

Payroll Tax and Household Consumption

by Chongen Bai and Binzhen Wu

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discussion by Martin Berka
Victoria University and CAMA

National School of Development at Peking University
CCER, Beijing, China

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Contribution

- Paper uses natural and exogenous experiment of phasing-in of social security contributions in Chinese cities
- Estimates a response of consumption and savings to changes in the current social security contributions
 - ▶ Large personal consumption/income dataset of 101 cities in 9 provinces between 1997 and 2006: total of 30,670 families
 - ▶ Richly heterogeneous policy constraint
 - ★ at city level: contributions phased in at different levels and speeds
 - ★ at income level: $I < 0.6\bar{I} \Rightarrow ss = 0.6ss(\bar{I})$, $I > 3\bar{I} \Rightarrow ss = 3ss(\bar{I})$
Implies compulsory contribution rates declining in income for over 45% of sample
- Social security contribution rate lowers consumption, semi-elasticity of about -3.3 (also increases saving). The effect is stronger for poorer families.
 - ▶ This is a very large number: PIH \Rightarrow elast=0, consuming your current income \Rightarrow elast=-1.
 - ▶ Proposed justifications: target saving (for house) when credit constrained

Model

- Representative consumer with exogenous income stream and prices

$$\max_{c_1, c_2, c_3, a_1, a_2} U(c_1, h_1) + \beta U(c_2, h_2) + \beta^2 U(c_3, h_3)$$

- Scenario: must save in period 1 to buy house in period 2

$$h_2 = 1, h_1 = h_3 = 0$$

- ▶ Period 1: $c_1 + a_1 = (1 - t_w - t_{ss})w_1 + (1 + r)a_0$
- ▶ Period 2: $c_2 + a_2 + p = (1 - t_w - t_{ss})w_2 + (1 + r)a_1$
- ▶ Period 3: $c_3 = (1 + r)a_2 + bB, B = t_{ss}(1 + r)^2(w_1 + w_2 / (1 + r))$

- If $b > 1$, pension contributions earn higher return than r
- Credit constrain: $a_i \geq 0 \forall i$
- Two saving motives (retirement, house ownership) are both compulsory in the scenario.

Model

- Consumption smoothing motive drives results
- with social security payments high relative to house price, $a_2 = 0$
- $\frac{\partial c_1}{\partial t_{SS}} > 0$ iff $b > 1$ and $a_2 > 0$: consumption rises with t_{SS}
 - ▶ social security has a higher-than-market return (and vice versa), and
 - ▶ there is savings "left over" after the purchase of the house
- Wealth is unaffected by temporal re-allocation of income if all forms of saving have the same return or if house prices are relatively low
- $\frac{\partial s_1}{\partial t_{SS}}$ is more nuanced, perhaps because they use after-contribution measure of income

Empirical analysis

- Basic regression: $\ln(c^i) = c + at_{ss}^i + controls$
- Unobservable job characteristics that cannot be controlled for but influence c
 - ▶ Large pensions usually in big and developed companies
 - ▶ Self-selection: risk-averse save more and also get more secure jobs
- Instrument for t_{ss}^i by city average $\overline{t_{ss}^i}$
- This has a dramatic effect on \hat{a} , which drops from $[-0.3, -0.7]$ to -3.3
- Poorer households have even more negative coefficient than average
- Other sources of heterogeneity (e.g., age) not relevant

Comments: general

- The empirical side of the paper is very detailed
- Thorough analysis of a number of potential sources of heterogeneity
- Very detailed work in constructing the instruments
- First draft: some lack of focus
 - ▶ The elephant in the room, size of the coefficient, is not explained
- What are the possible theoretical explanations for a result this strong?
- Can the house-buying motive explain this?
- Is the selection bias really so strong that the coefficient increases 5-10-fold?
- This needs to be understood, primarily because it is so counter-intuitive

Comments: general

- Main message, if one can explain the magnitude of coefficients: observed behaviour is weakly consistent with a permanent income hypothesis and strong credit constraints for the majority of population.
- "weakly" because it appears that the coefficients change in the direction PIH predicts for the the relevant sub-groups of the population
- But their magnitude contradicts standard PIH without credit constraints

