Workshop Summary: Are House Prices Endangering Financial Stability? If So, How Can We Counteract This?

Against the background of recent house price increases in several European countries, the OeNB organized a workshop entitled "Are House Prices Endangering Financial Stability? If So, How Can We Counteract This?" It was held in Vienna on October 9 and 10, 2014. The workshop contributions[2] demonstrated the complexity of assessing house price developments and of implementing macroprudential policy measures. One of the main policy conclusions was that collecting data on individual loan characteristics is a key priority for monitoring developments in the housing and mortgage loan markets.

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Housing markets and housing finance have seen a pronounced boom and bust cycle during the past decade, both in the U.S.A. and in Europe. In the vast majority of European countries, house prices and housing wealth have risen sharply since the mid-1990s. At the same time, household debt has reached record levels in many countries, largely as a result of the decrease in real and nominal interest rates and the introduction of a wide range of financial innovations on the mortgage markets. Problems in the U.S. mortgage market triggered the financial crisis, which resulted in an enormous loss of wealth and output around the globe.

The crisis has changed the way how policymakers deal with house price booms. Instead of neglecting the boom and "picking up the pieces" after the bust, a new consensus on the need for more preventive policies has evolved. In Europe, a new macroprudential policy framework centered on the European Systemic Risk Board (ESRB) has been installed. However, the detection of unsound developments in real time and the implementation of adequate policy instruments require sound knowledge in several fields.

In order to shed some light on these issues, the OeNB organized a workshop entitled "Are House Prices Endangering Financial Stability? If So, How Can We Counteract This?" It was held on October 9 and 10, 2014, in Vienna and aimed to bring together international experts in the field to share their expertise.

The workshop was organized around four sessions which dealt with the most important issues – from a central bank's perspective – of monitoring housing market developments and assessing their implications for financial stability. Session 1 dealt with house price measurement, which is a prerequisite for assessing upcoming house price bubbles. Session 2 looked at the drivers of house prices. Session 3 discussed methods to identify house price bubbles and session 4 looked at the relevant experience of countries whose authorities have already implemented measures to contain possible future bubbles.

In his keynote speech, Professor John Muellbauer (University of Oxford) shed light on the interactions between the housing sector, the mortgage sector and the real sector of the economy. He concentrated on the housing wealth channel and the credit channel. While the credit channel turns out to be important for explaining the impact of house prices on aggregate consumption (including imputed housing), the wealth effect is small or even negative in some countries. In Germany, where households' liquid assets far exceed their debt, higher interest rates dampen aggregate consumption. The indirect effects of higher interest rates, however, stimulate consumption in Germany via lower house prices. Poorly developed credit markets in other countries imply that aggregate consumption falls when house prices rise, since future first-time buyers have to save more for downpayment. The application of Muellbauer's estimated model shows that in France and Germany higher house prices reduce consumption. This result can be explained by low loan-to-value (LTV) ratios and conservative debt service ratios. The U.S.-type financial accelerator link is missing in Germany and France. Hence, a German house price boom will not produce a consumption boom that pulls the euro area out of recession.

1 House Price Measurement: A Prerequisite for Assessing Upcoming Bubbles

The construction of residential property price indices is a complex task, as each piece of property is a unique good with unique characteristics that change over time (deterioration, renovation, etc.). Most often, data on residential property sales are irregular and heterogeneous. Session 1 of the workshop dealt with the various approaches and challenges of index construction and with the question whether there is a potential for mismeasurement that could blur the assessment of upcoming bubbles sufficiently to keep the authorities from adequately fulfilling their task of maintaining financial stability.

Mick Silver (IMF) showed indices calculated on the basis of appraisal data and repeat sales data. He performed a regression of house prices (with panel data), showing that measurement variables alone have little to no explanatory power. When he included time and country effects, however, the explanatory power increased. Furthermore, he showed pooled regression results for house price indices with measurement-adjusted and unadjusted house prices and pointed out that commercial property price indices constitute important data. Their construction and/or calculation, however, is even more complicated than the construction of residential property price indices. Houses differ in both their physical characteristics and their individual location. Hedonic methods are used to construct quality-adjusted house price indices. The increased availability of geospatial data (i.e. the longitude and latitude coordinates of individual locations) means that more sophisticated approaches than simple hedonic models can be applied for the calculation of residential property price indices.

Michael Scholz (University of Graz) presented such approaches. Together with his co-author Robert J. Hill, he constructed a hedonic model of the housing market that includes a spline surface defined by geospatial data (i.e. the longitude and latitude coordinates of individual dwellings). House price indices are then obtained by imputing prices for individual dwellings from the hedonic model and inserting them into the Fisher price index formula. Using

data for Sydney, Australia, the authors compare the performance of four models: (1) a generalized additive model (GAM) with a geospatial spline, (2) a GAM with postal code dummies, (3) a semilog with geospatial spline, (4) a semilog with postal code dummies. Their results clearly confirm the superiority of geospatial splines, in terms of both the deviation between actual and imputed prices and – with repeat-sales observations – the deviation between the actual and the corresponding imputed price relative $p_{t+k,h} / p_{t,h}$ (price of house h in time period t and time period $t+k$). Splines combined with the hedonic imputation method provide a flexible way of incorporating geospatial data into a house price index. The cumulative increase in their Fisher price indices is between 15% and 25% higher (depending on the functional form of the model) over the 2001 to 2011 period when a geospatial spline is used. This difference can be attributed to the failure of postal code dummies to fully adjust for omitted locational characteristics.

