The future of macroeconomics

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Vítor Constâncio:
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- 1. Introduction
- 2. The New Keynesian DSGE model and its critics
- 3. Financial stability: lessons from modelling consumption, debt and house prices.
- 4. Lessons from modelling US core inflation
- 5. Forecasting per capita household income and GDP for France

- Joseph Stiglitz on 'information economics'; David Hendry on how better to learn from data and avoid forecasting pitfalls.

- From Joe's 2001 Nobel lecture: "In the 70s, economists became increasingly critical of traditional Keynesian ideas, partly because of their assumed lack of micro-foundations. The attempts made to construct a new macroeconomics based on *traditional* microeconomics, with its assumptions of well-functioning markets, was doomed to failure….. If individuals could easily smooth their consumption by borrowing at safe rates of interest, then the relatively slight loss of lifetime income caused by an interruption of work of six months or a year would hardly be a problem; but the unemployed do not have access to capital markets, at least not at reasonable terms".

- Stiglitz 2001:"Information economics has alerted us to the fact that history matters; there are important hysteresis effects…. Dynamics may be better described by evolutionary processes and models, than by equilibrium processes."

- Hendry (2017) : "There is a false belief that data-based model selection is a subterfuge of scoundrels—rather than the key to understanding the complexities of macro-economies".

- Hendry (2011):"Economic forecasting is inevitably carried out using (unknowingly) mis-specified models, in the face of unanticipated location shifts….much of the existing empirical evidence on forecast performance can be accounted for by a theory which allows for both features".

New Keynesian Dynamic Stochastic General Equilibrium models

- Not new, based on outdated ideas made redundant by the asymmetric information revolution of Stiglitz, Akerlof, Spence.

- Not Keynesian, ignoring co-ordination failures, especially between real economy and finance, hence useless for understanding financial stability.

- Not dynamic enough, misleading on real world lag structures.

- Hardly stochastic (statistical distributions), missing both radical uncertainty (time dimension) and heterogeneity (cross-section dimension) of distributions.

- Hardly GE, missing most of system feedbacks.

- Rational expectations and inter-temporal optimization need reformulation when structural breaks and radical uncertainty are endemic, Hendry & Mizon, VOXEU 2014.

- In the fashionable New Keynesian 'science of monetary policy' (Clarida, Gali and Gertler, 1999) credit sectors, money and asset prices were thought irrelevant.

- Blanchard (2017) https://piie.com/blogs/realtime-economic-issues-watch/need-least-five-classes-macro-models, and 2018 OXREP, favours major repairs of central bank policy models:

- less imperialistic attitude so that alternative GE models, closer to the data, can flourish.

- Many (BOC, DNB, ECB, RBA) have realised the need for non-DSGE macro models.

- Empirical evidence vs. New Keynesian DSGE models:

- 1) Failure of aggregate consumption Euler equation;

- 2) Mountains of new **micro-evidence** on heterogeneity, credit constraints, buffer stock behaviour, influence of house prices on consumption in liberal credit economies.

- 3) Evidence against NK-Phillips curve, micro and macro.

- Macro-evidence is seldom allowed to 'speak' in top journals: pincer movement between Lucas (1976) critique and Sims (1980) 'incredible restrictions critique' led to ban on macro-evidence outside DSGE and Bayesian VARs, where compromised by strong priors and calibration, see Hendry and Muellbauer (2018, OXREP)

- 1. Exogenous negative shocks can arrive: deterioration of terms of trade, collapse of export market (Finland early 1990s), rise in global interest rates (Reagan fiscal shock early 1980s & Trump shock now, German unification shock early 1990s), oil shocks, external credit supply shocks, political risk (state capture), climate change.

- 2. So-called 'fundamentals' may be fragile e.g. duration mis-match in credit supply (Ireland, UK seen in money-market stop in Aug 2007); currency mismatch of debt (Baltics, Hungary, Asian financial crisis); unsustainably weak financial regulation (bank mis-selling scandals, fraud).

