Housing and the macro-economy: inflation and the financial accelerator

JOHN MUELLBAUER
Nuffield College and INET, Oxford
Dallas Fed-IMF-JMCB conference Nov. 15, 2013

Overview

- Housing and inflation

- What drives house prices?

- Housing, credit and the financial accelerator:

(a)   the consumption channel

(b)   the investment channel

(c)   the bad-loans/risk-spreads feedbacks via the financial system

Housing and U.S. inflation

- Aron and Muellbauer (2013 Oxford Bulletin) overturn conventional wisdom on forecasting U.S. PCE inflation 12 months ahead.

- We find remarkable improvement in forecasting performance compared to naïve models and Stock and Watson's state space (stochastic volatility, stochastic trend) model.

- The key is that inflation dynamics is partly due to equilibrium correction to long-run solution for log price level PC incorporating foreign prices, unit labour costs, union density and house prices.

- The model also includes short run drivers such a changes in the unemployment rate, and inflation in PPI, PC and oil prices in the information set at the time the forecast is made.

- A methodological innovation overcomes 'curse of dimensionality' using parsimony restrictions on lags and so finds that longer lags really matter.

Interpreting long-run solution

- Using largest of the alternative information sets, the long-run solution is approximately:

- $\log PC$ = constant + 0.015 $UNDENS$ + 0.57 $\log ULC$ + 0.31 $\log HP$ + 0.12 $\log FP$, where FP measures foreign consumer prices and $UNDENS$ is union density.

- By coincidence, the weight on housing rents in the CPI-U (consumer price index for urban households), including imputed rent and lodging away from home, has been 32% in recent years (though lower in the PCE-deflator).

- House prices are strongly correlated with prices of commercial property which ultimately feed into business costs, including commercial rents. Hence the weight of about 31% in the long run solution for PC seems reasonable even though rents are not only driven by house prices.

The long-run weights on ULC, foreign prices, house prices are remarkably stable

TABLE 4

Stability of the long-run parameters.

