Macro analysis of the Swedish HICP

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Background and purpose of this analysis

Once a year a report on performed quality adjustment is presented by Statistics Sweden, SCB, for the Consumer Price Index Board. The analysis highlights the implicit quality index, IQI, and the result is discussed by the board, questioning if any of the applied methods could be considered inappropriate.

This macro analysis takes as a starting point a comparison of HICPs for NSIs of neighbouring countries. I do not explain the observed differences but point them out for SCB. Chosen principles and methodologies in

- population delimitation,
- sampling,
- substitution (when and to what),
- management of seasonal variations that are primarily due to sales and
- quality adjustments,

inevitably creates differences in outcome. Sampling of selling points, product offers and occasions (weeks) causes variance. Bias is, however, more harmful for users of HICP.

A similar analysis was made by Oskar Tysklind (2020), the Swedish Riksbank, in https://www.riksbank.se/globalassets/media/rapporter/staff-memo/svenska/2020/kvalitetsjusteringar-och-internationella-prisjamforelser.pdf : *Google translate:"* It can be seen that the price development of the product groups that are quality adjusted in the consumer price statistics differs greatly between different countries in Europe. Since it is often approximately the same products that are sold in all European countries and that they can easily be traded between countries, it can be difficult to understand these differences. --- The average contribution of these groups to the measured inflation rate between 2000 and 2018 differs by over half a percentage point between the countries with the slowest index development for these products, including Sweden, and the countries where these indices have developed the fastest. The slower price development in Sweden should also be seen in the light of the fact that the Swedish Krona has weakened by about 15 percent against the Euro during the period. ".

[1] This work mainly present statistics based on data available in Eurostat database. The choice of tables and diagrams, levels of product aggregation and countries to be compared represent the author's views and does not necessarily represent any positions of Statistics Sweden or its staff. No effort is laid on explaining differences but presenting them as a start for further evaluation. The author is affiliated to Statistics Sweden as an independent expert of the Consumer Price Index Board, but this work is a production by the author of his own. The analysis includes many tables and only with the use of a spread-sheet software there has been a great risk of mistakes. Errors can regretfully remain. The paper was presented for the Consumer Price Index Board 2023-05-23.

The Swedish (SEK), Norwegian (NOK) and Danish Krona (DKK) vs. EUR

From 2015 to 2021 the Swedish and Norwegian prices for one Euro have increased on the order of magnitude 13%. This can be an explanation in analysis of index levels.

Table 1 Annual average exchange rates vs EUR 2015 – 2022

Year	SEK vs EUR	NOK vs EUR	DKK vs EUR
2015	9,3535	8,9530	7,4587
2016	9,4689	9,2899	7,4453
2017	9,6351	9,3271	7,4386
2018	10,2583	9,5962	7,4532
2019	10,5891	9,8527	7,4661
2020	10,4848	10,7207	7,4543
2021	10,1465	10,1648	7,4370
2022	10,6296	10,1040	7,4396
2015 - 2021	+13,6%	+12,9%	-0,3%

Eurostat database

HICP for COICOP product groups are available in Eurostat database. I have analysed the following 13 countries plus the Euro-area. The Euro-area consists of Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Portugal, Slovakia, Slovenia and Spain.

Table 2 The average HICP-index 2021 (2015 = 100)

Country	Index
Switzerland	101,0
Denmark	**104,9**
Finland	**106,1**
Spain	107,0
France	107,7
Euro area - 19 countries	107,8
Germany	109,2
Luxembourg	109,6
Netherlands	110,0
Sweden	**110,5**
Austria	111,5
Belgium	111,7
Estonia	114,7
Norway	**117,2**

Short on price index methods

Information on statistical processes in the Nordic countries presented in this chapter is essentially taken from Reference Metadata in Euro-SDMX Metadata Structure (ESMS), but I have shortened the text very much.

Population demarcation

Manual collection of data was a resource-demanding task. Most likely a geographical demarcation is applied. SCB excluded areas far from any price collector insofar the aggregate sum of trade was at most 10% of the Swedish retail trade.

Sample selection

In the annual resampling procedure, it is assumed that any differences in price level between previous and current year can be attributed to quality differences. This may be a valid assumption for example in a market with perfect competition, while in other cases not so. SCB saw that the price collectors tended to avoid products with discounted prices in a new selection of a product offer in the reference period, December. For some product categories, such as electronics and household textiles, price collectors now select new products for the coming year already in September the year before (instead of in December) in order to reduce the upcoming bias. For clothing SCB applies a correction factor to mitigate this problem.

Data collection

The use of scanner data is increasing, for more product groups and by more NSIs. This implies a move from traditional selection of representative product offers towards measurement of full assortments, whether by total enumeration of transaction data or probability sampling. An apparent difference between the two approaches is the impact on average price change from a mass of product offers, often with short life-length. Those that generally exist less than a year are either explicitly substituted (sampling of manageable amounts) or treated with, for example, multi-lateral models (full populations).

In scanner data, one does not always have full control of which discounts are included (some may be conditioned).

Sweden

Survey data is collected by the following means:

- local price collectors doing visits in physical outlets using tablets
- an electronic web questionnaire (actual rentals)
- web scraping
- staff at the central office sending questionnaires via email
- internet price collection for flight tickets in a more or less fully automated way
- scanner data delivered from companies and governmental agencies
  - Daily necessities: (~80% market coverage, began in 2012)
  - Train tickets (~70% coverage)
  - Package holidays (~75-80% coverage)
  - Home electronics (75%), Cell phones (80%)

- Fuel products: fuel station (~90% coverage)

SCB uses an API to automatically collect the prices for domestic and foreign flights from a price comparison site. From 2021 SCB uses web scraping to collect prices and other relevant information for some furniture stores, home-decor stores, hardware stores, home-electronic stores, car accessories stores, pet stores and eye-glasses stores.

Finland

Price collection is carried out both centrally at Statistics Finland office and by Survey interviewers (price collectors). Complementary datasets, scanner data and web scraped data are also acknowledged in specific sub-classes.

Statistics Finland's interviewers collect monthly altogether around 17 000 prices on nearly 400 commodities from approximately 2 100 outlets for the HICP. Price collectors perform product replacement when a product is permanently not available in outlet. In case of closing outlets or similar, the CPI-team decides on the replacement of an outlet and instructs price collectors when this change need to be carried out.

In addition, about 1 000 items of prices are gathered by central data collection. This data collection covers 117 commodities. Centrally collected data contains prices that are collected either from internet pages, price lists or administrative web pages. This centrally collected data is supplemented with:

- several scanner datasets having 1 000 to 6 million price observations per month. Amount of observations depends on the data in question.
- Flight prices that are web-scraped from Amadeus (travel technology company) web page.

Norway

Prices are not collected by designated price collectors but collected directly from the outlets. About 30 per cent of the prices are currently collected through web questionnaires, however web questionnaires are replaced by other types of data collection on an increasing scale. Scanner data and other electronic formats consist of more than 30 per cent, data collected online by the Division itself consists of less than 20 per cent. We also use computer assisted telephone interviewing/web questionnaires for collection of rents and other statistics from Statistics Norway. Web Questionnaires are filled out by a representative sample of outlets online which is responsible for providing prices and other price related information.

Denmark

The price collection by price collectors is in Denmark focused on the collection of prices on fresh foods, clothes, and shoes. The price collection is handled by a private company, selected through EU public procurement every 5th year. Statistics Denmark is responsible for the training of the price collectors. The price collection includes about 10,000 prices each month.

About 15,000 prices are collected through digital questionnaires sent to stores.

Prices are collected on the internet from web shops for a number of products and services by the central staff. Examples on product groups are computers, TV and radio, cultural services and music downloads and clothing. In some cases the prices are used as representative for products purchased by internet (e.g. clothing) and in other cases the prices also represent prices in physical outlets (e.g. computers).

Quality adjustment

Sweden (SCB)

Supported judgmental quality adjustment by local price collectors, except for most consumer electronics, where it is performed by staff at the central office. The price collector/central staff indicates the judged value in SEK of the quality difference between the replaced and the replacing model.

For electronic goods, staff in central office make a judgement supported by information from the internet and in a number of cases also supported by hedonic models (coffee machines, TVs, digital cameras, mobile phones, computers and computer accessories). All quality adjustments are validated and approved centrally.

Hedonic regression, adjusting for major product features, is used for garments and footwear.

New cars:

- For change in equipment option pricing is used (including a 50% reduction of the quality change value)
- For changes in horsepower and fuel consumption, supported judgemental adjustment is used.
- For a car of new model year, either an expert judgement is carried out (by our data provider) or option pricing.
- For a new model generation, either SCB do no QA (the car exits in the sample) or a bridged overlap.
- Option pricing is used, from year 2007 in the usual form of adjusting for added or deleted features by 50 percent of their market prices as separate options. Changes in engine power and changes in fuel economy are included as features to adjust for.

Used cars: A simple hedonic regression model, adjusting for mileage, is used in combination with a successive re-weighting of model year to adjust for age.

Computer/video games, music recordings, video recordings, cinemas and books: A bestseller list approach is used.

Direct comparison is used for e.g. curtains, sleeping sheet, bags and saucepan where the product life cycle was assessed to be long enough and the product description could be narrowly defined.

The method "link to show no price change" is generally not applied in the Swedish CPI.

Finland

- Hedonic regression is currently applied only to second-hand cars.
- Direct price comparison may be used for virtually any good or service. Particularly for technical products it is precisely defined, for which characteristics of models explicit quality adjustment should not be applied.
- Class mean imputation is used for goods and services when prices are temporarily missing, also for permanently missing prices in some cases.
- Judgmental quality adjustment by experts (CPI staff) doing subjective judgment. Based on their experience (and specialist knowledge), they determine the share of the price difference due to quality differences.
- Final option is to exclude price quote from index calculation and introduce it in the following month.

Norway

Only implicit quality adjustment procedures are used. For web questionnaire data 'direct comparison' is widely used. Some product descriptions are wide enough for small changes in the product or service to be accepted without further ado. However, if the quality is assessed to be considered significant, the base price of the replacement product is imputed so that the price change for the specific observation equals the average rate of change for the products within the same item category i.e. 'overall mean imputation' (= bridged overlap, when the quality difference cannot be estimated). In the situation where a well justified opinion is possible to obtain from a seller or otherwise outside expert Norway makes use of such ('expert judgment'). For the index of new cars and indices based on scanner data the matched model approach is used.

Denmark

In general, implicit quality adjustments are made for most products and services in the sample. When the quality is assessed not to have changed significantly, the entire price difference is taken into the index (direct comparison). Broad product descriptions are applied so small changes in the products and services will not be considered as quality changes in this regard. When the quality change is assessed to be significant, the price change between items leaving and entering the sample is usually imputed by the average price change in the corresponding elementary aggregate (bridged overlap method). The rest of the price difference between the items leaving and entering the sample is implicitly assumed to be due to a quality difference. The assessment in this procedure is done together by at least two persons from the central staff using as far as possible detailed information about the products found for instance on the internet. This method is used for almost all products and services.

In some cases overlapping prices are used if the price of the new good is known in the overlapping month.

For IT-equipment the 'monthly matched model and chaining' method is used.

Explicit quality adjustments are only made for rents, internet connections and in case of quantity changes (especially food products). For used cars a hedonic

model is implicitly being used, as the price index is based on model-prices from a private company.

The link to show no price change method is never applied.

Analysis method

I have analysed three aspects:

- Index levels,
- seasonal variations and
- “white noise”, i.e. unexplained variation that to some part could be due to sampling, in other words sampling variance if the prerequisite were fulfilled.

Average index 2021 with 2015 = 100

Assuming that countries in the north of Europe have similar markets for many product groups, and thus could be expected to have similar price developments, is of course not trustworthy all-over. One factor having impact on Sweden and Norway compared with other Euro-countries is the changing value of the Swedish and the Norwegian krona relative to the Euro. Nevertheless, the analysis raises apparent questions that can be discussed by price statisticians, hoping to find qualified explanations or identifying questionable methods used.

Seasonal volatility

Seasonal sales are of somewhat different characters in countries and for product groups. Long ago, seasonal sales were very much concentrated to two or a few months for clothing in Sweden; January and August, but nowadays it seems as there are some eight seasons and sales occurs most all the time. As products are selected in base period December or as substitutes any month without any indicator of what will be the price at the end, sales occur “at random” in the selected data for the price index. Sales mean a decrease in price often by 30 – 70 percent. This causes a large variance for the price index (the estimate). Different strategies can be applied for handling the sales prices; as for how long period a sales price should be registered; one month or as long the offer exists.

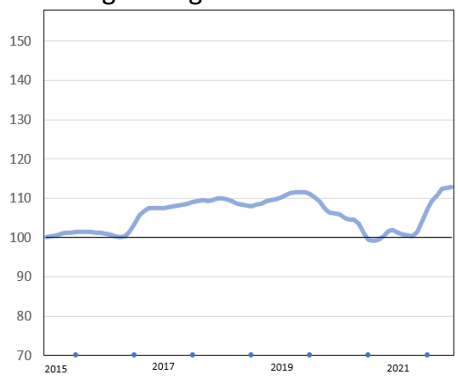
The measure presented in the analysis is based on variations January – December, i.e. not the change from December to January. For some taxes like 044 Water supply and miscellaneous services relating to the dwellings there are regular price increases in January.

Irregular variation

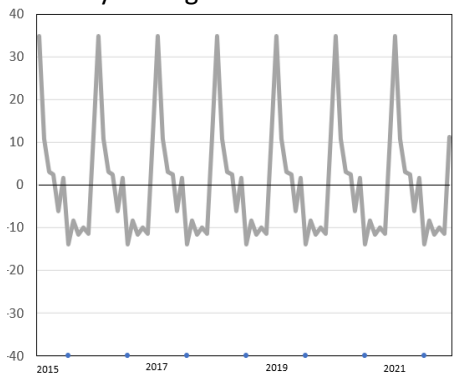
For the period July 2015 – June 2021 I have computed the 13 months moving average, the trend. I have computed a seasonal pattern as the average of differences between actual values and trend per month 2015 - 2021.
The very simple model used in the analysis is the sum of Trend plus Season.
Demonstration with 096 Package holidays for Sweden:

Diagram 1 Trend and season makes the model

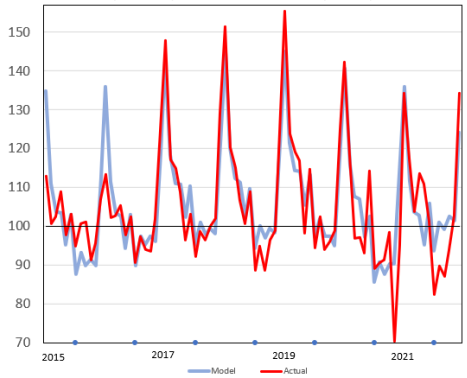
Moving average = the trend



Montly average deviation from trend



Model (blue) and Actual (red)

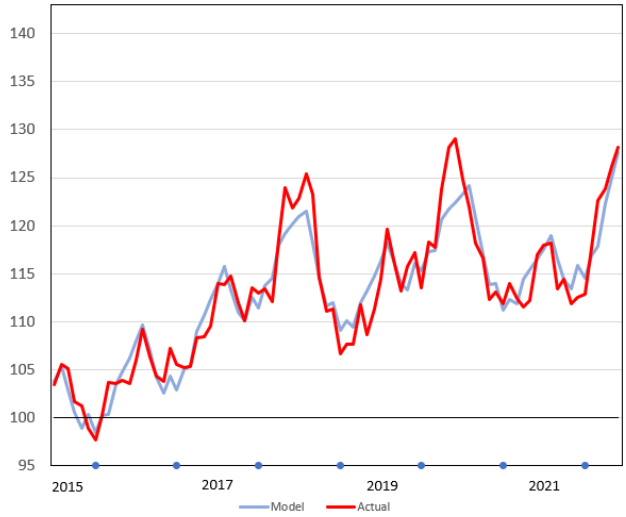


The roots of a mean of squared deviations between actual values and modelled values are called RMSD. These can be aggregated to CPI totals with product group weight in the same way as standard deviations, via variances.

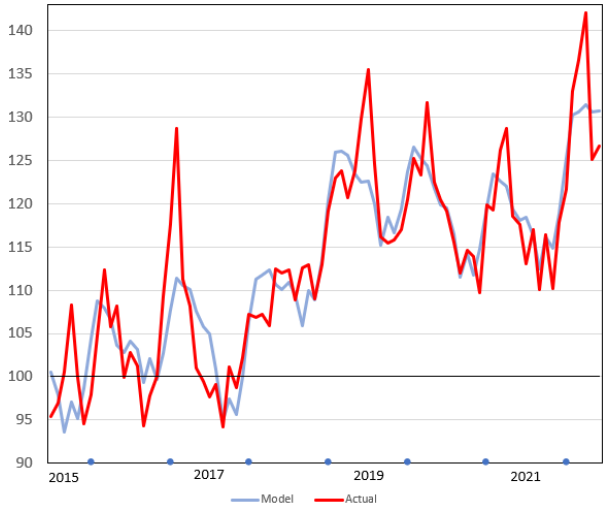
Sweden's price index for fresh and chilled vegetables are more volatile and unpredictable than fruit prices, due to a few months with very high prices for vegetables. These months are February, April, and July.

