PRICE INDEX THEORY

Course lectures within Economic Statistics
at Stockholm University
Part 5

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Autumn 2011

Insurance: Adjustment for excess

▶ *Actuarial risk premium at excess b is*

$$r(0) \int_{b}^{\infty} (x - b)\, dF(x)$$

Rate of damages > 0

Damage distribution

▶ *If the excess is raised from b to c then the risk premium falls by*

$$r(b') \, (c - b), \qquad b \leq b' \leq c$$

Insurance: Gross vs net principle 1

    Gross premium
+ Premium supplements (yield on reserves)
– Claims
– Changes in actuarial provisions

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= Service charge (Net premium)

Insurance: Gross vs net principle 2

▶ **Gross premium**

    ↳ *Adequate for compensation index*

▶ **Service charge (Net premium)**

    ↳ *Prescribed for NA & HICP*

    ↳ *Can be used only for weights*

   ↳ *Then acceptable proxy also for compensation index*

Banking services: Delineation of coverage

► **Exclusion of FISIM (Financial Inter-mediation Services Indirectly Measured)**
  - ⇨ *Only part of price is seen*
  - ⇨ *Could give artificial index changes*

► **Currency exchange is implicitly charged**
  - ⇨ *Is FISIM by HICP rules*

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Banking services: HICP outcome
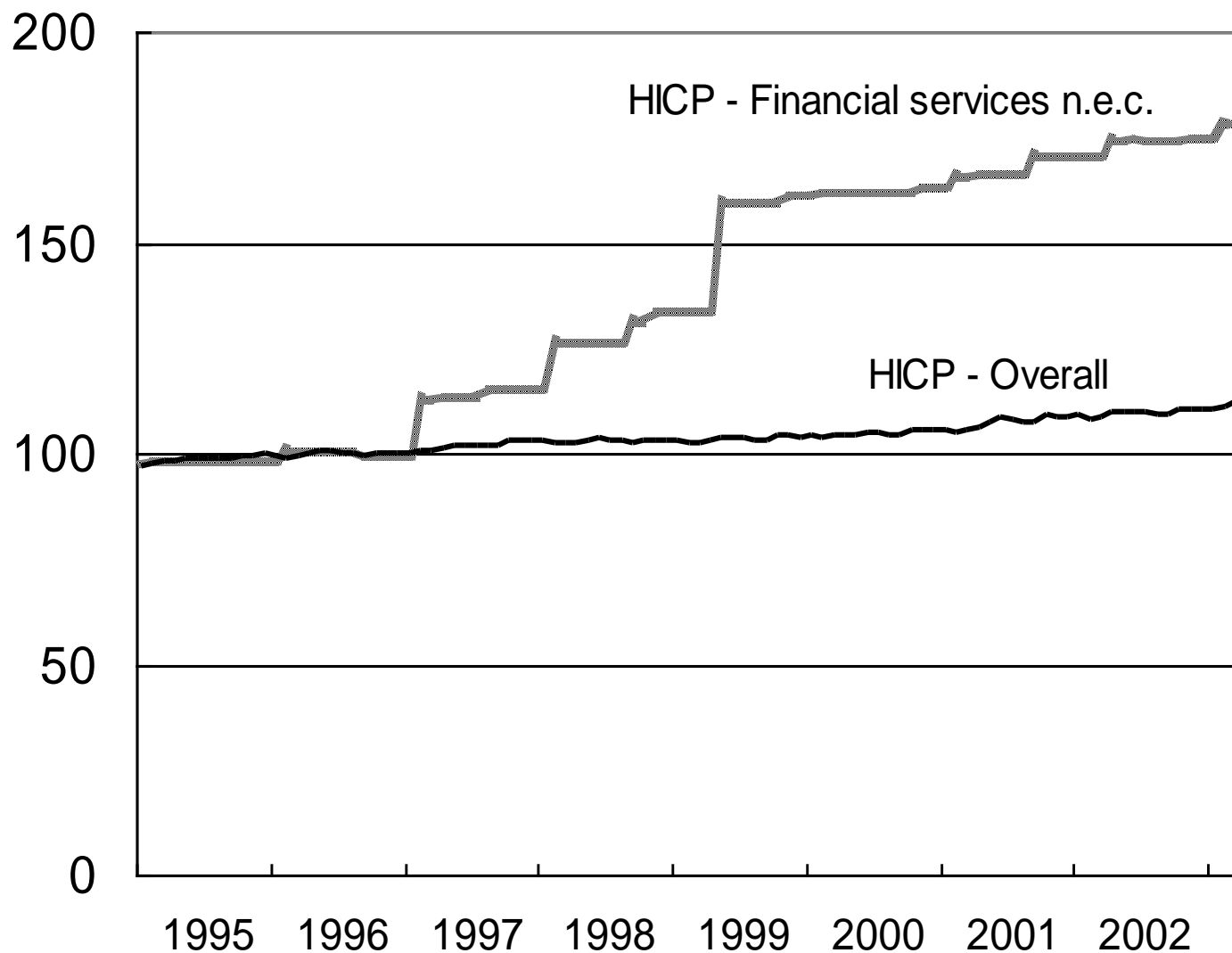
Owner Occupied Housing: Alternative approaches

