Does House Price Growth Drive Consumption Growth in the UK?

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House Prices & Consumption

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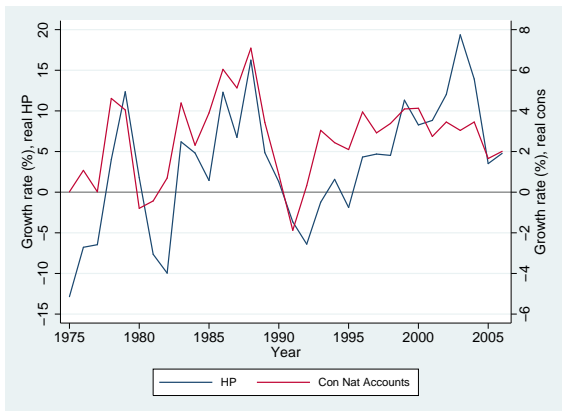Summary of Model

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Strong correlation between House Prices and Consumption Growth in UK

Correlation: National Accounts data: 0.75

.

Strong correlation between House Prices and Consumption
Growth in UK

Why?

(Muellbauer & Murphy (MM), 1990; King, 1990; Pagano, 1990; Attanasio &
Weber (AW), 1994):

- A mechanism from House Prices HP to consumption?
  - Wealth effect
  - Collateral effect
- Or some "Other Factor" as common cause?
  - Income expectations
  - Credit market conditions
  - (Population structure)

Difficult to discriminate between these in aggregate data
references as above plus:

- Muellbauer and Murphy 1997;
- Campbell & Cocco (CC), 2007;
- Aron, Muellbauer and Murphy, 2007;
- Attanasio, Blow, Hamilton and Leicester, 2007.

- Controlling for other factors (correlated with HP)can be difficult and unconvincing

Greater discriminatory power in micro data:

- Wealth, real estate capital gains and income expectations are likely to have different effects on the consumption of different types of individual

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- In the UK the Family Expenditure Survey is available on a continuous and consistent basis since the early 1970s

- The FES does a pretty good job at reproducing aggregate National Account data.

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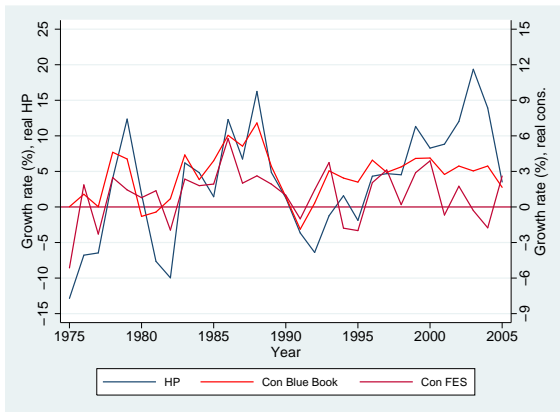
Correlation: National Accounts data, 0.75

Correlation: FES data, 0.70

- Intuition: the effect of capital gains and expected future earnings should be different for individuals of different ages.
  - Attanasio and Weber (1994) and Attanasio, Blow, Hamilton and Leicester (2007)

- Intuition: the effect of capital gains and expected future earnings should be different for individuals of different ages.
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- Older hhs respond to shocks to housing wealth
- Younger hhs more scope to enjoy increases to future income

Evidence from the FES: Attanasio and Weber Economic Journal 1994.

Fig. 7. Estimated profile of consumption, excluding expenditure on housing, controlling for occupation, region and months.

