Does House Price Growth Drive Consumption Growth in the UK?

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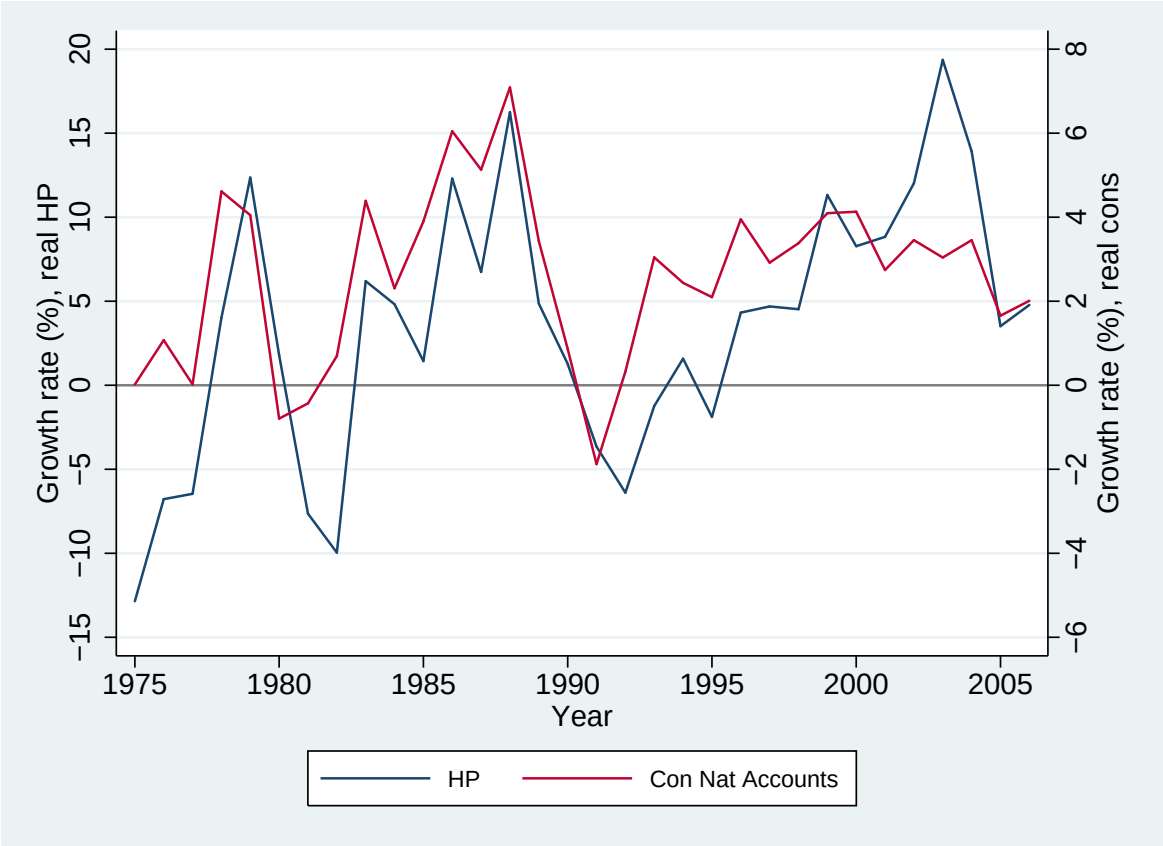

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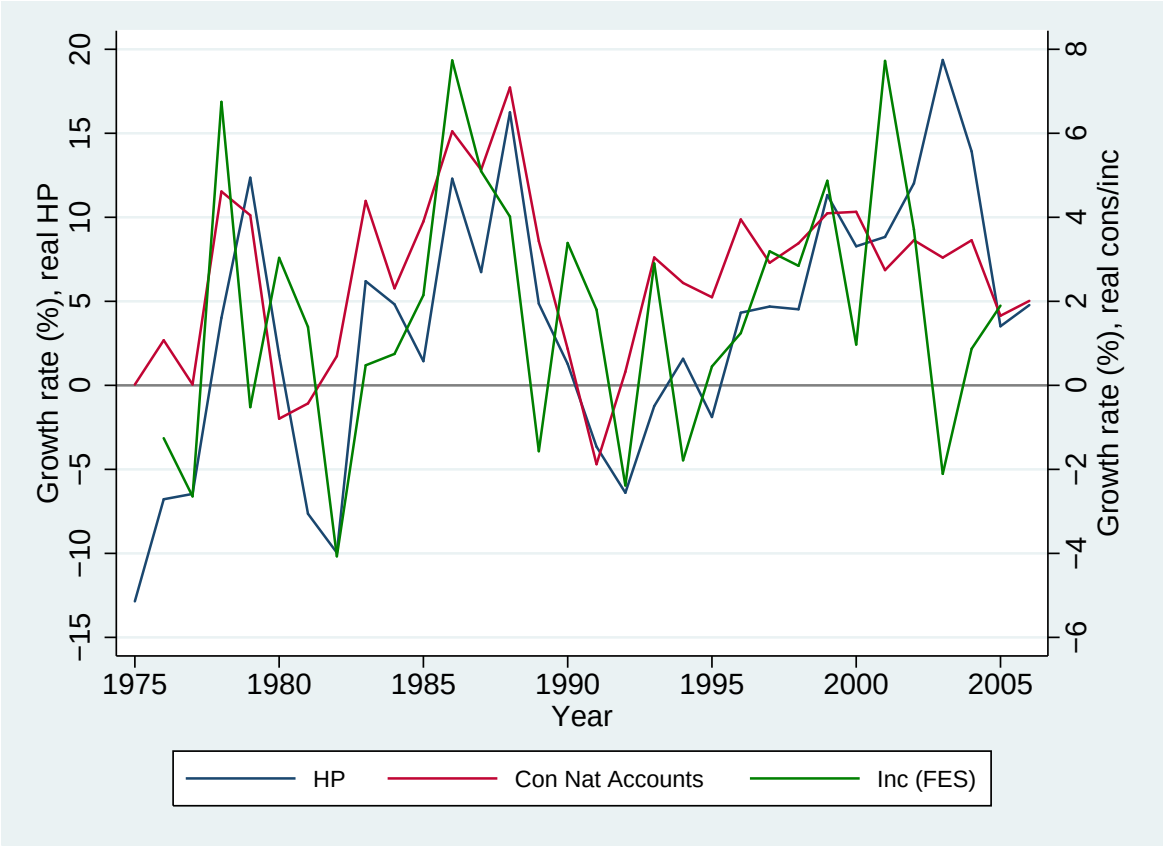

