

Changing Baskets in the CPI. Jan Walschots, Statistics Netherlands

In the HICP 1996-2018 there have been 23 baskets. In this paper we investigate how much impact there is on long term inflation from the changes in the baskets. We will show that more recent baskets have lower inflation. Is this true or is it some way mismeasurement? If it is true, then the question is whether Central Banks should lower their inflation targets. An alternative is that the trend towards lower inflation is a result of increasing impact of Quality Adjustment. Then the question is whether price statisticians apply too much quality adjustments

HICP 1996-2018: Chained index with 23 baskets, and 23 weighting schemes. What would be the HICP if we would use any of the 23 weighting schemes during the full period.

Data

We do not have time series at article level of the 23 baskets.
We do have time series at the level of COICOP Divisions, Groups and Classes.

Breaks in series:

- Extension of HICP coverage between 1996 and 2001
- Change in health insurance system 2006
- Change in basic source for weights HBS 1996-2002, National Accounts from 2003
- National Accounts revisions → No HICP weights revisions
- Observation threshold weights 1 per 1000

Taking limitations into account we have comparable series:

- For the years 2003-2018
- For all COICOP Divisions,
- for all Groups, except for Divisions 06 and 10; use division data
- for 67 Classes; other Groups are not subdivided or data were not observed in all years.

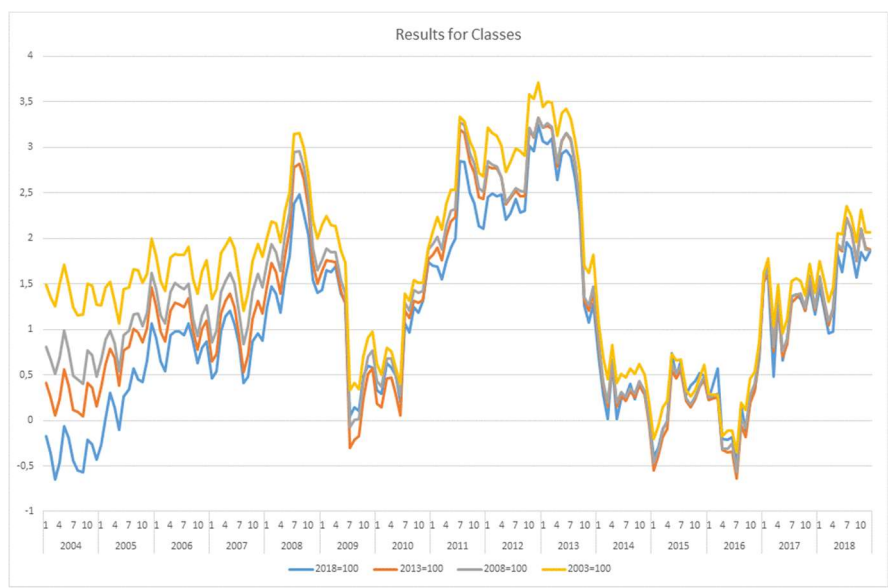
Results

Overall HICP development 2003-2018 using 16 baskets at three levels of detail

Weighting Scheme	Index change			Average annual rate		
	COICOP Divisions	COICOP Groups	COICOP Classes	COICOP Divisions	COICOP Groups	COICOP Classes
2018=100	21,44	19,14	16,79	1,30	1,17	1,04
2017=100	21,71	19,45	17,24	1,32	1,19	1,07
2016=100	22,04	19,99	17,68	1,34	1,22	1,09
2015=100	22,17	20,52	18,41	1,34	1,25	1,13
2014=100	22,46	20,80	19,61	1,36	1,27	1,20
2013=100	22,55	20,73	19,51	1,37	1,26	1,20
2012=100	22,75	21,02	19,93	1,38	1,28	1,22
2011=100	22,78	21,37	20,63	1,38	1,30	1,26
2010=100	22,50	21,19	20,61	1,36	1,29	1,26
2009=100	22,60	21,37	20,86	1,37	1,30	1,27
2008=100	22,80	22,03	21,76	1,38	1,34	1,32
2007=100	22,94	22,77	22,89	1,39	1,38	1,38
2006=100	25,22	25,96	26,26	1,51	1,55	1,57
2005=100	25,65	26,51	27,10	1,53	1,58	1,61
2004=100	25,65	26,51	27,10	1,53	1,58	1,61
2003=100	25,65	26,51	27,10	1,53	1,58	1,61
Chained index	23,88	23,88	23,88	1,44	1,44	1,44

1. **Newer baskets show lower inflation**
2. **Using more detail gives larger differences**
3. **An average annual rate that goes down from 1.61% to 1.04% means 0.1%-point less inflation every 3 years!**
4. **We suspect that results at article level would have shown even larger differences.**

Time series of inflation for weights schemes 2003, 2008, 2013 and 2018



Can we determine what are the reasons behind these developments?

A relative consumption volume index is compiled from:

- Total expenditures following inflation gives time series of expenditures,
- Expenditures per COICOP category per year determined by weights,
- Deflated expenditures per COICOP category per determine volume.

