

Consumption, Land Prices and the Monetary Transmission Mechanism in Japan

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Overview

- Japan's bubble collapse in the early 1990s, banking crisis and 'the lost decade' raise questions about lessons for the US in 2001-3 and in the current financial crisis.
- Understanding why monetary transmission works so differently in Japan vs. US and UK is vital for learning the right lessons.

Monetary transmission via consumption: fall in short-term rate

1. Direct interest rate effect, given income, wealth, expected income (?): depends on context e.g. net assets/income, preferences.
2. Indirect classical wealth effects via asset prices of financial assets (+) and homes, land(?): depends on def.n of consumption.
3. Credit channel effect via short-term cash flows(+): depends on extent of adjustable rate debt.

Fall in short term rate (cont'd)

4. Credit channel effects via asset prices:
 - (a) Collateral (+)
 - (b) Downpayment constraints(-) : net effect (?) depends on context, esp'y on credit conditions.
5. Indirect effect via expected income growth(+): depends on system response, incl. consumption, investment, net exports.

Is the direct interest rate effect, given income, wealth and expected income, positive or negative?

- Examine a simple 2-period model to get the basic insight.
- Multiperiod extension is trivial.

The case of CES Preferences

Here $U^{-\rho} = c_1^{-\rho} + [1 / (1 + \delta)]c_2^{-\rho}$

where the elasticity of substitution, $\sigma = 1 / (1 + \rho)$, $\rho > -1$.

Maximise utility subject to the two-period budget constraint

The solved-out consumption function is

$$c_1 = W_1 / k_1 \quad (2.3)$$

The responsiveness of consumption to the real interest rate, given A_0 , y_1 , and y_2^e

With
$$W_1 = A_0(1 + r_0) + y_1 + \frac{y_2^e}{1 + r_1}$$

$$k \approx 1 + \frac{1}{1 + \sigma\delta + (1 - \sigma)r_1}$$

$$\begin{aligned} \frac{\partial \log c_1}{\partial r_1} &= \frac{\partial \log W_1}{\partial r_1} - \frac{\partial \log k}{\partial r_1} \\ &= \frac{-y_2^e}{W} + \frac{1 - \sigma}{k(1 + \sigma\delta + (1 - \sigma)r)^2} \end{aligned} \quad (2.6)$$

Increase of consumption in response to higher r is likely in Japan

- Low y^e_2/W (high share of assets in W) and low σ make positive response more likely.
- Japan has high ratio of net assets, esp'y net liquid assets, to income, and subdued income growth expectations.
- σ measures tolerance to consumption fluctuations: Japanese households are famed for their caution.
- Such households will also tend to apply larger risk discount to expected income growth.

Is there a housing wealth effect in the life-cycle permanent income model?

- Equations (2.7) and (2.8) in the paper show that the effect of a permanent rise in real house prices is small and negative for correctly measured aggregate consumption index incl. imputed rent.
- This point seems to have been overlooked in the classic work by Modigliani and Brumberg (1954), Friedman (1957, 1963) and Ando and Modigliani (1963).
- Consistent with BOE view of no housing wealth effect.

Credit is key to house price to consumption link

- With **weak** access to credit, first time buyers save more when house prices rise (unless they give up on house purchase)
- Existing owners have only limited access to home equity loans. Hence aggregate consumption effect of rise in hp is negative.
- With **liberal** credit markets, FTB saving doesn't rise much, but at higher house prices, collateral is greater and home equity loans and so consumption are higher.

Towards an empirical model encompassing life-cycle and credit channel

- We choose solved-out Ando-Modigliani style consumption function, not Euler equation.
- Uses long-run information discarded in Euler approach.
- Robust to failure of strict rational expectations, full consumer rationality hypotheses.
- Just needs some consumer awareness of the inter-temporal budget constraint.

Log-linearizing the consumption function

- The basic aggregate life-cycle/permanent income consumption function has the form:

$$c_t = \gamma^* A_{t-1} + \lambda y_t^P \quad (2.11)$$

where agg. MPCs are weighted averages of micro MPCs, so will evolve with demography .