- 3. Endogenous feedback loops can amplify risks, as in the financial accelerator seen in the US.

- 1. Build-up of debt, especially if quality of lending has deteriorated, weighs on further spending.

- 2. Large expansion of housing stock would later dampen prices –depends on how elastic is supply – low in UK.

- 3. Increased saving for a housing down-payment as house prices/income rise– depends on size of down-payment constraint – high in Germany and France, low in UK, US.

- 4. Property taxes linked to recent valuations – not UK.

- Much depends on timing of stabilising feed-backs relative to amplifying ones.

- 1. Extrapolative expectations of capital gains matter more where high leverage is possible, since leverage amplifies gains.

- 2. Leverage cycle: gains cause lenders to relax conditions; profitable lending increases their capital base. In down-phase, even stronger transmission (Duca et al 2016).

- 3. Residential investment boom boosts employment and income, raising aggregate demand.

- 4. In countries with easy equity withdrawal –not Germany nor France, large collateral effects on consumption can occur, US and UK, but time-varying with credit conditions.

- These amplifying feedbacks, if ahead of slower, but more persistent negative ones, increase risk of financial instability.

- In the down-turn, these amplifying feedbacks, plus the tailwinds of the *previously* stabilising ones, can be crushing.
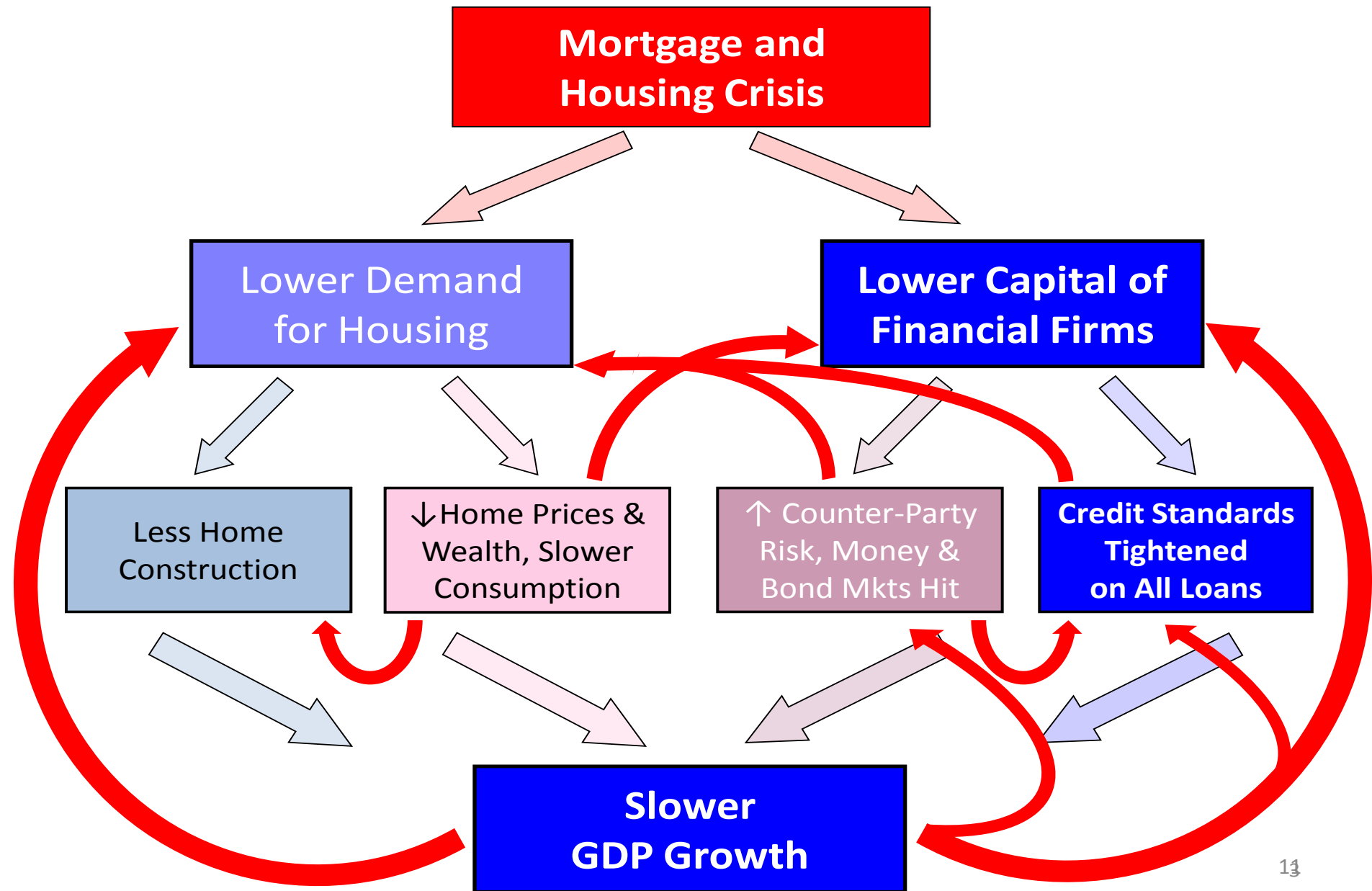
FRB-US model is good on expectations, but fails in other ways:

