Are Recent Increases of Residential Property Prices in Vienna and Austria Justified by Fundamentals?

Martin Schneider
Oesterreichische Nationalbank, Economic Analysis Division
October 10, 2014
OeNB Workshop “Are House Prices Endangering Financial Stability? If so, how Can We Counteract This?”

House Price Developments in Euro Area Countries

Countries with strong corrections
Countries with modest corrections
Countries without corrections

Source: ECB

www.oenb.at  - 2 -  oenb.info@oenb.at
Residential Property Price Monitoring of Selected Central Banks

- **European Central Bank:**
  Regular monitoring of residential and commercial property markets in Financial Stability Review. Misalignment indicator based on four different measures.

- **Deutsche Bundesbank:**
  Publishes regular analysis since 2009. In Oct. 2013, BuBa found overvaluations of house prices of up to 20% in attractive cities.

- **Swiss Nationalbank:**
  SNB is involved in new procedure to activate anticyclical capital buffers. SNB’s duty is to assess real estate and mortgage markets on a regular base (‘guided discretion’ approach).

- **Österreichische Nationalbank**
  OeNB publishes Fundamental Residential Property Price Indicator for Austria since January 2014 on a regular base. Homepage will go online soon.

A Fundamental Residential Property Price Indicator for Austria

- **Equilibrium approach:** indicator aims to identify deviations from fundamental house prices
- **Multiple-indicator approach offers different perspectives (based on UBS indicator)**
  - Household perspective
    - Real residential property prices
    - Affordability
  - Investor perspective:
    - Price-to-rent ratio
    - Residential property prices to construction costs
  - System perspective
    - Loan-bearing capacity
    - Housing investment-to-GDP ratio
    - Interest rate risk
  - Indicators are transformed to trend/mean deviations in % and are aggregated with principal components weights
  - Based on quarterly data since 1989Q1

1.) Real residential property prices

- Compares residential property prices to basket of consumption goods
- Real residential property prices should be stationary in the long run
- "Long run" implies centuries rather than decades
- Predictive power low

2.) Affordability

- Disposable household income is a key determinant of a household's purchasing power, BUT
- Interest rate also play a crucial role for affordability

\[ K = \frac{c \times Y_t}{R_t} \left( \frac{1 - R_t^{T+1}}{1 - R_t} \right) \]

\( R_t \) … Interest rate (gross)
\( Y_t \) … Disposable household income
\( c \) … Share of income for mortgage payments
\( T \) … Repayment period in years (T=20)
\( K \) … Hypothetical borrowing volume
3.) Price-to-Rent Ratio

- Asset Pricing Model: Value of an asset equals discounted sum of expected future returns
- Due to data problems (risk premium, discount factor, ...) price-to-rent ratio is used
- Common measurement problems:
  - Transactions (prices) vs. stocks (rents)
  - Increase of quality of flats
  - High share of regulated rental contracts
  - Transfer payments (“Ablösen”)

4.) Residential Property Prices to Building Costs

- Building costs are important supply-side factor (Tobin’s q)
  \[ q = \frac{\text{Market price}}{\text{Replacement costs}} \]

- Problem:
  - Price of building lots not included
5.) Loan Bearing Capacity

- (Inverse) loan bearing capacity = loan volume / hypothetical borrowing volume
- No regional data available

6.) Housing Investment to GDP Ratio

- Housing investment to GDP ratio is indicator for inflated construction sector
- Due to increasing internalization falling shares of domestic demand components → linear trend
7.) Interest Rate Risk 1/2

- Interest rate is (exogenous) fundamental for housing market, BUT
- endogenous from a macroeconomic perspective
- What is the appropriate level given the current macroeconomic environment?
- → Taylor rule

\[ R^*_T = \bar{r} + \pi + \alpha_1 \cdot \bar{y} + \alpha_2 \cdot (\pi - \bar{\pi}) \]

\( \bar{r} \ldots \text{equilibrium real interest rate} \)
\( \pi \ldots \text{Inflation rate} \)
\( \bar{y} \ldots \text{Target inflation rate} \)
\( \bar{\pi} \ldots \text{Output gap} \)

7.) Interest Rate Risk 2/2

- If interest rates are too low → risk of interest rate increase
- To ensure comparability with other indicators, hypothetical borrowing volume is calculated for both short term and Taylor interest rate
- Indicator is ratio of both hypothetical borrowing volumes
Weighting and Aggregation

- Indicator is calculated as weighted sum of subindicators: \( I_t = \sum v_i x_i \)

- Weights are determined by principal components:

- Each indicator \( x_{i,t} \) can be expressed as linear combination of factors \( F_{j,t} \):
  \[ x_{i,t} = a_{1j} F_{1,t} + a_{2j} F_{2,t} + \ldots a_{lj} F_{l,t} + \epsilon_i \]

- 3 factors explain 85% of the variance of the data set

- Weights
  \[ v_i = a_{ij}^2 \varphi_j \]

- \( \varphi_j = \frac{\sigma_j^2}{\sum_{j=1}^{l} \sigma_j^2} \) ... Share of variance explained by factor \( j \)

- (Factor \( j \) is factor with highest loading for variable \( i \)) \( j = \arg \max \left( \text{abs}(a_{ij}) \right) \)

---

Main Results

- Indicator shows deviation of residential property prices from fundamental price in %
- Vienna: Increasing overvaluation (currently 23%)
- Austria: Prices in line with fundamentals
- Results are in line with findings by the Deutsche Bundesbank (2013), which identified overvaluations of 5% to 10% in urban housing markets and up to 20% in attractive major cities.
House Price Developments in Euro Area Countries

- Countries with strong corrections
- Countries with modest corrections
- Countries without corrections

Source: ECB

Misalignment Indicator for Euro Area Countries

- Countries with strong corrections
- Countries with modest corrections
- Countries without corrections

Source: ECB