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  - Wealth effect.
  - Collateral effect.

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Why?
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- 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 hypotheses 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, 2008.
- Piazzesi et al. (2010).

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

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

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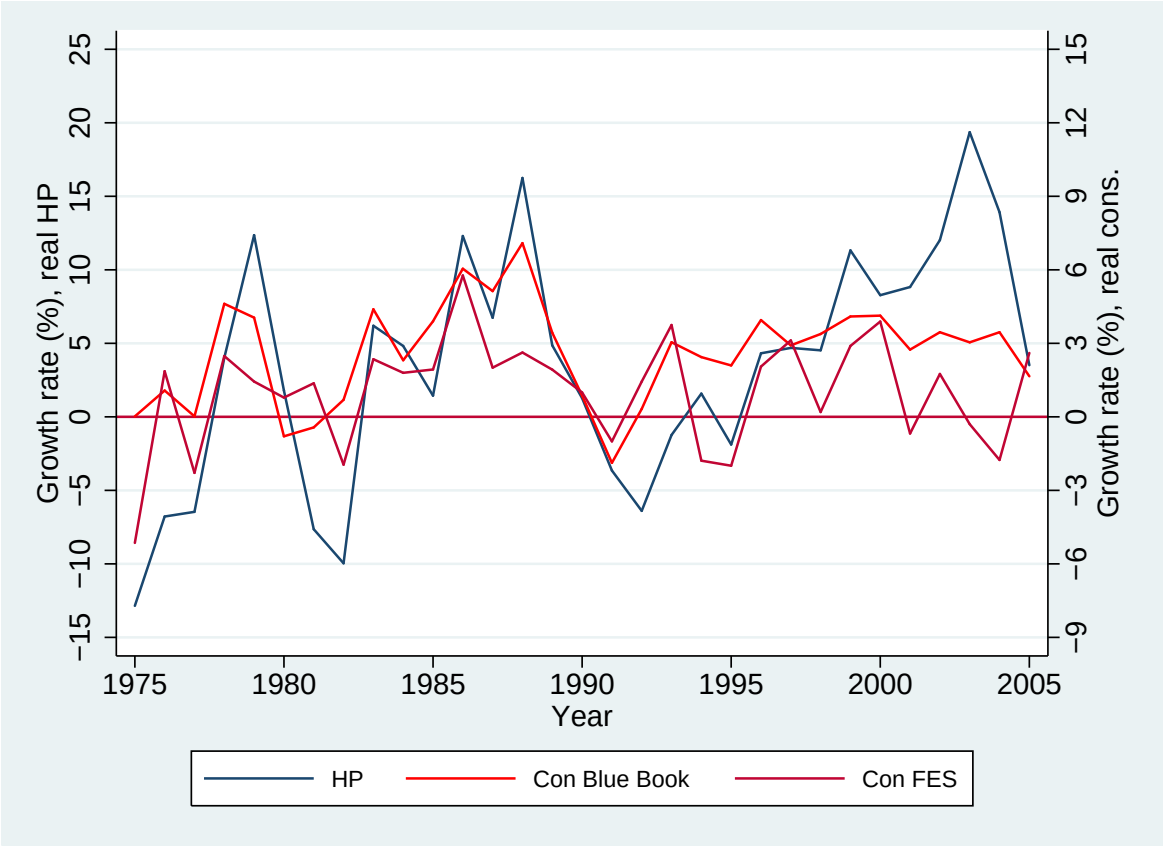

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House price and income shocks and the cross-sectional distribution of consumption.

- 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 (2008).

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- 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.