- Imposes net worth constraint as the only way asset price, liquidity and credit shocks can affect consumption, given income.

  – debt has trivial role relative to housing and stock market wealth.

- Amplifying feedback loops via financial system's ability to extend credit are missing, failing 2007 acid test, Mishkin (2008).

- Unstable parameters: speed of adjustment for non-durables 0.18 in 2009, 0.10 now, inconsistent with folk-wisdom about timing of real economy effects of monetary policy.

- Though claimed to be 'micro-founded', not a 'structural equation' in the Cowles Commission sense.

- Also need a decent residential investment equation.

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- Theory-based models make simplifying assumptions.

- We generally do not know which model is correct.

- For applied work, formulate a model which encompasses or 'nests' rival models, each being a special case (imposing parameter restrictions) of the encompassing model.

- David Hendry and co-authors proposed this approach in the 1970s, Davidson et al (1978), see Birner (2002) for the history of thought context.

- The basic aggregate life-cycle/permanent income consumption function

$$\log c_t = \alpha_0 + \log(yperm \, / \, y_t) + \gamma A_{t-1} \, / \, y_t + \log y_t$$

can be generalised:

- a) Split net worth into key elements with different coefficients – e.g. to reflect notion that cash is more spendable than pension wealth, and that housing wealth differs from financial wealth according to inter-temporal choice theory.

- b) Allow coefficient on *log (yperm/y_t)* to differ from 1 - e.g. to allow for the possibility that some households are myopic.

- c) Allow intercept α_0 to be time-varying: if down-payments required for mortgage and other loans fall, saving for a down-payment declines so that α_0 rises.

- d) Allow time-variation in house price/income effect and/or housing collateral effect which shifts with access to home equity loans.

Need consumption-portfolio-asset price system.

- To plug consumption function with disaggregation of wealth into a macro model, we need equations for assets and debt.

- Extract credit conditions as latent variables from same system (LIVES 'latent interactive variable equation system').

- *ECB w. paper 1904 on Germany* with Felix Geiger (BuBa) and Manuel Rupprecht; forthcoming paper with Valerie Chauvin, BdF:

  – estimate 6-equation sub-system for consumption, unsecured debt, mortgage debt, liquid assets, house prices and 'permanent income'. Evidence for dampening mechanisms.

