

Discussion:
“External imbalances between China and the US:
a dynamic analysis with a life-cycle model”

By Julia Niemeläinen

Ippei Fujiwara
Keio University / ANU

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Outline

- 1 Brief Summary
- 2 Comments

Diamond (1965) meets Lucas (1991)

- When societal aging is anticipated, real interest rates may decline.
 - Diamond (1965): OLG model can result in dynamic inefficiency
 - Modigliani (1966): Young save and old dis-save
- Higher potential growth should lead to capital inflow
 - Lucas (1990): “Why doesn’t capital flow from rich to poor countries?”
 - Obstfeld and Rogoff (1995): “The intertemporal approach to the current account”
- Ferrero (2010), which uses the similar approach to this paper following Gertler (1999), “shows that productivity growth differentials can indeed explain the majority of the fluctuations of the trade balance between the US and G6 countries from 1970 to 2005”
- “but for China, the same model predicts a counterfactual trade deficit during the simulation period.”
 - Lack of social security system in China may solve this puzzle.

Simple OLG

- Utility of generation at t is given by

$$u_t = \ln(c_t^y) + \ln(c_t^o),$$

which is maximized subject to the budget constraints:

$$\begin{aligned}(1 + \tau) c_t^y + s_t &= w_t, \\ c_t^o &= (1 + r_{t+1}) s_t + \mathbf{g}.\end{aligned}$$

- The government budget constraint is given by

$$L_{t+1} \tau c_{t+1}^y = L_t \mathbf{g},$$

where population growth is governed by

$$L_t = (1 + \phi) L_{t-1}.$$

- A representative firm maximizes profit:

$$K_t^\alpha L_t^{1-\alpha} - w_t L_t - (1 + r_t) K_t,$$

where 100% depreciation is assumed (as usual).

- Saving for retirement

- Less youth leads (lower ϕ) to less consumption for old (given capital).
- Less social security transfer (lower g) leads to less consumption for old (given capital).
 - Increase in K (or equivalently, decrease in r)

- Distortionary taxation

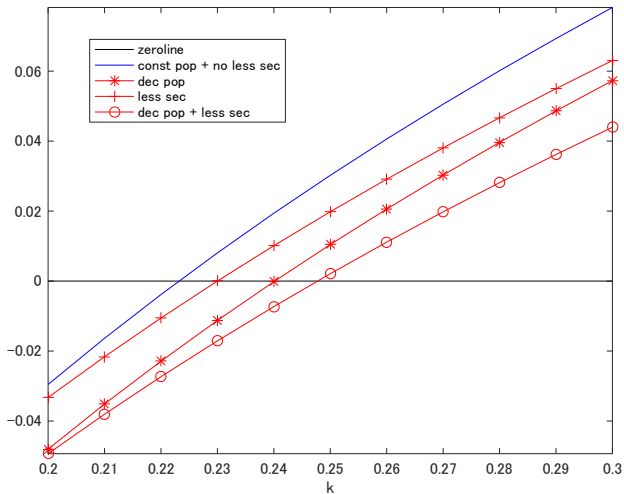
- This affects intertemporal optimality condition.
- (Probably) increase in K (or equivalently, decrease in c^y)

- Solution for $k := K/L$ is given by

$$2\phi k^\alpha - (1 - \alpha) k^{2\alpha-1} - \frac{g}{1 + \phi} k^{\alpha-1} + \frac{g}{\alpha} = 0,$$

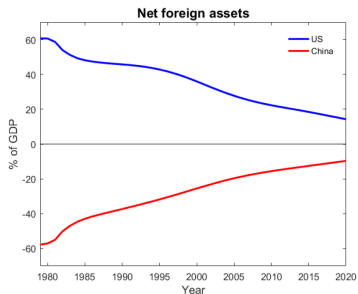
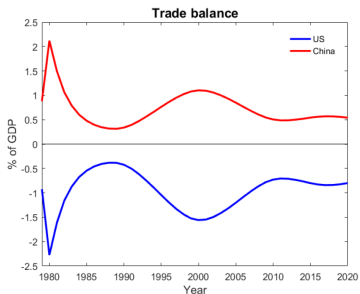
which is if $g = 0$,

$$k = \left[\frac{1 - \alpha}{2(1 + \phi)} \right]^{\frac{1}{1-\alpha}}.$$

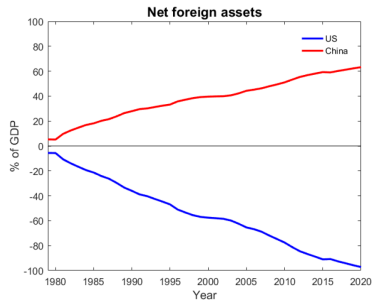


- Note that interest rates are the decreasing function of capital.