- Paper shows that log approximation of (2.11), using the fact that $\log(1+x) \approx x$, is

Log-linearization cont'd

$$\log c_t = \alpha_0 + \log y_t + \gamma A_{t-1} / y_t + \log(y_t^P / y_t) \quad (2.13)$$

$$\gamma = \gamma^* / \lambda \quad \text{and} \quad \alpha_0 = \log \lambda$$

- **The last term captures income growth expectations. The log formulation is good for exponentially trending macro data, since residuals are likely to be homoscedastic.**
- **Most models in the literature use log net worth formulation – very bad for low or negative (!) net worth. (2.13) makes it easy to split A into components.**

M&L (1995) Handbook of A.E. consumption model where no immediate credit constraint

$$\Delta \log c_t \approx \beta \left[\begin{array}{l} \alpha_0 - \alpha_1 r_{1t} - \alpha_2 \theta_t \\ + \alpha_3 E_t \Delta \log ym_{t+k} \\ + \gamma_1 NLA_{t-1} / y_t \\ + \gamma_2 IFA_{t-1} / y_t + \gamma_3 HA_{t-1} / y_t \\ + \log y_t - \log c_{t-1} \end{array} \right]$$

If some consumers credit constrained, add....

$$+\beta_1 \Delta \log y_t - \beta_2 (DB_{t-1} / y_t) \Delta \log nr_t + \varepsilon_t$$

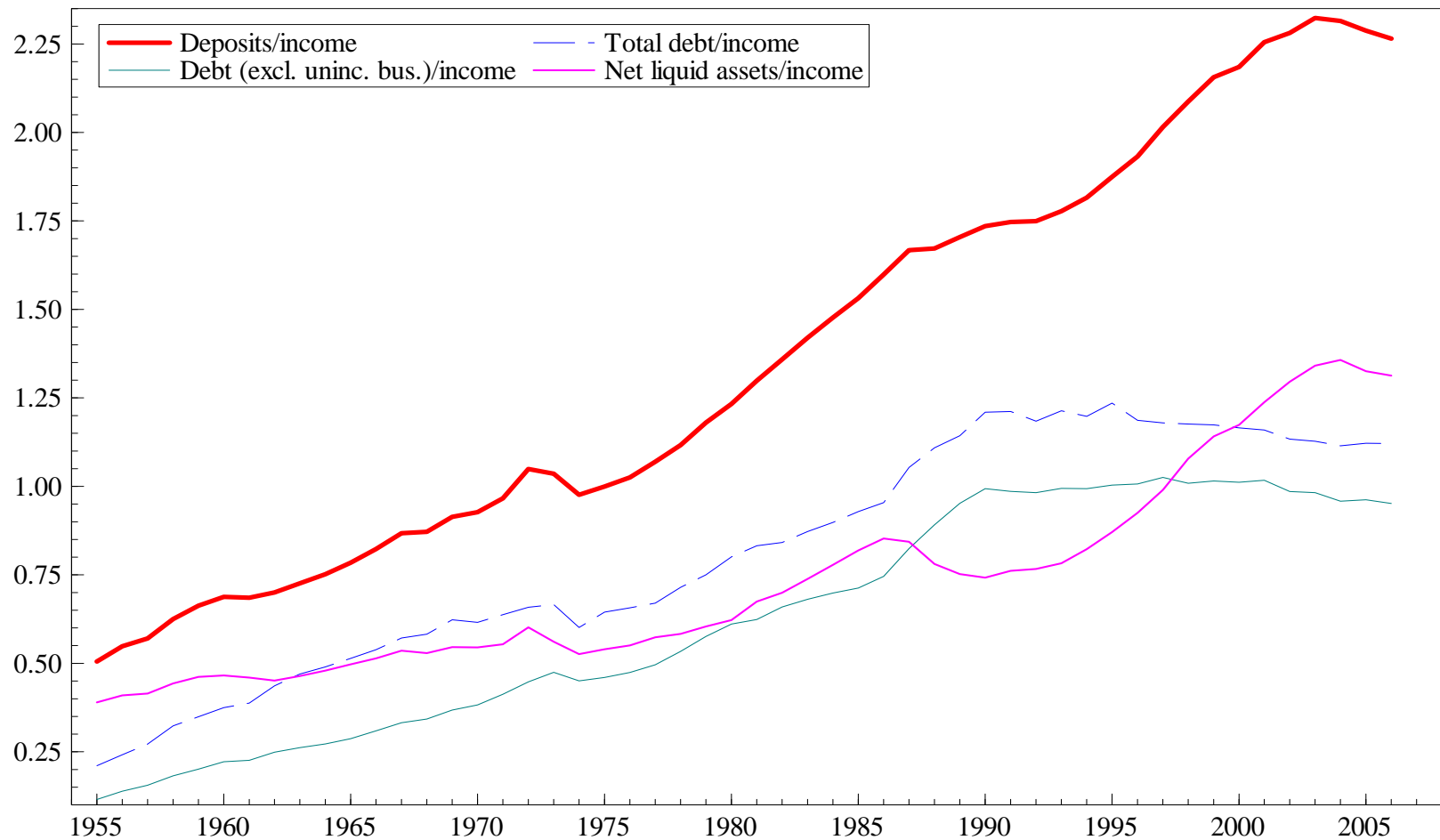
and possibly a housing capital gains term since transactions costs make expected value of house relevant, eq. (2.14) in the paper.