Diagram 2 Index and modelled values July 2015 – June 2022

Sweden: Fresh and chilled fruits



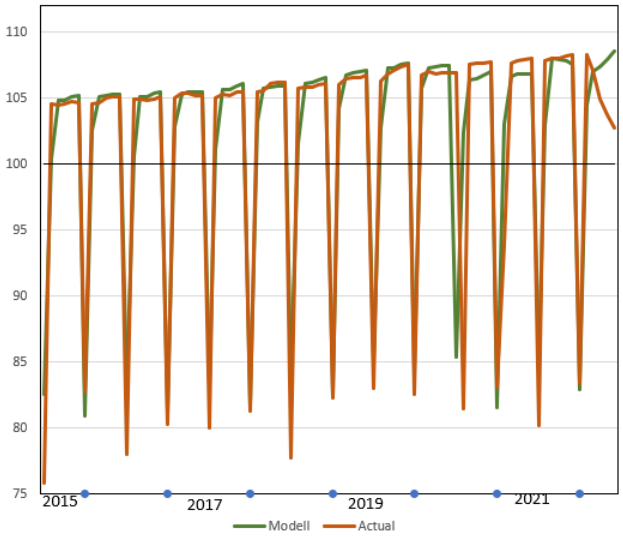
Sweden: Fresh and chilled vegetables



Prices for clothing are extremely seasonal in Belgium, with low sales prices two months per year. Notice that the autumn sales is one month later in 2020 which will contribute significantly to the Belgian RMSD.
Spain has a similar pattern. One of the most irregular index series in this analysis is personal transports by air for the Netherlands.

Diagram 3 Index and modelled values July 2015 – June 2022

Belgium: Garments for women



Netherlands: Passenger transport by air by.

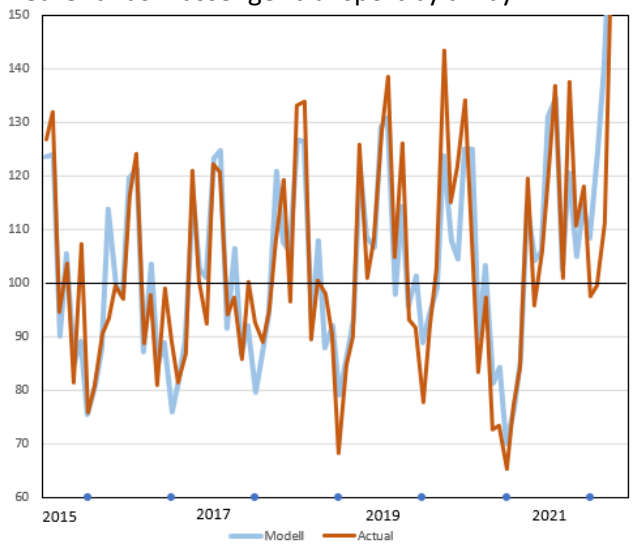


Table 3 Swedish RMSD for coicop groups with the largest impact on total RMSD for CPI. 2015 - 2019

Coicop	Product group	Sweden
045	Electricity, gas and other fuels	31,6%
072	Operation of personal transport equipment	28,9%
096	Package holidays	16,8%
073	Transport services	8,4%
031	Clothing	4,8%
011	Food	2,6%
094	Recreational and cultural services	2,3%
091	Audio-visual, photographic and information processing eq.	0,8%
111	Catering services	0,6%
051	Furniture and furnishings, carpets and other floor coverings	0,5%
071	Purchase of vehicles	0,3%
032	Footwear	0,3%

Results

Price index levels

My biggest worries are the detection that the four Nordic countries have very different price indexes for several groups. For clothing, footwear and household furniture the Swedish index is high relative other countries. Clothing and footwear are discussed because of apparent different results by NSIs without any reasonable explanation based on markets and products. Household furniture and Household textiles might have explanations of the same kind when it comes to index methods. Domestic flights has high index while International flights has low index for Sweden.

Table 4 Product groups with a remarkably low or high price index 2021 (2015 = 100), judgementally considering currency exchange rate. Nordic countries only

Product group	Low index	High index
011 Food	Finland	
012 Non-alcoholic beverages	Denmark	
0311 Garment	Denmark, Finland, Norway	**(Sweden)**
032 Footwear	Norway, Finland	Denmark
044 Water supply and miscellaneous services relating to the dwelling		**Sweden**
0451 Electricity	Denmark	Norway, **Sweden**
05111 Household furniture	Denmark, Norway	
052 Textile	Finland, Denmark	Norway
0531 Major household appliances	Finland	Norway
0532 Small electric household appliances	Denmark	Norway
054 Glassware, tableware and household utensils	Denmark	
07111 New motor cars	Denmark, Finland, Norway	
07331 Domestic flights	Denmark	Finland, **Sweden**
07332International flights	**Sweden**	
08202 Mobile telephone	(Sweden), Finland	Norway
0911 Equipment for the reception, recording and reproduction of sound and picture	Finland, **Sweden**	Norway
0912 Photographic and cinematographic equipment and optical instruments	Finland, Sweden	Norway
09131 Personal computers	Denmark, (Sweden)	Norway
0931 Games, toys and hobbies	Finland	
0951 Books		Denmark, **Sweden**
094 Recreational and cultural services		Norway, Denmark

The price index for garment is not high in relation to all-items index nor the Euro-area, but in comparison to neighbouring countries. SCB has changed the method lately for 08202 Mobile telephone and 09131 Personal computers. Disregarding these product groups, the Swedish HICP is more seldom strikingly low or high.

Clothing and footwear

The Swedish index is relatively high for clothing, in comparison with other countries. Still, the index is lower than the “All items” index for Sweden. Sweden does not exceed the Euro-area index much, in fact less than the change of the currency.

The index for women’s garment is higher (107,5) than for men’s garment (102,2). This is not the case in all countries.

Very low index numbers for Denmark, Finland and Norway in clothing is conspicuous.

The Swedish footwear index is close to Euro-area footwear index, but lower than the Swedish All-item-index.

Opposite to clothing, the index for Danish footwear is high.

A complementary analysis of price changes from 2005 to 2021 has been made. Sweden is in top of clothing, six percent lower than the Swedish All-items. For footwear The Danish index is 28 percent higher than their all-item index. Sweden has high index compared to other countries but seven percent lower than the Swedish all-item.

Since 1993 Statistics Sweden has applied hedonic quality adjustments to clothing, and soon after to footwear. The method requires detailed data and the survey is resource-demanding. Continuously, the method is revised, and interest is focused on the indicator “implicit quality index” IQI. It can be seen that on average, the IQI is close to 100 for Sweden.

Table 5 Implicit quality index , IQI, for Swedish price index for garments and footwear

Year	Garment	Footwear
2012	100,1	102,0
2013	100,6	100,1
2014	99,4	100,5
2015	99,5	97,5
2016	99,7	101,7
2017	100,0	100,6
2018	99,6	100,9
2019	99,7	100,4
2020	99,5	100,2
2021	99,9	99,5
Chained index	98,0	103,4

Statistics Finland applies direct comparison/supported judgement for garment-

Seasonal volatility

The retail trade in Sweden has, to my knowledge, no regulations concerning sales periods. I have learned from this analysis that seasonal sales of clothing etc. is restricted to two months in Belgium and Spain for example. Thus, in many countries there are sales prices also in December.

Seasonal volatility causes problems for price index production in such a way that the sampling variance threatens to get large. There is also a risk for selection bias when the procedure for selecting product offer in the linking month (December) than in all other months. It is not a question of having the same proportion of sales prices all months but having the same proportion in the two samples in December when any price difference in average is assumed to be a matter of changed quality over time.

How come Sweden, Denmark, Finland and Norway have so very different seasonal and irregular variations for 096 package holidays?

Table 6 Product groups with a remarkably low or high seasonality. Nordic countries

Product group	Low seasonality	High seasonality
011 Food		Norway
012 Non-alcoholic beverages		Norway
0312 Garment	Finland	
0321 Shoes	Norway	
043 Maintenance and repair of dwelling		**Sweden**
05111 Household furniture	Finland, Norway	
052 Textile		Norway
053 Household appliances	Finland	
054 Glassware, tableware and household utensils		Denmark
056 Goods and services for routine household maintenance		Norway
0722 Petrol		**Sweden**
07332 International flights		**Sweden**
0931 Games, toys and hobbies		**Sweden**
0951 Books	Finland	**Sweden**, Norway, Denmark
096 Package holidays	Finland, Norway	**Sweden**

Irregular variations

Detailed indicators are found in the table at the very end of this paper.

The aggregated RMSD for the 61% of CPI-weight, as if the rest has RMSD = 0, is presented in the following table, together with the RMSD for the all-items index itself. The meaning of RMSD is most comparable to standard deviation for Monthly change, however including market variations that are not sampling errors.

The results seem possible to accept; the Swedish RMSD = 0,23 compared to the quality declaration = 0,14/2 = 0,07. In the official estimate of confidence intervals, the finite population coefficient is close to zero for 0451 Electricity and 0722 Petrol, two products with the largest contribution to RMSD. The Covid epidemic interfered with trends and seasonal pattern 2020.

Table 7 The aggregated RMSD for analysed items (Swedish weights 2019) and RMSD for all-items-index

	July 2015 – Dec 2019		July 2015 – Dec 2021	
Country	Aggregate:	All items	Aggregate:	All items
France	0,13	0,21	0,14	0,23
Denmark	0,13	0,22	0,15	0,26
Austria	0,17	0,22	0,18	0,27
Sweden	**0,17-0,19**	**0,23**	**0,22**	**0,28**
Euro area	0,11	0,23	0,14	0,27
Norway	0,31-0,32	0,28	0,51	0,37
Netherlands	0,21-0,27	0,29	0,27	0,37
Belgium	0,19-0,20	0,30	0,25	0,40
Finland	0,20-0,21	0,30	0,20	0,30
Germany	0,12-0,13	0,32	0,16	0,41
Spain	0,18-0,20	0,34	0,19	0,35
Luxembourg	0,20-0,21	0,36	0,27	0,47

Coicop groups with high impact on total CPI of irregular variation for Sweden 2019 are:

- 045 Electricity, gas and other fuels 32% of the aggregate (Electricity alone 31%) ,
- 072 Operation of personal transport equipment 29% (including 0722 Petrol 16% of variation but only 28% of weight for 072)
- 096 Package holidays 17%,
- 073 Transport services (including international air flights) 8%
- 031 Clothing 5%
- 011 Food 3%
- All others 6%

The CPI weights are very influential on the impact. Other Coicop groups with high RMSD but small weights are Fresh and chilled vegetables, Fresh and chilled fruits, Shoes and footwear, Household furniture, Household textile, Small electric

household appliances, Equipment for the reception, recording and reproduction of sound and picture, Games, toys and hobbies, Books.

The following table, copied from the quality declaration of CPI, shows the lengths of confidence intervals, for sampling errors only:

Table 8 Estimated sampling inaccuracy for Swedish CPI, length of 95% confidence interval 2021

Statistics	Length of 95% Confidence Interval	Comments
Monthly Change	±0.14	Somewhat shorter for April, May, June and November
Annual Change (Inflation Rate)	±0.23	Somewhat shorter for December
Monthly Change in Inflation Rate (low)	±0.15	For April, May, June and November
Monthly Change in Inflation Rate (high)	±0.20	Other months

Comments

Package holidays (096) is a problem for Sweden and Germany. The average index 2021 (2015 = 100) is 102,8 for Sweden but the variations during the years are among the largest in this study. Norway and Finland, on the other hand, have very low seasonal variations, but higher levels.

Clothing (031): The Swedish index 2021 was the highest next to Switzerland but lower than the overall Swedish HICP-index. The seasonal variations are near the average for Euro-19. The irregular variations are high, but not as high as for the Netherlands, Belgium and France. The other Nordic countries have the lowest indexes, lower than 100, and the smallest seasonal variation. For children´s clothing the seasonal effects are not as strong as for men's and women's clothing.

Food (011) index is high 2021 for Sweden and Germany, compared with most countries. Striking that the neighbour Finland has much lower index. Fresh and chilled vegetables is more difficult to measure than fresh and chilled fruits.

Mobile telephones (08202) and personal computers (09131) were measured with MCR on to 2021 and the effect is clear, a heavy price index decrease. There was a decreasing index also in 2022 compared with 2021 while many countries have increasing index numbers.

Books (0951) exhibits two extremely different pattern; Sweden, Norway and Estonia have high variation, all other countries have little monthly variation. In Sweden the "Bokrean", a period of sales prices, is in late February. This does not influence price index that month, the heavy impact is seen In March.

Clocks and watches (12312) have exceptionally large variations for Sweden and the index is high.

Norway

Norway has the highest index 2021 among the analysed countries. Examples of high index for product groups are; Household textiles, Glassware, tableware and other household utensils, Small electric household appliances, Mobile telephone equipment (the only index > 100), Equipment for the reception, recording and reproduction of sound and picture), Photographic and cinematographic equipment and optical instruments, Personal computers and Package holidays.

The index stands out as low for Clothing and Shoes and other footwear.

The Norwegian HICP is volatile for Household textiles (052), Personal computer (09131), Toys, games and hobbies (0931), Books (0951). Norway and Finland have low variation for Package holidays.

Finland

Finland has remarkably low index (from Swedish perspective) for food, clothing, shoes and for many other product groups. For mobile telephones the index went downwards until 2020 when it began to rise. Contrary; for international flights Finland has close to the highest index.

Denmark

Denmark has a low overall index. It is striking that the index for clothing is very low while the index for shoes is very high. For Glassware, tableware and other household utensils and for Small electric household appliances the Danish index went steep down when the Norwegian index went as steep up. For New motor cars Denmark and Finland went low. Personal computers follow the Swedish index. The book index went extra-ordinary high in fall 2019.

Tables and diagrams

Tables and diagrams

Definitions

Annual average index (2015 = 100) is a simple average.

Annual average index (2005 = 100) is a simple average.

Seasonality is computed per year. A long linear trend is used to adjust, measured as (average 2021 / average 2015)$^{1/6}$.
Seasonality = Maximum / Minimum / Trend.
This measure can be lower than 1,00 if Trend is steep.

A 13-month moving average is another trend.
The seasonal pattern is the average of differences between actual values and this trend 2016 – 2021, per month.
Model value = Trend + Seasonal pattern.
A mean of squared deviations between actual and model values is computed, the root of which is **Root mean squared deviation from modelled values.**

011 Food and 012 Non-alcoholic beverages

Index level

The Swedish HICP (2015 = 100) is higher 2021 than for several of the compared countries. The neighbour Finland has a much lower index. Norway has large seasonal variations.

Diagram 011 Food 2015 - 2022

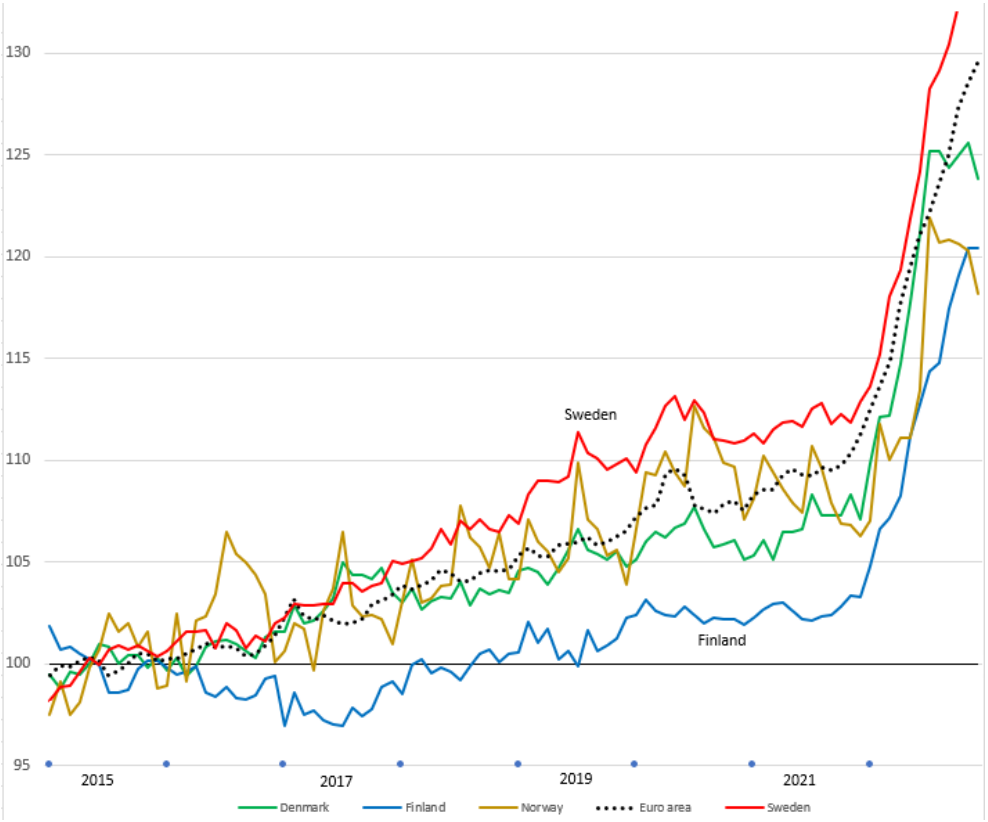
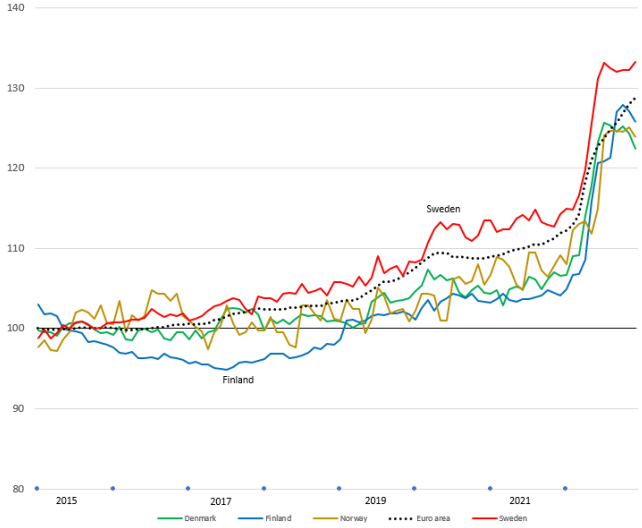


Table Average index 2021 (2015 = 100)

