Making Sense of China’s Excessive Reserves

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March 2011 - Marseille
What is it about?

Over the last three decades:

- Fast growth in China
- An increase in (private) savings in China (faster than investment)
- Large current account surpluses in China and build-up of foreign reserves

Reconcile these features in a dynamic macro model where increase in savings is a complement of fast growth when households face borrowing constraints and idiosyncratic risks.
Source: PWT and China Household Surveys (from Song and Yang)
y-axis: Chinese current account % of GDP (1982-2007)
x-axis: Chinese Household savings rate % of disposable income (1982-2007)

\[ y = 0.4317x - 5.6145 \]

\[ R^2 = 0.5611 \]
Why is it theoretically puzzling?

Following a permanent increase in productivity, standard models would predict:

- A rise in investment in the fast growing country

- A fall in savings in the fast growing country (permanent income hypothesis)

- A current account deficit in the fast growing country

To account for recent developments in China, one needs (at least) to break down the standard Euler equation.

This is what the paper does
What the paper does?

1) Develops a simple tractable model of precautionary savings where savings increase following a growth episode.

2) Develops a more general two sector model (export versus non-tradable sector) with capital. Analyzes the impact of the relaxation of capital controls on the Renminbi.

Focus on the first part.
Main Intuition

Idiosyncratic risk (individual shocks to discount factor) makes people willing to borrow or save in different states.

Borrowing constraints prevents borrowing $\Rightarrow$ self-insurance requires to accumulate a buffer stock savings

How growth magnifies the effects?
Main Intuition?

Impatience versus Precautionary Motive

How growth magnifies the effects? This is the tricky part.


‘Growth makes households more impatient’ (willing to ’front load’ consumption) as in standard models

Here growth also increases precautionary motive: growth enters in a multiplicative way with the idiosyncratic risk
Impatience versus Precautionary Motive

Impatience depends on:

\[ E\left[ \frac{1 + \bar{g}}{\beta} \theta_t(i) \right] = \frac{1 + \bar{g}}{\beta} \]

Increases with growth rate \( \bar{g} \): tends to lower saving rate

Precautionary motive depends on the dispersion of the same variable:

\[ \text{Std}_i \left[ \frac{1 + \bar{g}}{\beta} \theta_t(i) \right] = \frac{1 + \bar{g}}{\beta} \text{Std}_i [\theta_t(i)] \]

Also increases with \( \bar{g} \)
Impatience versus Precautionary Motive

Trade-off between the two effects

Same flavour as Carroll and Jeanne (2009) where fast growth leads to higher unemployment risk. If the rise in unemployment risk is strong enough $\Rightarrow$ higher precautionary savings $\Rightarrow$ accumulation of foreign assets

Remark: is the set-up here isomorphic to a model with idiosyncratic labor risk $\varepsilon(i)$ where labor incomes would follow: $w_t(i) = \varepsilon(i)(1+\bar{g})w_{t-1}$

(with $w_{t-1}$ aggregate labor income)

Instead of $w_t(i) = (1+\bar{g})w_{t-1}+\varepsilon(i)$
Savings and Growth

Response of savings to growth depends on these two forces: precautionary motive dominates for low values of $\bar{g}$. For $\bar{g}$ above a very high threshold, impatience dominates.

For reasonable $\bar{g}$, model replicates a raise in savings rate following a permanent increase in $\bar{g}$.

Quantitatively large impact.

Model able to replicate the large increase in savings rate in China in response to productivity growth and the build-up of reserves.
The good news

Savings “glut” story (Bernanke (2005)).

Savings seem to be the driving force of global imbalances at least for the last decade.

To be opposed to investment based stories (Caballero et al. (2008), Song, Storesletten and Zilibotti (2011))

Some saving stories based on precautionary motives might not survive to growth.