Parameters vary with shifts in credit market conditions, see UK and US evidence in Muellbauer (2008).

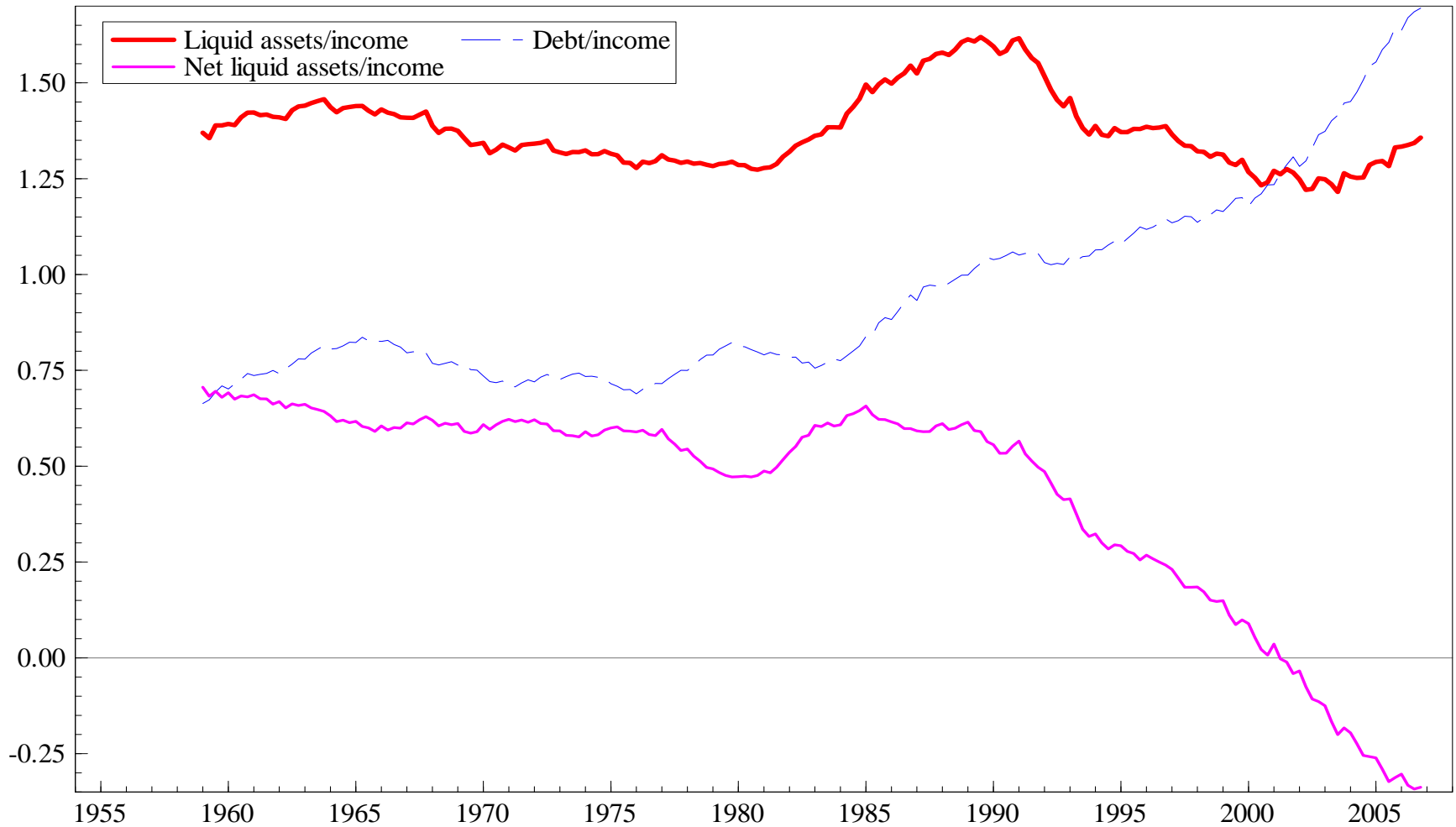
Modelling income growth expectations

- Some claim that housing wealth or collateral effects on consumption are an illusion, being merely a proxy for omitted income growth expectations, see King (1990) commenting on Muellbauer and Murphy (1990).
- Hence important to control for this.
- Table 1 model shows that in Japan, income reverts to split trend (lower after 1973), but big Ricardian effect (gov't deficit, debt to GDP ratios), US GDP, change in nominal interest rate. (No real exchange effect on non-prop. inc.)

Figure 5: Ratios to income of household deposits, total debt, debt excluding unincorporated enterprises, and net liquid assets.



US hh liquid asset/income, debt/income



Highlights of consumption fn. (Table 2)

- Positive real interest rate effect
- Negative real land price or physical wealth/income effects.
- Net financial wealth: $MPC=0.05$
- deposits+shares+pension wealth-debt can be aggregated - unlike UK or US, where illiquid financial assets have lower MPC

Highlights continued

- Income uncertainty effects notable
- Income growth coeff. is signif. positive, unlike US and UK.
- In Campbell-Mankiw story, its coeff.=consumption share of income constrained $\times(1-\text{speed of adj.})$. Implies share of income constr. consumption in Japan exceeds 50%.
- Stable coefficients

Co-integration analysis

- Think of model in terms of $\log(c/y)$. Then current dated regressors are real interest rate, $d\log y$ and uncertainty proxies. The latter are $I(0)$ given break in growth rate in 1974.
- Hence VAR in $\log(c/y)$ and real r , conditioning on weakly exog. $d\log y$ and income vol.
- Gives 2 cointegrating vectors. Suggests that real land price effect on cons. is even more negative, correcting for endogeneity of real r .

Figure 12 long-run contribution to log consumption/income of net financial assets/income and log real land price.