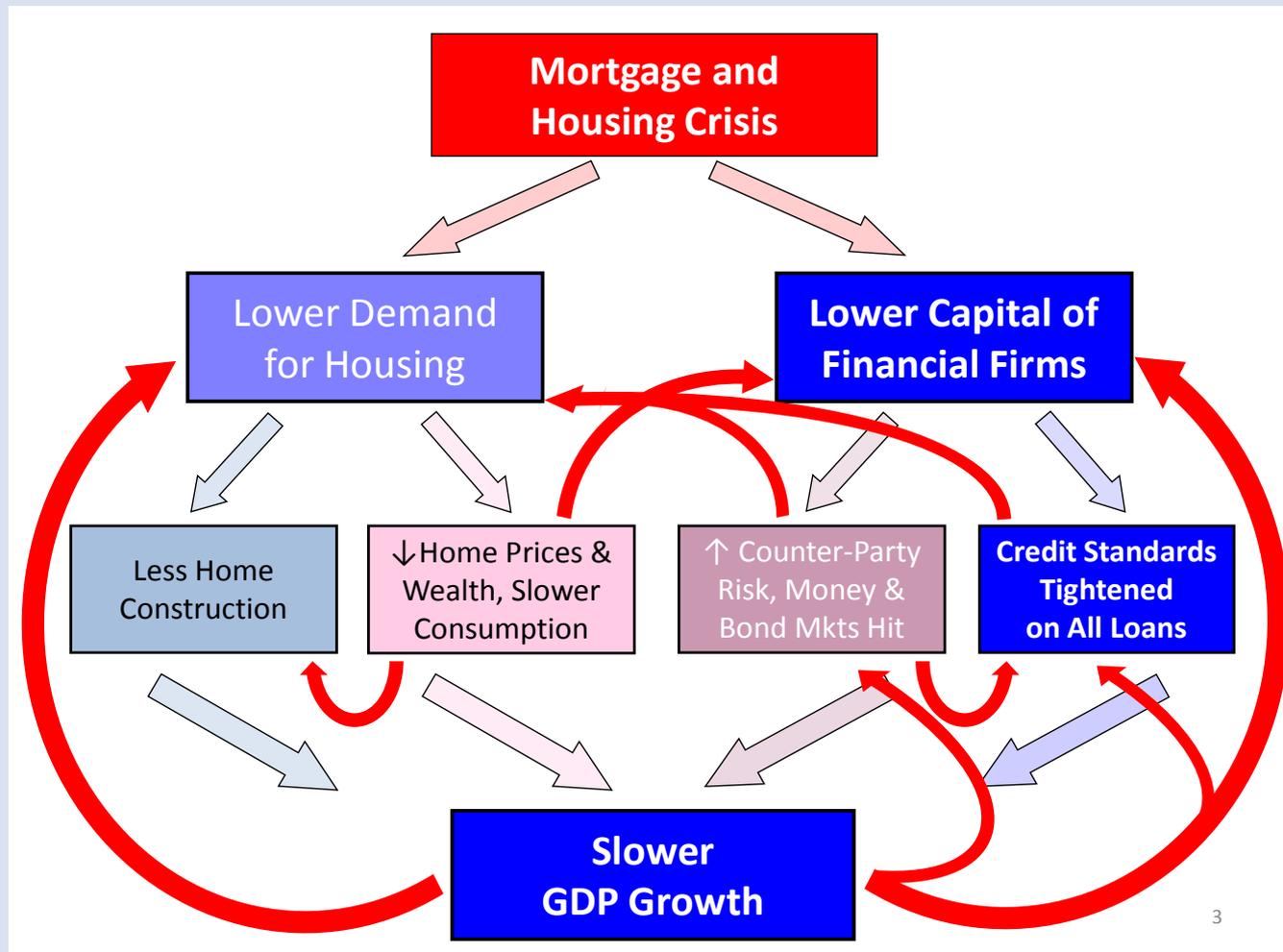| Long-run coefficients*	Variable	1974-1998	1974-2006	1983-2006
log unit labour costs	log ULC	0.25	0.3	0.26
		(6.4)	(9.3)	(4.2)
log real exchange rate	log REER	-0.057	-0.064	-0.055
		(-6.1)	(-11.0)	(-6.1)
log house prices	log HP	0.2	0.17	0.14
		(12.1)	(17.0)	(10.0)
union density	UNDENS	0.0107	0.0094	0.0069
		(16.2)	(17.8)	(6.5)

Notes:
*Based on *Info Set 7*, the model is run over different samples, with t ratios in parenthesis, corrected for autocorrelation and heteroscedasticity.

Practical Implications

- Model for core PCE inflation confirms these findings.

- QE and conventional monetary policy affect inflation via economic activity, the exchange rate and house prices.

- Low inflation risks from unit labour costs and exchange rate: labour cost outlook looks subdued and productivity growth prospects good.

- U.S. growth leadership and energy revolution should keep up the exchange rate.

- Feed-through from both house prices and unit labour costs is slow.

- House price recovery should soon be feeding through.

- Improving housing market efficiency by bringing foreclosed housing back into use would moderate rise in rents. Reform of GSEs would help prevent future house price bubble.

- Sectoral approach for forecasting inflation would benefit from rent forecasting model.

Financial accelerator via construction, consumption and credit channel: U.S. yes, but Europe??

Source: Duca, John and John Muellbauer (2013), "Tobin LIVES: Integrating Evolving Credit Market Architecture into Flow of Funds Based Macro Models," ECB Working Paper No. 1581.

Is there a housing related financial accelerator in Europe?

- Model key aspects of interaction between the financial sector and the real economy with flow of funds balance sheet data.

- Linkages between consumption, credit, house prices, hh portfolios.

- Model structural change due to shift in credit market architecture.

- International patterns of institutions and of house price movements are diverse – so important to understand their role.

- Financial fragility connected with overvaluation of house prices and credit booms.