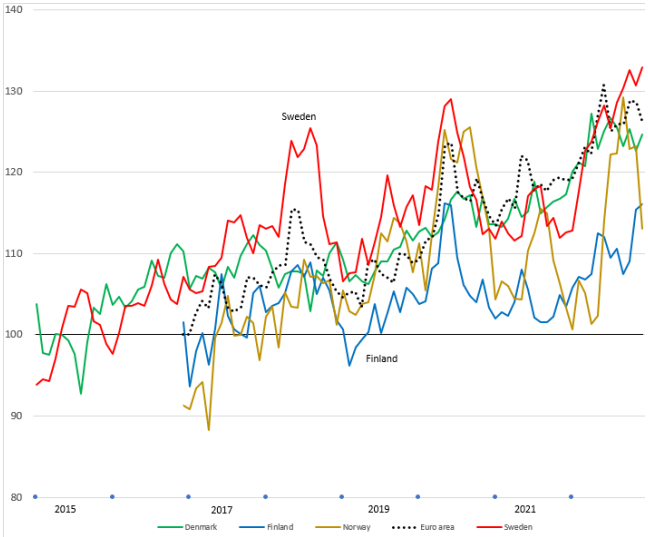
Country	Food	Meat	Fresh or chilled fruit	Fresh or chilled vegetables	Non-alcoholic beverages
Switzerland	100,8	105,0	97,4	98,3	98,6
Finland	**102,7**	**103,9**	**103,4**	**104,8**	**110,4**
Denmark	106,8	105,4	115,6	109,4	97,2
Belgium	107,9	107,9	102,1	100,4	107,8
Norway	108,3	107,7	108,2	118,0	100,1
Austria	109,1	112,3	104,3	106,7	107,9
Euro-area	109,5	110,2	118,0	109,9	105,7
France	109,6	109,2	130,4	139,1	103,1
Spain	109,7	108,7	128,2	118,3	112,9
Netherlands	110,8	116,3	113,0	104,9	107,0
Sweden	**111,9**	**113,3**	**114,0**	**117,9**	**111,2**
Luxembourg	112,4	115,1	115,5	115,1	108,6
Germany	114,1	117,5	116,7	116,7	107,8
Estonia	117,2	111,6	127,5	140,6	109,5

0112 Meat



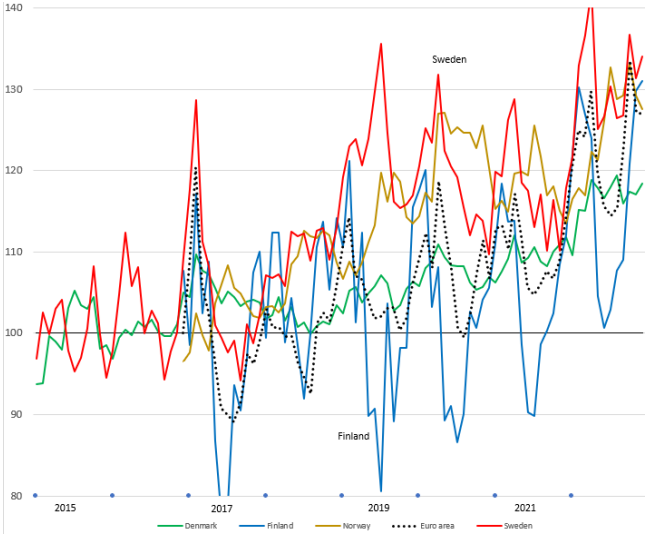
Meat has an index very much like food. Sweden has higher index then the Euro-area and the Nordic countries

01161 Fresh or chilled fruit



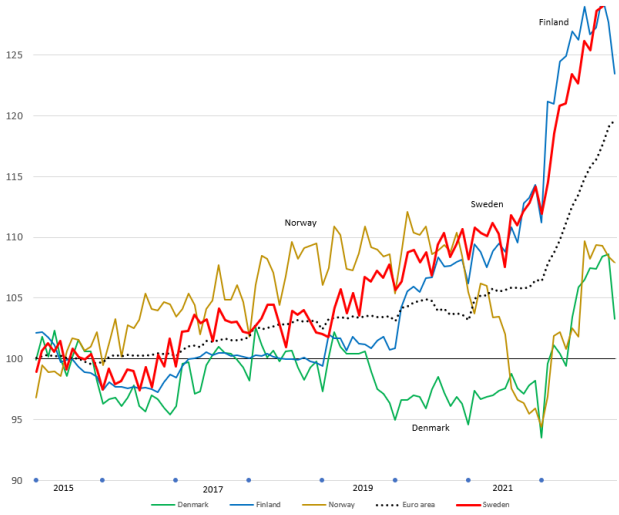
The Euro-area average is higher than the Sweden 2021, as is Denmark. Finland has a low index.

01162 Fresh or chilled vegetables other than potatoes and other tubers



Vegetables have a larger volatility then fruits. Sweden and Norway have high indexes while Finland and Denmark have low.

012 Non-alcoholic beverages



Seasonality (and variance)

Norway stands out with relatively high volatility / seasonality, with the highest prices in July. Finland has very low prices for vegetables in June and July.

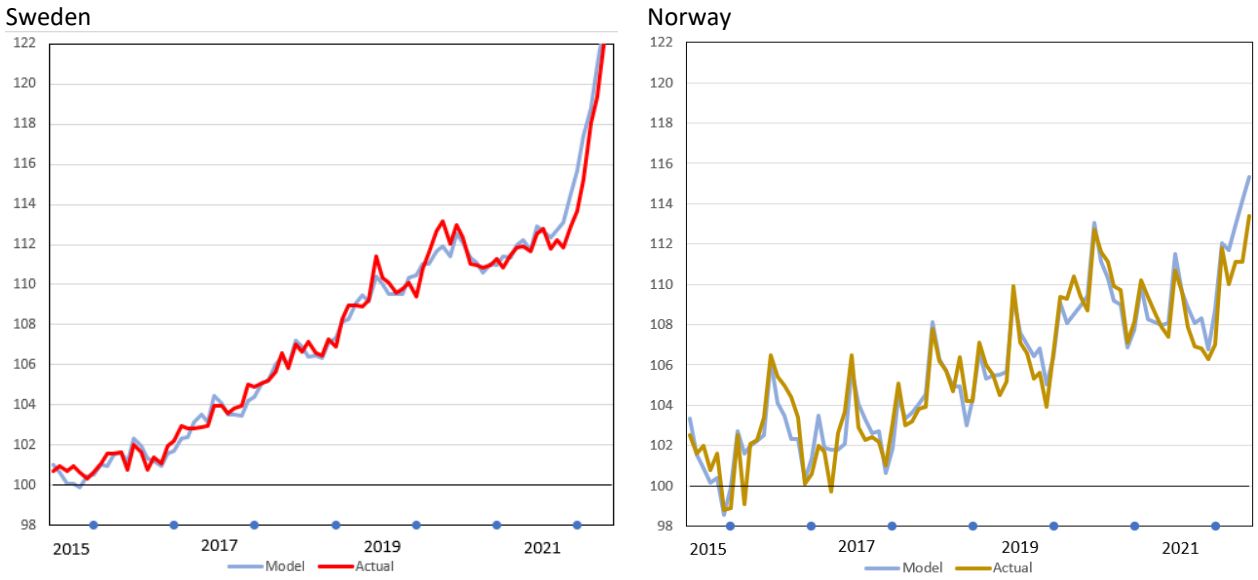
Table Ratio between highest and lowest index per country and year, average 2015 – 2021

Country	Food	Meat	Fruits	Vegetables	Non-alcoholic beverages
France	1,019	1,02	1,16	1,17	1,01
Belgium	1,022	1,02	1,17	1,17	1,02
Euro-area	1,015	1,02	1,09	1,19	1,01
Spain	1,023	1,02	1,20	1,14	1,02
Luxembourg	1,018	1,02	1,11	1,16	1,02
Switzerland	1,028	1,03	1,10	1,22	1,04
Finland	1,020	1,03	1,10	**1,39**	1,03
Germany	1,023	1,03	1,08	1,23	1,02
Sweden	**1,027**	**1,03**	**1,11**	**1,19**	**1,04**
Austria	1,019	1,03	1,06	1,11	1,02
Denmark	1,025	1,03	1,08	1,07	1,05
Netherlands	1,028	1,03	1,09	1,10	1,03
Estonia	1,038	1,03	1,22	1,36	1,04
Norway	1,057	1,06	1,14	1,11	1,07

Irregularity / Variance (and changed seasonal pattern)

Norway has large irregular variations measured by Root mean squared deviation between actual and modelled values, RMSD.

Diagram Actual and modelled values for Food, Sweden (RMSD = 0,23) and Norway (RMSD = 0,28)



Norway has higher Root of mean squared deviation between actual and modelled indexes for meat and fruits. Sweden and Finland have “problems” with vegetables. Denmark has “succeeded” to produce stable index series.

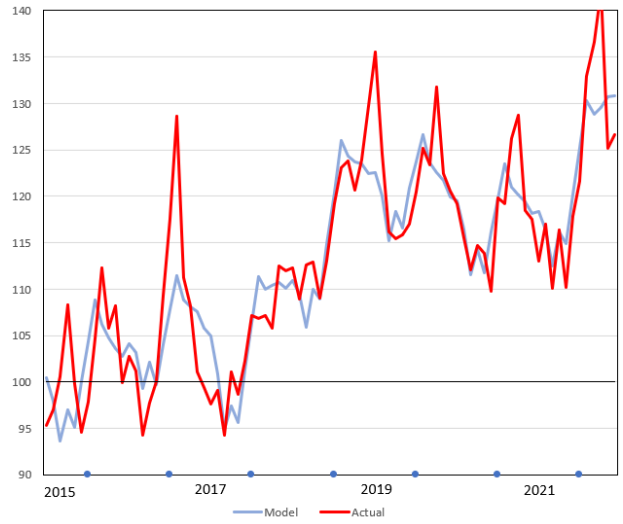
Table 2 Root of mean squared deviation between actual and modelled indexes. Average 2015 - 2019

Product group	Sweden	Norway	Finland	Denmark	Germany
Food	0,23	0,28	0,30	0,22	0,32
Meat	0,50	0,98	1,08	0,60	0,51
Fresh or chilled fruit	2,00	3,26	1,97	1,70	1,63
Fresh or chilled vegetables other than	5,19	1,79	5,45	1,78	5,44
Non-alcoholic beverages and other tubers	0,69	1,00	0,94	0,96	0,42

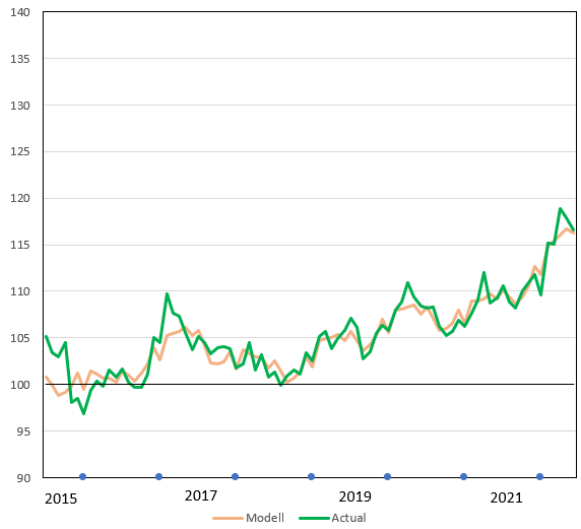
The Swedish index for fresh and chilled vegetables differ very much from the model in October 2015, January and February 2017 and July 2019, i.e. any unpredictable month.

Diagram Actual and modelled values for Fresh vegetables, Sweden (RMSD = 5,19) and Denmark (RMSD = 1,78), Finland (RMSD = 5,45) and Norway (RMSD = 1,79)

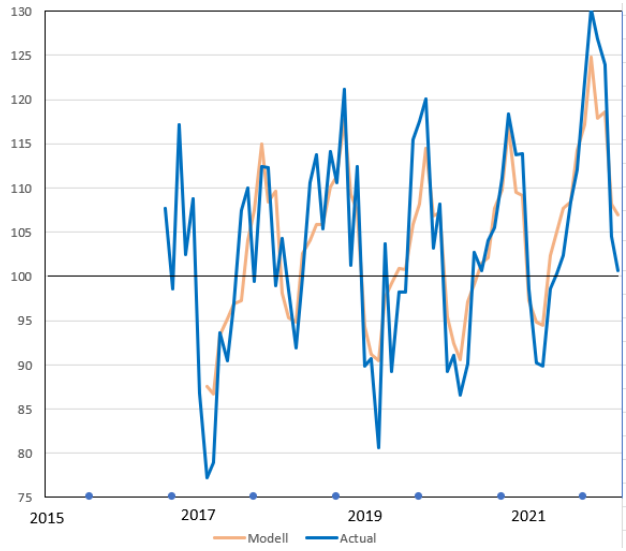
Sweden



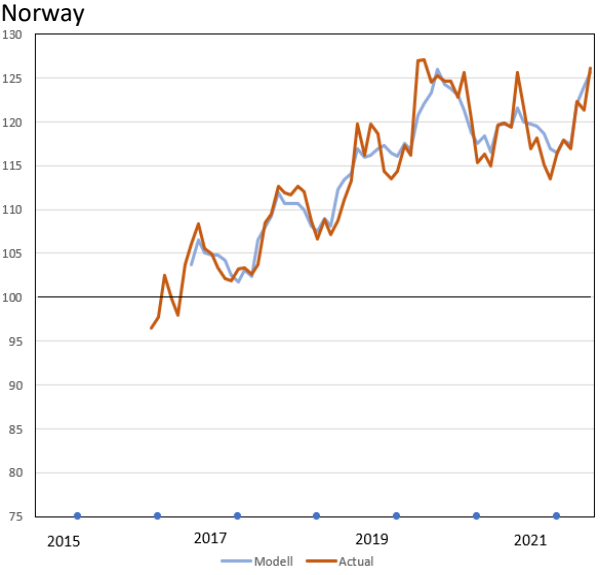
Denmark



Finland



Norway



031 Clothing and 032 Footwear

Index level

The Swedish HICP (2015 = 100) for garment is higher 2021 than all compared countries, except for Switzerland. The Swedish index for garment is however lower than the overall HICP for Sweden.

Diagram 0312 Garment 2015 - 2022

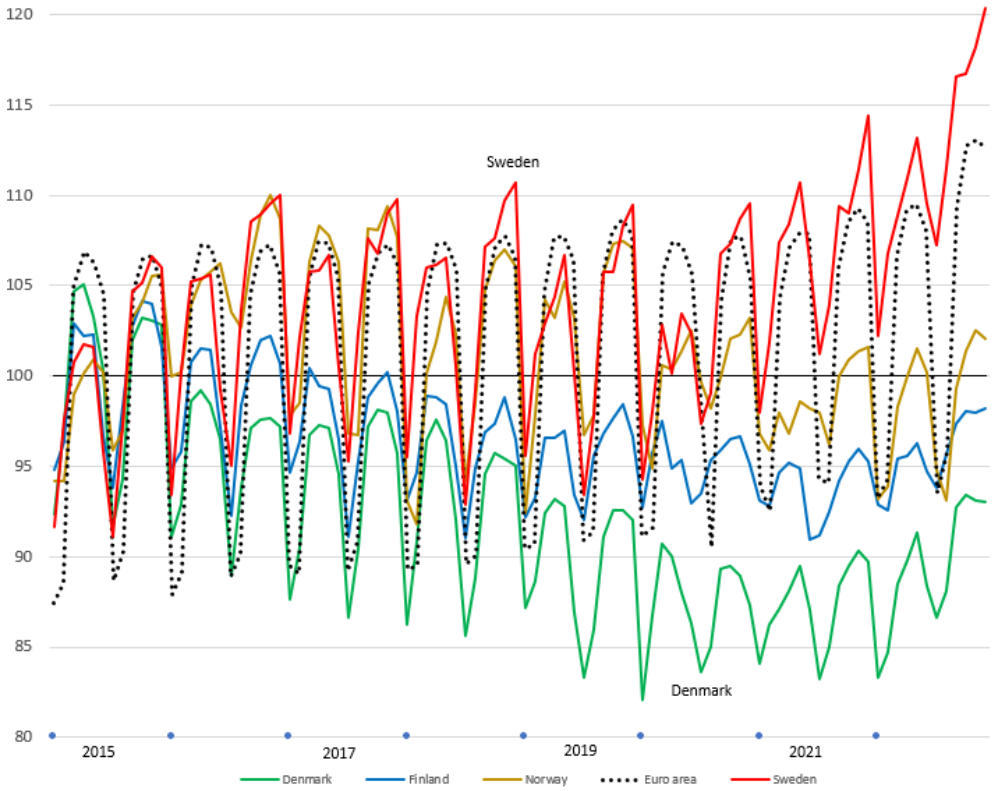


Table Average index 2021 (2015 = 100) for 031 Clothing

Country	O31 Clothing	0312 Garment	03121 Garment Men	03122 Garment Women	03123 Garment Children
Denmark	**88,3**	**87,4**	**88,6**	**87,5**	**84,1**
Finland	**94,8**	**93,8**	**94,3**	**94,2**	**91,8**
Norway	**98,7**	**98,5**[2]	**93,9**[1]	**91,6**[1]	**97,2**[1]
France	100,2	99,8	98,9	100,9	
Belgium	102,2	101,7	103,4	102,4	
Euro-area	103,1	102,9	97,2	97,9	95,6
Netherlands	104,1	104,0	105,2	101,8	
Austria	104,3	104,0	105,9	102,0	
Germany	105,2	104,5	104,9	103,7	
Luxembourg	105,7	105,6	105,4	105,7	
Spain	105,8	105,7	104,9	105,8	
Estonia	106,5	106,8	106,1	105,5	
Sweden	**106,5**	**106,8**	**102,2**	**107,5**	**115,7**
Switzerland	110,8	112,0	107,6	115,2	

[2] Looks like some kind of error that Garment total is larger than all of the sub-indexes

For shoes the Danish index is among the highest when the Norwegian index is very low. Swedish HICP (2015 = 100) for footwear and shoes are close to 100 and close to Euro-area.

