Price Persistence of Services in the Swedish CPI

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**Motive for study**

**Background**
- Eurostat workshop 2015 - the issue of non-changing prices raised
- Sweden 2017 – pre-study at Swedish CPI Board meeting
  - The Riksbank showed specific interest
- Resulted in this joint work – micro data supporting macro analysis
- The topic has been addressed in other countries
  - This is the pioneer study with Swedish price data
- The topic can be wider, e.g.: Boskin Commission in 1996
Swedish inflation in recent years

- Inflation slowed as an effect of the financial crisis
- Inflation declined further in 2011 and reached record lows in 2014
- Since then, Swedish economy shows high growth and rising employment
- Inflation is now back in line again with the Riksbank target (2%)
- Components of inflation important analysis subject for the Riksbank (the transmission mechanism for monetary policy to inflation)
- Main division into Goods and Services
Duration example – prices on hairdressing services

**Hairdresser 1**

- **Duration = 11**

  - Dec 19
  - Jan 19
  - Feb 19
  - Mar 19
  - Apr 19
  - May 19
  - Jun 19
  - Jul 19
  - Aug 19
  - Sep 19
  - Oct 19
  - Nov 19
  - Dec 21

**Hairdresser 2**

- **Duration = 3**

  - Dec 19
  - Jan 19
  - Feb 19
  - Mar 19
  - Apr 21
  - May 21
  - Jun 21
  - Jul 21
  - Aug 22
  - Sep 22
  - Oct 22
  - Nov 22
  - Dec 23
Some methodology

- Price censoring and spot prices
- Treatment of temporary discounts
- Directly computed duration
- Indirectly computed *implied* duration
- Non-duration
- **Price censoring and spot prices**
  The price lifespan can be denoted as the price trajectory

  The trajectory is subject to a measurement problem: prices may, and most often do, exist both before and after the observation period in the CPI

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- **Treatment of temporary discounts**
  Prices sometimes make temporary level shifts and then return to previous levels, i.e. in campaigns. How to account for them?
- Non-duration

Data divides into either Changes or Non-changes. Each Change may be followed by a Non-change or a Change again. Sequence of Changes spawns no duration = noise.

Noise is relevant for two reasons:
1) It prevails how much data can potentially be used in the analysis.
2) It suggests the stability of prices (in general) in the subject of analysis.

The Noise-measure applies to all data, i.e. censored/non-censored.
Method distinction by purpose

- **Directly computed duration**
  The time that a product offer’s price remains non-changed since previous observation. Also referred to as a *Price Spell*.
  Ideal measure – but flawed with censoring bias

- **Indirectly computed implied duration**
  The frequency of changes i.e. the change rate for the complete subset, denoted as $f_i$, and the duration $D = \frac{1}{f_i}$. 
Duration for goods

- Mostly traditional price collection
- Partly "bestseller list"-method
- Partly scanner data

Implied mean duration, months

- Textiles, yarns and sewing mat.
- Furniture, carpets and lighting
- Cars and spare parts for cars
- Other goods, excl. maint.
- Gold goods
- Toys, games and hobbies
- Newspapers and magazines
- Clothing & footwear
- Household appliances
- Flowers, etc.
- Home electronics
- Household utensils
- Books
- Medicine
- Personal care, goods
- Health and medical goods
- Household items
- Other recreational items
- Other recreational items
Duration for goods

- Weighted average duration for goods: 5.3 months
- Weighted average duration for other goods, excl. maint.: 1.3 months
- Weighted average duration for toys, games, and hobbies: 1.0 month
Duration for services (non-administered)

- Weighted average: 9.9 months
Duration for services (non-administered)

Flexible pricing is used in travel, accommodation and insurance sector
Administered services: prices set or highly regulated by government or local authorities

Duration for services

- Postal services, TV-licence
- Water, sewage, cleaning, chimney-sweeping
- Rentals for housing

Implied mean duration (months)
Higher competition means lower duration?

The bar chart shows the implied mean duration (months) for different industries, with darker bars indicating higher competition and lower duration. The line graph represents the share of companies not perceiving high competition.

The formula for the implied mean duration is \( (1 - x) \), where \( x \) is the share of companies that perceive high or very high competition.
Implied mean duration of services, by country

Comparability issues 1: treatment of discounts

Average 19.2 months

Temporary discounts filtered out

Average 13.7 months

Temporary discounts included
Implied mean duration of services, by country

Comparability issues 2: basket composition

Excluding rentals etc

Temporary discounts filtered out

Temporary discounts included
Implied mean duration of services, by country

Comparability issues 3: time period

Later time period than all other studies

Only two years

Temporary discounts filtered out

Temporary discounts included
Conclusions

- Duration longer for services than for goods
  - in line with studies from other countries

- Similar results found in UK and US
  - Some comparability issues however since methodologies and the analyzed time periods differ

- Indication of shorter duration in competitive sectors