Wolfgang Brunauer (Real(e)value) and Wolfgang Feilmayr (Vienna University of Technology), who calculate the Residential Property Price Index (RPPI) for Austria in cooperation with the OeNB, elaborated on the challenges of index construction. They gave an overview of available (residential) property-related indices in Austria. First, they presented the time dummy index (using data series starting in 1986) – a multiple linear regression model where the price index is explained by attributes and district dummy variables. Next, they demonstrated the spatial imputation index, the calculation of which is based on semiparametric models that take nonlinearity and spatial heterogeneity into account and produce unbiased quality-adjusted time effects as omitted variable effects are modeled

adequately. Moreover, the use of imputation methods ensures that structural changes in the estimated effects do not have any distorting effects. Brunauer and Feilmayr presented their results for condominiums and single-family houses (at census level) for Austria and for Vienna.

2 Which Factors Drive House Prices?

House prices are determined by a complex interplay of various demand and supply factors, some of which tend to produce cyclical price movements. Session 2 discussed the differences between, and similarities of, individual countries and dealt with the question whether we can learn something from the experience gained in other countries.

Christophe André (OECD) gave an overview of the latest global housing cycle, the price pickups in Austria, Germany and Switzerland, the soaring investment in Ireland and Spain, and the arrears in the U.K., Ireland and Spain. Then he turned to some factors driving house prices – declining interest rates, innovations in mortgage markets, low mortgage rates – and stated that local factors also play a role (e.g. disposable income, population characteristics and households' expectations). His overview ended with some conclusions on the implications of the development of these factors and of house prices for financial stability, explaining that excessive loan maturity and currency mismatches create funding risks and that low interest rates create risks of new bubbles. Therefore, a holistic approach to housing is needed, entailing e.g. a number of changes in tax regulation and a relaxation of planning regulations to boost the rental market and the supply of affordable housing.

Kostas Tsatsaronis (BIS) tested whether the institutional characteristics

of housing finance markets have any effects on house price dynamics. Using a simple Vector Autoregressive (VAR) framework, he and his co-author analyze the joint dynamics of macrovariables (GDP, inflation), house prices and (mortgage) credit growth. They test how market structure affects the interaction between macrovariables and house prices. To this end, they group countries by the characteristics of housing finance (interest rate structure (fixed or floating rate), the existence of mortgage equity withdrawal and the size of LTV ratios) and label the resulting three groups of countries "conservative," "aggressive fixed" and "aggressive variable." Applying a VAR specification, they find that house price dynamics themselves seem to be by far the most important driver of house prices – a finding they interpret as "momentum effect" (while, alternatively, it could also indicate poor model specification). He concluded that mortgage market characteristics explain the development of some variables, but not all.

Christian Hott (Zürich Insurance Group) gave a presentation on "Explaining House Price Fluctuations." He showed that in most countries, house prices fluctuate more strongly than fundamentals. He developed a model of fundamental house prices that tries to solve the question which part of house price dynamics can be explained by fundamentals. He defined the fundamental house price as the present value of future imputed rents. Imputed rents were calculated as the fundamental value of rents by including the mortgage rate, the sum of maintenance costs and the risk premium as factors. The comparison of fundamental house prices with actual house prices indicates that house prices fluctuate more than fundamentally justified. To explain this, he developed several variations of the basis

model with alternative assumptions about agents' expectations. By assuming that agents do not react to changes in user costs (i.e. the mortgage rate), he concluded that agents overreact to current fundamentals as well as to past returns and that they are influenced by their sentiment. Stating that forecasting models that rely on fundamentals miss part of the development of house prices, Hott showed that the excess fluctuations of actual house prices can be partly explained by incorporating herding behavior and speculation into his house price model.

3 How Can We Identify House Price Bubbles in Advance?

Session 3 dealt with the question of how to identify house price bubbles in advance. Whenever house prices are rising, the question is whether this rise actually means that a bubble is building up. Still, it is notoriously difficult to define and identify house price bubbles in real time. The presentations in this session gave a good overview of commonly used empirical methods.

Florian Kajuth (Deutsche Bundesbank) presented an assessment of house prices in Germany using an estimated stock-flow model. His model is estimated with a panel estimator using regional data. Explanatory variables are the housing stock, income, the population aged between 30 and 55, population density, interest rate and growth expectations. Estimation results show that low growth expectations and declining interest rates can explain the decline of real house prices during the last decade. Currently, the model shows an overvaluation by 5% to 20% of apartments in certain German cities.