Diagram 0321 Shoes 2015 - 2022

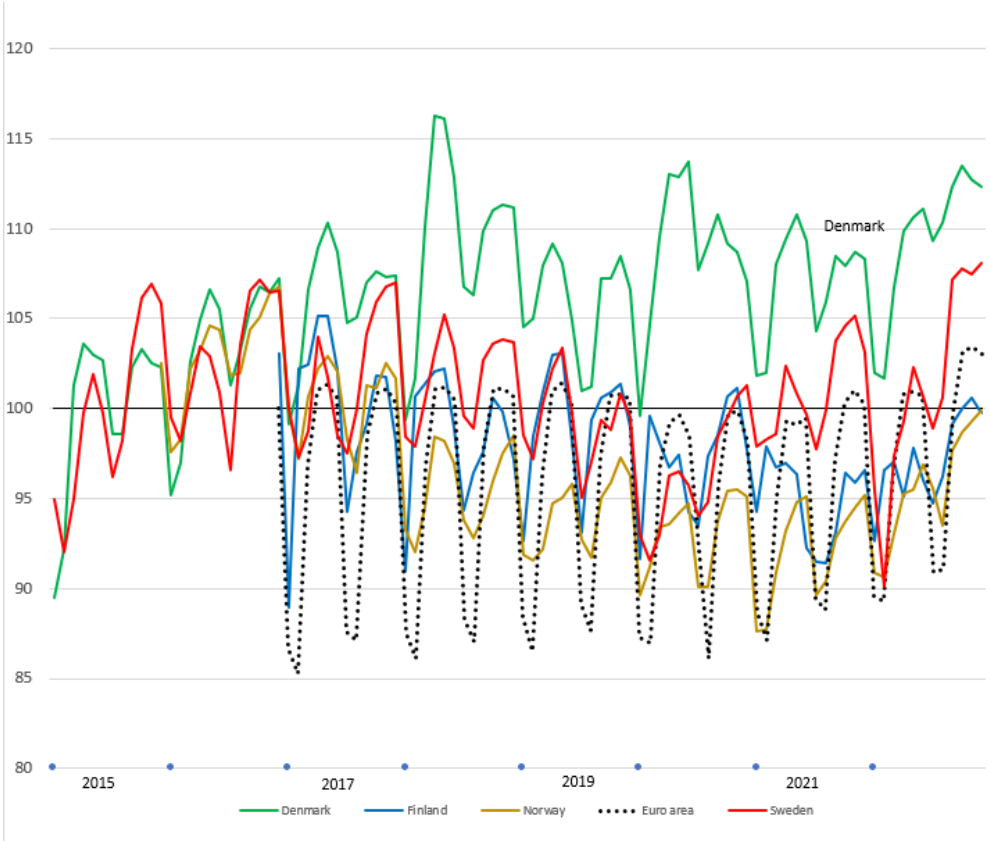


Table Average index 2021 (2015 = 100) for 032 Footwear and 0321 Shoes

Country	Footwear	Shoes
Norway	**92,8**	**92,1**
Netherlands	93,2	93,2
Finland	94,9	94,9
France	98,7	98,4
Switzerland	99,2	99,2
Euro-area	100,6	95,5
Sweden	**100,9**	**101,0**
Belgium	102,4	102,1
Germany	104,6	104,4
Austria	105,4	105,1
Spain	106,0	105,9
Luxembourg	107,0	105,7
Denmark	**107,3**	**107,1**
Estonia	110,0	109,8

Norway and Sweden are close to extremes when it comes to index for clothing. Denmark is an extreme with different indexes for clothing and footwear.

The relations have been long-lasting, according to this analysis of 2005 – 2021. The Swedish indexes for clothing and footwear are 6 – 7 percentage units lower than the all-items index. The Norwegian garment index is now only half of the all-items index.

Table Average index 2021 (2005 = 100) for Clothing and footwear

Country	All items	031 Clothing	0312 Garment	032 Footwear	Relatives Clothing/ All items	Garment/ All items	Footwear/ All items
Norway	141,1	73,5	**71,2**	**93,5**	0,52	**0,50**	**0,66**
Denmark	123,4	81,3	**79,0**	**158,1**	0,66	**0,64**	**1,28**
Finland	129,1	99,0	96,7	96,7	0,77	0,75	0,75
Netherlands	128,5	103,0	102,4	98,3	0,80	0,80	0,76
Belgium	135,1	110,5	109,4	118,1	0,82	0,81	0,87
Luxembourg	135,6	112,0	111,4	119,8	0,83	0,82	0,88
Austria	135,4	113,0	111,7	124,4	0,83	0,82	0,92
France	124,5	104,2	102,7	110,3	0,84	0,82	0,89
Euro area	127,3	108,8	107,8	109,1	0,85	0,85	0,86
Spain	128,5	111,1	110,7	114,3	0,86	0,86	0,89
Italy	125,4	111,6	110,7	104,4	0,89	0,88	0,83
Germany	127,8	114,5	113,4	116,5	0,90	0,89	0,91
Estonia	165,6	152,3	152,3	148,5	0,92	0,92	0,90
Sweden	**126,9**	**119,0**	**118,3**	**117,9**	**0,94**	**0,93**	**0,93**

Seasonality

Table Ratio between highest and lowest index for Garments per country and year. Average 2015 - 2021

Country	0312 Garment	03121 Men	03122 Women	0321 Shoes
Romania	1,03			
Slovakia	1,03			
Finland	1,08	1,05	1,06	1,10
Germany	1,10	1,10	1,11	1,08
Estonia	1,11	1,08	1,12	1,13
Denmark	1,12	1,11	1,14	1,13
Norway	1,12	1,10	1,06	1,08
Switzerland	1,17	1,15	1,19	1,15
France	1,17	1,14	1,20	1,17
Sweden	**1,17**	**1,18**	**1,17**	**1,10**
Euro-area	1,20	1,16	1,17	1,14
Luxembourg	1,21	1,17	1,23	1,29
Netherlands	1,22	1,20	1,24	1,18
Croatia	1,32			
Portugal	1,33			
Italy	1,38			
Austria	1,28	1,28	1,28	1,16
Belgium	1,32	1,26	1,34	1,28
Spain	1,43	1,37	1,38	1,24
Greece	1,50			

Big differences between countries concerning seasonality. Finland, Denmark and Norway have relatively little effects of sale periods when Austria, Belgium and Spain have very large effects of sales in January and July. Sweden is close to the average for Euro-area.

There seem to be some kind of regulation for sales in for example Spain. I have not made a thorough research but found indications in https://www.consumoteca.com/comercio/fechas-de-las-rebajas/. This is a google translation:

> "The duration of the sale in sales in general (except Communities such as Catalonia or Galicia as we have seen) is free, but must be announced in the establishment, it will not be less than one week or more than two months and defective or damaged objects can not be subject to discounts.

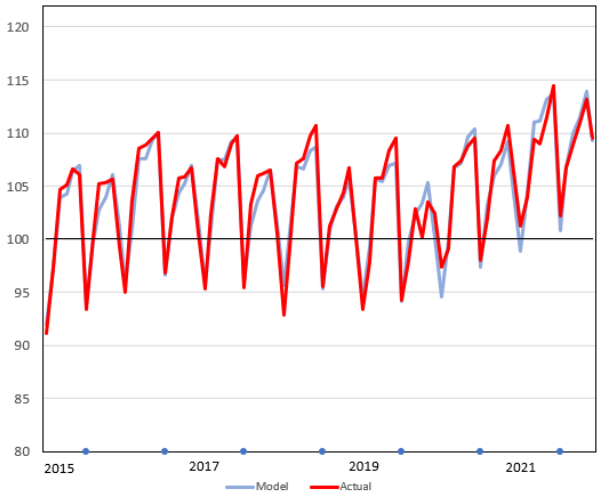
The Valencian legislation says as follows in this regard:

> *Both in the previous advertising and during the sales, as well as in the presentation of the products inside the commercial premises, the reduction of the prices must be manifested by displaying the new price next to the usual price applied by the commercial establishment. However, in the case of a percentage reduction of a set of articles listed inside the establishment, the generic announcement of such a reduction on the usual price shall suffice, without the need for it to appear individually in each article. The duration of the sales period shall be announced to the public, visibly and unequivocally in the establishment, by indicating from the beginning of each season, the start and end dates of the sales period."*

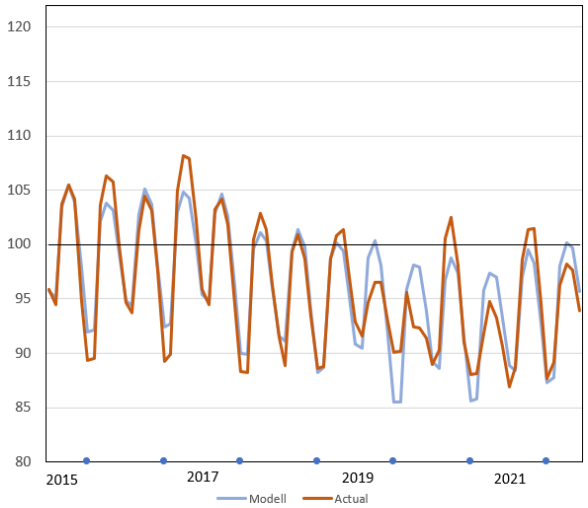
Irregularity / Variance (and changed seasonal pattern) for 0312 Garment

Diagram Actual and modelled values for 0312 Garments, Sweden (RMSD = 1,16), Netherlands (2,58), Norway (1,73) and Denmark (1,17), Belgium (1,98) and Spain (0,74)

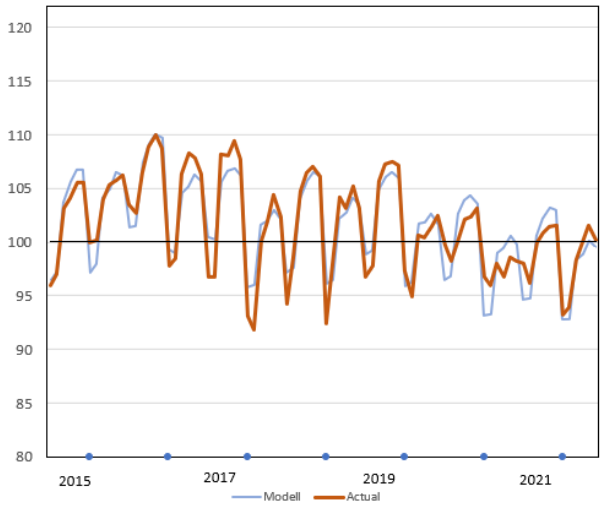
Sweden



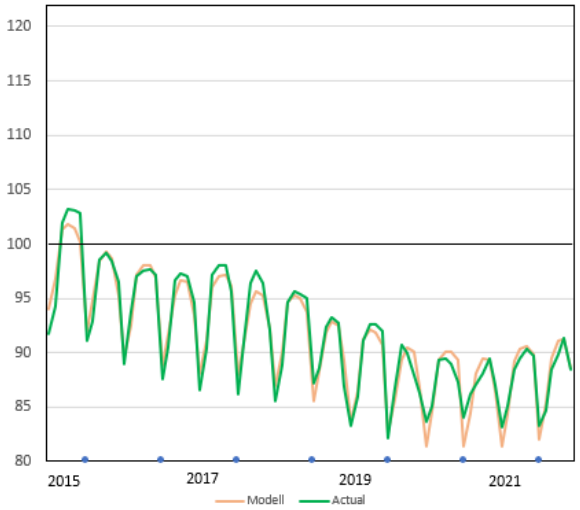
The Netherlands



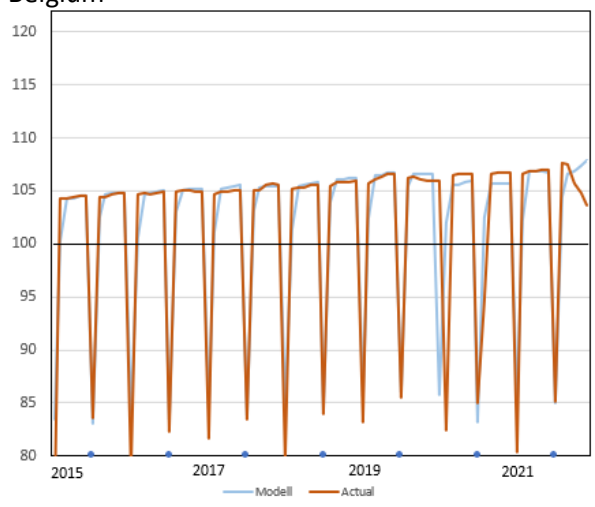
Norway



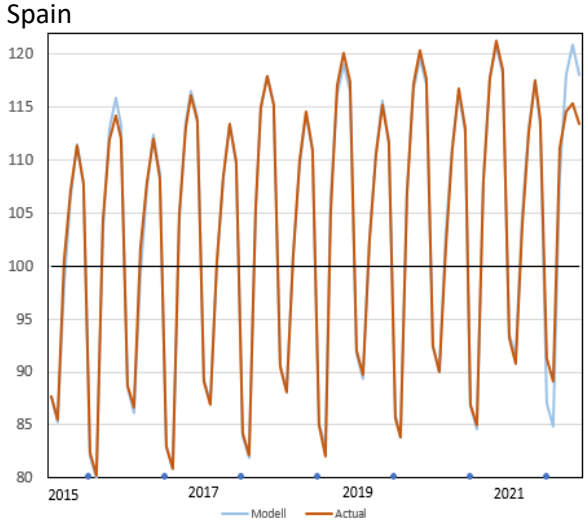
Denmark



Belgium



Spain

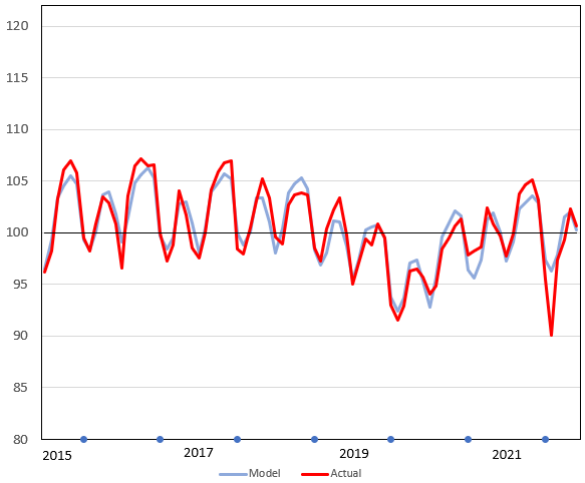


Belgium has extra low index July 2016 and 2018. In 2020 the summer-sales were late.

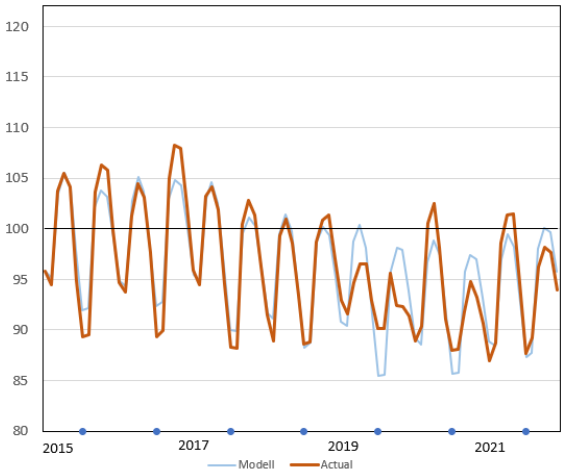
From fall 2019 the sales changes very much for the Netherlands.

Diagram Actual and modelled values for 0321 Shoes and other footwear

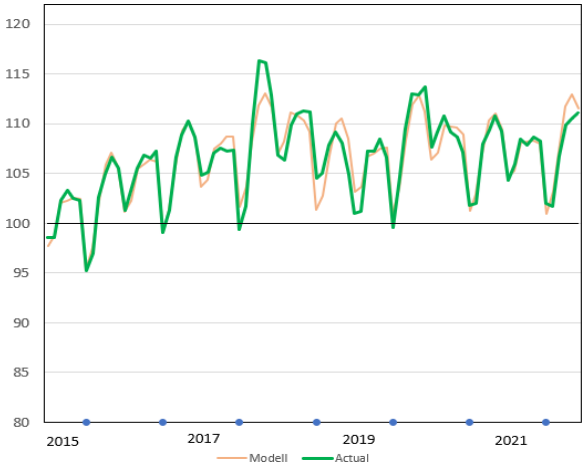
Sweden



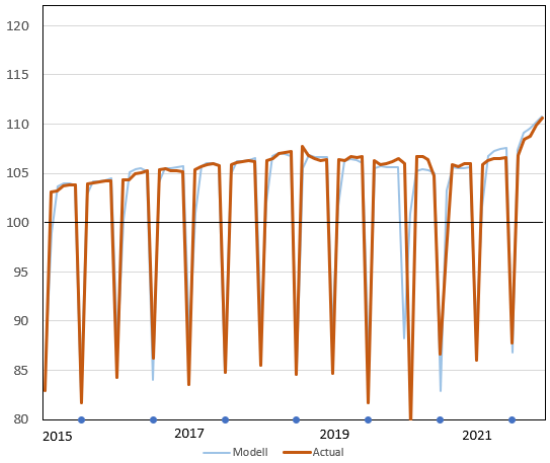
The Netherlands



Denmark



Belgium



The Swedish price index for Sweden has approximately an irregular variation of the same magnitude as best countries. The Netherlands has a large variation, as shown above due to changed seasonal pattern.