  – Duca and Muellbauer (2013) 4-equation system for US and Duca et al (2016) confirm powerful amplifying mechanisms in US

- Lagged ratio of French non-performing loans/total bank loans to private sector is negatively correlated with MCCI, role for bank balance sheets.
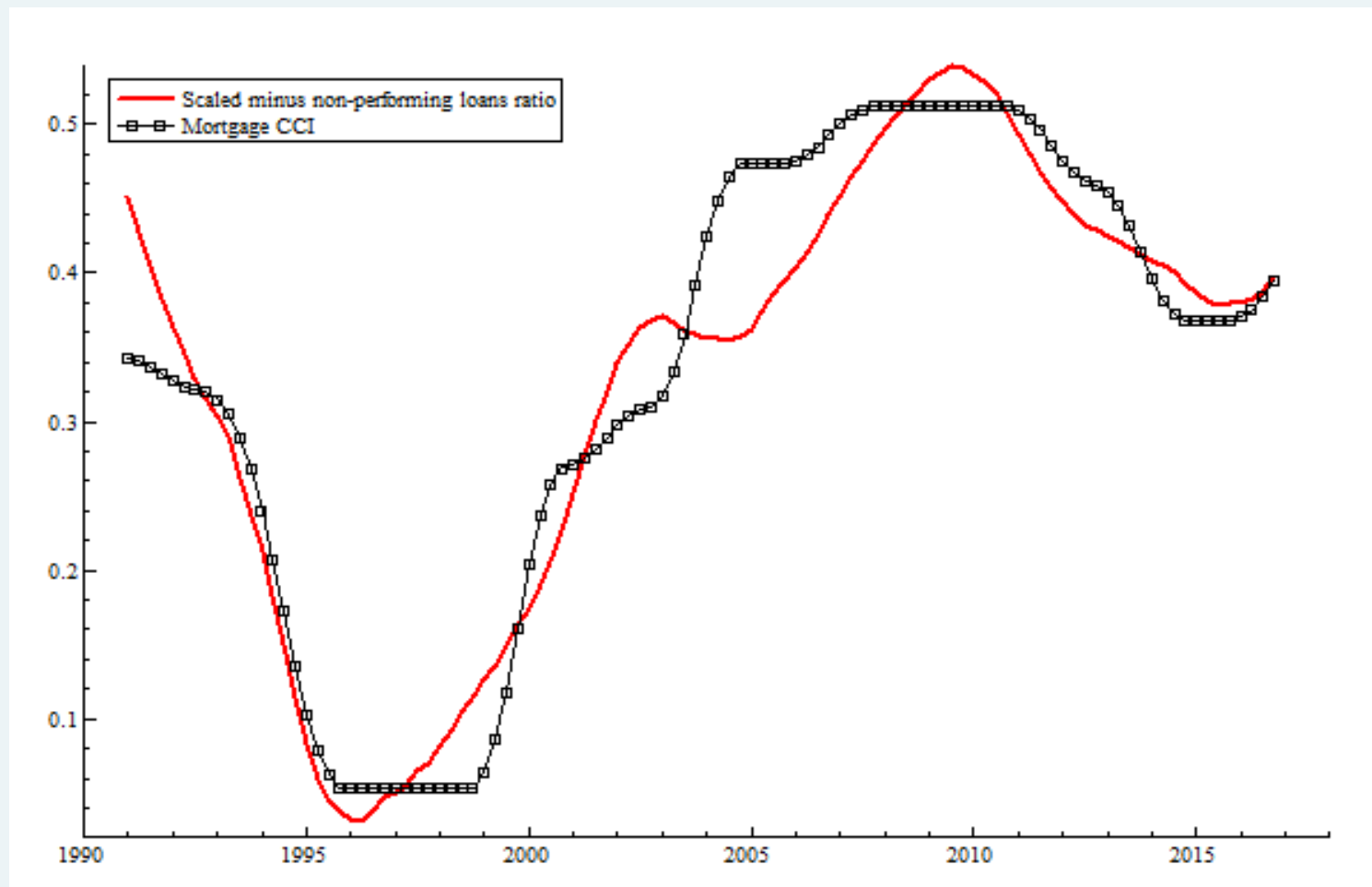
- 4 key insights from Aron and Muellbauer (2013) forecasting PCE inflation in US:

- 1. Inflation is partly a process of relative price adjustment: long run solution determines relative prices, see Sargan (1964) paper on wages and prices in the UK, which introduced 'equilibrium correction', and Hendry (2001).