- Compare France, Spain and Germany in joint (Wim Duisenberg visiting fellowship at ECB) project with Valerie Chauvin (Banque de France), Celestino Giron (ECB), and Felix Geiger and Manuel Rupprecht (Bundesbank)

Issues for France

- Understand French consumption behaviour: what effects from increased access to credit? Do higher house prices increase consumption? What impact from liquid assets, debt and illiquid financial assets? (see Aron-Duca-Muellbauer-Murphy-Murata 2012 *Rev. Income and Wealth* for comp. UK, U.S. and Japan evidence)

- What explains the post-1995 French house price boom?– hard to explain according to France's leading housing expert Friggit(2012). Previous models all break down or have unreasonable elasticities.

- How sustainable are French house prices? More than 30% overvalued according to OECD (2013).

- Could U.S.-style financial accelerator operate in France?

- What are potential vulnerabilities?

Some key findings

- Germany and France: there is *negative* effect of real house prices on consumption. A 10% rise in real house prices reduces consumer spending by about 0.7% in France and about 1% in Germany, all else equal, but small *positive* effect for Spain (*large* in UK & U.S.).

- Key factors: home equity loans are unavailable in Germany and France. With large down-payments required, aspiring home-owners have to save more when house prices rise.

- *German house price boom will not generate consumer-led eurozone recovery.* Also note parallels for China's efforts to rebalance.

- Shifts in credit conditions for housing loans had large effects on house prices and mortgages in France and Spain.

- Double offset in France from negative consumption effect of higher house prices & higher debt neutralised most of consumption impact.

- Downside risk in French housing market comes more from weaker income or higher interest rates than from fragile finance or overbuilding. *Little* risk of U.S.-style financial accelerator.

Drivers of house prices: the 'inverse demand' approach based on supply and demand

- Demand for housing services (∝ hs ≡ housing stock)

$$\log hs_t = a_0 + a_1 \log y_t + a_2 \log z_t - a_3 (\log rhp_t + \log uch_t)$$

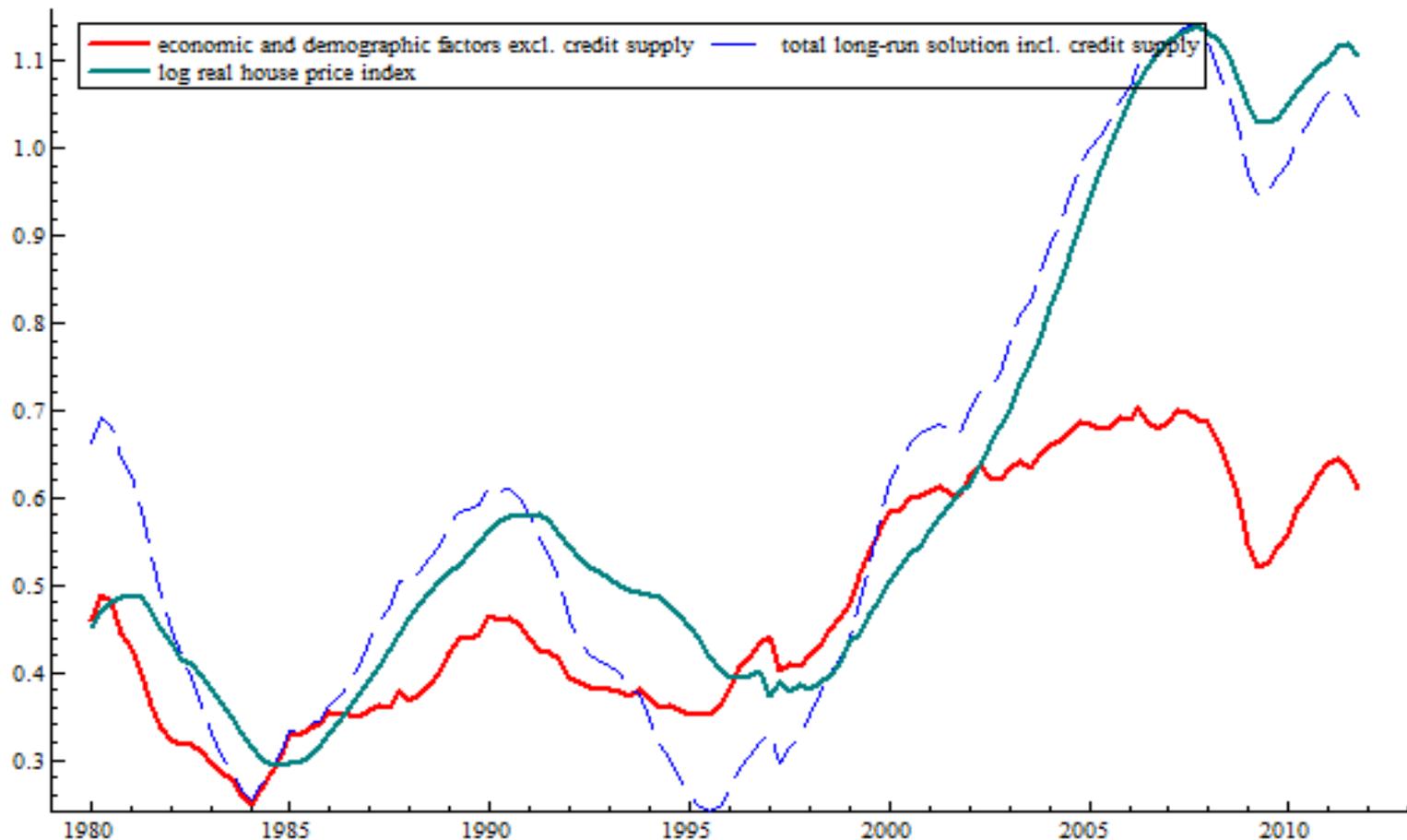- Inverted demand => long-run house price equation

