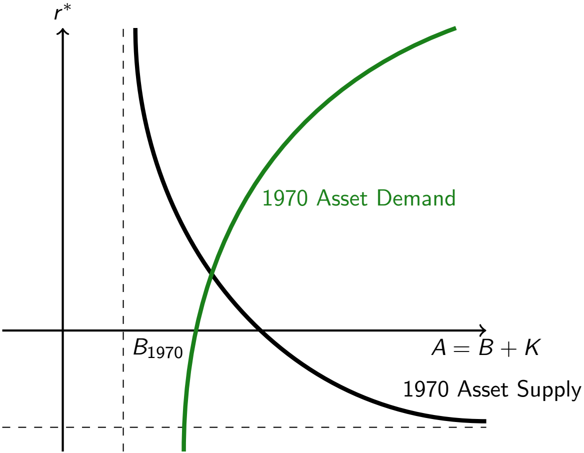
- Quantitative model: 56 period OLG model, where key inputs are
  - Fertility: number of children per household Γ
    - changes ss pop growth
  - Aging: shifting probabilities of survival $\{s_j\}$
    - changes life expectancy
- Main quantitative finding: can get 4% decline in r^*
  1. **Productivity**: almost same as in standard rep agent model

     $$\triangle r^* \simeq \frac{1}{\sigma} \triangle g^a$$

     with $\sigma = 0.75$ and $\triangle g^a = -1.35\%$, gets us -1.8%
  2. **Other factors** can all be understood in long run asset supply/demand framework (complementary to paper's good market approach)

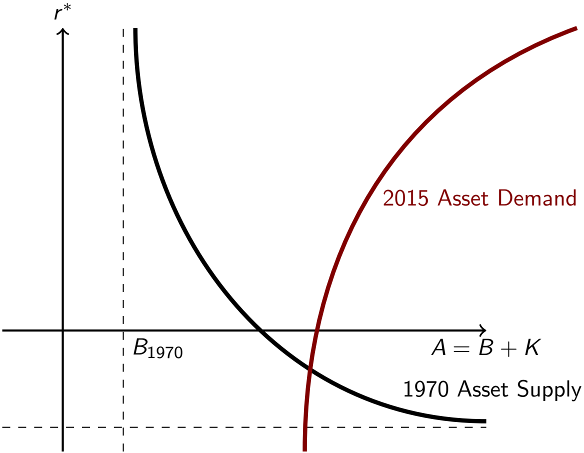
Asset supply and demand

- Equilibrium in long-run capital markets: $A = B + K$



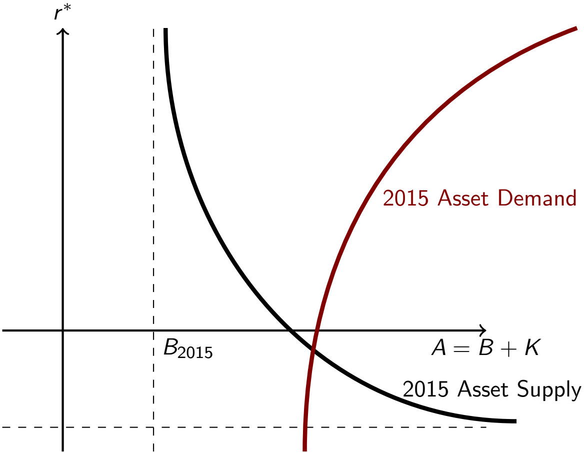
Asset supply and demand

- **Fertility**, **mortality** $\Rightarrow$ savings $\uparrow$, $r^* \downarrow$



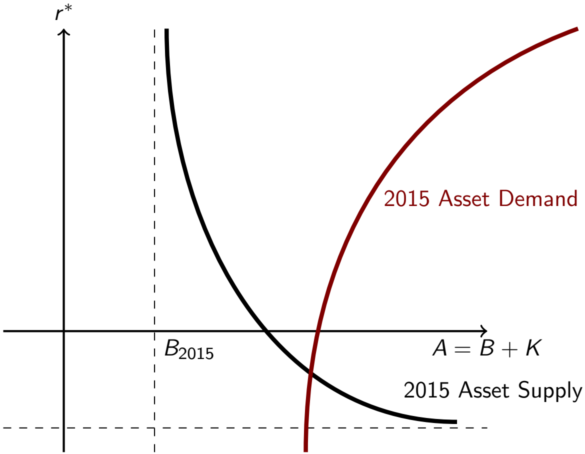
Asset supply and demand

- **Gov debt** $B \uparrow$ mitigates this. **Borrowing constraint** is equivalent.