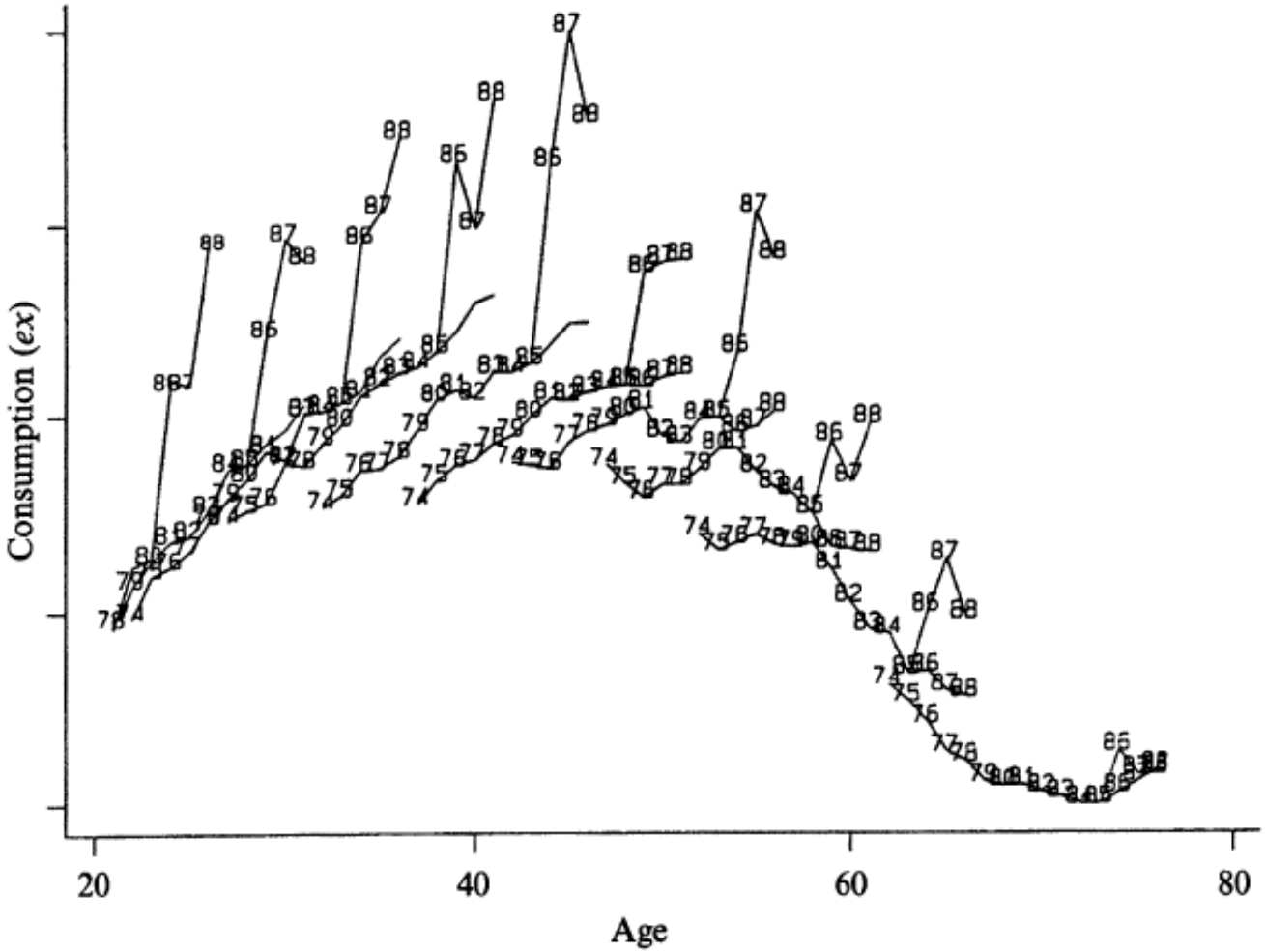
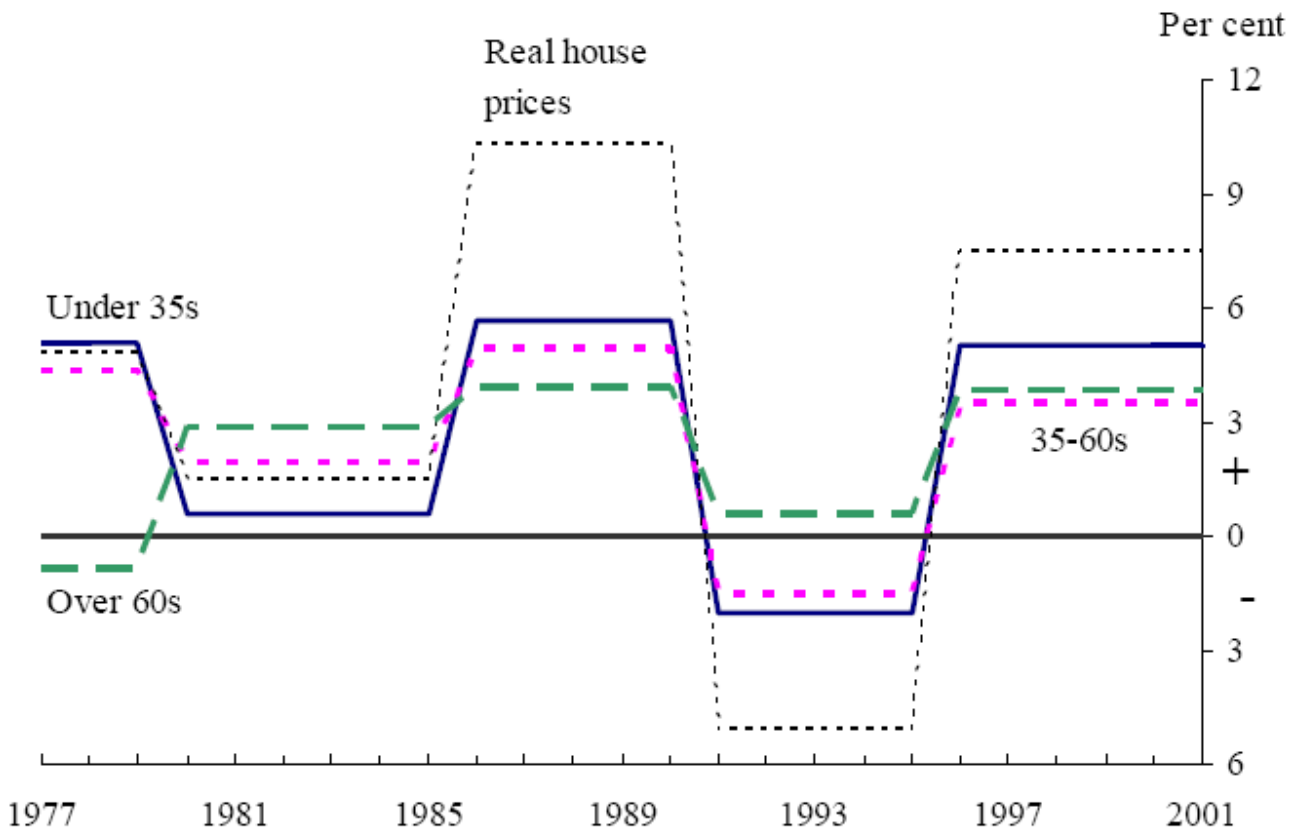