- **Exclusion of capital part (the house)**

- **(Net) Aquisition Approach**
  - ↳ *"Houses like potatoes"*

- **Rental Equivalent Approach**
  - ↳ *Appealing, but depends on rents*

- **User Cost Approach**
  - ↳ *Variants: partial cost*

- **Payment Approach**

Owner Occupied Housing

Swedish CPI:
- Depreciation
- Interest cost
- Real estate tax
- Site rent
- Repairs
- Insurance
- Water, etc.
- Oil, Electricity

HICP – plan:
- Purchase of new houses

- Repairs
- Insurance
- Water, etc.
- Oil, Electricity

Interest cost

- **Interest on mortgage + equity**
  - ⮩ *On mortgage = Interest payment*
    On equity = Opportunity cost

- **Rates of interest on mortgages of different types**

- **Based on a capital equal to present owner's purchase price**

- **Interest cost deducted in underlying inflation**

Interest cost index

$$I = RS \cdot KS$$

| Interest rate index | Capital stock index |

$$RS_{01} = \frac{\sum_i w_i^{RS} \overline{R}_i^1}{\sum_i w_i^{RS} \overline{R}_i^0}$$

Average rate, mortgage type i

Depreciation

- **Loss of value due to wear etc.**

- **Weight = 1.4 % of market value**

- ***Before 1999*: Building Price Index (BPI), updated by a Factor Price Index**

- ***From 1999*: Price index for "major" repairs**

  = 0.7 × (price index for material) + 0.3 × (price index for labour)

  ↳ *A wage index, adjusted for productivity*

Re-considerations

- **How to find the true cost of having your own home?**

- *Recent CPI Commission suggested:*
  Real interest of housing, on market value of house, at interest rate assumed constant
  ⇪ *Severely criticised*

- *In Government Budget Proposal 2002:*
  Urgent to improve the computations – the CPI Board should consider the issue

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Owner occupied housing: Capital cost

Present CPI:

➡ Depreciation

➡ Interest of mortgages and capital (current market rates)

Proposal of recent CPI Commission:

➡ Depreciation

➡ Real interest of housing, rate taken constant

    ↳ *Cost prop. to market value of house*

A general expression for the capital cost

Market price

Depreciation rate

$$C_t = P_t \left(r_t + d_t - \pi_t \right)$$

Nominal interest rate

House inflation rate

Commission Index Proposal

$$\frac{C_{t+1}}{C_t} = \frac{P_{t+1}\left(r_t + d_t - \pi_t\right)}{P_t\left(r_t + d_t - \pi_t\right)} = \frac{P_{t+1}}{P_t}$$

Dynamic approach to OOH: Consumer's utility

Model by A. Klevmarken – consumer's utlility is a function of:

➢ **Consumption of other products**

➢ **Housing in rented dwelling**

➢ **Owned dwelling at period start**

➢ **Owned dwelling at period end**

➢ **Financial assets & debts, per. end**

Dynamic approach to OOH: Consumer's budget

Income components:
- ➢ **Labour income**
- ➢ **Capital income**
- ➢ **Net savings withdrawals**
- ➢ **Net new loans**

Income is to cover:
- ➢ **Cost for other consumption (than housing)**
- ➢ **Cost for rents**
- ➢ **Cost for repairs / maintenance**
- ➢ **Cost for loan interest**
- ➢ **Cost for new construction, extensions etc.**

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Swedish core inflation (underlying inflation)

► **Alternative measures of inflation for use in monetary policy**

► **General idea: To capture price change except changes of temporary/transitional or exogenous kind**

► *KPIX / CPIX* **measure of core inflation – defined by Sveriges Riksbank and produced monthly by Statistics Sweden**

Core inflation measures

- *KPIX / CPIX (formerly called UND1X)*
  - shows price change *except* changes in:
    Owner occupiers' interest cost
    Indirect taxes & subsidies

- *UNDINHX (recently discontinued)*
  - shows price change *except* changes in:
    Owner occupiers' interest cost
    Indirect taxes & subsidies
    Prices of mainly imported products

Index of a tax *j*

$$I{S}_{j}^{1\,1:1} = \frac{t_{j}^{1} \times (1 + K^{1})}{t_{j}^{0} \times (1 + K^{0})}$$

Tax rate as tax per unit

VAT rate

▶ **Used for Net Price Index (NPI) and CPIX**

Year-to-year link of CPIX

$$\text{CPIX}_{2003}^{2004} = \text{CPI}_{2003;\,\text{excl interest cost}}^{2004} -$$

$$- \sum_{k \in T \& S} W_k^{2004} \times \Delta I_{2003;\,k}^{2004}$$

Taxes & Subsidies

Change in index of tax/subsidy k

Walsh weight of a tax *k*

Tax revenues

$$W_k^{2004} = \frac{\sqrt{U_k^{2003} \times U_k^{2004} / I_{2003,k}^{2004}}}{\sum_{g \neq \text{i.c.}} \sqrt{U_g^{2003} \times U_g^{2004} / \text{CPI}_{2003,g}^{2004}}}$$

Year-to-month link of CPIX

$$\text{CPIX}^{2006,\text{May}}_{2004} = \text{CPI}^{2006,\text{May}}_{2004;\text{excl.i.c.}} -$$

$$- \sum_{k \in T\&S} W_k^{2006} \times \Delta I^{2006,\text{May}}_{2004;k}$$