Some results of consumption volume for 2018, compared to 2003 =100

CP00 - All-items HICP	100,0	CP091 - Audio-visual, photographic and inf	271,0
CP08 - Communications	183,6	CP0911 - Equipment for the reception, recc	242,2
CP022 - Tobacco	53,7	CP0912 - Photographic and cinematograph	578,6
CP095 - Newspapers, books and stationery	54,5	CP0913 - Information processing equipmen	1194,1

Which COICOP categories have most influence on results?

A. Measured by "Contribution"

COICOP classes	Contribution to Price index change 2003 - 2018		
	2018=100	2003=100	reduction
CP022 - Tobacco	1,28	2,51	-1,23
CP06 - Health	1,04	2,17	-1,13
CP082_083 - Telephone and telefax equipment and services	-2,29	-1,31	-0,98
CP0911 - Equipment for the reception, recording and reproduction of sound and picture	-1,53	-0,72	-0,81
CP0912 - Photographic and cinematographic equipment and optical instruments	-0,78	-0,13	-0,64
CP0913 - Information processing equipment	-2,72	-0,21	-2,50
CP0952 - Newspapers and periodicals	0,23	0,79	-0,57
CP1253 - Insurance connected with health	0,36	1,01	-0,65
CP127 - Other services n.e.c.	0,73	1,27	-0,54
All other classes, total	20,48	21,73	-1,25
Total computed by Classes	16,79	27,10	-10,31

B. Measured by "Impact"

	HICP increase 2003-2018			Impact		
	Basket 2003	Basket 2018	Difference	Basket 2003	Basket 2018	Difference
Total	27,10	16,79	-10,31			
Total excluding						
excl COICOP01	28,41	16,66	-11,75	-1,32	0,13	1,44
excl COICOP02	25,20	15,62	-9,58	1,90	1,17	-0,73
excl COICOP03	29,36	18,68	-10,68	-2,27	-1,90	0,37
excl COICOP04	24,38	12,89	-11,49	2,71	3,90	1,19
excl COICOP05	28,75	17,44	-11,30	-1,65	-0,65	0,99
excl COICOP06	26,15	16,11	-10,04	0,95	0,68	-0,27
excl COICOP07	25,64	14,07	-11,57	1,46	2,72	1,27
excl COICOP08	29,34	20,30	-9,04	-2,24	-3,51	-1,27
excl COICOP09	28,80	23,01	-5,79	-1,70	-6,22	-4,52
excl COICOP10	27,21	16,86	-10,35	-0,12	-0,07	0,05
excl COICOP11	25,73	14,49	-11,24	1,37	2,30	0,93
excl COICOP12	25,97	15,61	-10,36	1,13	1,18	0,05
excl COICOP091	29,06	23,73	-5,33	-1,96	-6,94	-4,97

The reduction of inflation occurs most in COICOP categories where we apply most Quality adjustment, which also show gigantic volume growth.

We simulated "less Quality adjustment" in COICOP 091 by increasing the inflation each year by 1%.

Originally published results	2003			2018			change		
	Price index	Weight	Volume index	Price index	Weight	Volume index	in %	in %	in %
CP0911 - Equipment for the reception, recording and reproduction of sound and picture	305,0	10,79	100	88,6	6,13	242,2	-70,9	-43,2	139,2
CP0912 - Photographic and cinematographic equipment and optical instruments	396,1	1,94	100	97,5	2,23	578,6	-75,4	14,9	183,1
CP0913 - Information processing equipment	360,2	3,41	100	91,3	8,33	1194,1	-74,7	144,3	733,8
CP0914 - Recording media	151,9	7,69	100	98,3	2,95	73,4	-35,3	-61,6	-78,5
CP0915 - Repair of audio-visual, photographic and information processing equipment	64,5	0,31	100	108,1	0,34	81,1	67,5	9,7	16,6

results under the assumption of 1% less QA and 1% more price change per year	2003			2018			change		
	Price index	Weight	Volume index	Price index	Weight	Volume index	in %	in %	in %
CP0911 - Equipment for the reception, recording and reproduction of sound and picture	270,7	10,79	100	91,3	6,13	208,6	-66,3	-43,2	139,2
CP0912 - Photographic and cinematographic equipment and optical instruments	351,5	1,94	100	100,4	2,23	498,4	-71,4	14,9	183,1
CP0913 - Information processing equipment	319,6	3,41	100	94,0	8,33	1028,6	-70,6	144,3	733,8
CP0914 - Recording media	134,8	7,69	100	101,3	2,95	63,2	-24,8	-61,6	-71,0
CP0915 - Repair of audio-visual, photographic and information processing equipment	57,3	0,31	100	111,3	0,34	69,9	94,4	9,7	12,6

This small change in data reduced the long term effect on inflation from -10.3% to -9.3%

CONCLUSION:

- Either inflation is going down and is there a need for accepting that, or
- Price statisticians are applying too much quality adjustments.