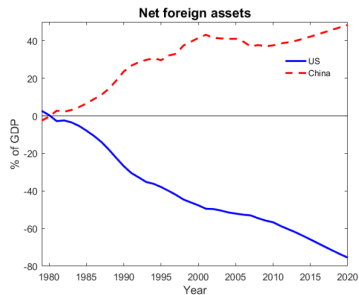
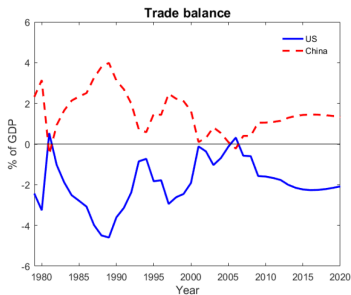
The dynamic effects of demographic transition



+ a permanent difference in social security



+ Learning



- Learning weakens too large wealth effects from perfect foresight

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Comments

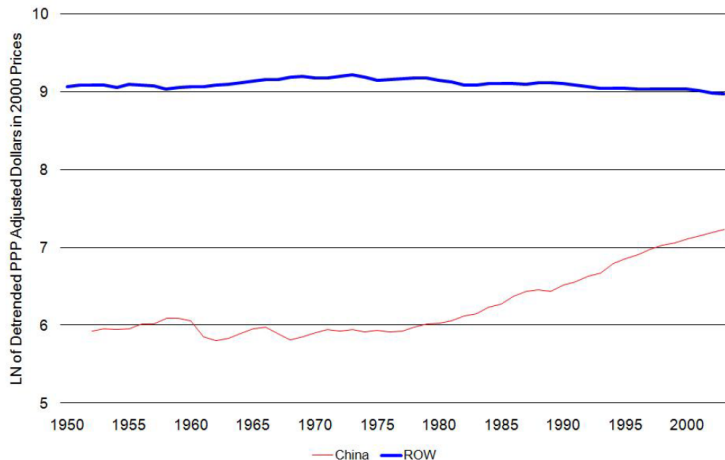
- A very nice tractable model to explain the trade deficit (surplus) in the US (China)!
 - Below are my comments.
- 1 Assumptions about steady states
 - 2 Attanasio, Bonfatti, Kitao and Weber (2006)
 - Asset ratio
 - Trade frictions
 - 3 Model and data
 - 4 Others

Assumptions about steady states

- It is assumed in steady states,
 - “productivity and population growth rates (x and n^w) are the same across the countries so that the faster growing economy cannot become the only economy in the world.”
 - “The annual productivity growth rate is 1 % in both steady states, which is the average of the observed growth rates between the countries between 1980 and 2015.”
- These seem strong assumptions.
- These definitely weaken the wealth effects which are one of the most important channel for the analysis on low frequency events.
 - News shocks on higher growth of TFP have significant different impacts than those on the level (Fujiwara, 2010).
- TFP growth rates have been and will be higher in China.
 - Lucas (1990) strikes back.
- With the extended path algorithm by Fair and Taylor (1983), the rational expectations equilibrium can be solved only by assuming identical growth rates far into the future.

PPP-ADJ Per Capita GDP in China and G7

Figure 2. Output



source: Fujiwara, Otsu and Saito (2012)

Attanasio, Bonfatti, Kitao and Weber (2016)

- “Global Demographic Trends: Consumption, Saving and International Capital Flows,” in *Handbook of the Economics of Population Aging*, edited by John Piggott and Alan Woodland, North Holland, Amsterdam, November 2016, Vol. 1 A, Chapter 4.
 - “review the recent literature on the effects of changing global demographic trends on consumption, factor prices and social security.”
 - “an overlapping generation model with four regions of the world”
 - “projected demographic trends, which converge to common values across regions by 2200”
 - “to study the evolution of factor prices, current accounts and welfare during the transition and explore the differences between open and closed economies, when we limit factor mobility to capital mobility and we make different assumptions about future trends in demographics and productivity”

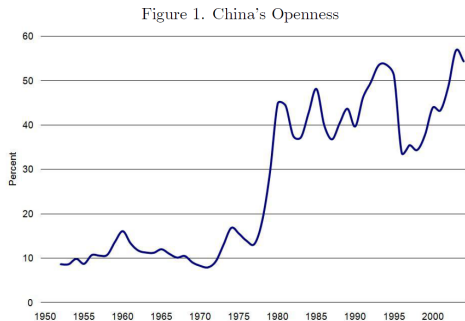
- What could be new contributions of this paper compared to them, who construct richer multi-generations model?
- Good news is that they assume no intensive margin adjustment in labor.
 - “According to Kilponen et al (2006),” endogenous labor supply “plays an important role in an ageing economy”
 - Yet, is intensive margin still crucial to explain capital flows?
- The advantage using Getler (1999) model is its tractability and therefore, gauging the impacts from other distortions or considering normative analysis may be good idea

Asset ratio

- According to Fujiwara and Teranishi (2008), which is the extension of Gerter (1999) to the new Keynesian model, the model predicts much higher savings of youth / those of old than in the data.
 - The data is around 50% in 1989 and 15% in 2014
 - The model predictions are from 75% to 85% with reasonable survival rate
- Even if macro saving can be explained well, individual savings may be not.
 - Multi-generations models assume bequest motive to increase saving by old.

Trade frictions

- As analyzed in Attanasio, Bonfatti, Kitao and Weber (2006), trade frictions seem to be the most important factor for asset positions in the US and China.
 - At least, some forms of trade frictions seem necessary at the initial steady states.



Source: Fujiwara, Otsu and Saito (2012)

Model and data

- The model consists of young workers and old workers and there is no child.
- Thus, what is important in the model is not the fertility rate but the entry rate.
 - With no significant change in participation rates or immigration, they are very similar but with about 20 years of delay.
 - Is the model and the data consistent with regard to entry rate?
- Learning exercises are justified under the claim: “Based on old revisions of the United Nations population forecast, the demographic transition has not been fully anticipated.”
 - The entry rate is forecastable at least for the next 20 years.

Others

- In a model without any friction, current account immediately responds to interest rate differentials.
 - Investment growth adjustment cost must be playing an important role
- Which channel is more important, social security or distortionary tax?
 - With heterogeneous agents, non-distortionary lump-sum tax is not possible, but what happens if social security expenses are financed by the least distortionary tax?