# Estimation of private consumption functions for Switzerland

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# The data

The data come from the Swiss national accounts, they are available for 12 consumption functions in the COICOP classification over the period 1980-2005.

The definition of the private consumption is the national one, it means that the expenditure from resident abroad are included in the function. This is also the case for the price index which takes

into consideration both the evolution of prices in Switzerland and outside of the country. For the last one the Statistical office considers the price index from the 12 countries the most visited by resident in Switzerland.

For the estimation we had to aggregate these functions which are the following

1. Food, beverage, tobacco
2. Clothing and footwear
3. Housing, water, electricity, gas
4. Furnishing, household equipment
5. Health
6. Transport and communication
7. Leisure, culture and education
8. Other goods and services

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Stability in the consumption for food and beverage
Increase in the consumption for housing, water, electricity and gas and also for Health
Decline in the consumption of Clothing and furnishing

The systems of consumption functions

## 1. Linear expenditure system

$$d_i = p_i a_i + t_i \cdot trend + b_i y - b_i \sum_{i=1}^{n} p_i a_i$$

# 2. Almost ideal demand system

$$w_i = a_i + \sum \gamma_{ij} \cdot Log(p_j) + b_i \cdot Log\left(\frac{y}{P}\right)$$

3. ## Perhaps adequate demand system

$$q_{it} = \left[ a_i^*(t) + b_i \cdot \left(\frac{y}{P}\right) \right] \prod_{k=1}^{n} p_k^{\lambda_{ik}S_k}$$

We used the TSP software for the estimations.

# Results

Mean values

Income elasticities

$$\eta < 0 \text{ inferior goods}$$
$$0 < \eta < 1 \text{ normal good}$$
$$\eta > 1 \text{ superior good}$$

| Consumption functions | LES | AIDS | PADS |
|---|---|---|---|
| Food, beverage, tobacco | Normal | Normal | Normal |
| Clothing and footwear | Luxe | Normal | Normal |
| Housing, water, electricity, gas | Normal | Normal | Normal |
| Furnishing, household equipment | Luxe | Luxe | Normal |
| Health | Normal | Normal | Inferior goods |
| Transport and communication | Luxe | Luxe | Luxe |
| Leisure, culture and education | Luxe | Luxe | Luxe |
| Other goods and services | Luxe | Luxe | Luxe |

# Compensated price elasticities

# LES

| | E_PP1 | E_PP2 | E_PP3 | E_PP4 | E_PP5 | E_PP6 | E_PP7 | E_PP8 |
|---|---|---|---|---|---|---|---|---|
| 1 | -0.2624 | 0.0685 | 0.0152 | 0.0620 | 0.0199 | 0.0744 | 0.0682 | 0.0473 |
| 2 | 0.0343 | -0.5795 | 0.0170 | 0.0696 | 0.0224 | 0.0835 | 0.0766 | 0.0530 |
| 3 | 0.0170 | 0.0380 | -0.1370 | 0.0344 | 0.0110 | 0.0413 | 0.0378 | 0.0262 |
| 4 | 0.0296 | 0.0663 | 0.0147 | -0.5344 | 0.0193 | 0.0720 | 0.0660 | 0.0457 |
| 5 | 0.0084 | 0.0188 | 0.0042 | 0.0170 | -0.1854 | 0.0204 | 0.0187 | 0.0129 |
| 6 | 0.0455 | 0.1019 | 0.0226 | 0.0922 | 0.0296 | -0.6022 | 0.1014 | 0.0703 |
| 7 | 0.0313 | 0.0702 | 0.0156 | 0.0636 | 0.0204 | 0.0763 | -0.5836 | 0.0484 |
| 8 | 0.0964 | 0.2159 | 0.0478 | 0.1955 | 0.0628 | 0.2345 | 0.2149 | -0.3039 |