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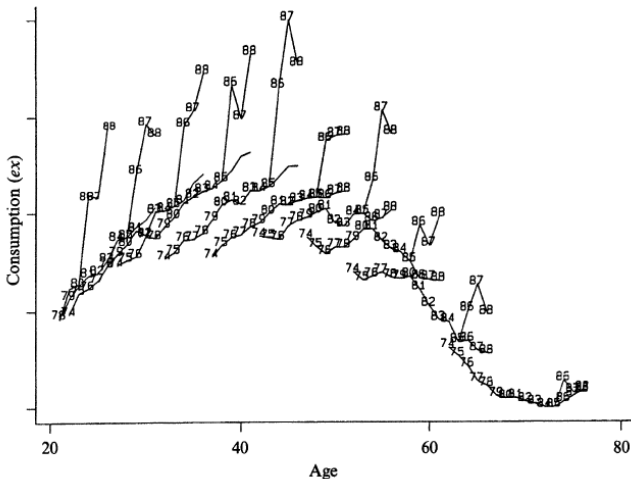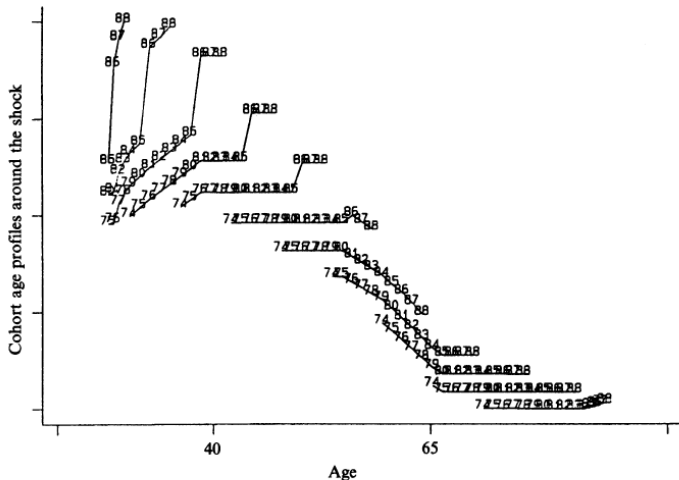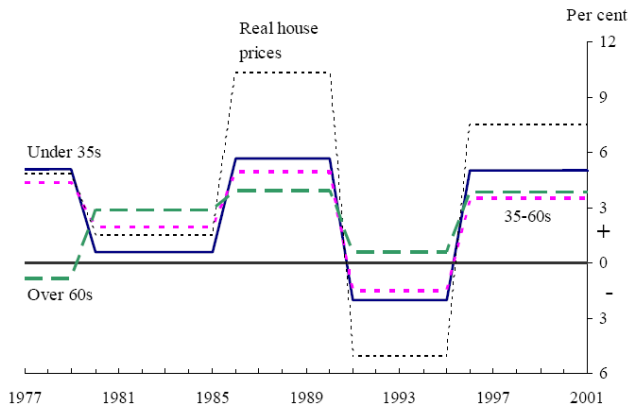C Residuals

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Fig. 15. Age consumption profiles of various cohorts around the shock.

Attanasio, Blow, Hamilton and Leicester
Economica, forthcoming .

Chart 4: House price growth and real consumption growth of different age groups

Sources: FES/EFS, Communities and Local Government, ONS, and authors' calculations.

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    - Does a realistic model confirm intuitions?
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- *Not* an equilibrium model

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- Counterfactuals
- Examine counterfactuals to disentangle role of house prices and aggregate income shocks
  - Counterfactual in income and HP shocks
  - Look at effects on different modelled cohorts

Our Exercise

Factors not emphasized here:

- Life cycle profiles:
    - Consumption
    - Home ownership

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- Comparative Statics: elasticity of consumption, ownership, quantity of housing to:
    - changes in house prices
    - changes in life time income
    - changes in uncertainty and other factors.

A Life Cycle Model of Consumption and Housing Choices

- Preferences
- Market Structure
- Exogenous Stochastic Processes
  - Earnings and House prices

Standard lifecycle consumption/savings model

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$$\beta E V_{t+1}\left(A_{t+1}, h_t, P_{t+1}, Y_{t+1}, Z_{t+1}\right)$$

subject to

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subject to (if flat is owned)

$$A_{t+1} =$$

$$R_{t+1}(A_t + W_t - c_t + \kappa P_t(1-F)I(h_t \neq 1) - P_t(1+F)I(h_t = 2))$$

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- Individuals are heterogeneous in their skill level

- Low education (compulsory school only)

- High education (more than compulsory education)

Within period utility function is CRRA, augmented by a term
reflecting the value of home ownership:

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Value of $\gamma = 1.43$ taken from literature; θ, ϕ & ψ calibrated through moments exercise.