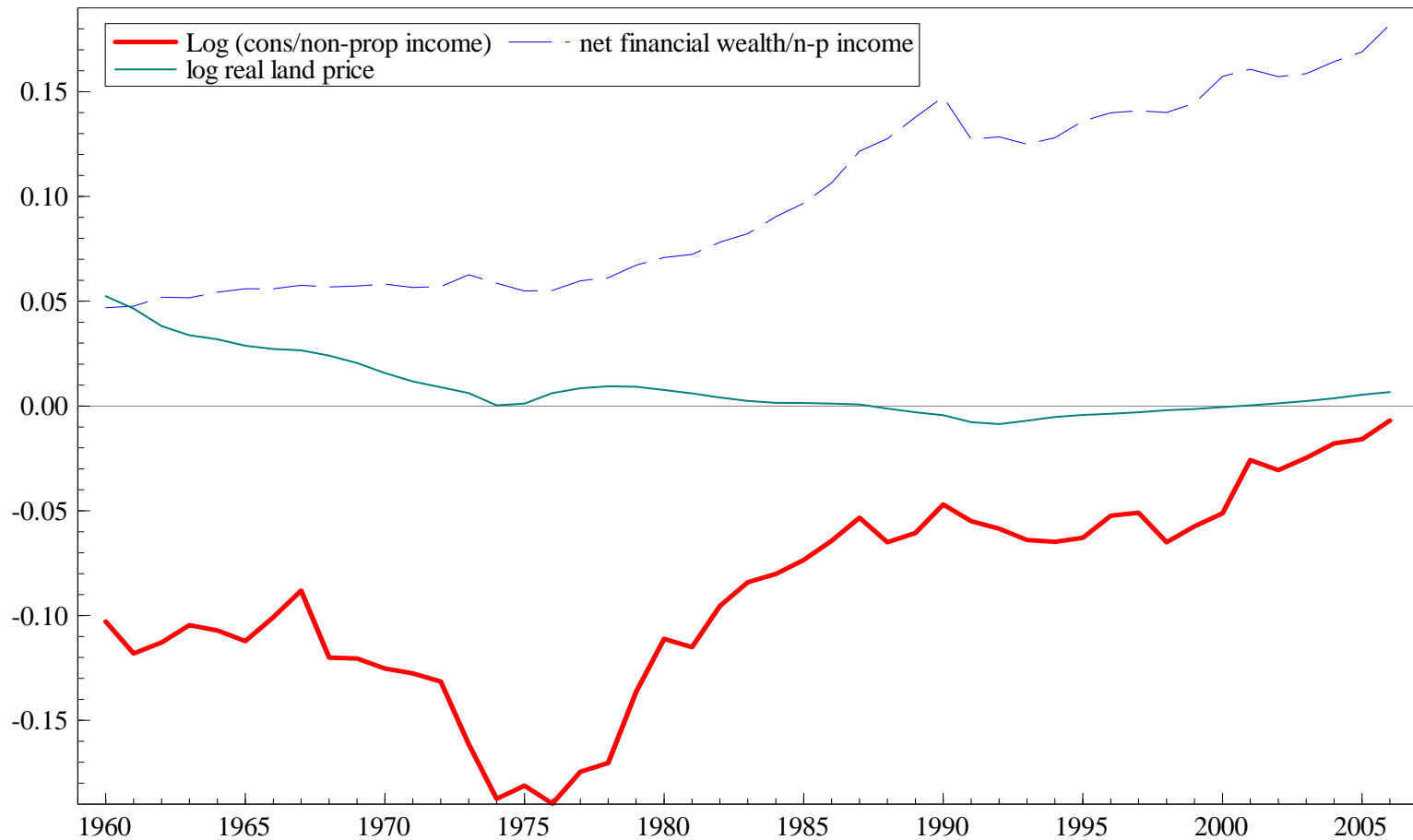