Fig. 7. Estimated profile of consumption, excluding expenditure on housing, controlling for occupation, region and months.

Attanasio, Blow, Hamilton and Leicester Economica, (2008) .

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



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

Is this intuition confirmed in a structural, well-specified (and calibrated) model?

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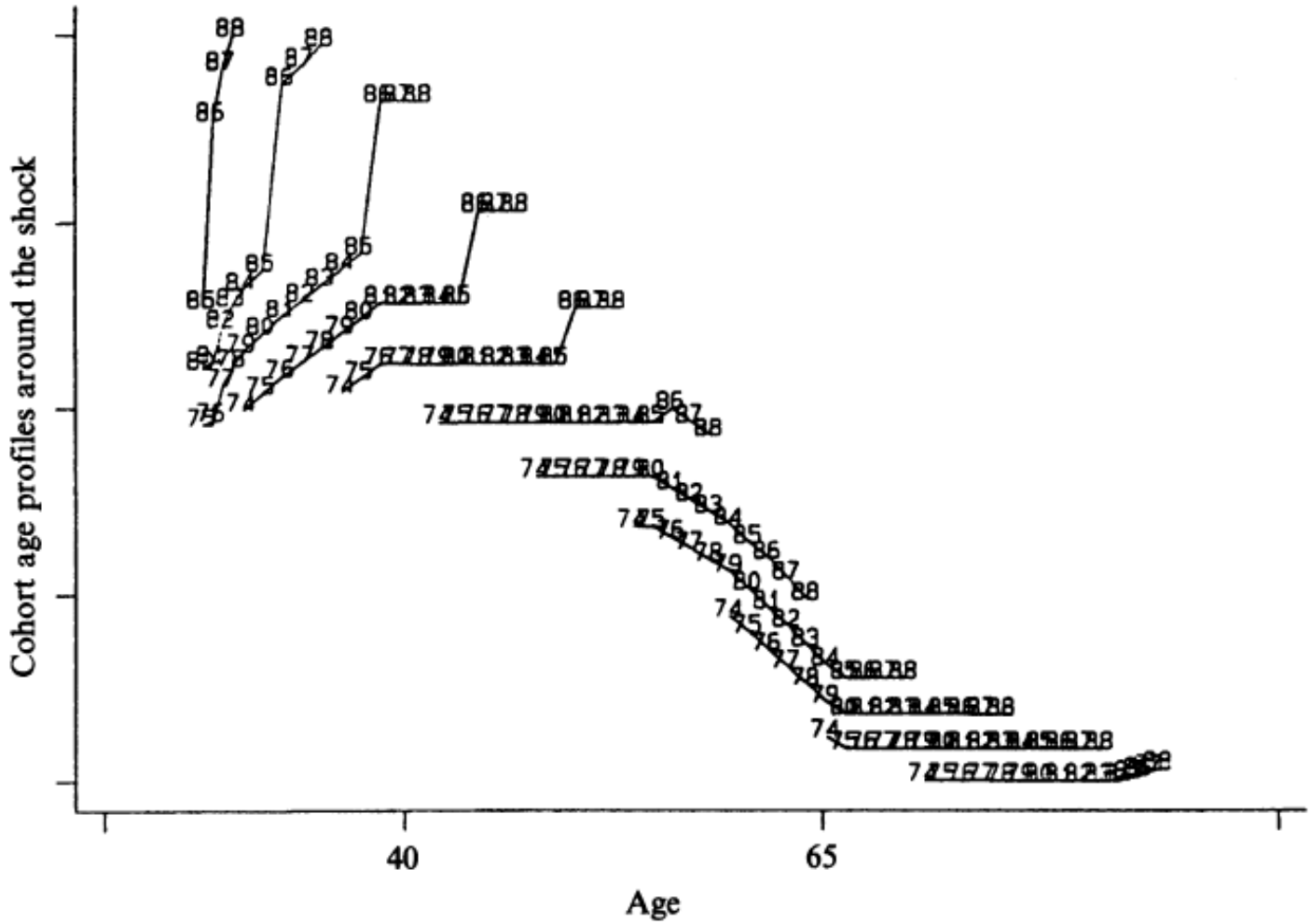

Fig. 15. Age consumption profiles of various cohorts around the shock.

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- Our aim is to fill modelling gap:
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- *Not* an equilibrium model

1. Background
2. Our Exercise
3. The Model
   - Preferences
   - Borrowing Constraints
   - Stochastic processes
   - Model's summary
4. Model Fit
   - Calibration.
   - Aggregate fit.
5. Counterfactuals
   - C Growth
   - Cross sectional decomp.
6. Fixing the model
7. Conclusions
   - Summary
   - Further work

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  - Input actual house price and income shocks - these are the exogenous aggregate shocks in the 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 cohorts.