# All direct elasticities are < 0
# All crossed elasticities are > 0
# What is expected with the LES

# AIDS

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.0667 | 0.2357 | -0.0444 | 0.0648 | 0.2113 | -0.0287 | -0.1563 | -0.3429 |
| 2 | 0.6698 | -0.5344 | -0.3136 | 0.0875 | 0.4421 | -0.4127 | 0.5954 | -0.5225 |
| 3 | -0.0324 | -0.0807 | 0.0890 | -0.2735 | 0.1153 | -0.0593 | 0.0777 | 0.1726 |
| 4 | 0.1773 | 0.0842 | -1.0240 | 0.3995 | -0.0829 | 0.6028 | 0.4459 | -0.5859 |
| 5 | 0.2851 | 0.2099 | 0.2127 | -0.0409 | -1.3190 | -0.2253 | 0.7198 | 0.1536 |
| 6 | -0.0452 | -0.2288 | -0.1279 | 0.3470 | -0.2630 | -0.3276 | 0.7885 | -0.1186 |
| 7 | -0.2858 | 0.3832 | 0.1945 | 0.2981 | 0.9759 | 0.9156 | -3.6145 | 1.1702 |
| 8 | -0.2612 | -0.1427 | 0.1909 | -0.1679 | 0.0998 | -0.0637 | 0.4901 | -0.1207 |

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | + | + | - | + | + | - | - | - |
| 2 | + | - | - | + | + | - | + | - |
| 3 | - | - | + | - | + | - | + | + |
| 4 | + | + | - | + | - | + | + | - |
| 5 | + | + | + | - | - | - | + | + |
| 6 | - | - | - | + | - | - | + | - |
| 7 | - | + | + | + | + | + | - | + |
| 8 | - | - | + | - | + | - | + | - |

Three direct compensated price elasticities are > 0, for food consumption, for housing, water and electricity and for Furnishing.
PADS

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| **1** | 0.1567 | 0.7972 | -0.0852 | 0.4393 | 0.0978 | -0.1105 | 0.0031 | -0.3242 |
| **2** | 0.2444 | -0.5857 | -0.0509 | -0.1072 | 0.0674 | -0.2661 | 0.0828 | 0.0853 |
| **3** | -0.1185 | -0.2283 | 0.0031 | -0.5699 | 0.3897 | 0.1760 | 0.1933 | -0.2065 |
| **4** | 0.1590 | -0.1103 | -0.1303 | -0.2737 | -0.1257 | 0.0185 | 0.3917 | 0.0160 |
| **5** | 0.0951 | 0.2479 | 0.2512 | -0.3183 | -1.1783 | -0.3549 | 0.5461 | 0.4545 |
| **6** | -0.0540 | -0.6147 | 0.0559 | 0.0626 | -0.2964 | -0.5506 | 0.8097 | 0.2100 |
| **7** | 0.0340 | 0.2014 | 0.0463 | 0.7761 | 0.3042 | 0.7036 | -2.4812 | 0.2168 |
| **8** | -0.4027 | 0.3889 | -0.1946 | 0.0679 | 0.5809 | 0.3711 | 0.4369 | -0.4215 |

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| **1** | + | + | - | + | + | - | + | - |
| **2** | + | - | - | - | + | - | + | + |
| **3** | - | - | + | - | + | + | + | - |
| **4** | + | - | - | - | - | + | + | + |
| **5** | + | + | + | - | - | - | + | + |
| **6** | - | - | + | + | - | - | + | + |
| **7** | + | + | + | + | + | + | - | + |
| **8** | - | + | - | + | + | + | + | - |

Two direct elasticities
are $> 0$
For food, beverage and
tobacco and for
Housing, water and
electricity.

Concerning the
characteristics of the
goods in term of
substitutability or

complementarity the results are the same except for the links between :

functions 1 and 7

functions 2 and 4

functions 3 and 6,

as well as for the function 8 with almost all the other functions except 1, 5 and 7.

# Conclusion

The results are not very satisfactory neither for the AIDS nor for the PADS.
They give contradictory classification for the goods in term of complementarity or subsituability.

Some compensated direct price elasticities are greater than zero

We wait on the new series from the Swiss statistical office which will be more disaggregated.