CPIs, owner-occupied housing and measures of underlying inflation in monetary policy – a case study*

– Session 4 –

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All views expressed are those of the authors, not necessarily those of the ECB.
Motivation

- Current situation in the euro area of medium-term annual inflation well below 2% since mid-2013
- Current use of indicators on underlying inflation in the European Central Bank (ECB):
  *What do other central banks do?*
- Current experimental phase on provision of acquisition indices on Owner-Occupied Housing (OOH) in the European Union (EU):
  *What are the properties? What route to go? Are there alternatives?*
European Central Bank

Monetary policy

• Price stability (Treaty on the Functioning of the European Union)

• Quantitative definition:
  • Below, but close to 2% over the medium-term
  • Measured by all-items Harmonised Index of Consumer Prices (HICP) for the euro area, which does not include owner-occupied housing (OOH)
Owner-occupied housing (OOH)

- Not yet included in HICP
- **Experimental**: net acquisition approach (≈9% in 2015 in the euro area HICP)
- Quarterly indices, reported after three months
- Land prices included → asset prices
- Experimental data
- Report by European Commission to European Council and Parliament by end-2018
Additional statistics and measures of underlying inflation

- HICPs at constant tax rates, HICPs administered prices
- HICPs excluding (unprocessed) food and energy
- Trimmed means, weighted median
- Super-core inflation (economic slack)
- Dynamic factor model (input: breakdowns by countries and by classification)
- Producer, import and export price indices
- Surveys on inflation perception and expectations, Purchasing Manager Indices, residential property price indicators
Bank of Canada

Monetary policy

• “Inflation-control target”
• Contribution to flexible exchange rate regime
• Quantification of inflation-control target:
  • 2%, between 1% and 3%
  • Measured by all-items consumer price index (includes OOH)
Owner-occupied housing (OOH)

- User cost approach
- Mortgage interest costs: distribution of vintages (25 years)
- Potential capital gains/losses and opportunity costs excluded
- Repair and depreciation (imputation) included
  → “Accounting” concept (A. Baldwin)
Additional statistics and measures of underlying inflation

- Preferred measures of underlying inflation (since November 2016), derived from 55 categories of CPI excluding indirect taxes
  - “CPI-common”: factor-model-based index
  - “CPI-trim”: 20% trimmed mean of seasonally adjusted month-on-month changes
  - “CPI-median”
- Another CPI measure: “CPI-W”, i.e. weighted inversely with respect to volatility
- In addition: Implicit deflators, commodity price indices
Bank of England

Monetary policy

• Inflation target (set by government)
• Quantification of inflation target: year-on-year growth rate of 2%
• Referring to all-items consumer price index (before 2003: Retail Price Index excluding mortgage interest payments = RPIX)
• Quarterly “Inflation Report”
• Public letter by Governor to Chancellor of the Exchequer if actual inflation deviates by more than one percentage point from target
Owner-occupied housing (OOH)

- Not included in CPI (=HICP), included in Retail Price Index (RPI) and in CPIH
- RPI: user cost approach
- Office for National Statistics: quarterly report on three approaches to OOH
- Mortgage interest payments: new contracts, distribution of vintages of existing contracts (23 years)
- Potential capital gains/losses and opportunity costs excluded
- Depreciation included, derived from house price developments (smoothed index)
Additional statistics and measures of underlying inflation

• Core inflation: CPI excluding food and energy
• “Inflation Report”
  • Current economic development
  • Drivers of inflation from supply and demand side
• Outlook
• Includes section on “Housing”
Bank of Japan

Monetary policy

• Targets price stability
• Quantification of price stability: year-on-year growth rate of 2% of all-items consumer price index (includes OOH)
• Control of short-term and long-term interest rates through market operations: “Yield curve control“
Owner-occupied housing (OOH)

- Rental equivalence approach → imputed rent
- Weights by strata according to structure and size, derived from “National Survey of Family Income and Expenditure”
- Prices: application of actual rents by stratum
Additional statistics and measures of underlying inflation

- Core inflation:
  - CPI excluding fresh food and CPI excluding fresh food and energy
  - CPI excluding imputed rent
  - Trimmed mean (10%), weighted median, diffusion index
- Producer price indices, deflators
Central Bank of Iceland

Monetary policy

• Contribution to price stability
• Quantification of price stability: year-on-year growth rate of 2.5% of all-items consumer price index (includes OOH)
• Report by Central Bank to government if actual inflation deviates by more than one and a half percentage point from target
• **Owner-occupied housing (OOH)**
  • User cost approach
  • “Simple” version: annuity
  • Real interest rate, calculated by referring to the CPI
  • Excludes potential capital gains/losses
  • Includes opportunity costs, referring to a long-term rate of return required by pension funds
Additional statistics and measures of underlying inflation