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- Life cycle profiles:
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  - Home ownership.
- 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.
- See Attanasio, Bottazzi, Low, Neisham & Wakefield, (2010).

A Life-Cycle Model of Consumption and Housing Choices

- Preferences:
  - Non-separabilities between non-durable consumption and housing services;
  - Preference for ownership.
- Market Structure:
  - Mortgages and liquidity constraints.
- Exogenous Stochastic Processes:
  - Earnings and House prices

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

Value function

- Value function if owned a flat ($h_{t-1} = 1$ & $D_t^m = 0$):

$$V_t(A_t, 1, P_t, Y_t, Z_t) = \max_{\{c_t, h_t\}} u(c_t, h_t) +$$

$$\beta\{(1-\eta)EV_{t+1}(A_{t+1}, h_t, P_{t+1}, Y_{t+1}, Z_{t+1}) +$$

$$\eta EV_{t+1}(A_{t+1}, 0, P_{t+1}, Y_{t+1}, Z_{t+1})\}$$

The budget constraint.

- This value function

$$V_t(A_t, 1, P_t, Y_t, Z_t)$$

- maximized subject to:

$$A_{t+1} = R_{t+1}(A_t + W_t - c_t + \kappa P_t(1-F)I(h_t \neq 1) -$$
$$I(h_t = 0).\min\{\iota\overline{P_t}, 0.5W_t\} - P_t(1+F)I(h_t = 2)\}) +$$
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Budget constraint says that:

- current financial assets, plus income and proceeds from property sale, less consumption and cost of purchase/rent, all carried in to $t+1$ with interest;
- there augmented by proceeds from sale at beginning of $t+1$ if own and $D^m_{t+1} = 1$

Financial Markets.

Only collateralized debt. When buy or increase mortgage:

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

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

Exogenous Stochastic Processes.

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- These components are parameterised (BHPS data) for the two skill groups that we have in the model:
  - Low education (compulsory school only)
  - High education (more than compulsory education)

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- Shocks entered in simulations **from data**.

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Use this model in our exercise:

- Input actual shocks for cohorts in simulations.
- Does the model match consumption growth and consumption patterns?
- Use counterfactuals to unpick roles of shocks driving consumption growth.

Model Calibration and Fit.

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- Simulate the model and check aggregate fit.

Parameter	Value		Source
	Utility Parameters		
γ	1.43		(Attanasio and Weber, 1993)
	High Edu	Low edu	
β	1.04^{-1}	1.045^{-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
ι	0.006		FES
η	0.01		
	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		
$\bar{r}$	0.03		B.o.E.

Calibration to Home Ownership.

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

- Utility from owning house: 4%.
- Utility from flat relative to house: 0.1.
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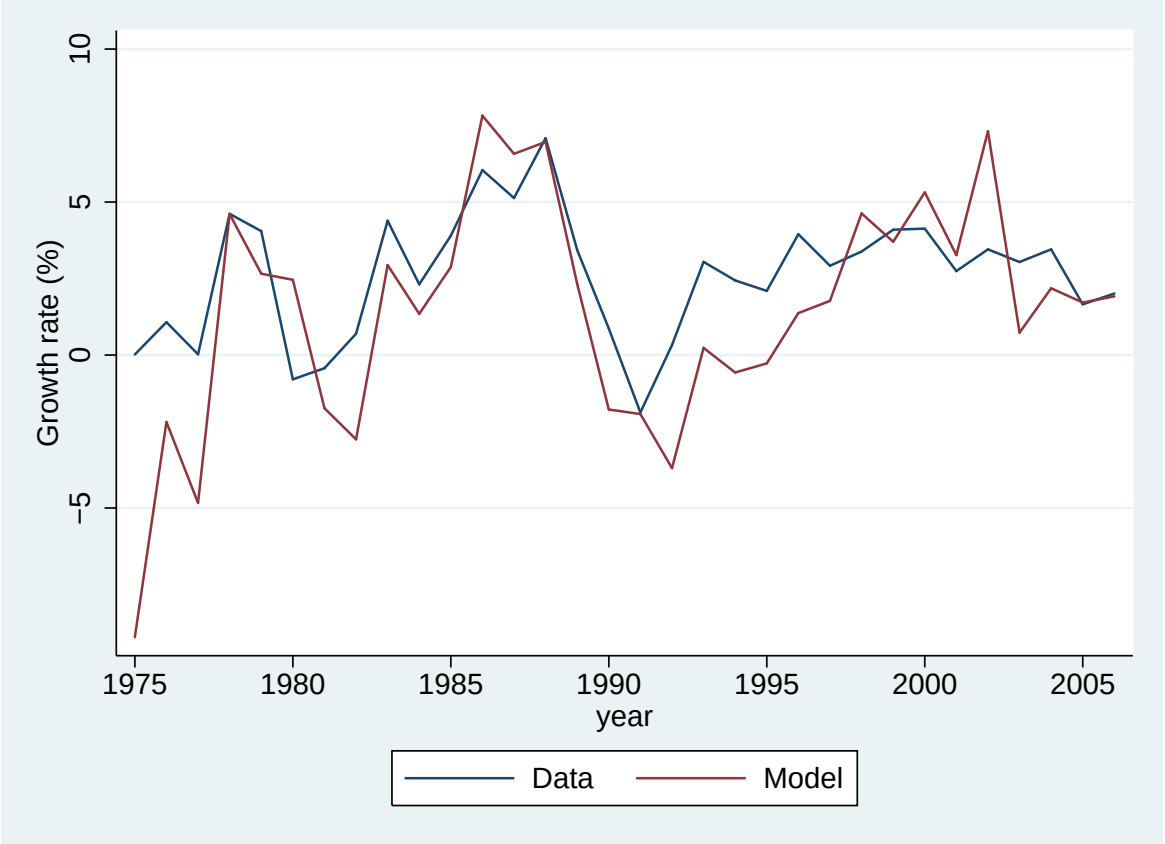
Table: Calibration Statistics