Comments: empirical analysis

- Sometimes difficult to understand what is going on
- Focus on explaining the magnitude of the effect
- Result that coefficient is more negative for poorer households is not surprising
 - ▶ Policy: contribution rate declines with income

Comments: empirical analysis

- Strong evidence in support of PIH? In 6.5, rich households see no effect, middle-income average effect, poor very strong effect
 - ▶ Rich are not credit constrained $\Rightarrow t_{SS}$ does not matter for c_t (consumer a constant fraction of wealth).
 - ▶ This is reassuring, but raises the question of your coefficient again, as elasticity for poor is -5.3
 - ▶ It would be interesting to isolate the portion due to policy design
- Credit constraints, as well as target saving, drive the negative response:
 - ▶ No house and No debt (most likely with access to credit): 0 elasticity
 - ▶ House & debt (credit constrained): elasticity -9.8
 - ▶ No house & debt (some constrain and without a house): elast -13!
- Ranking of coefficients consistent with PIH under credit constraints
- Magnitude still seems large

Comments: Model

- If one cannot borrow, how is it possible that temporal income re-allocation does not affect consumption? (when $b=1$)
 - ▶ Let $a_0 = 0$ and imagine t_{ss} increases from 0 to 1.
 - ▶ Then, $c_1 = 0$, which would not be optimal with $t_{ss} = 0$
- The utility function in the worked example $U(c) = \frac{c^{1-\gamma}}{1-\gamma}$ does not contain H
 - ▶ Consequently, house payment P is effectively a lump-sum tax
 - ▶ This tax (without a benefit) determines direction of $\frac{\partial s_1}{\partial t_{ss}}$
 - ▶ With $\text{tax}=0$, $\frac{\partial s_1}{\partial t_{ss}} \leq 0$ for any b , as higher t_{ss} reallocates income for a constrained household
 - ▶ Therefore, I suspect it will be difficult to generate $\frac{\partial s_1}{\partial t_{ss}} > 0$ in the model when h is added into the utility function.

Comments: Model

Other ways to generate positive response of savings to t_{ss}

- 1 Last decades saw a (real) house price boom in China. In a more general setting, this could imply secular increase in the savings rate
 - ▶ In the model, $\frac{\partial s_1}{\partial P} = \frac{1}{Y_1(1+r)(1+d+d^2)} \geq 0$ and $\frac{\partial c_i}{\partial P} < 0$ for $i = 1, 2$, but this will change with the addition of houses to the utility.
- 2 Real interest rates declined in China from 7% in 1997 to around 2% in 2006 (World Bank)
 - ▶ Decline in wealth
 - ▶ Increases the likelihood of $\frac{\partial s_1}{\partial t_{ss}} \geq 0$ in the current model
- 3 The reason for separating h from c is the asset nature of the house. However, in the model, house ownership is not included in assets.
 - ▶ May be motivated by a strong bequest motive (credit constraints) which is not modeled.
 - ▶ Alternatively, allowing elderly to sell their house in period 3 would eliminate one saving motive \Rightarrow OLG framework?
 - ▶ One could adjust an existing RA model with infinitely lived households (e.g, Grossman and Laroque 1990)

Small elephant?

- Negative semi-elasticity is vaguely consistent (PIH world) with t_{SS} being an income tax without a benefit
 - ▶ Higher t_{SS} lowers wealth \Rightarrow constrained households need to offset by saving more and consuming less.
- Is t_{SS} clearly separated from overall payroll tax contributions?
- Even if separate, is it clear to employees that an increase in t_{SS} leads to increase in benefits?
- In a PAYG system, there is no clear link between my t_{SS} today and my social security benefits in the future.
- This could be rationalized under PIH
 - ▶ PIH: negative semi-elasticity for unconstrained households
 - ▶ Strong constraints may explain elasticity -3.3

Comment about ageing

- If there is nobody there to provide for my pension when I am old, it is understandable that sensitivity of my saving to income shocks increases.
- Does ageing effectively reform a PAYG system into a Fully Funded system?
- If it does, is ageing problem overstated?
- One interpretation of this paper's results may suggest so