Mendoza, Quadrini and Rios-Rull (2009)

But is the right story? How much does it explain?
Two main issues

1) Robustness of the findings and key hypothesis

2) Empirical evidence - more empirical support could allow to disentangle from competing stories
Robustness of the findings and key hypothesis

Finding depends on the trade-off between patience and precautionary motive, could the authors be more explicit on the robustness of their findings?

Is the proportional increase in idiosyncratic risk (and precautionary motive) with income growth a reasonable assumption?

Probably yes

see Chamon, Liu and Prasad (2010) - unemployment risk multiplied by 2 to 3 over the period 1990-2005

Perloff and Wu (2005): increase in Gini coefficients!
Gini Index in Urban China 1985-2001

Source: Perloff and Wu (2005)
Robustness of the findings and key hypothesis

Very specific model for tractability

Utility function ($\log(c)$ and linear in labor) - Pareto distribution of shocks - no borrowing - Idiosyncratic preference shocks instead of income shocks - zero nominal foreign currency interest rate

How the results are dependent on such assumptions?

Note that higher risk aversion would strengthen the effects.
Robustness of the findings and key hypothesis

One key parameter makes everything in the model = coefficient governing the dispersion of idiosyncratic shocks = $\sigma$

$\sigma$ is either calibrated to:

(i) to match dispersion of consumption expenditure (Gini in similar countries)

Likely to be an upper-bound for $\sigma$?

- Gini can also be related to different deterministic abilities/productivities
- Perloff and Wu (2005) report much smaller Gini for income in China
- More model based measure: match dispersion in consumption growth
Robustness of the findings and key hypothesis

(ii) to match exports (or net exports) and reserves accumulation

- one big spike towards the end of the sample and one degree of freedom

Would be nice to match other empirical moments such as changes in the dispersion of savings/consumption growth (or Ginis)...

$\sigma$ calibrated to match current account data in a model without investment. Fast growing countries invest more, current account surpluses much smaller. Cannot match data anymore?

How much can we explain with a reasonable $\sigma$ in presence of capital accumulation?
Empirical evidence on key mechanisms

Who is mostly driving the increase in savings in China?

Households - Corporates - Public?

If households are key, who are the savers? Average workers facing large idiosyncratic risks? Or very rich households very unlikely to be facing borrowing constraints?

Some descriptive statistics using household surveys could be useful to strengthen the message.

Could allow to match other moments of the data across households (see above).

Evidence (even anecdotal) on borrowing constraints in China would also be useful.
Conclusion

Very nice paper! Elegant model - makes sense of important recent developments in the China that contradicts standard models. Everything in closed form!

Probably part of the story but needs more direct empirical evidence to quantify how much of the data their mechanism can explain.

Many competing/complementary stories out there. Would be nice to have more evidence to disentangle this story from others

Want to draw the author attention on two recent papers potentially useful: Song and Tang (2010), Coeurdacier, Guibaud and Jin (2011) (self promotion!)

See also Bachetta and Benhima (2011) on corporate savings.
Competing/complementary stories (among others): Life cycle savings
together with a change in life earning profiles: Song and Tang (2010)

Argue that young Chinese benefited more from growth than old (increase in return to education and fall in return to experience) and even more than retired (fall in replacement ratio)

Model explains a raise of savings that has been unequal across generations (increase for young workers and old workers) as in the data.

Present model would generate an equal increase unless the change in idiosyn- cratic risk has been spread unevenly across generations. Maybe young more affected?
Competing/complementary stories (among others): Life cycle savings together with borrowing constraints: Coeurdacier, Guibaud and Jin (2011)

Similar flavour than the present model.

Relies on first order effects of growth on savers (middle-aged guy) in a neoclassical growth model with capital accumulation

Main mechanism: high growth in high propensity to save country (due to high borrowing constraints) lowers world interest rates. Workers (middle aged) save more (income effects dominates): savings rate increase in Asia and China. They fall in countries with looser constraints as borrowers (young) can borrow more.

Accounts for the divergence of savings rate across regions.