	High Education		Low Education	
Statistic	**Data**	**Model**	**Data**	**Model**
Ownership rate				
Age 26 - 35	0.559	0.534	0.473	0.393
Age 36 - 60	0.787	0.792	0.623	0.654
Age 56 - 70	0.821	0.857	0.632	0.636
Owners w House	0.582			0.576
Sum Abs. Devs				**0.188**

Notes: Data figures are based on 1990-2006 of the FES.

Fit to Consumption Growth

Have fed in actual shocks to HP and agg. income



Fit to Consumption Growth

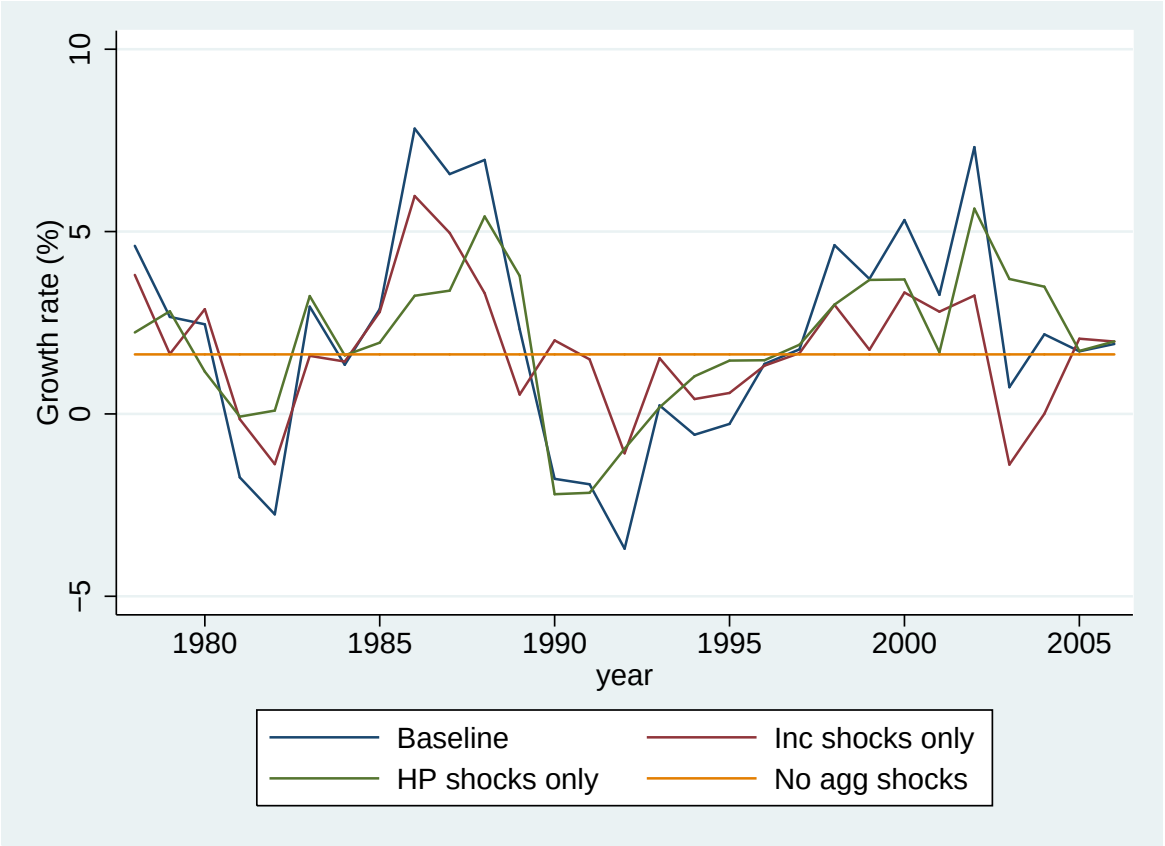
Is this better than with only income shocks? It is in the late 80s boom early nineties bust:

Given the model we can construct counterfactual simulations to isolate the effect of different shocks