Only collateralized debt. When buy or remortgage:

$$A_{t+1} \geq -\lambda_h P_t (1 + r)$$

The value $(1 - \lambda_h)$ is downpayment requirement.

$$A_{t+1} \geq -\lambda_w W_t (1 + r)$$

$$\lambda_h = 0.9 \ \& \ \lambda_w = 3$$

When do not remortgage, must service interest

Income arrives exogenously; process which generates it (lower case for logs):

$$w_t = d_t + y_t + z_t$$

d_t is a deterministic part (Cubic)

y_t is persistent idiosyncratic stochastic element (AR(1));
both parameterized using data from BHPS

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$$\left[\begin{array}{c} z_t \\ p_t \end{array} \right] = \left[\begin{array}{c} \alpha_0^z \\ \alpha_0^h \end{array} \right] + \left[\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right] \left[\begin{array}{c} z_{t-1} \\ p_{t-1} \end{array} \right] + \left[\begin{array}{c} u_t^z \\ u_t^h \end{array} \right]$$

- Unit persistence suggested by data (FES & DCLG)
- Growth rates $\alpha_0^z = 1.66\%$, $\alpha_0^h = 3.58\%$
- Shocks joint normal ($\underline{u}_t \sim \mathbb{N}(0, \underline{\Omega})$):
  - Variance shock to HP about 2.75 times variance of shock to aggregate income
  - Correlation coefficient 0.645

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- Shocks entered in simulations **from data**

Standard lifecycle consumption/savings model augmented with choice of whether to own flat, house, or no housing

- Bequests
- Realistic mortgage borrowing constraints
- Fixed costs of housing transactions
- Persistent stochastic process for idiosyncratic income
- Unit persistent joint process for aggregate income and house price
  - Input actual shocks for cohorts in simulations

Parameter	Value	Source
Utility Parameters		
γ	1.43	(Attanasio and Weber, 1995)
β	1.0358^{-1}	
Aggregate House Price and Income Process		
α_0^z	1.66%	FES
σ_z	0.033	FES
α_0^h	3.58%	DCLG
σ_h	0.091	DCLG
τ	0.645	FES / DCLG
κ	0.6	BHPS
Idiosyncratic Income Process		
Deterministic component: cubic in age		BHPS
	High Edu Low edu	
ρ_y	0.76 0.77	BHPS
σ_ξ	0.39 0.41	BHPS
$\frac{MedianP_{22}}{MedianY_{22}}$	3.3 4.4	BHPS
Credit market Institutions		
λ_y	3.0	
λ_h	0.9	
F	3%	
$\bar{r}$	0.03	B.o.E.

Calibration to Home Ownership

Match ownership profiles for low and high education
Calibrated parameters are:

- Utility from owning house: 1.5%

- Utility from flat relative to house: 2/3

- Bequest parameter 4

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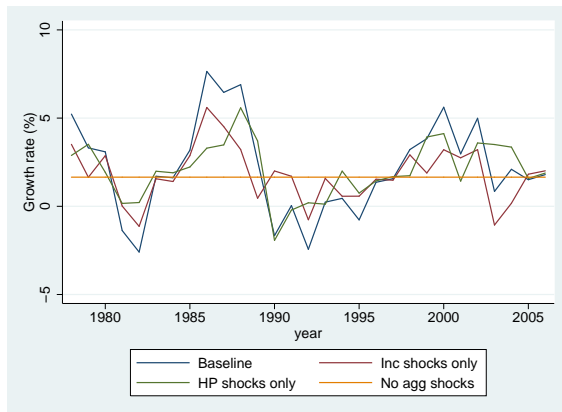Counterfact.s
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These parameters yield:

Table: Calibration Statistics

Statistic	High Education Data	Model	Low Education Data	Model
Ownership rate				
Age 26 - 35	0.558	0.584	0.474	0.423
Age 36 - 60	0.794	0.822	0.632	0.681

Notes: The data figures for home-ownership rates are based on the years

1990-2006 of the FES.