Table Root of mean squared deviation between actual and modelled indexes

Product group	Sweden	Norway	Finland	Denmark	Germany	Nether-lands
Clothing	1,0	1,7	0,8	1,1	0,9	2,5
Garments	1,2	1,7	0,9	1,2	1,0	2,6
Garments for men	1,4		0,8	1,1	1,1	2,7
Garments for women	1,1		0,9	1,4	1,1	3,0
Footwear	1,2	0,8	1,8	1,4	0,9	1,7
Shoes and other footwear	1,2	0,8		1,4	0,9	1,7

043 Maintenance and repair of the dwelling

Sweden and Norway have the highest price indexes and also much more irregular variation. Denmark's and Finland's curves are smooth.

Diagram 044 Maintenance and repair of dwelling, 2015 – 2022

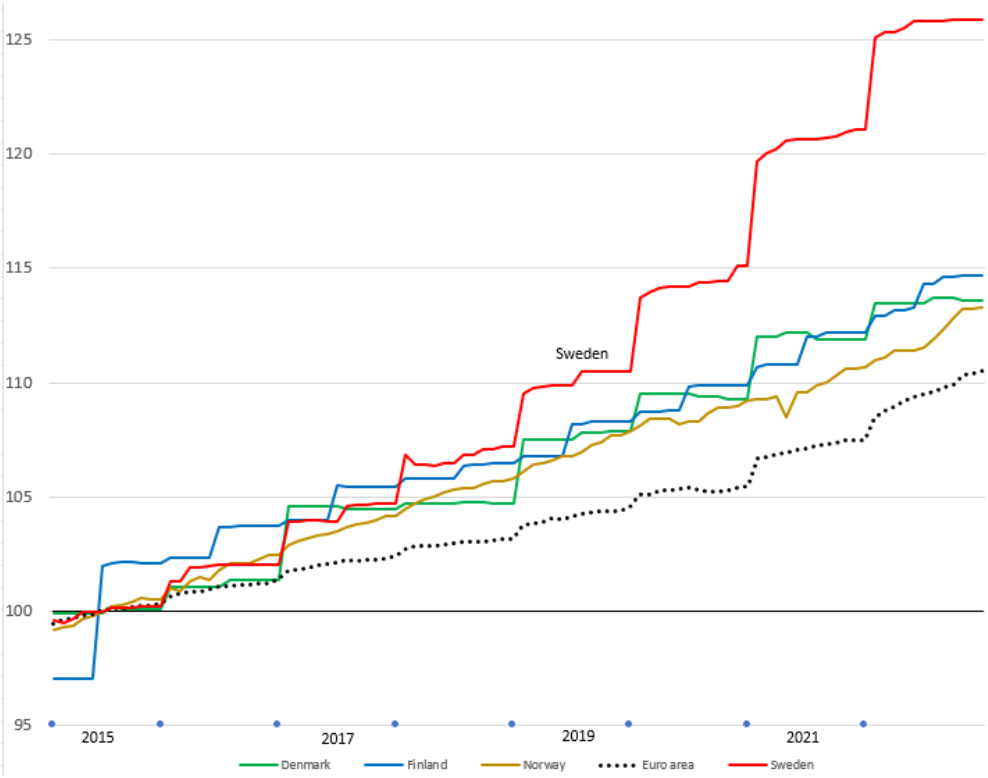


Table Average index 2021 and 2022 (2015 = 100) for 043 Maintenance and repair of dwelling

Country	2021	2022
Switzerland	103,1	106,1
Spain	107,0	113,8
Netherlands	107,1	118,6
Denmark	109,2	123,6
Belgium	110,5	118,7
Finland	110,5	120,9
France	110,7	116,4
Euro-area	111,7	121,4
Luxembourg	113,5	122,1
Austria	114,4	128,4
Estonia	114,9	135,4
Germany	116,8	132,0
Sweden	**119,6**	**129,4**
Norway	122,9	131,8

Table Ratio highest and lowest index for 043 Maintenance and repair of dwelling per country and year. Average 2015 - 2021

Country	Meanl
Switzerland	1,007
Spain	1,011
France	1,014
Belgium	1,016
Luxembourg	1,018
Euro-area	1,018
Finland	1,020
Austria	1,026
Denmark	1,027
Germany	1,028
Netherlands	1,039
Estonia	1,042
Norway	1,046
Sweden	**1,049**

044 Water supply and miscellaneous services relating to the dwelling

Sweden and Denmark have no observed seasonal variation but more or less annual changes, opposite to Norway with continuous price index curve.

Diagram 044 Water supply and miscellaneous services relating to the dwelling, 2015 – 2022

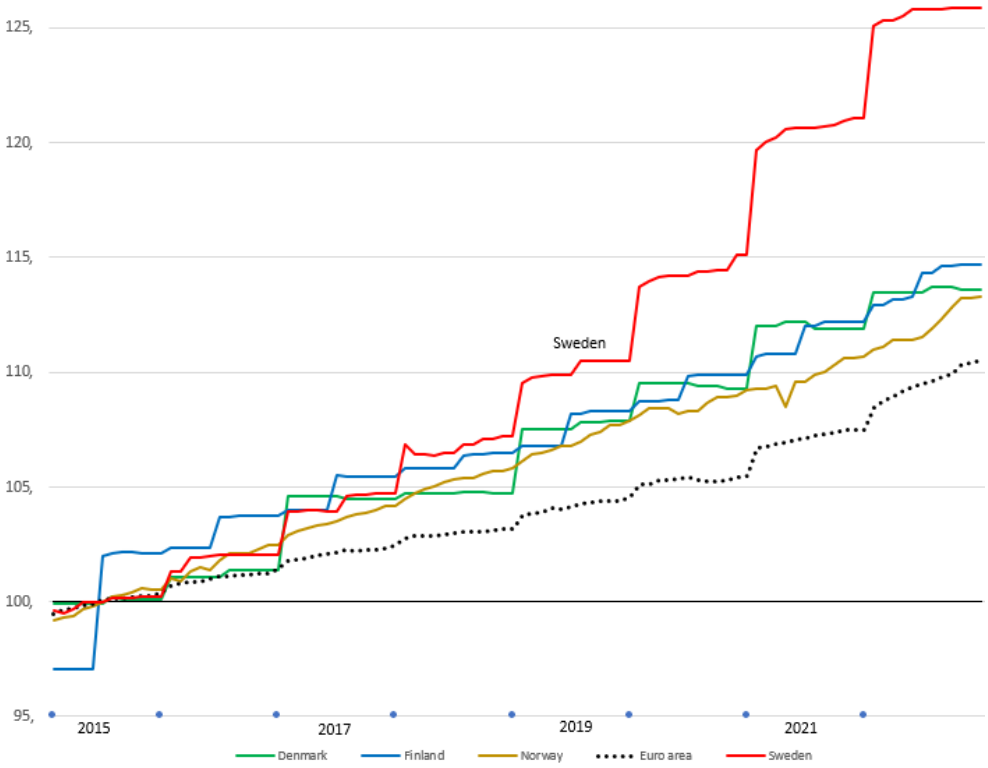


Table Average index 2021 (2015 = 100) for 044 Water supply and miscellaneous services relating to the dwelling

Country	2021	2022
Switzerland	98,4	98,4
Spain	103,1	104,8
Luxembourg	104,2	105,1
France	106,0	108,4
Euro-area	107,1	109,6
Germany	107,3	109,8
Austria	109,0	113,4
Norway	109,8	112,0
Estonia	110,0	116,5
Netherlands	110,1	112,0
Belgium	111,4	118,2
Finland	111,6	114,0
Denmark	112,0	113,6
Sweden	**120,6**	**125,7**

045 Electricity, gas and other fuels

Electricity is the major part of this group, for Sweden.

Diagram 045 Electricity, gas and other fuels, 2015 – 2022

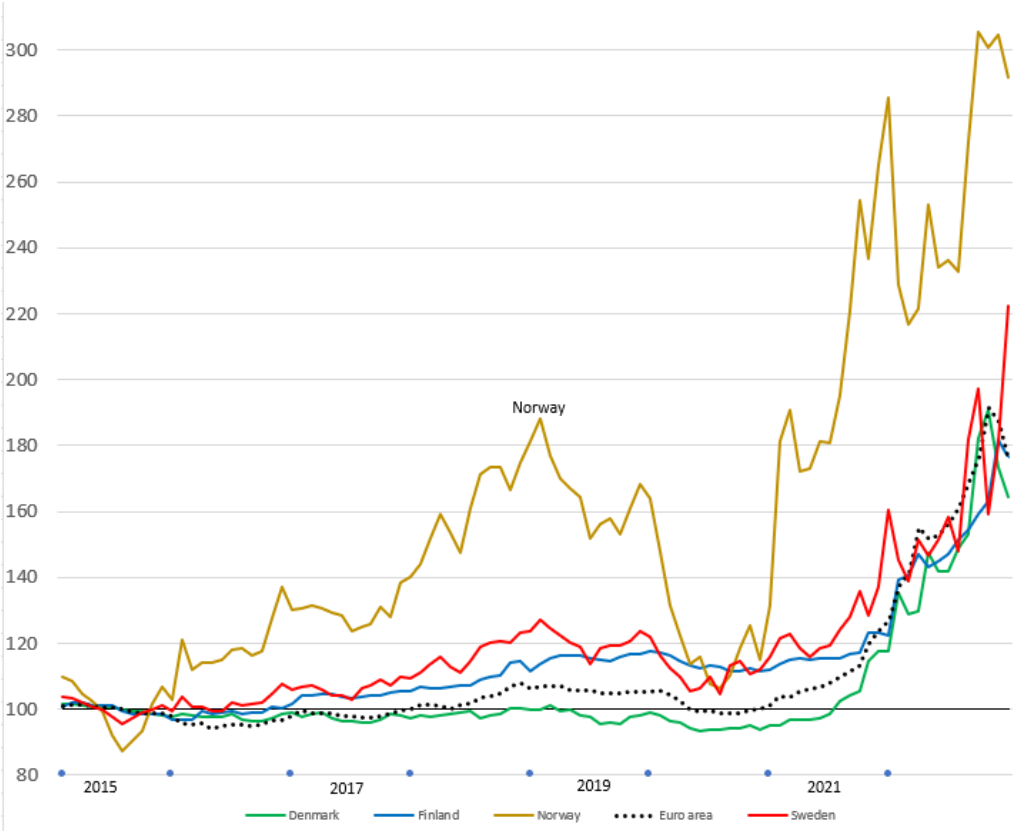


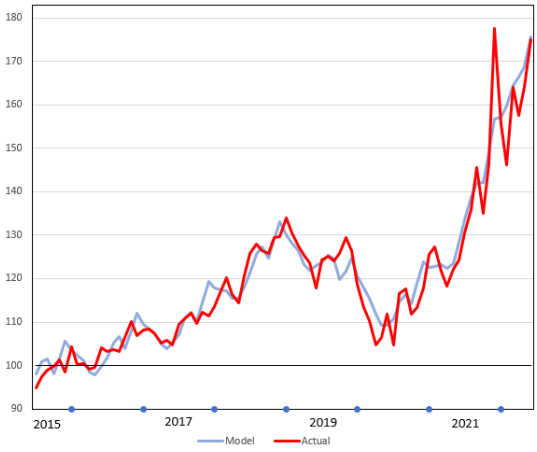
Table Average index 2021 (2015 = 100)

	Electricity, gas and other fuels		Electricity	
Country	2021	2022	2021	2022
Denmark	**103,7**	**153,2**	**103,3**	**169,3**
Germany	105,7	146,5	111,7	134,1
Switzerland	106,8	131,2	105,8	108,4
Austria	109,4	151,1	113,3	125,9
Spain	110,5	145,2	116,7	148,0
Euro-area	111,6	162,9	116,0	157,8
Luxembourg	114,8	148,1	113,9	116,3
Finland	117,3	154,0	119,9	168,9
France	120,2	149,1	118,9	127,7
Estonia	123,1	224,7	148,4	288,5
Netherlands	123,5	264,3	85,0	185,3
Sweden	**127,6**	**165,0**	**134,2**	**182,5**
Belgium	130,9	226,7	156,3	245,5
Norway	**211,3**	**258,1**	**224,6**	**272,0**

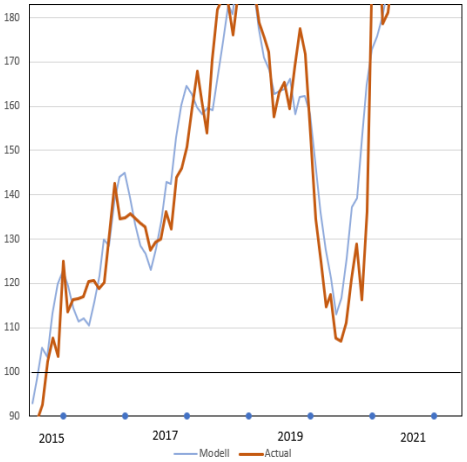
The irregular variation is much larger for Sweden than for Denmark and Finland. Norway is not comparable to any of the analysed countries

Diagram 0451 Electricity, 2015 – 2022

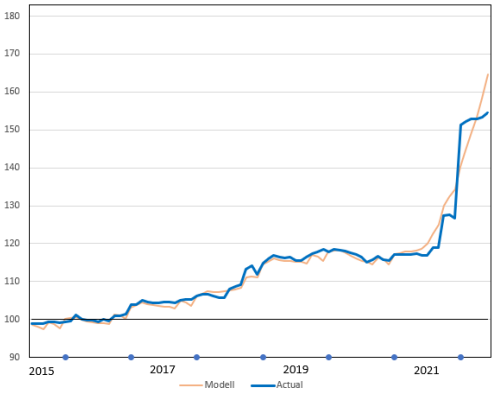
Sweden (RMSD =3,0)



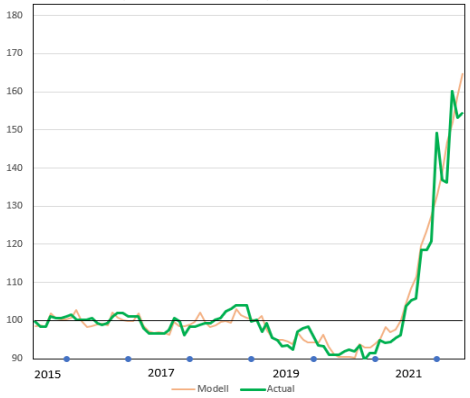
Norway (RMSD =7,6)



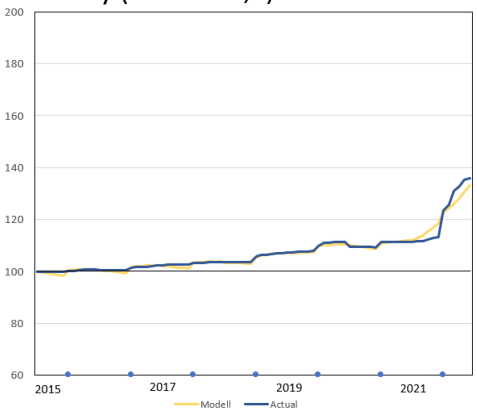
Finland (RMSD =(2,6)



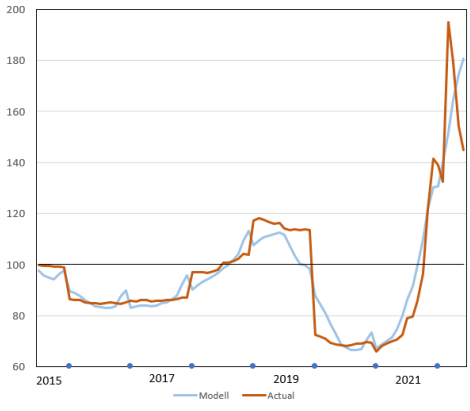
Denmark (RMSD = 1,5)



Germany (RMSD = 0,6)



The Netherlands (RMSD = 5,3)



05111 Household furniture and 052 Household textiles

Denmark and Norway have higher index for textile than for furniture, when other countries have similar shapes for the two product groups.

