

Introduction to “Housing Price and Investment in the Business Cycle with Credit Constraints”

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1. What is the question of the paper?

研究房地產的兩部門模型中，許多文獻發現房價與資本呈現負相關。這個與實際情形不一致的現象，是否可以透過修正模型得到解決？

2. Why should we care about it?

在美國近年來，住宅房價與資本投資一同經歷了快速成長而又下降，吸引了許多經濟學家關心房地產在總體經濟當中所扮演的角色。Davis and Heathcote (2005)透過消費與房地產的兩部門模型成功地量化分析了目前美國景氣循環的特性。但在他們的模型當中，房價與商業投資並沒有呈現同向變化，這個現象與美國在次級房貸危機時所呈現的是不一致的。因此，我們好奇這樣不一致的現象背後是甚麼原因造成的。

3. What is the authors' answer?

資料顯示，在美國，70%的商業融資是以不動產做為抵押品。如果在模型中刻畫這個現象，使公司可以使用房地產作為融資的抵押品，則所推導出來的結果，房價就會和商業投資呈像同向的變化，且吻合實證資料所呈現的現象。

How did the authors get there?

作者在既有的 Davis and Heathcote (2005)模型中，多考慮了抵押限制式(collateral constraints on business loans)，來強調不動產在商業融資中的重要性。透過如此延伸的模型，即可推導出房價與投資呈現同向變化的結果，進而解決了在 Davis and Heathcote (2005)的不一致問題。

Notations

$i \in \{b, m, s\}$: To denote construction, manufactures, and services sectors, respectively.

k_{it} : Capital used in sector $i \in \{b, m, s\}$ at date t .

n_{it} : Labor used in sector $i \in \{b, m, s\}$ at date t .

$x_{it} = k_{it}^{\theta_i} (z_{it} n_{it})^{1-\theta_i}$: Production technology of intermediates x_{it} at date t . Where θ_i denote the different capital intensities in these sectors and z_{it} denotes the sector-specific productivity shocks.

$z_t = (\log z_{bt}, \log z_{mt}, \log z_{st})'$ Denote sector-specific productivity shocks in intermediate technology and follows an autoregressive process: $z_{t+1} = Bz_t + \varepsilon_{t+1}$.

$U(c_{it}, h_{it}) = \frac{(c_{it}^{\nu_c} h_{it}^{\nu_h})^{1-\eta}}{1-\eta}$: The utility of an entrepreneur (also an consumer) in sector i in period t derives from consumption c_{it} and housing owned h_{it} .

$\gamma_i < \beta < 1$: γ_i is entrepreneurs' discount factor and β is the discount factor of households.

p_{it} : The price of intermediate i ; p_{ht} : The price of housing

a_{it} : The period- t debt; R_{t-1} : The gross interest rate; w_t : The wage.

$j \in \{c, d\}$: Where c used to index consumption/investment goods and d to index residential goods.

y_{jt} : The output produced in final-good sector $j \in \{c, d\}$ with technology $y_{jt} = b_{jt}^{\alpha_{bj}} m_{jt}^{\alpha_{mj}} s_{jt}^{1-\alpha_{bj}-\alpha_{mj}}$.

$y_{ht} = x_{it}^{\phi} x_{dt}^{1-\phi}$: The technology of residential houses, where x_{it} is the quantity of land purchased and x_{dt} is the quantity of new residential structures bought by the real estate developer.

$U(c_t, h_t, 1-n_t) = \frac{[c_t^{\mu_c} h_t^{\mu_h} (1-n_t)^{1-\mu_c-\mu_h}]^{1-\sigma}}{1-\sigma}$: Period utility per household at date t .

Example:

日本科技巨擎東芝日前爆發財務危機。日前路透社稱東芝向有交易關係的銀團提供新的擔保方案，以半導體業股份以及不動產等作為抵押。由此一例子我們不難發現，企業在面臨需要融資的時刻，除了股份，不動產等物業也扮演了相當關鍵的角色。因此考慮以不動產做為抵押的模型與真實情況是相當一致的。