Fit to Consumption Growth

Have fed in actual shocks to HP and agg. income

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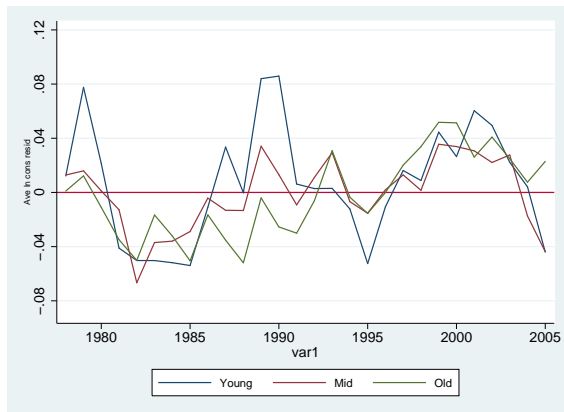
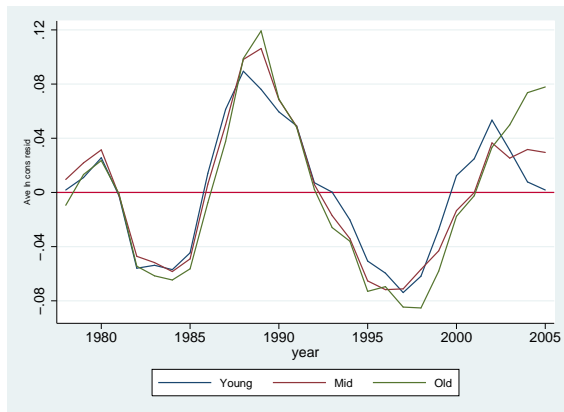Model Fit &
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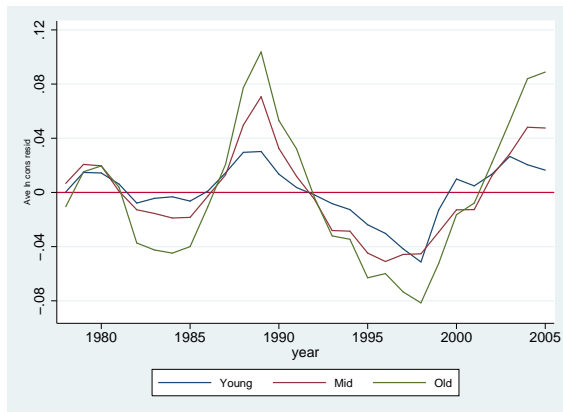Calibration
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Decomposition of consumption growth

Residuals from consumption equation, by age

- Regress ln Cons on:
    - Quintic in age of head of household; Cohort dummies;
      Occupation dummies; Region & Month dummies; Controls
      for family composition; Education attainment dummies.
- Take residuals
- Average these residuals by year and age group
- Do this for data and model

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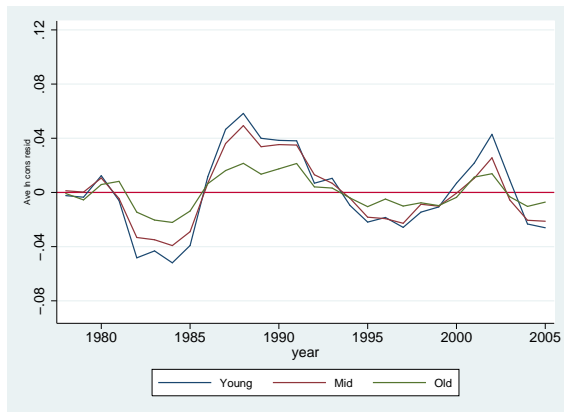Calibration
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Residuals from consumption equation: Data

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Residuals from consumption equation: HP shocks only

Residuals from consumption equation: Income shocks

- Potential of framework to provide foundations for tests based on intuitions and (more) stylised lifecycle model
  - It seems that looking at age-groups is a good approach

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- Remarkable match to consumption growth
- Possibility of doing counter-factual analysis
- First step towards equilibrium model

- Why such high volatility for old, particularly to HP growth?

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- Progress to Equilibrium Model

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- Much remains to be done

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