Martin Schneider (OeNB) presented the OeNB's fundamentals indicator for residential property prices, which serves to assess deviations of house prices from

fundamentally justified prices. The indicator consists of seven subindicators that address a variety of perspectives, including those related to households, investors and systemic factors. For Vienna, the indicator points to an increasing degree of overvaluation in property prices (by 23% in the second quarter of 2014). The overvaluation evident in the indicator does not suggest that an abrupt price correction will occur in the near future. Rather, such imbalances may subside gradually, as happened in the wake of the price hikes experienced in the early 1990s. For Austria as a whole, the indicator suggests that house prices are in line with fundamentals. Schneider also applied this indicator to a total of 11 euro area countries. His results suggest that, currently, residential property is overvalued in Belgium and France. In Austria and Finland, house prices are in line with fundamentals, while in Germany, Ireland, Greece, Spain, Italy, the Netherlands and Portugal, they are below fundamentally justified values.

Christian Dreger (German Institute for Economic Research – DIW Berlin) introduced an early warning system for predicting house price bubbles based on three alternative approaches: a signaling approach, logit models and probit models. To start with, he constructed a house price bubble chronology for 12 OECD countries. His empirical results show that while the signaling approach does not produce reliable forecasts, the predictive accuracy of the logit and probit models is high enough to make them useful in forecasting bubbles in the housing market.

4 Which Instruments Are Available to Contain Upcoming Bubbles?

House price bubbles can pose a serious threat to financial stability, especially if accompanied by a strong increase in credit. Having identified an upcoming bubble, the central question is what instruments are available to contain it. Policymakers have a variety of instruments at their disposal for this purpose. Session 4 looked at the experience of other countries whose authorities have already implemented such measures.

Thomas Schepens (Nationale Bank van België/Banque Nationale de Belgique – NBB) presented recent developments in Belgian housing and mortgage markets and the related prudential measures implemented recently. The NBB has developed a new graphical early warning indicator methodology. The basic idea behind this new methodology is to identify thresholds for early warning indicators, e.g. the credit-to-GDP ratio, the credit-to-GDP gap, nominal house price growth or the price-to-income ratio. The identification of early warning indicators that signal excessive developments (e.g. in credit and leverage) and the potential occurrence of banking crises is based on a clustering of countries with banking crises, noncrisis countries and tranquil periods. Based on the results of this approach, prudential measures were implemented in Belgium in the fourth quarter of 2013 (comprising an add-on of 5 percentage points to risk weights for mortgages).

Fergus Cumming (Bank of England – BoE) gave an overview of macroprudential regulation in the U.K. residential mortgage market. House prices and indebtedness have increased rapidly in the U.K. over recent months. The BoE uses a modeling approach based on individual loan data to assess risks arising from mortgage indebtedness. By using forecasts for macroeconomic variables such as house prices or incomes, distributions for the LTV and loan-to-income (LTI) ratios of future borrowers

can be simulated. This approach allows for simulating different scenarios of mortgage indebtedness. Based on the results of this method, the BoE published two recommendations in its June 2014 Financial Stability Report. While the first recommendation to lenders targets loan affordability by stating that lenders should assess whether borrowers could still afford a 3 percentage point interest rate increase, the second recommendation explicitly focuses on the distribution of LTI ratios. Banks have to ensure that mortgage lenders do not extend more than 15% of their total number of new residential mortgages at LTI ratios of 4.5 or above.

Srobona Mitra (IMF) reported on experience made with implementing macroprudential measures, focusing on the implementation of caps to LTV and debt-to-income ratios. While there is no one-size-fits-all solution, some generalizations can be made. Usually, a number of different national institutions decide which prudential and macroeconomic policy tools to use while their central bank monitors systemic risks. This means that actions taken by these institutions are usually not coordinated with the central bank's monetary policy. In most cases, these prudential and macroeconomic policy tools were applied immediately, with only a narrow gap between the announcement that a specific instrument was to be used and its application. In many cases, high LTV ratios, long maturities and speculation (as measured by the share of multiple-loan holders) were alerting signals of a property price boom-bust cycle. Often, the respective instruments were applied in a discretionary manner and had an effect on credit growth, but not on house price growth. Measures targeting risky mortgages worked better than broad measures.

Conclusions: What Have We Learned?

The OeNB workshop on house prices and financial stability clearly demonstrated how challenging it is for authorities to deal with house price booms and their possible impact on financial stability. Contributions in session 1 provided insight into the construction of residential property price indices, which are the basis of any further analysis of housing market developments. This construction process requires sound theoretical and technical capabilities and requires a lot of data. Papers presented in session 2 demonstrated the diversity and interplay of the various factors that drive house prices. It became evident that both structural and cyclical factors play a crucial role and that house prices tend to overshoot, i.e. they fluctuate more strongly than fundamental factors. Among the relevant structural factors, tax policy seems to be most important. The papers delivered in session 3 discussed the difficulties of identifying house price bubbles in real time. Although there is no single, absolutely reliable method, it is crucial for central banks to integrate adequate methods for the identification of house price bubbles in their toolkits. Session 4 looked at the experience of countries whose authorities have already implemented measures to contain upcoming house price bubbles. The main takeaway from this session was – as the Belgian example showed – that collecting granular data on loan-to-value, debt-to-income and debt service-to-income ratios is a key priority for monitoring developments in housing and mortgage markets.