$$\log rhp_t = [a_0 + a_1 \log y_t + a_2 \log z_t - \log hs_t] / a_3$$
$$- \log uch_t$$

- Add dynamic adjustment so that part of gap between LHS and RHS is made up every quarter.

- z includes a mortgage credit conditions index, a latent variable estimated from system of equations; and a measure of user costs *uch* including extrapolative expectations and a risk premium.

- Duca-Muellbauer-Murphy (2012,EJ;2013) confirm role of credit conditions (LTV for FT buyers) for U.S. house prices both in rent-arbitrage and inverse demand approaches.
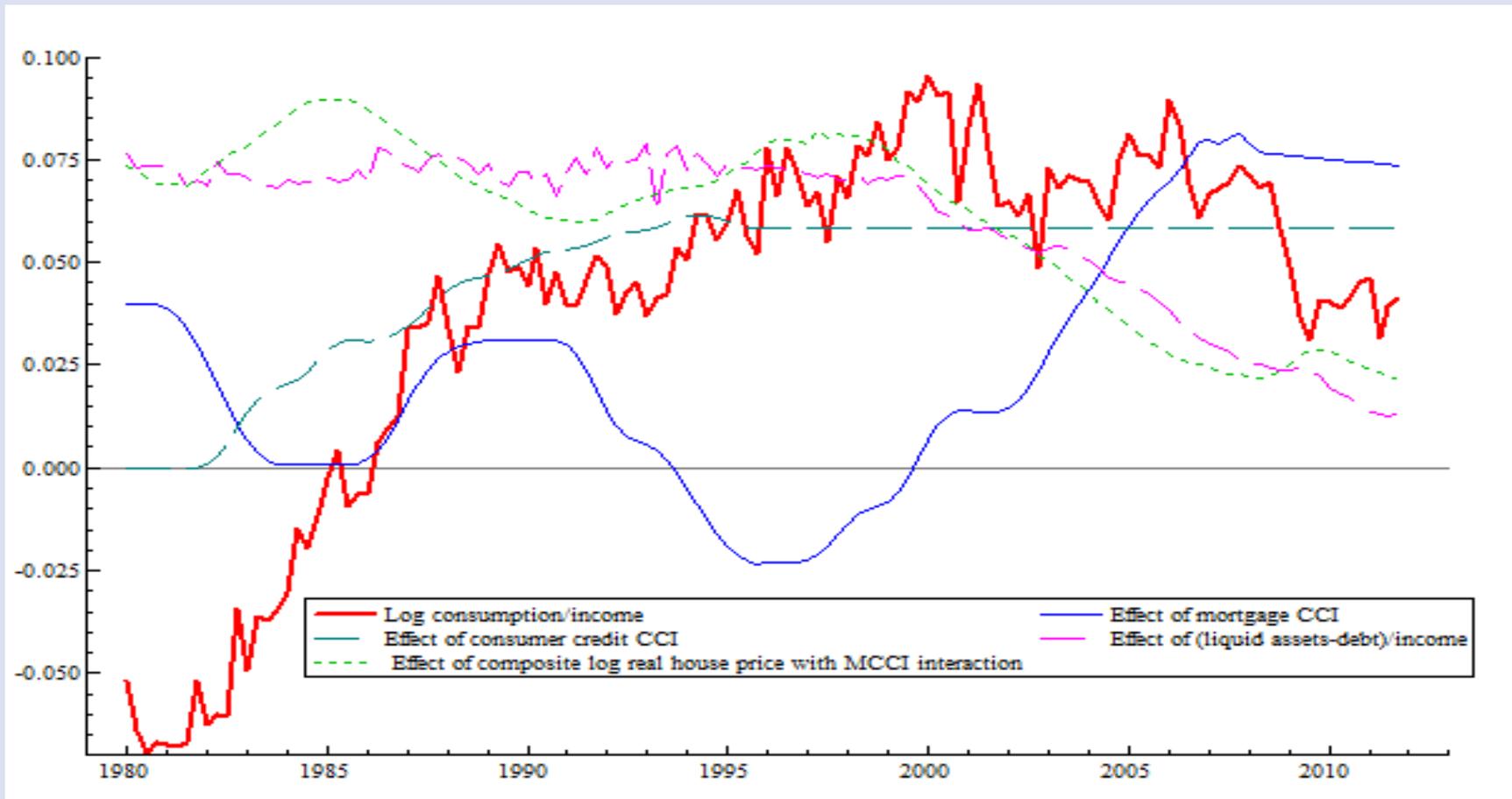
11