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

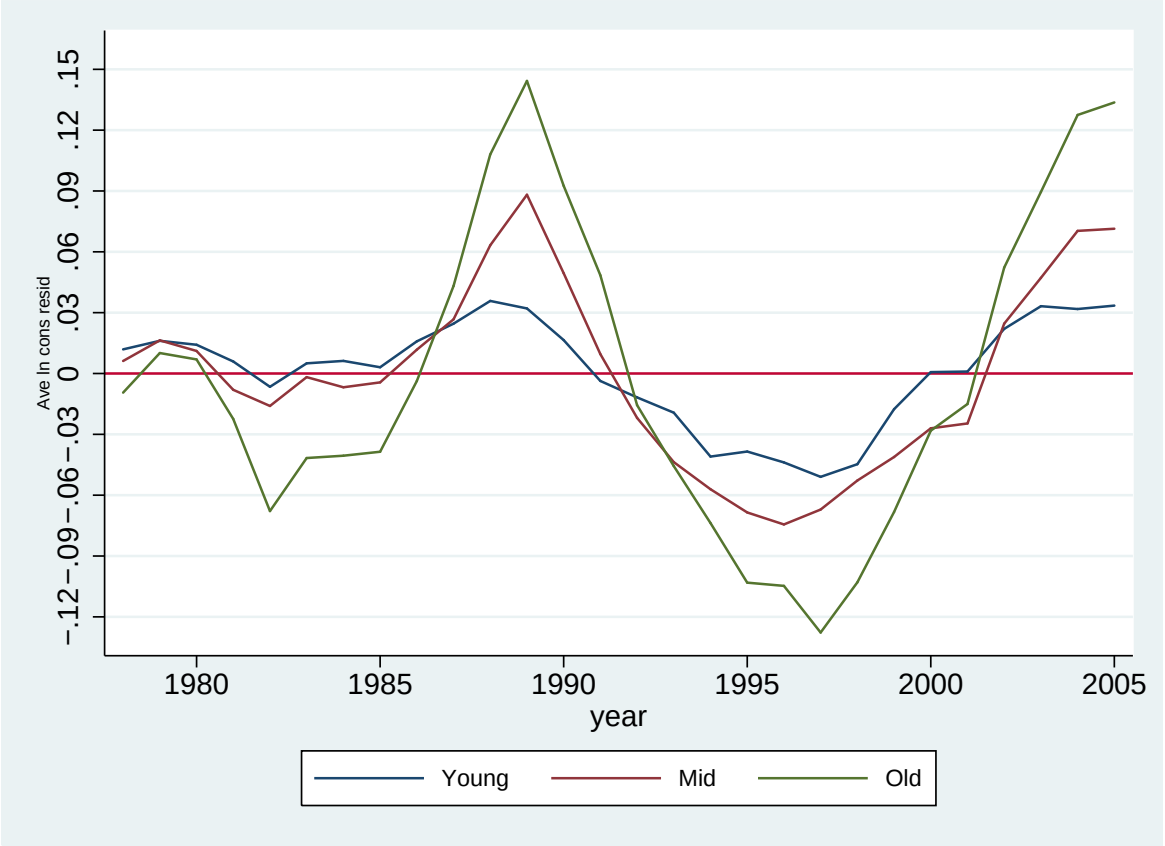
Decomposition of consumption growth



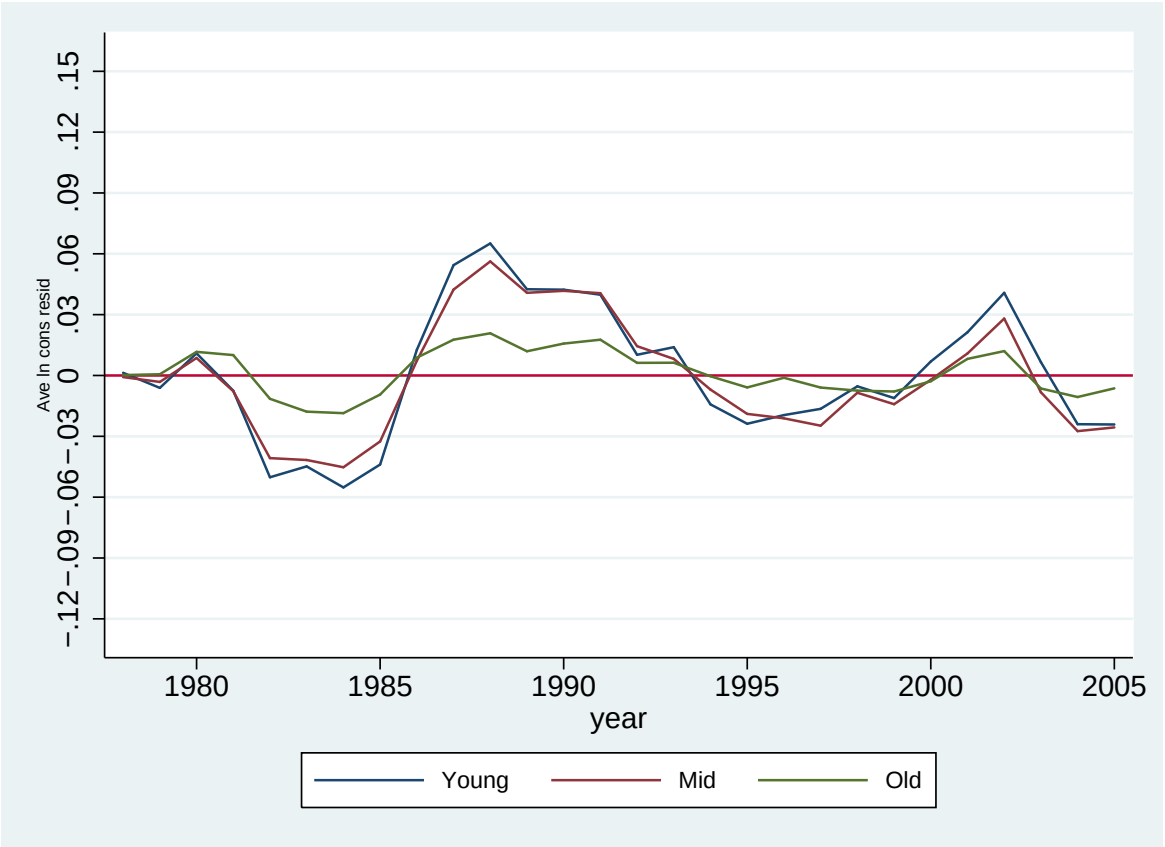
Residuals from consumption equation: Data

Residuals from consumption equation: Model

Residuals from consumption equation: HP shocks only



Residuals from consumption equation: Income shocks



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  - Ownership rates are reduced at levels not observed in the data.
- Possible modification of the model:
  - Increase utility of housing in late age (and cost of selling housing).