Diagram 05111 Household furniture, 2015 – 2022

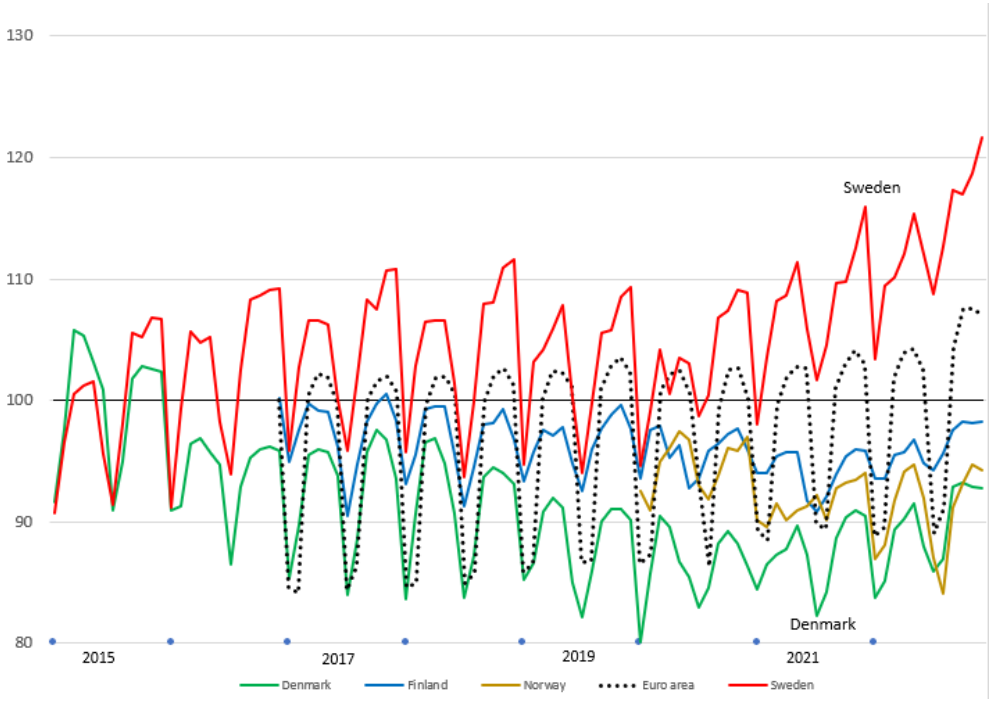
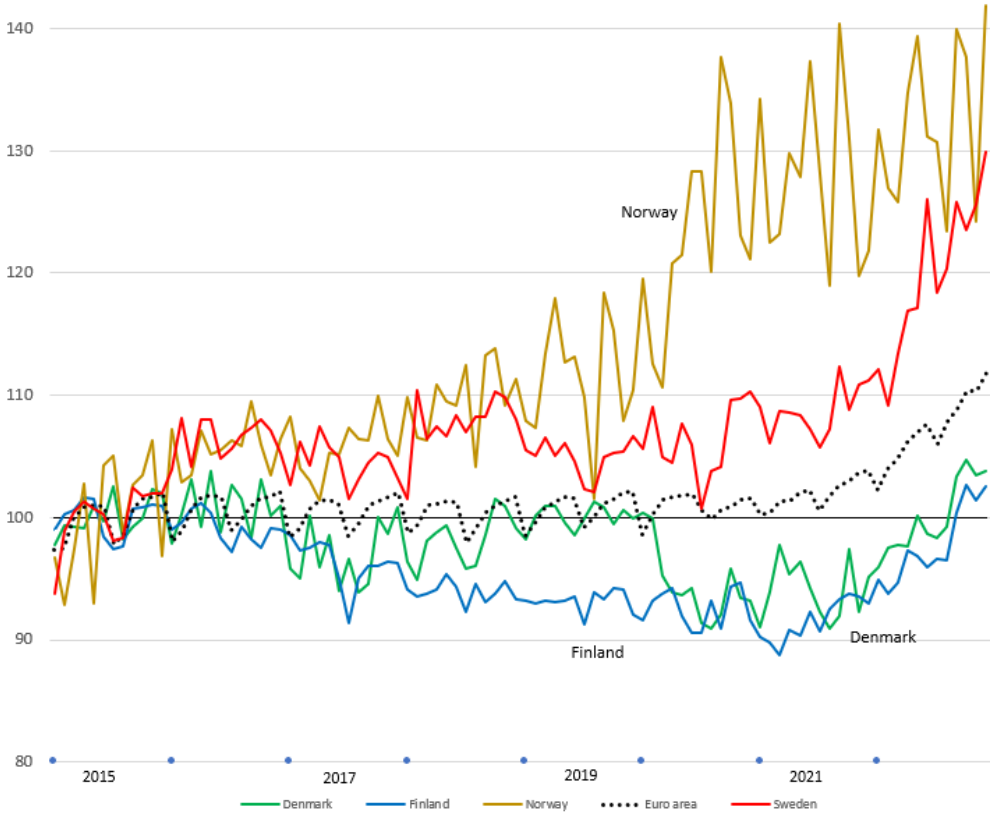


Diagram 052 Household textile, 2015 – 2022



Coicop 051 includes garden furniture, lighting equipment and other furniture and furnishings, services of laying of fitted carpets and floor coverings and repair of furniture, furnishings and floor coverings.

Table Average index 2021 (2015 = 100)

Country	051 Furniture and furnishings, carpets and other floor coverings	05111 Household furniture	052 Household textiles
Denmark	**97,6**	**87,5**	**94,0**
Finland	**101,1**	**94,2**	**91,6**
Euro-area	106,0	97,9	101,9
Spain	104,4	105,8	97,3
France	104,9	100,9	104,8
Switzerland	100,8	115,2	95,6
Austria	113,0	102,0	99,3
Belgium	106,7	102,4	105,7
Germany	107,6	103,7	107,4
Netherlands	108,9	101,8	108,4
Sweden	**106,8**	**107,5**	**108,7**
Luxembourg	112,6	105,7	105,2
Estonia	117,3	105,5	105,7
Norway	**117,5**	**94,0**	**127,9**

As for garments, Austria, Belgium, Luxembourg and Spain have very significant sales prices for furniture in January and July.

Table Ratio between highest and lowest index for furniture etc. and textile, per country and year. Average 2015 - 2021

Country	051 Furniture and furnishings, carpets and other floor coverings	05111 Household furniture	052 Household textiles
Germany	1,02	1,11	1,02
Finland	1,08	1,06	1,05
Estonia	1,04	1,12	1,05
Euro-area	1,02	1,17	1,04
Denmark	1,04	1,14	1,07
Sweden	**1,03**	**1,17**	**1,07**
Switzerland	1,05	1,19	1,05
France	1,04	1,20	1,05
Netherlands	1,03	1,24	1,06
Norway	1,13	1,06	1,14
Austria	1,04	1,28	1,03
Luxembourg	1,07	1,23	1,07
Belgium	1,01	**1,34**	1,09
Spain	1,02	**1,38**	1,06

Major (0531) and small (0532) household appliances

Index levels

The Euro-area has quite similar developments for major and small appliances, Sweden has different trends for the two. Finland and Denmark stands out with low price index whereas Norway stands out with very high price indexes.

Diagram 0531 Major household appliances 2015 – 2022

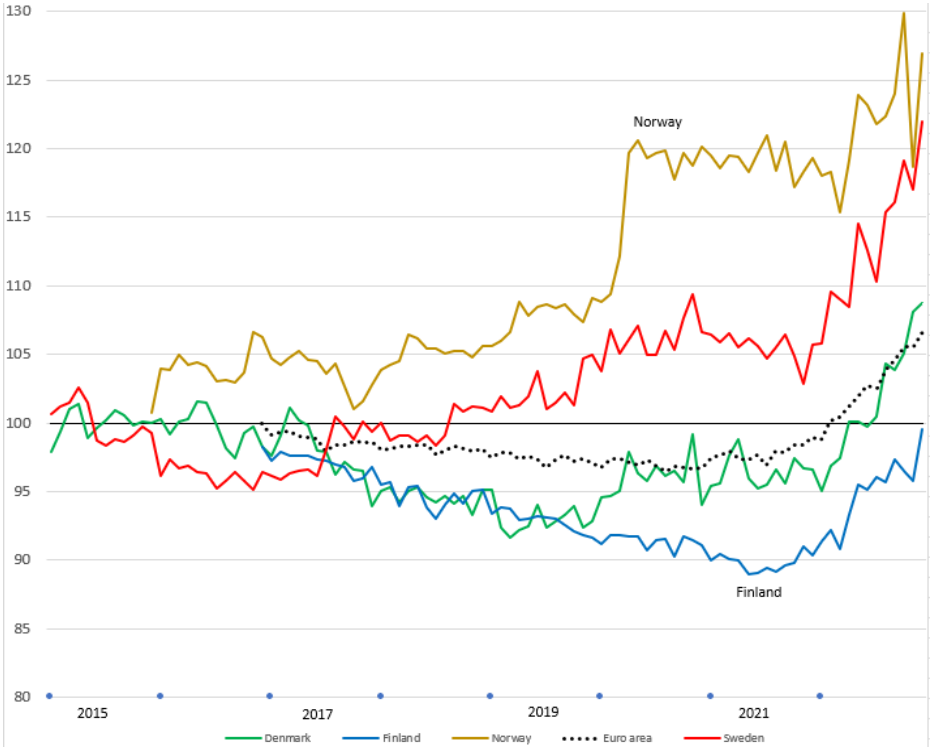
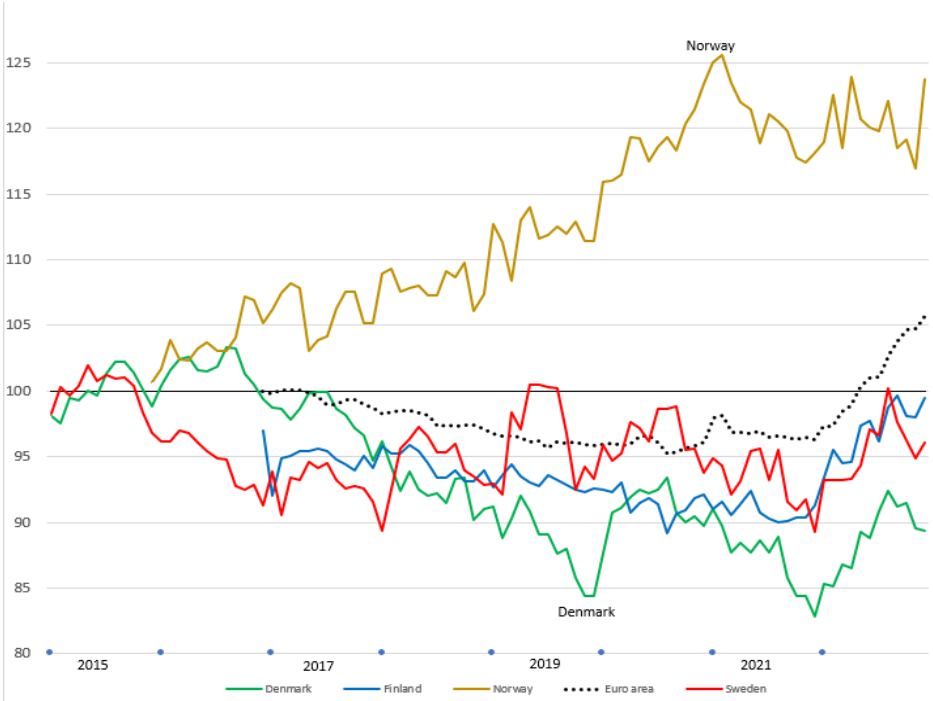


Diagram 0532 Small electric household appliances 2015 – 2022



Sweden has remarkedly big difference between index for small electric and major household appliances. The same goes for Switzerland, Denmark and Austria, but the Euro-area has the same index for the two. The difference between the Nordic countries Finland/Denmark and Norway is the most striking.

Table Average index 2021 (2015 = 100)

	053 Household appliances	0531 Major household appliances	0532 Small electric household appliances
Finland	**90,4**	**89,8**	**90,8**
Switzerland	90,6	93,5	82,4
France	93,1	91,7	91,1
Denmark	**95,1**	**96,4**	**87,3**
Luxembourg	95,7	94,8	92,1
Spain	96,2	94,9	94,6
Euro-area	97,3	97,8	96,9
Belgium	99,1	98,6	104,0
Sweden	**99,3**	**105,5**	**93,2**
Germany	99,9	98,3	100,9
Netherlands	107,1	106,1	106,4
Estonia	108,2	107,2	110,9
Austria	111,3	111,8	101,6
Norway	**119,3**	**119,1**	**120,9**

Seasonality is weak overall. Swedish prices are somewhat lower in October to February and high in May -August.

Table Ratio between highest and lowest index for Furniture etc. and Textile, per country and year. Average 2015 - 2021

	053 Household appliances	0531 Major household appliances	0532 Small electric household appliances
Euro-area	1,01	1,01	1,01
Spain	1,01	1,01	1,02
Germany	1,01	1,01	1,02
France	1,02	1,02	1,02
Finland	1,02	1,02	1,03
Luxembourg	1,02	1,03	1,04
Estonia	1,03	1,04	1,03
Austria	1,03	1,03	1,04
Switzerland	1,03	1,04	1,05
Norway	1,04	1,04	1,05
Netherlands	1,04	1,05	1,05
Denmark	1,04	1,04	1,07
Sweden	**1,04**	**1,04**	**1,07**
Belgium	1,10	1,10	1,07

Irregularity / Variance (and changed seasonal pattern)

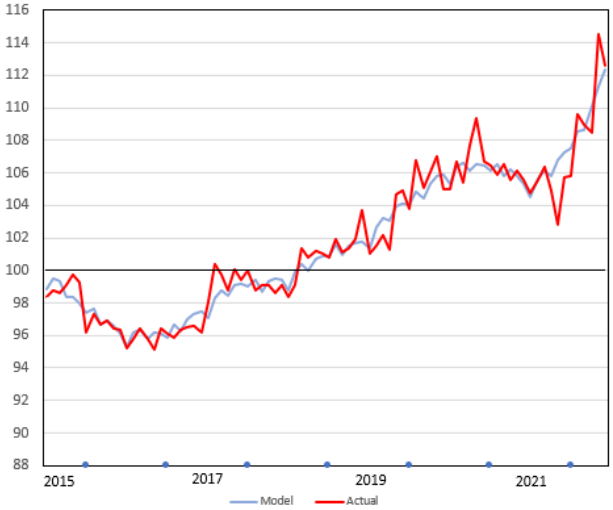
Small appliances generally have more irregular variations than large.

Germany has stable index, but for the second half of 2021.

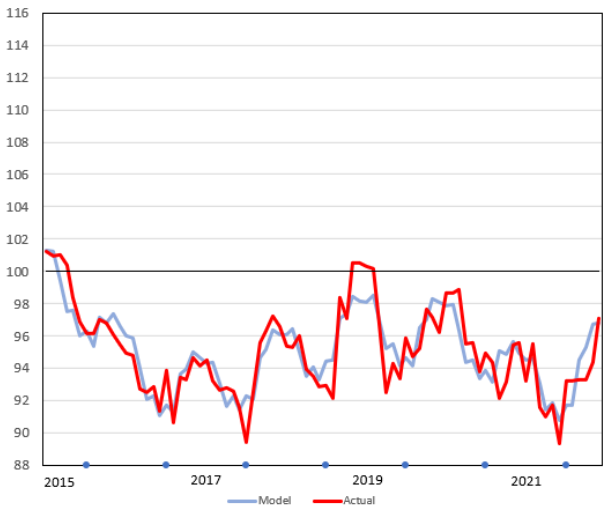
Belgium has regular big sales, but for summer 2020 when the sales period was August instead of July.

Diagram Actual and modelled values for 0531 Major Household appliances and 0532 Small electric appliances

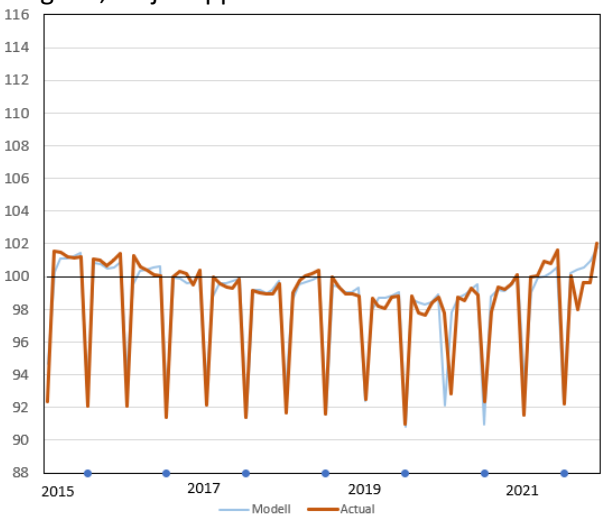
Sweden, major appliances



Sweden, small electric appliances



Belgium, major appliances



Belgium, small electric appliances

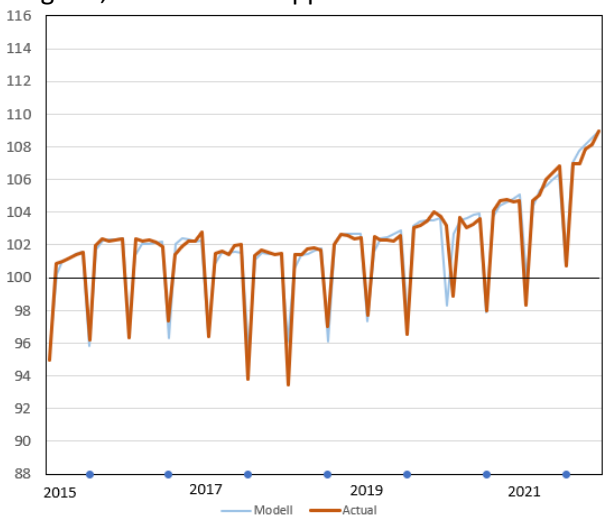


Table Root of mean squared deviation between actual and modelled indexes 2015-2019

Product group	Sweden	Norway	Finland	Denmark	Belgium	Nether-lands
Household appliances	0,80	0,85	0,53	0,79	0,63	0,83
Major household appliances	0,81	1,14	0,61	0,94	0,66	1,10
Small electric household	1,24	1,25	0,69	1,15	0,60	1,04

054 Glassware, tableware and household utensils

This product group has developed quite like 052 Textile. Norway has high and volatile index, Denmark has extremely low and volatile index. Finland is close to Euro-area and Sweden is a little higher.