Latent interactive variable equation system (LIVES)

- System of 4 equilibrium correction models: consumption, house prices, consumer credit and mortgage stock, quarterly data. (Methodology in Duca-Muellbauer, 2013, ECB wp 1581).

- France 1981 – 2011, Spain 1986-2012, Germany 1981-2012

- Two common, unobserved, evolving structural influences proxied by linear comb. of smoothed step dummies → spline function

- MCCI, a mortgage credit conditions index potentially enters each equation through *intercept* and *interaction* with key economic variables. CRCCI for non-housing consumer credit mainly has intercept role for consumption.

- Other countries: U.S. (Duca-Muellbauer-Murphy, 2012), Australia (Muellbauer-Williams, 2011), S Africa (Aron-Muellbauer, 2013 *Rev. of Income and Wealth*)

Long run solution for log real house price index for France with and without mortgage credit conditions index (Chauvin-Muellbauer, 2013)

13

Decomposition of long-run solution for French consumption (Chauvin-Muellbauer, 2013) (a)

Legend:
- Log consumption/income
- Effect of consumer credit CCI
- Effect of composite log real house price with MCCI interaction
- Effect of mortgage CCI
- Effect of (liquid assets-debt)/income

Decomposition of long-run solution for French consumption (Chauvin-Muellbauer, 2013) (b)
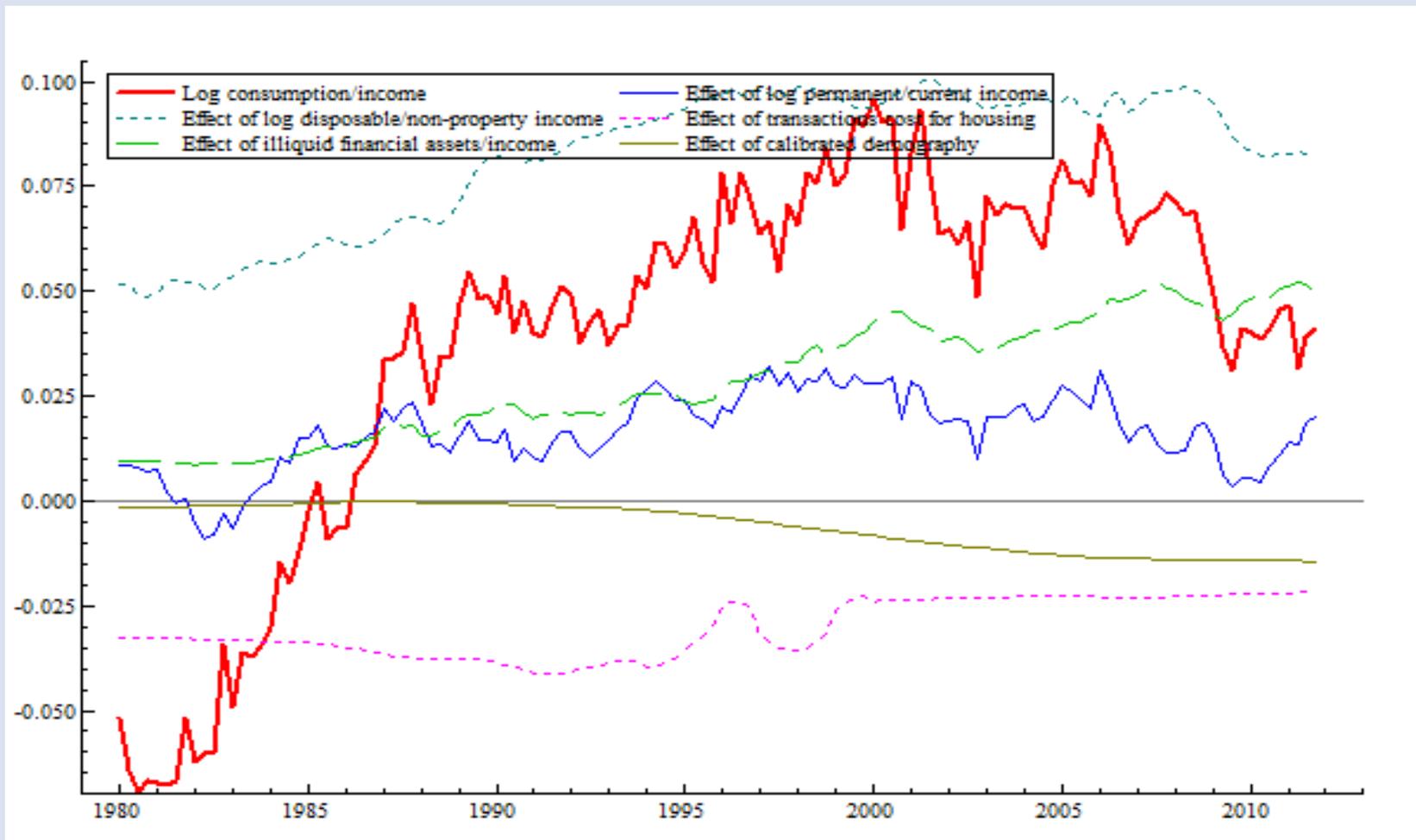
Housing investment channel

- Econometric models of aggregate residential investment are fraught with difficulty (Muellbauer, 2012 *RBA-BIS vol.*, Muellbauer & Murphy, 2008 *Ox. Rev. of Econ. Pol.*)

- Order of integration of the data: is there a house price effect on supply of housing or a rate of return effect if house-builders' returns are driven by capital gains on land? (Mayer-Somerville, 2000).

- How to model expectations of appreciation?

- How to handle tightening of aggregate land-supply constraint?

- What are the implications of varying credit constraints on builders and developers?

- Relative importance of stock vs flow equilibrium concepts.

- Research is needed! Fall in U.S. residential investment accounted for 3-4% of GDP.

Feedbacks via financial sector

- Aron and Muellbauer (2010, SERC dp) modelled one UK component: mortgage delinquencies and foreclosures – driven by debt service ratio, estimates of negative equity and the unemployment rate, plus lending quality indicator and forbearance policy indicator.

- But still need feed-through into NPLs of mortgage lenders.

- In the UK, bad commercial loans to the real estate sector did even more damage to bank balance sheets. Not easy to model.

- However, we do capture consequences of resulting credit crunch on consumption, mortgage stock and house prices in our latent credit conditions variables.