- Four exclusion measures provided by Statistics Iceland
  - “Core Index 1” excludes vegetables, fruit, other agricultural products and petrol
  - “Core Index 2” disregards also prices for public services
  - “Core Index 3” excludes also real mortgage interest
  - “Core Index 4” disregards also market prices for housing
- Dynamic factor model
Central Bank of the United States: Federal Reserve System (Fed)

Monetary policy

• Mandate: price stability and maximum sustainable employment

• Price stability: year-on-year growth rate of 2% of price index for personal consumption expenditures (includes OOH)
  • Broader coverage than CPI, covering also employer-provided health insurance and NPISHs
  • Fisher index
Owner-occupied housing (OOH)

- Rental equivalence approach
- In price index for personal consumption expenditures ($\approx 13\%$) and in CPI ($\approx 24\%$)
- Price index for personal consumption expenditures: per-unit approach
- CPI: derived from data about actual rent obtained by rotating survey
Additional statistics and measures of underlying inflation

- Price index for personal consumption expenditures excluding food and energy
- Median and 16% trimmed-mean
- The New York Fed Staff Underlying Inflation Gauge (UIG)
  - Dynamic factor model
  - Based on a broad range of economic and financial variables
- Producer, import and export price indices
Reserve Bank of Australia

Monetary policy

• Objectives:
  • Price stability
  • Full employment
  • Contribution to economic welfare
• Inflation target:
  Year-on-year growth rate between 2% and 3% over the medium term, measured by all-items CPI; CPI is a quarterly index (includes OOH)
Owner-occupied housing (OOH)

• Net acquisition approach
  • Houses
    • Project homes \((i.e. \text{ prices paid for construction of dwellings on purchasers’ block of land})\)
  • Survey of construction companies
• Apartments
  • Input approach
  • Construction price indices
• Land price excluded
Additional statistics and measures of underlying inflation

- Producer price indices, import and export price indices
- Treasury's underlying rate
  - CPI excluding price indices which are highly volatile, or influenced by seasonal or policy factors
- Around 49% of the basket
- Trimmed mean, weighted median
Monetary policy

- Inflation targeting
- 1%-3% on average over the medium term, with a focus on 2% of consumer price index
- CPI is a quarterly index (includes OOH)
- Range rather than single value → more flexibility
Owner-occupied housing (OOH)

- Net acquisition approach
- Standard-plan houses
- Survey of construction companies
- Land price excluded
Additional statistics and measures of underlying inflation

- CPI tradable and non-tradable components
- CPI excluding food, petrol and government charges
- Dynamic factor model
- Trimmed mean (10%), weighted median, double-weighted median (additional weighting according to inverse volatility)
- Exponentially smoothed inflation
- Asset prices: residential and commercial properties, land prices
Central Bank of Sweden: Riksbank

Monetary policy

• Objective: maintain price stability
• Inflation around 2% year on year
• “CPIF”
  • Consumer price index with fixed interest rate
  • Cost-of-living index: Walsh index, becomes final after two years
• User cost approach to OOH
Owner-occupied housing (OOH)

- User cost approach
- For one- and two dwelling houses and for tenant-owned apartments
- Capital-stock index, referring to a factor price index
- Interest rate index
- Potential capital gains/losses excluded
- Opportunity costs included
Additional statistics and measures of underlying inflation

- CPIF excluding energy, CPIF with constant tax rates
- Trimmed mean “TRIM85”, weighted median
- Weighted according to inverse volatility according to last 24 months: “UND24”
- Producer price indices, import and export price indices
Most central banks refer to “headline” CPI in their quantification of price stability except Sweden and the USA:

- Headline CPI well known, broad coverage
- Regardless of whether or not owner-occupied housing (OOH) is included
- Revisions: USA
- User cost approaches: changes of parameters

OOH in inflation target: If user cost approach, mortgage interest component ...

- Excluded formerly in the UK: RPIX
- Interest rate kept constant in Sweden
- Not excluded in Canada and Iceland
Findings (2)

- **Derived indices**
  - may exclude OOH components
  - but not the USA’s rental equivalence approach → *no high volatility*
  - also not for Australia’s and New Zealand’s net acquisition approaches
  - refer to project or standard houses or construction cost indices → *no high volatility*
  - excluding land prices → *no asset prices*