- 2. Unit labour costs, international prices and exchange rate and house prices are key elements of long-run solution.

- 3. Including union density, a measure of labour market power, improves relevance of the unemployment rate.

- Curse of dimensionality is a problem for VARs and reduced form forecasting equations: poor trade-off between number of variables vs. lag length.

- 4. Parsimonious Longer Lags (PLL) allow better trade-off. Key intuition: impulse response functions become fuzzier as lag-length rises, but do NOT ignore longer lags.

- Monthly version: no restrictions on Dx(t), Dx(t-1), Dx(t-2), then D3x(t-3), D6x(t-6), D12x(t-12): 6 parameters instead of 24, still allows *some* role for longer lags.

- We showed that for *every information set considered*, PLL beats BIC applied to the unrestricted equation.

- Aron & Muellbauer (2018) examine pseudo-out of sample *post-crisis* performance of alternative models of US *core* inflation over various horizons. PLL usually helps.

- We add a 5th insight: pricing power of firms matters for price setting along with union power for wage setting.

- Grullon et al (2017): profits related to firm concentration.

- Their Herfindahl-Hirschman index (HHI) of US firm concentration is highly significant in our forecasting models, improving in-sample parameter stability and out of sample forecasting performance.

- Key long-run drivers of core US PCE deflator: union density and unemployment rate, foreign prices, house prices and HHI.

- Union density and unemployment rate seem to be picking up unit labour costs.