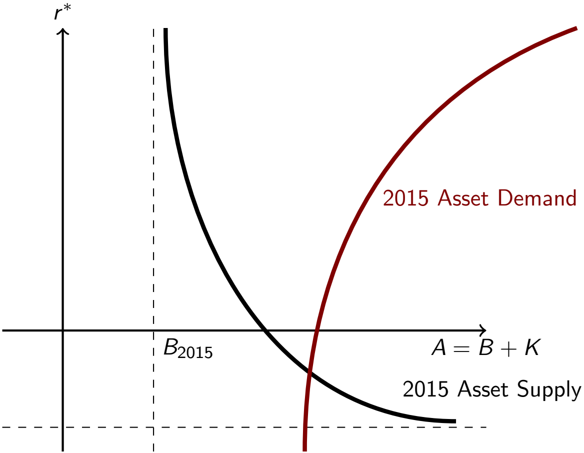
Asset supply and demand

- **Markups** ↑ contracts asset supply (will come back to this)



Asset supply and demand

- **Price of investment** $\downarrow$ also provided capital-labor elasticity $\sigma < 1$



Using elasticities to understand magnitudes

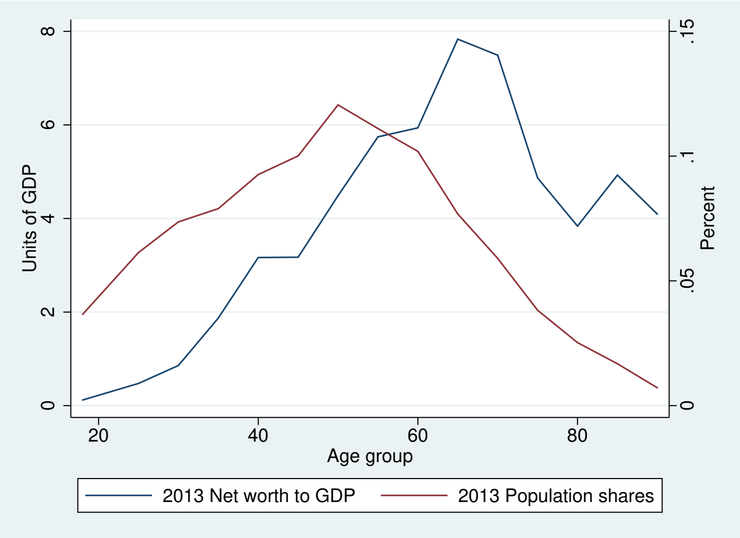
- Can cross-validate the model using first order approximation:

$$\Delta r^* = \frac{\frac{\triangle A}{A}}{\epsilon_D - \epsilon_S}$$

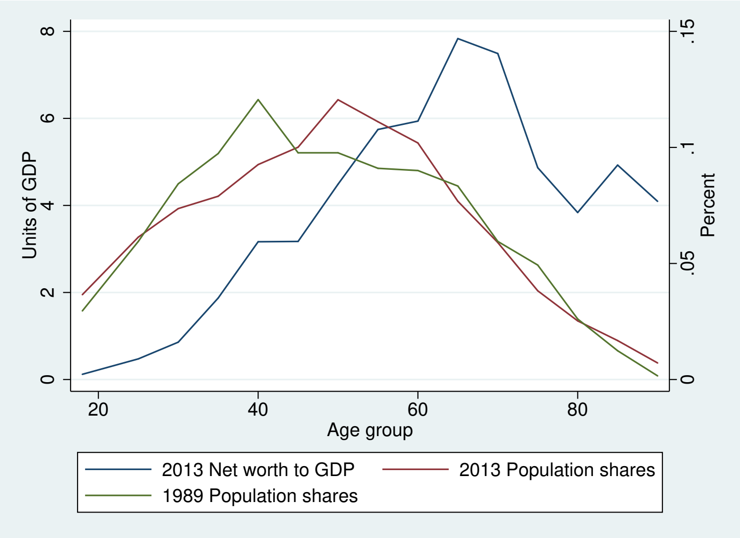
where $\frac{\triangle A}{A}$ is % change in asset demand-to-GDP holding r constant, and ϵ_D (ϵ_S) is semielasticity of asset demand (supply) to r

- In paper, inferring from B change, $\epsilon_D - \epsilon_S \simeq \frac{68\%}{2.11\%} \simeq 33$
  - Similar to semielasticities from typical Bewley-Aiyagari models
- Since get $\Delta r^* = -3.6\%$ from demographics, implied $\frac{\triangle A}{A} = 118\%$
- Is this plausible?

SCF net worth by age in 2013



SCF net worth by age in 1989



Decomposing effects

- Simple shift-share analysis only predicts 2.5% change in $\frac{A}{Y}$, but
  - Does not take account of population shifts from 75 to 89
  - Does not take account changes in life-cycle profile of assets
  - Here: more retirement saving, more bequests per children, ...
- Suggestion: decompose the effects in model into these sources and map to data profiles when possible

Other comments

1. Paper shows *large* steady state output gap $x = -15\%$ with standard parameter values
   - In 'Inequality and aggregate demand', we show that large r to Y conversion is highly mitigated with responsive fiscal policy (B and G)
2. Does increase in markups reduce r^*?
   - We show that if markup profits are capitalized, then a rise in markups that leads to a decline in labor share always increases r^*
     - asset supply $\uparrow$, not $\downarrow$
   - Key questions: do markups $\uparrow$ also increase asset values? Is risk-free rate appropriate for them?

Conclusion

- A key paper in the literature just got even better with quantitative analysis
- Includes most of the relevant forces
  - Rightly emphasises that they do not all go in same direction
  - Role of demographics very interesting, deserves more investigation
- Going forward for the literature: need more on understanding
  - factors that shift savings at constant r
  - as well as elasticities of aggregate savings wrt r