Diagram 054 Glassware, tableware and household utensils 2015 – 2022

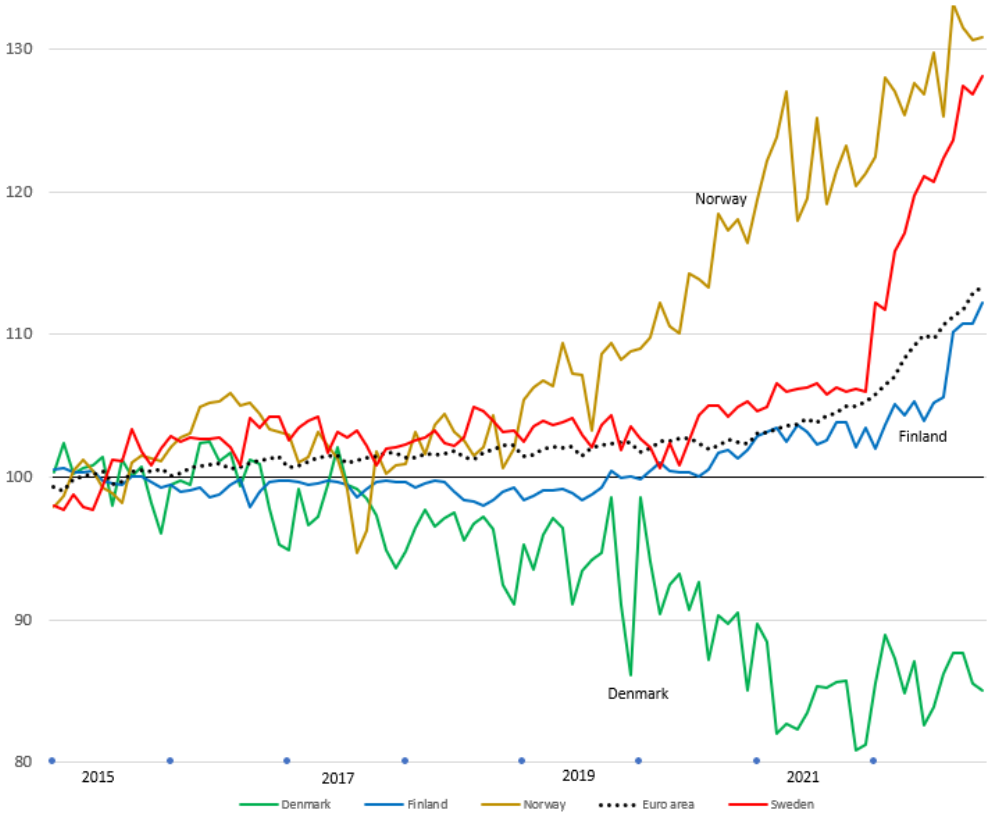


Table Average index 2021 (2015 = 100)

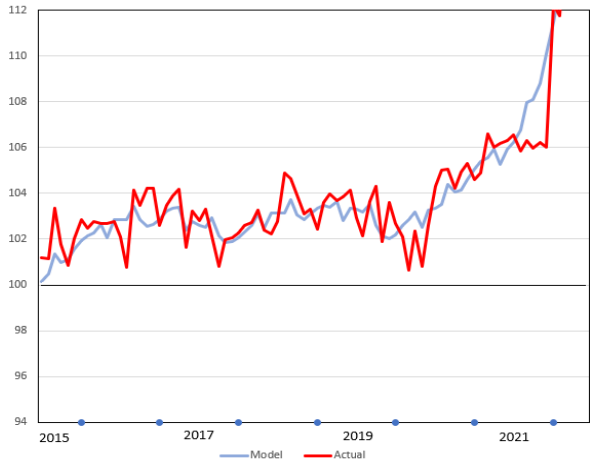
Country	2021
Denmark	**84,4**
Estonia	96,7
Netherlands	98,5
Switzerland	99,8
Finland	103,1
Euro-area	104,1
Spain	104,7
Belgium	105,6
France	105,9
Sweden	**106,0**
Germany	106,2
Austria	107,2
Luxembourg	108,1
Norway	**121,7**

Table Ratio between highest and lowest index for 054 Glassware, tableware and household utensils,
per country and year. Average 2015 - 2021

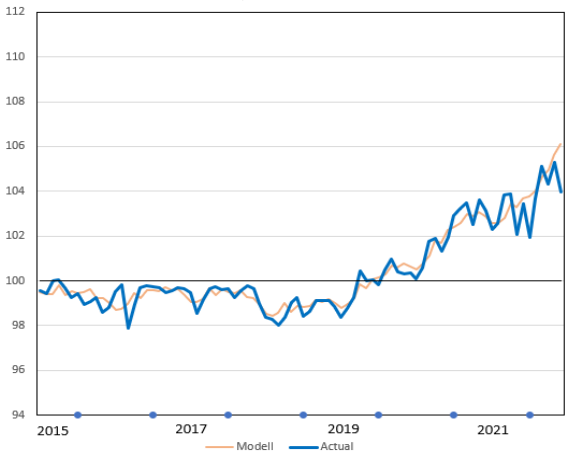
Country	Mean ratio
France	1,01
Belgium	1,01
Euro-area	1,01
Switzerland	1,02
Spain	1,02
Germany	1,02
Finland	1,02
Estonia	1,03
Sweden	**1,03**
Luxembourg	1,04
Austria	1,04
Netherlands	1,04
Norway	1,06
Denmark	1,10

Diagram Actual and modelled values for 054 Glassware, tableware and household utensils.

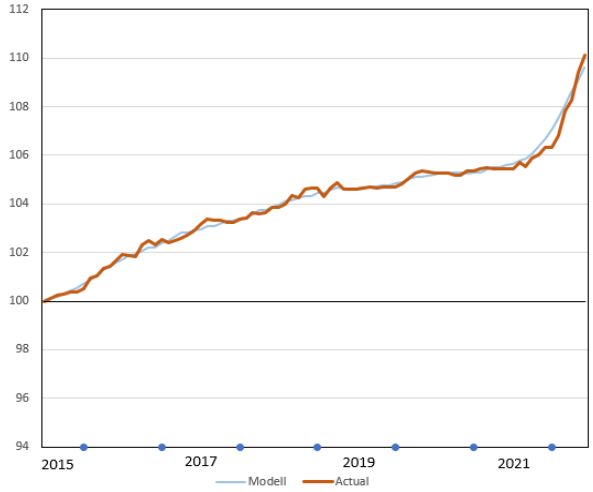
Sweden (RMSD = 0,85)



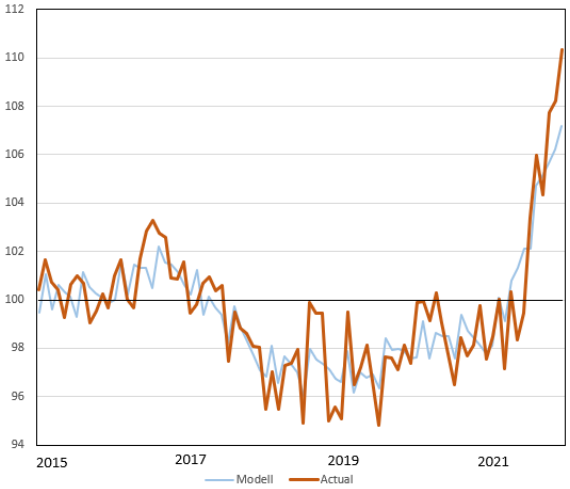
Finland (RMSD = 0,53)



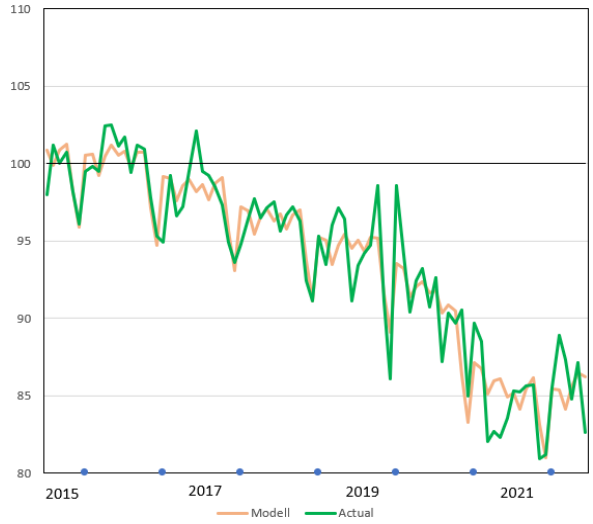
Belgium (RMSD = 0,14)



The Netherlands (RMSD = 1,11)



Denmark (RMSD = 1,57)



055 Tools and equipment for house and garden

The Swedish prices are somewhat higher in February – April.

Diagram 055 Tools and equipment for house and garden 2015 – 2022

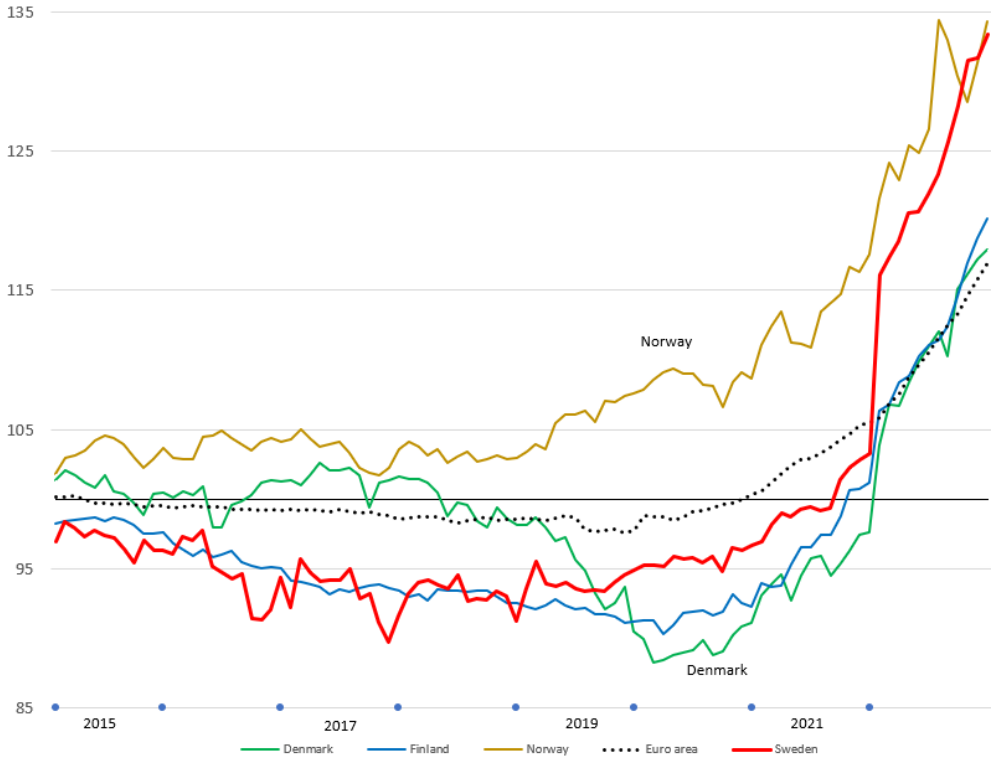


Table Average index 2021 and 2022 (2015 = 100) for Tools and equipment for house and garden

Country	2021	2022
Estonia	94,7	106,0
Netherlands	94,7	97,8
Denmark	95,2	111,3
Austria	95,4	97,4
Spain	96,4	99,0
Switzerland	96,9	100,4
Finland	97,2	112,2
Sweden	**100,0**	**124,1**
Germany	100,2	104,4
France	100,9	104,6
Belgium	101,5	106,6
Luxembourg	101,9	108,1
Euro-area	103,2	111,2
Norway	113,6	128,1

Table Ratio between highest and lowest index for 055 Tools and equipment for house and garden, per country and year. Average 2015 - 2021

Country	Average
Spain	1,008
Belgium	1,009
France	1,010
Germany	1,013
Euro-area	1,015
Luxembourg	1,018
Austria	1,019
Switzerland	1,024
Finland	1,026
Norway	1,032
Netherlands	1,044
Denmark	1,044
Sweden	**1,044**
Estonia	1,049

056 Goods and services for routine household maintenance

Diagram 056 Goods and services for routine household maintenance 2015 – 2022

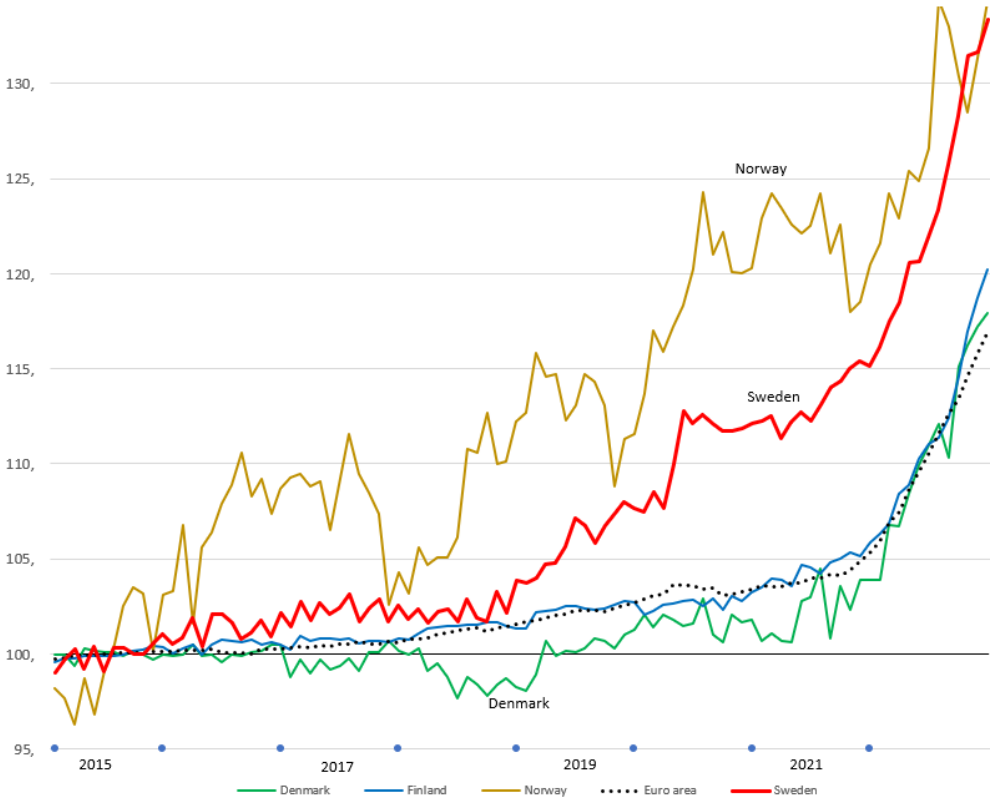


Table Average index 2021 and 2022 (2015 = 100) for Goods and services for routine household maintenance

Country	2021	2022
Switzerland	99,9	101,5
Denmark	102,3	111,3
France	102,4	109,2
Spain	103,9	110,2
Euro-area	104,1	111,2
Finland	104,6	112,2
Belgium	106,3	112,3
Austria	106,5	112,2
Luxembourg	107,6	114,2
Germany	108,1	121,2
Estonia	109,9	128,6
Netherlands	110,4	118,3
Sweden	**113,4**	**124,1**
Norway	121,9	128,1

Table Ratio between highest and lowest index for Goods and services for routine household maintenance ,per country and year. Average 2015 – 2022

Country	Average
France	1,009
Euro-area	1,009
Spain	1,017
Germany	1,017
Luxembourg	1,019
Belgium	1,021
Austria	1,024
Netherlands	1,025
Finland	1,029
Estonia	1,036
Switzerland	1,038
Sweden	**1,044**
Denmark	1,051
Norway	1,065

0711 Motor cars

Diagram 07111 New motor cars 2015 – 2022

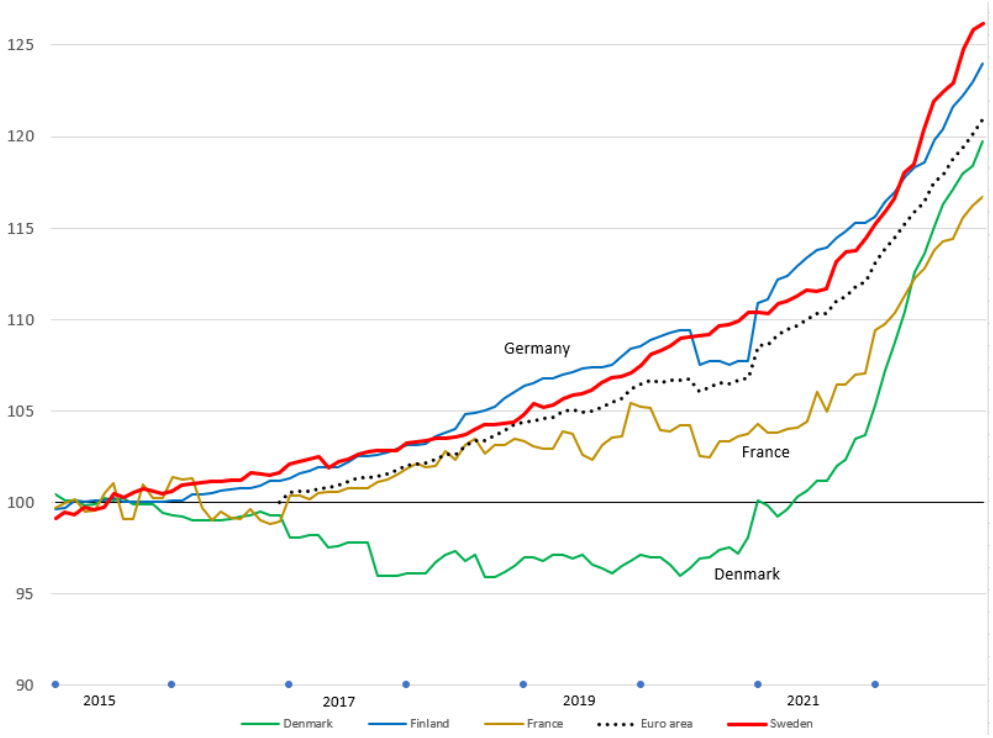
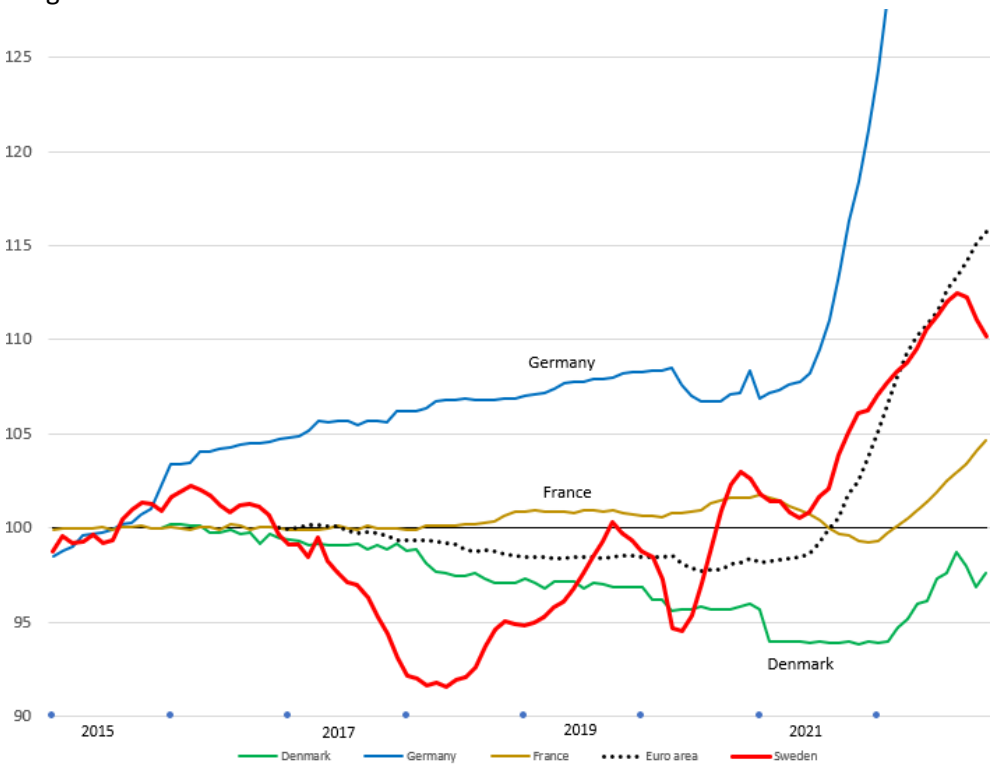


Diagram 07112 Second-hand motor cars 2015 – 2022



For new cars, SCB measures list prices, not taking into account individual discounts. For second-hand cars, the “data provider” estimates approximate transaction prices using a model, taking into account for example how long the car has been available for purchase.