- Implied Sargan-Phillips curve is stable: *after 3 years of crisis are omitted, conditional relationship is similar to before*. Very short-run dynamics somewhat less stable.
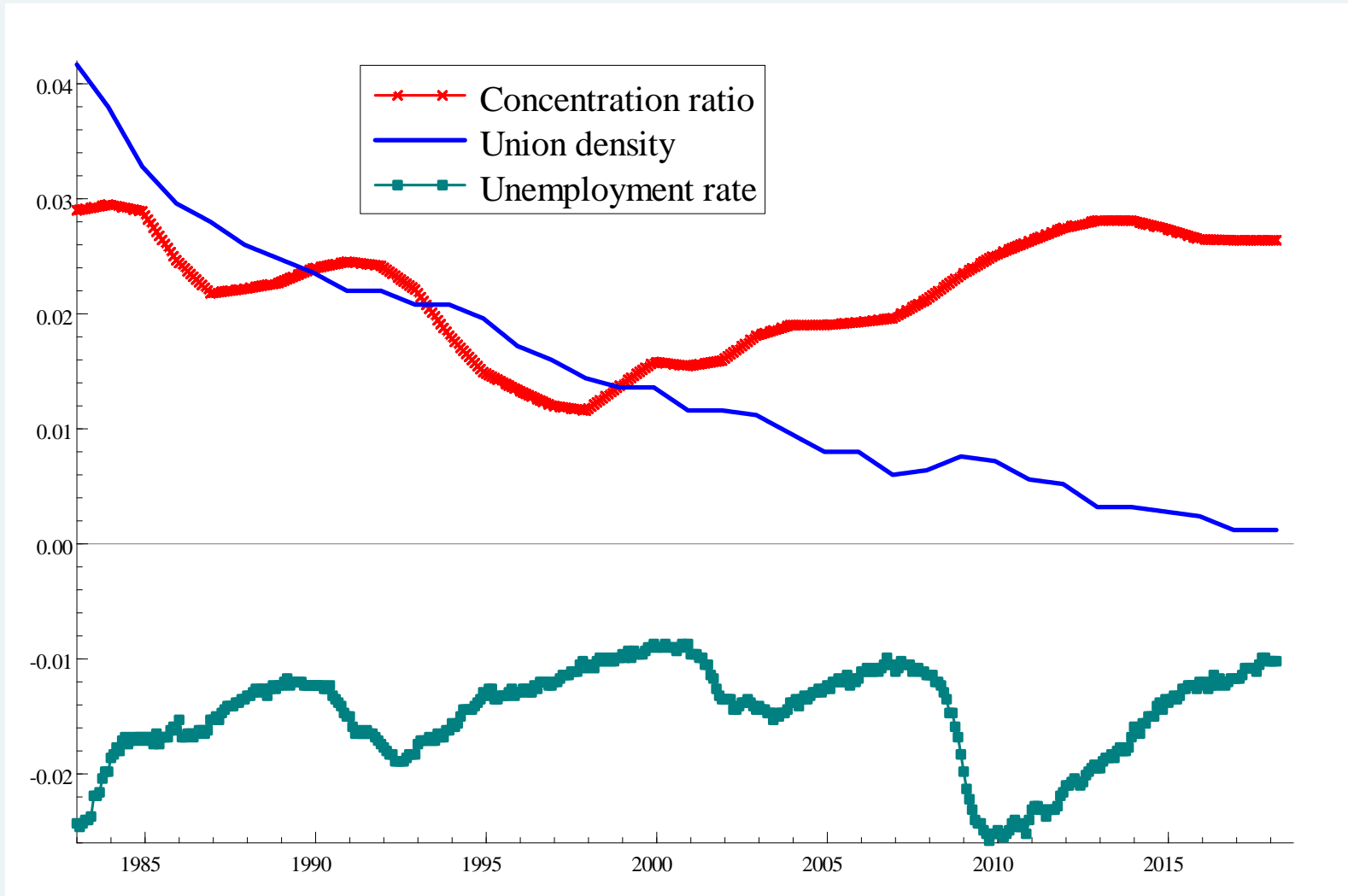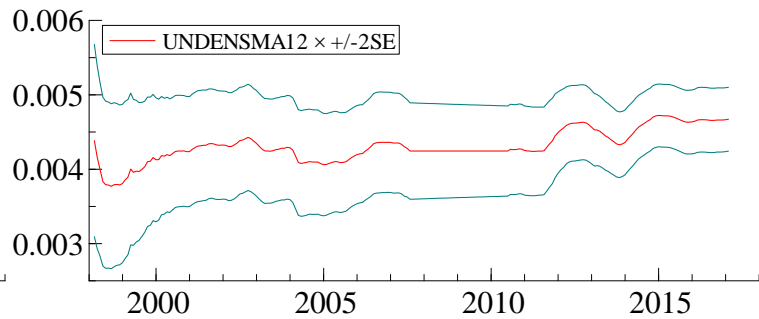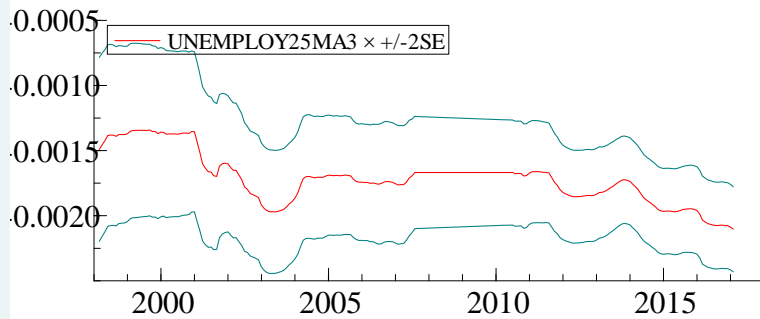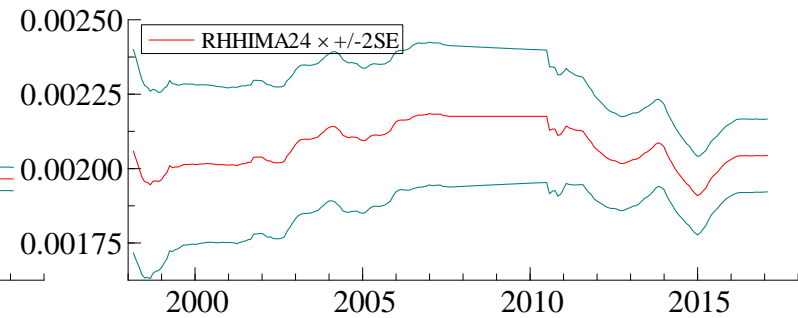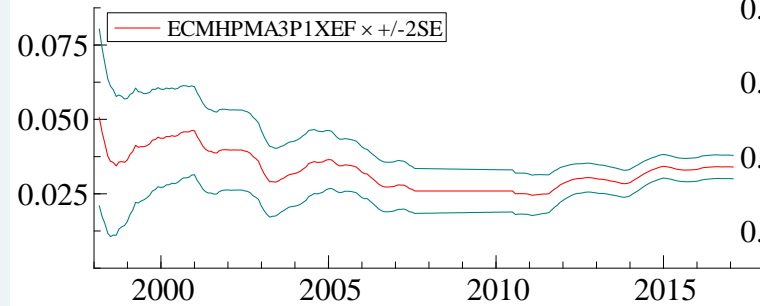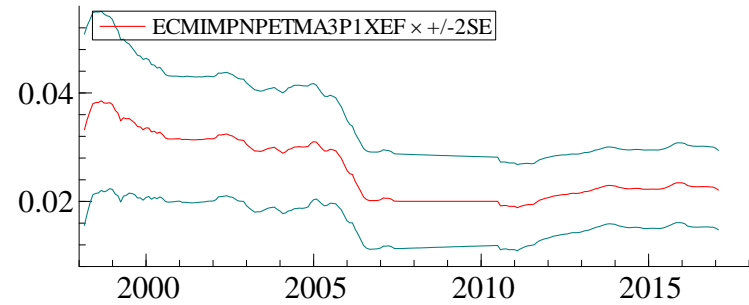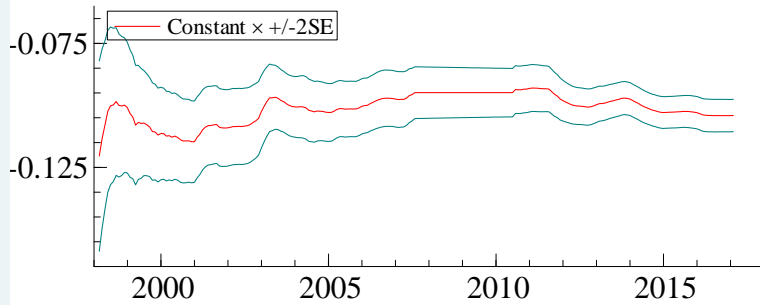
- But the Sargan-Phillips curve is alive and well, *given the right long-run controls, including relative price adjustment and market power relationships.*