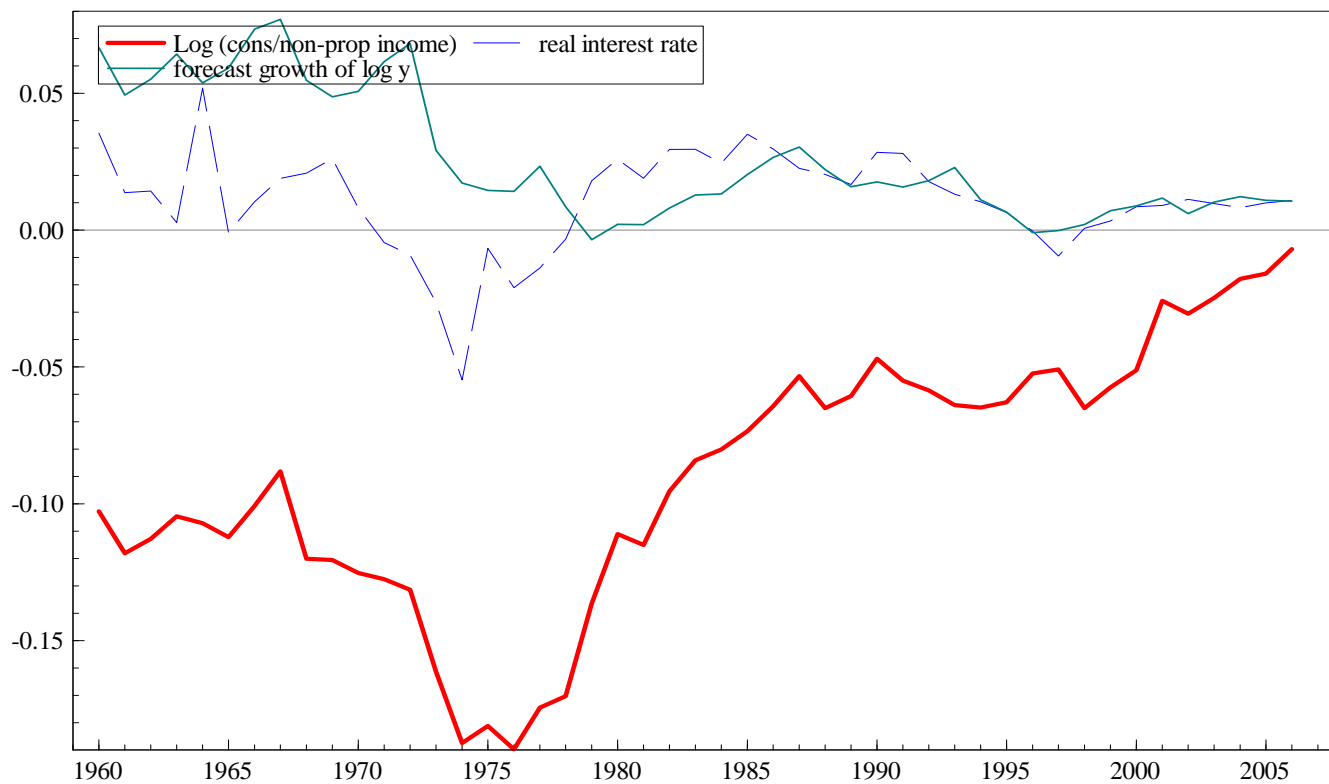


