

## **Discussant remarks on John V Duca, John Muellbauer and Anthony Murphy's paper "Credit standards and the bubble in US house prices: new econometric evidence"**

Frank Warnock<sup>1</sup>

The main thought one has when setting out to write a discussion of this paper is that it is one of many in this research agenda.<sup>2</sup> As such, it is difficult to disentangle its contribution. If I had one main comment for the authors (other than how much I like the paper and the research agenda), it is to spend some time helping the reader differentiate each paper's contribution.

As of now it is difficult to differentiate one paper in this research agenda from another. Duca, Muellbauer and Murphy (2011) state the following: "Most US house price models break down in the mid-2000s, due to the omission of exogenous changes in mortgage credit supply ... from house price-to-rent ratio and inverted housing demand models.<sup>3</sup> Previous models lack data on credit constraints facing first-time homebuyers. Incorporating a measure of credit conditions ... into house price-to-rent ratio models yields stable long-run relationships, more precisely estimated effects, reasonable speeds of adjustment and improved model fits." They also state that "(s)imilar results are obtained using ... an approach which inverts the demand function (available in an appendix)". The abstract of the current paper seems identical, but with this sentence added: "Our first-time buyer LTV series is weakly exogenous and captures shifts in the supply of mortgage credit and not expectations of future house price appreciation." Just from that simple comparison it seems that, relative to Duca, Muellbauer and Murphy (2011), the current paper spills a bit more ink on the exogeneity of the main explanatory variable. More needs to be done to help the reader understand the value added of each paper in this research agenda. In sum it is obvious; paper by paper it is not easy for the reader to differentiate.

This paper applies an inverted demand function model of house prices. If it is assumed that in the short run supply is fixed, then demand determines price. Demand in this model is a function of price, permanent income, and other factors such as real user cost of housing and credit constraints. Inverting the demand function yields price as a function of permanent income, housing stock, real user cost, and credit constraints. Of course, many other factors can drive house prices; the authors use a vector error correction (VEC) model to capture adjustment to stock and flow disequilibria. The main takeaway from the empirical exercise is that US house price models – be they house price-to-rent or inverted housing demand models – that do not include an exogenous measure of changes in mortgage credit supply break down in the mid-2000s. In particular, the cyclically adjusted loan-to-value ratio (LTV) for first-time homebuyers is an important variable omitted from many previous home price papers.

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<sup>1</sup> Professor, University of Virginia.

<sup>2</sup> See, among others, Duca, Johnson, Muellbauer and Murphy (2011), Duca, Muellbauer and Murphy (2009), Duca, Muellbauer and Murphy (2010), and Duca, Muellbauer and Murphy (2011).

<sup>3</sup> Real user costs are given by real after-tax interest rate of borrowing plus depreciation rate plus property tax rate less expected rate of capital appreciation. House prices are Freddie Mac's of repeat home sales. Housing stock is flow of funds estimated replacement cost of households' residential housing structures.

A reader comes away with an appreciation of the paper's main points, but also some questions.

The measure of credit standards – LTVs for first-time homebuyers, based on American Housing Survey data (for conventional mortgages) – is a critical component of this paper. The authors argue that first-time homebuyer LTV has less of an endogeneity issue than a price-to-income (PTI) ratio, which is affected by shifts in two other determinants of house prices (interest rates and income), and that the LTV measure should capture exogenous shifts in credit standards, not expectations of future house price changes. Reasonable people might disagree. For example, Crowe et al (2011) noted that “because of the feedback loop between mortgage credit availability and house price movements, endogeneity remains a concern”. Since reasonable people might question whether the authors' LTV measure is truly exogenous, more discussion on this important point is necessary. One way to dispel all doubts on this point is for the authors to assume that the LTV measure is endogenous. How would that alter the main results?

Another main point in the paper is that most house price models omit a credit standards variable, and including one (the LTV measure) improves the model's fit. But Figures 2 and 3 in the conference version of the paper seem somewhat inconsistent. The text around Figure 2 states the following: “As a result of lower down payment requirements, the effective demand for housing rose in the mid-2000s, pushing up prices and construction. This fed into higher house-price expectations among borrowers and lenders, further boosting prices.” This sounds right to me. But looking at the figure, the improved out-of-sample fit during 2003–2006 owes to the fact that the LTV model has a smaller increase in home prices than the non-LTV model. This seems odd. For Figure 3, the non-LTV model has a smaller increase throughout and does just fine until mid-2008. The authors state that home price models break down in the mid-2000s, but to my eyes Figure 3 suggests the breakdown is more like 2008 (when many models broke down). I would like a more complete discussion of this. Even in the short forecast section at the end of the paper, the LTV and non-LTV models produce similar forecasts. The magnitudes of forecasted price changes differ, but both suggest US home prices will bottom out in the next six months and then begin a sharp appreciation. Do we know that the LTV model is really superior? I think the answer is yes, but I am not exactly sure why.

I have two primary suggestions. The first concerns the LTV measure. The reader is asked to believe that the LTV measure improves the fit of home price models. I think I can buy that. But what drives changes in the LTV series? In the conference version of the paper, this is dealt with in words only. We are told that the major shifts in the LTV series (in the early to mid-1990s and between 2000 and 2005) coincide with major changes in government mortgage policy and financial innovation. Are there ways to model this (other than adding more dummies to the paper, which already has more than its share of dummy variables)? Are some changes in the LTV series benign and others likely to be more problematic? Do we have any way to differentiate? I think the readers deserve a better understanding of what drives movements in the LTV series.

The second suggestion is that the paper should be repackaged to sharpen its contribution. Right now it comes across as derivative, far too similar to other papers in this research agenda. The question the authors should address front and centre is, what can we learn from this that we could not have learned from past work? Instead of focusing on what is done (improving the fit of a home price model), I would like to see some focus on how it informs (and who it informs).

To summarise, I really enjoyed this paper as well as Duca et al (2009, 2010, 2011a, 2011b). In this research agenda, these authors have made substantial contributions to an important topic. For this particular paper, I would like more analysis of the LTV series, which is key to the paper, as well as a sharpened focus on what we learn from this paper that we could not have learned from previous work. How does this paper change our thinking? Are there

mistakes we have made that would have been prevented had we known this? And how should this work inform policymakers?

## References

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