- Other insights: foreign prices can be represented several ways, including via import price index and foreign prices buried in the REER.

- Dynamics are consistent with findings from exchange rate pass-through literature: evidence of pricing to local Dollar market.

- For forecasting, model averaging of best models with univariate model, improves robustness as in Aron-Muellbauer (2013). Improvement over naïve benchmark similar, around 35-40% lower RMSEs.

- Is there a stable relationship between unemployment and inflation?

- If it is stable, what is the lag between them?

- Which measure of labour market slack produces the best forecasting results and/or longer parameter stability?

- Are the NAIRU or the Natural Rate useful concepts?

- Does the inclusion of private sector inflation forecasts improve forecast performance?

- What is the role of international factors and the exchange rate in driving US inflation?

- Is there a connection with the housing market?

- How important is unemployment for the determination of unit labour costs?

- In macro, heterogeneity rules: unemployment is highly heterogeneous, as is price setting behaviour.

- Nevertheless, a stable relationship, a Sargan-Phillips curve, exists between aggregate inflation and unemployment, given the right controls.

- The profession often neglects longer lags. PLL is a simple technique for improving trade-offs between range of variables and lags. For forecasting, PLL combined with factor models is worth a try.

- The information economics revolution has highlighted the relevance of credit and other liquidity constraints.

- Hence aggregate shifts in credit constraints need to be included in policy models relevant for understanding financial stability: latent variable techniques help.