Figure 13: Long-run contribution to log consumption/income of real interest rate and forecast income growth



The rise in the consumption/income ratio

- Rise in cons/income ratio largely “explained” by rise in financial wealth/income (graphs based on single eq solution)
- But that will depend on portfolio composition and asset price developments likely to be influenced by demographic trends.
- Fall in real land price has also contrib. to rise in cons/inc. (bigger from co-integ, analysis)

Finally, was there credit market liberalization in Japan?

- Stable consumption function parameters suggest not.
- Further evidence from stable and remarkably simple debt equation, Table 3. Driven by income, physical wealth, illiquid financial wealth, nominal interest rate.
- By contrast, UK debt subject to huge structural breaks; US also needs liberalization indicator.

Further work

- Use quarterly data
- Split mortgage/non-mortgage debt
- Examine mortgage market spreads
- Examine role of state and private mortgage markets
- More sophisticated measures of interest rates
- Murata (1999) already examined durables/non-durables and survey data allowing age splits.

Conclusions

1. Theory can explain why real interest rates might have negative consumption effects in Japan and the evidence is that they do.
2. When credit markets are underdeveloped and other institutional features are present, e.g. inheritance taxes favouring land and housing, theory suggests a negative housing wealth effect and the evidence from Japan is that is negative (and even more strongly from a co-integration analysis).
3. There is no evidence of serious credit market liberalization in Japan.

Conclusions 2

- Between the mid-1990s and the early 2000s, the mounting bad loan problem of the banking system made such liberalization even more difficult. Our research conclusions are therefore broadly consistent with the focus on problems in the banking sector by Hoshi and Kashyap (2004).
- Our story explains why Japan responded so weakly to lower short term rates – and also helps explain why fiscal policy was fairly ineffective.

Conclusions 3

- One major policy error in Japan was not to follow Norway, Finland in speedily refinancing and reforming the banking system.
- Instead limped along with bad debt overhang, intermediation not working as seen in large spreads between lending and borrowing rates, poor capital investment decisions, with major loss of consumer welfare and output.
- US does not look to be making this mistake.