Discussion of results.

- The model is successful in fitting the aggregate rate of consumption growth over several cycles.
- However, the model is much less successful at fitting the cross sectional pattern of consumption growth.
  - Consumption growth of older households reacts much more than in the data to house price shocks.
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- Possible modification of the model:
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  - Aggregation issues:
    - Regional specific shocks.
    - Cohort specific 'aggregates'.

Increasing cost of selling and utility from owning after 55

- We want to reduce the number of owners who sell in the years before death.
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- .... and on the ability to fit the cross-sectional patterns of consumption growth.

Calibration to Home Ownership

How are the calibration statistics affected?

Not too much, though age 56-70 for low ed is a bit off, as is the proportion of house owners.

Table: Calibration Statistics

	High Education		Low Education	
Statistic	**Data**	**Model**	**Data**	**Model**
Ownership rate				
Age 26 - 35	0.559	0.520	0.473	0.398
Age 36 - 60	0.787	0.761	0.623	0.632
Age 56 - 70	0.821	0.815	0.632	0.555
Owners w House	0.582			0.847
Sum Abs. Devs				**0.496**

Notes: Data figures are based on 1990-2006 of the FES.

Ownership at end of life is 33.8% (low edu) and 66.4% (high edu)

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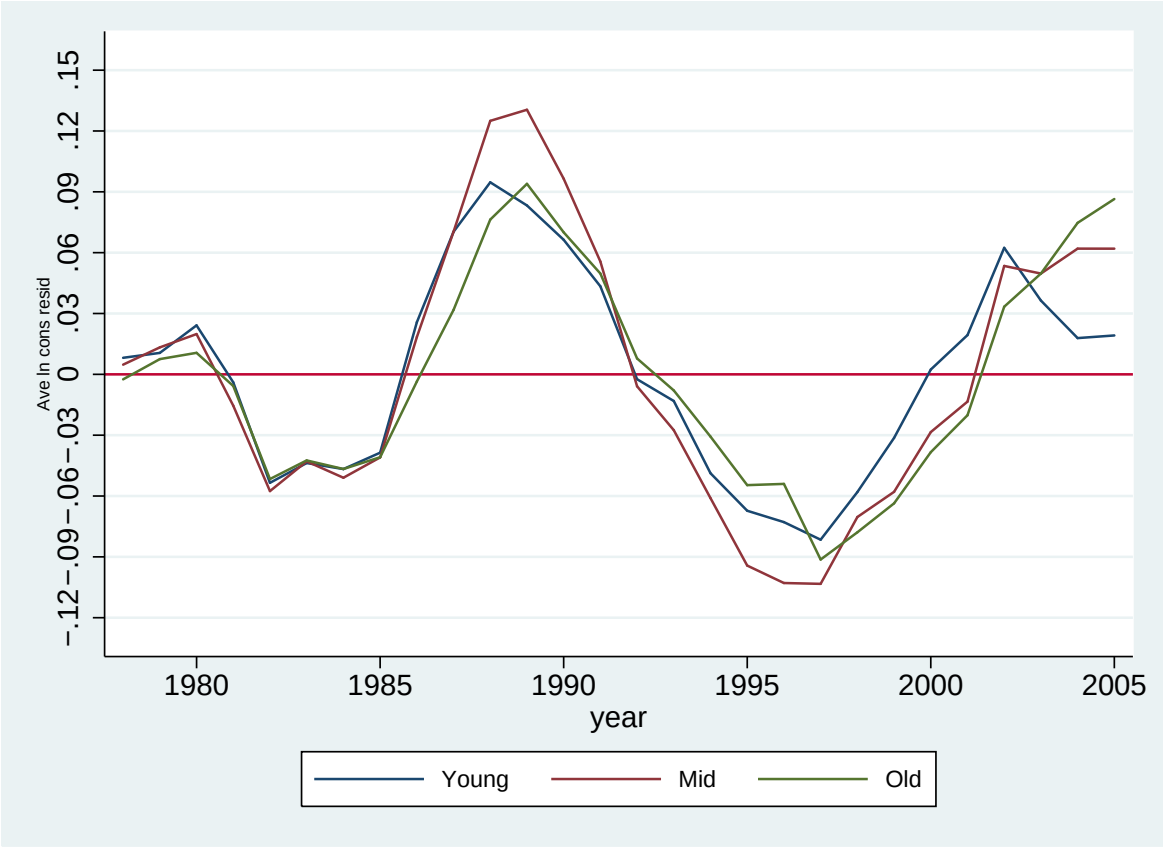
- Houses become a less attractive investment and ownership rates goes down.

Residuals from consumption equation: Model with Increasing cost of selling and increasing utility from owning



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  - ... consumption patters look a bit more like the data.
- Reduced ownership before age 70, and the high fixed cost of selling that eats into capital gains, are partly explaining the improved results, in a way that is unrealistic.

Summary and conclusions.

We built a framework to provide foundations for tests based on intuitions and (more) stylised lifecycle models.

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- Aggregation of model provided a promising fit for consumption growth.
- But cross-sectional patterns is counterfactual:
  - Too much consumption volatility for the old;
  - This a response to house-price movements.
- House price movements *not* a good candidate to drive young having biggest cons booms & busts
- Thus it seems that looking at age-groups is a good approach.

Further work.

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Does House Price Growth Drive Consumption Growth in the UK?

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