Prices for new cars develops quite similarly for compared countries. Considering the change of the Swedish and Norwegian exchange rate, the Norwegian index is surprisingly low, and the Swedish index is also quite low. The Netherlands, on the other hand, has a high index for new cars.

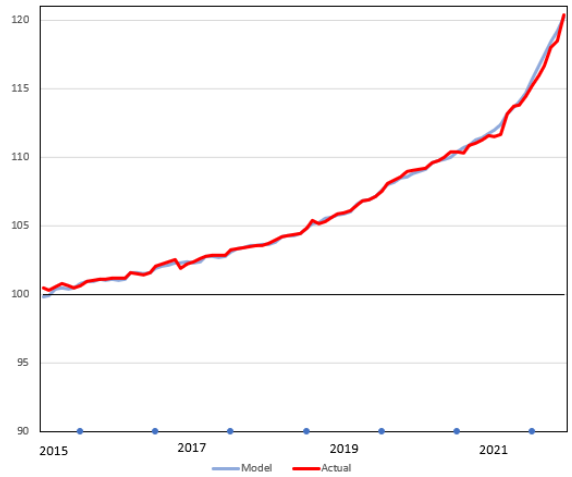
Second-hand cars have generally ten percent lower and much more various indexes. Now Belgium and Germany have distinctive indexes. Germany, Finland and Belgium have the same index levels 2021 for new and second-hand cars.

Table Average index 2021 (2015 = 100)

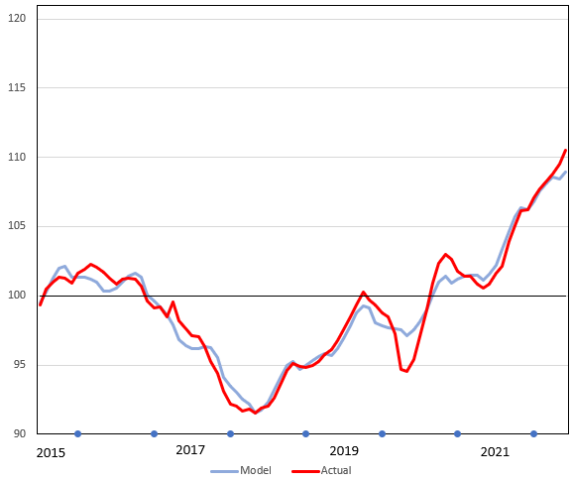
	071 Purchase of vehicles	07111 New motor cars	07112 Second-hand motor cars	Diff New – Second-hand
Estonia	93,9	108,7	75,2	33,4
Denmark	**98,9**	**101,1**	**94,1**	**7,0**
Finland	100,5	100,0	100,1	-0,1
Switzerland	101,6	104,1	96,7	7,3
France	103,7	105,2	100,5	4,7
Austria	106,2	113,7	96,7	17,0
Spain	107,9	110,7	98,3	12,4
Euro-area	108,3	110,2	99,8	10,3
Luxembourg	108,9	109,3	89,8	19,5
Sweden	**109,4**	**112,0**	**102,7**	**9,3**
Netherlands	111,1	119,0	103,6	15,4
Norway	112,3	105,2	100,5	4,7
Germany	112,9	113,4	111,2	2,1
Belgium	114,8	113,2	113,7	-0,5

Diagram Actual and modelled values for new and used cars.

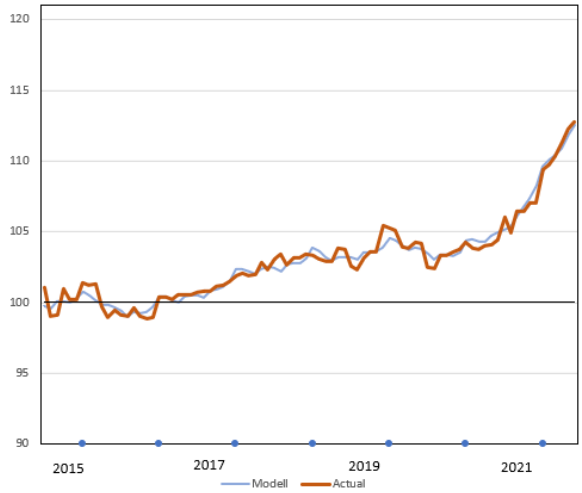
Sweden, new cars



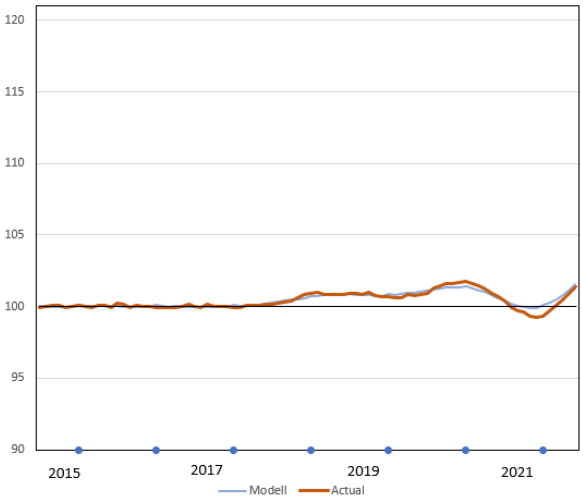
Sweden, used cars



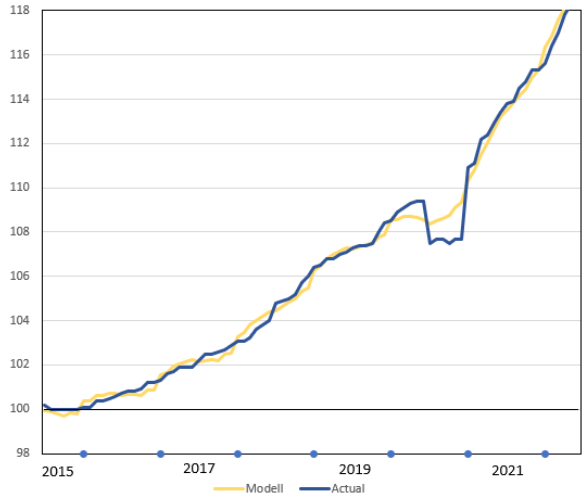
France, new cars



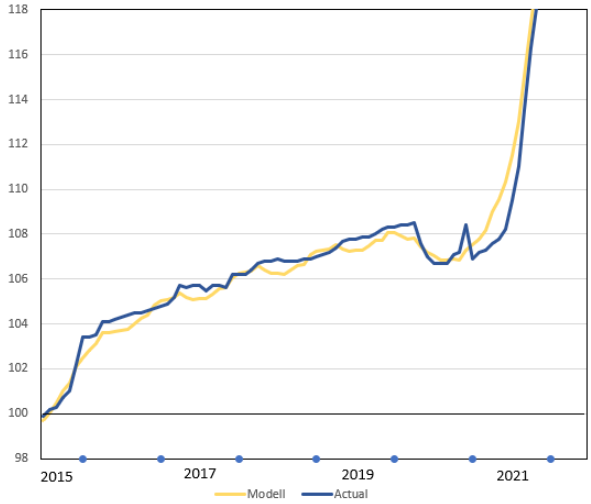
France, used cars



Germany, new cars



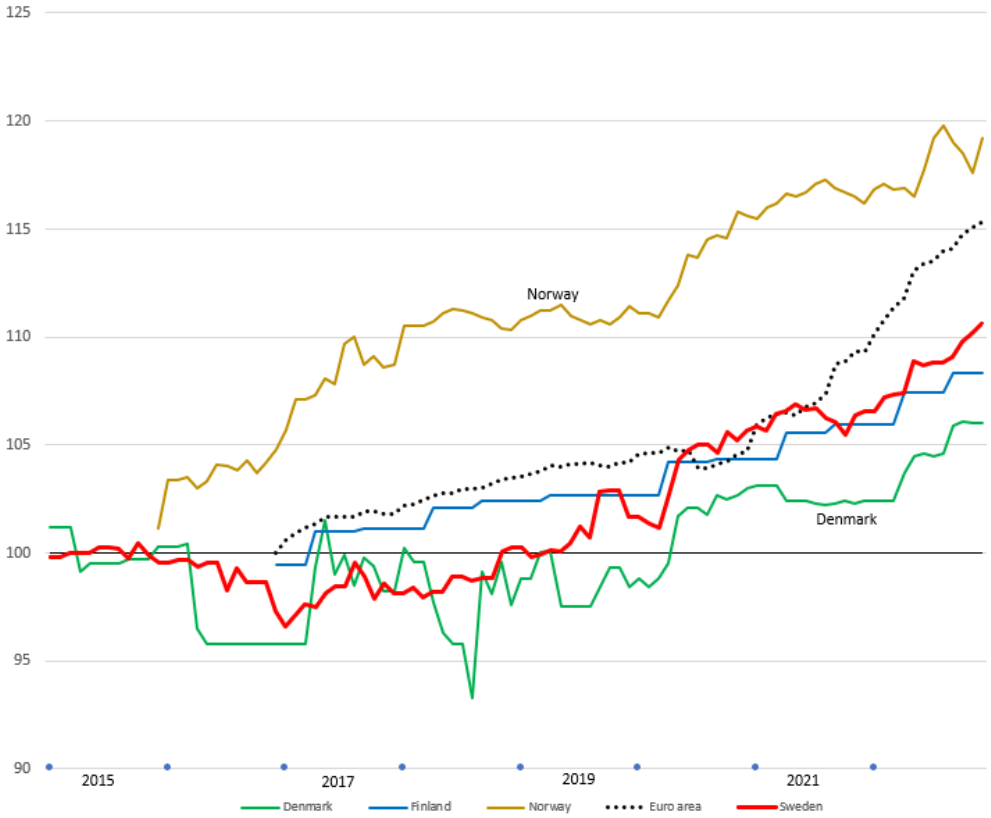
Germany, used cars



France has high RMSD for new cars and low for used cars, contrary to many other countries.

0712 Motor cycle

Diagram 0712 Motor cycles 2015 – 2022



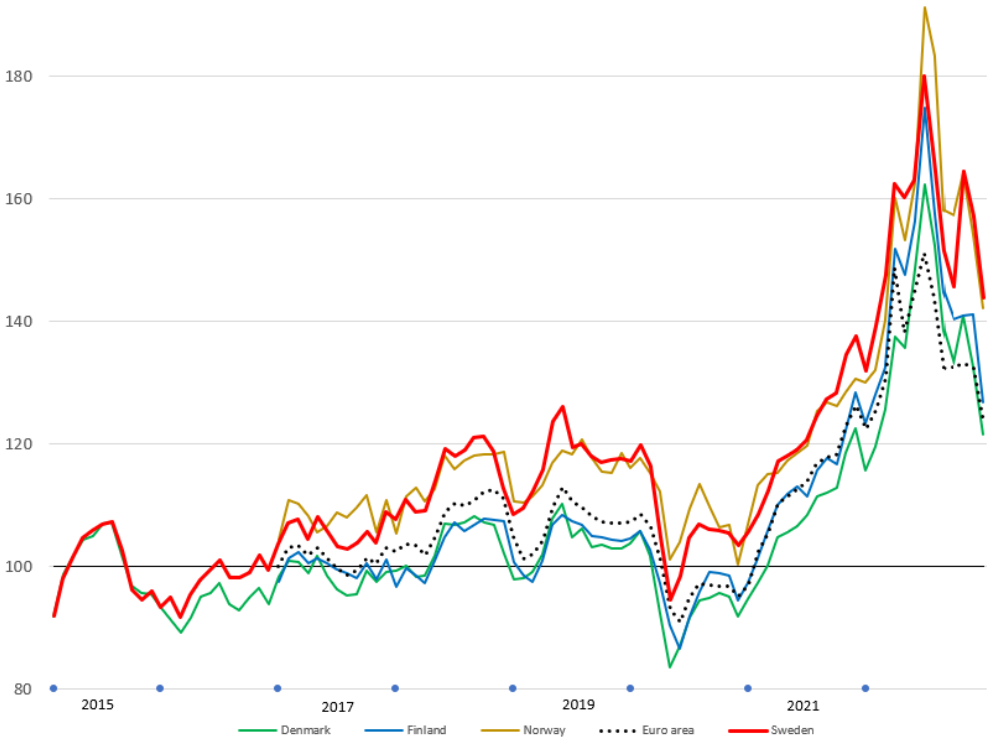
072 Operation of personal transport equipment

0722 petrol is a big part of this coicop-group.

Table Average index 2021 (2015 = 100)

	072		0722 Petrol	
	2021	2022	2021	2022
Switzerland	106,6	119,6	112,6	134,9
Finland	109,9	128,1	114,9	145,3
Spain	111,0	128,0	114,4	131,3
Denmark	111,1	124,8	109,7	137,4
Austria	112,6	136,0	106,5	143,8
Euro-area	113,0	129,3	115,1	136,4
Luxembourg	113,8	146,0	112,7	144,0
France	114,4	127,7	113,3	131,1
Germany	115,7	134,8	113,6	138,3
Belgium	116,3	133,6	109,6	131,9
Netherlands	116,4	132,1	116,9	134,1
Sweden	**119,6**	**136,3**	**123,4**	**156,9**
Norway	122,0	141,4	122,3	158,3
Estonia	123,1	159,9	130,9	170,2

Diagram 0722 Petrol 2015 – 2022

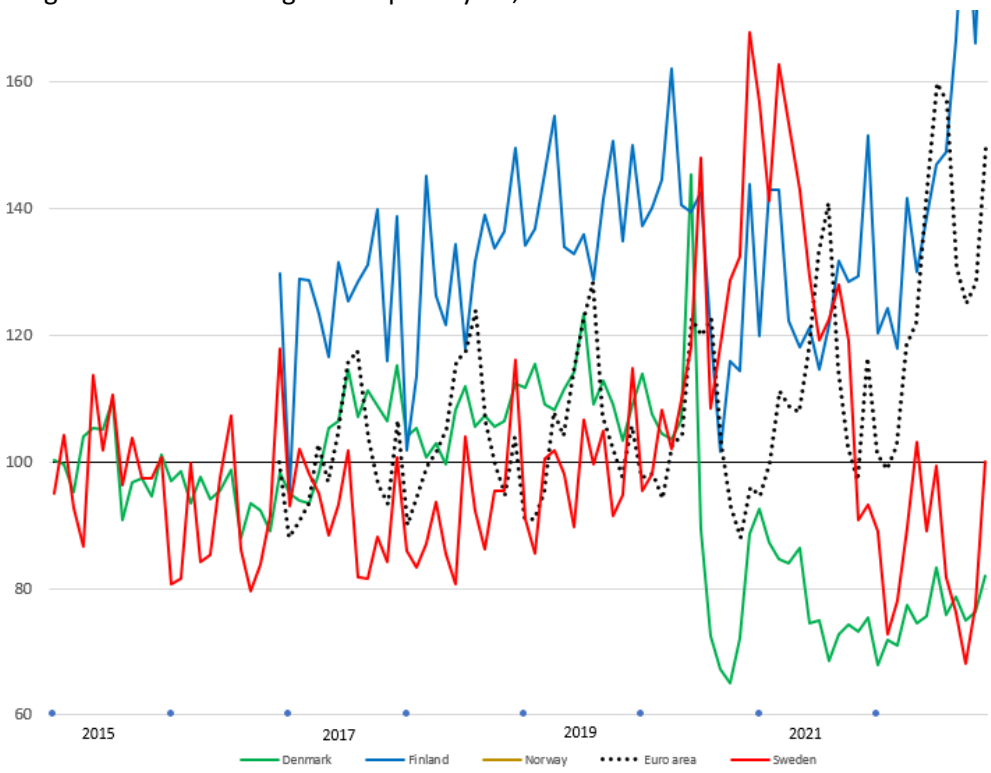


07331 Domestic flights and 07332 International flights

Table Average index 2021 (2015 = 100)

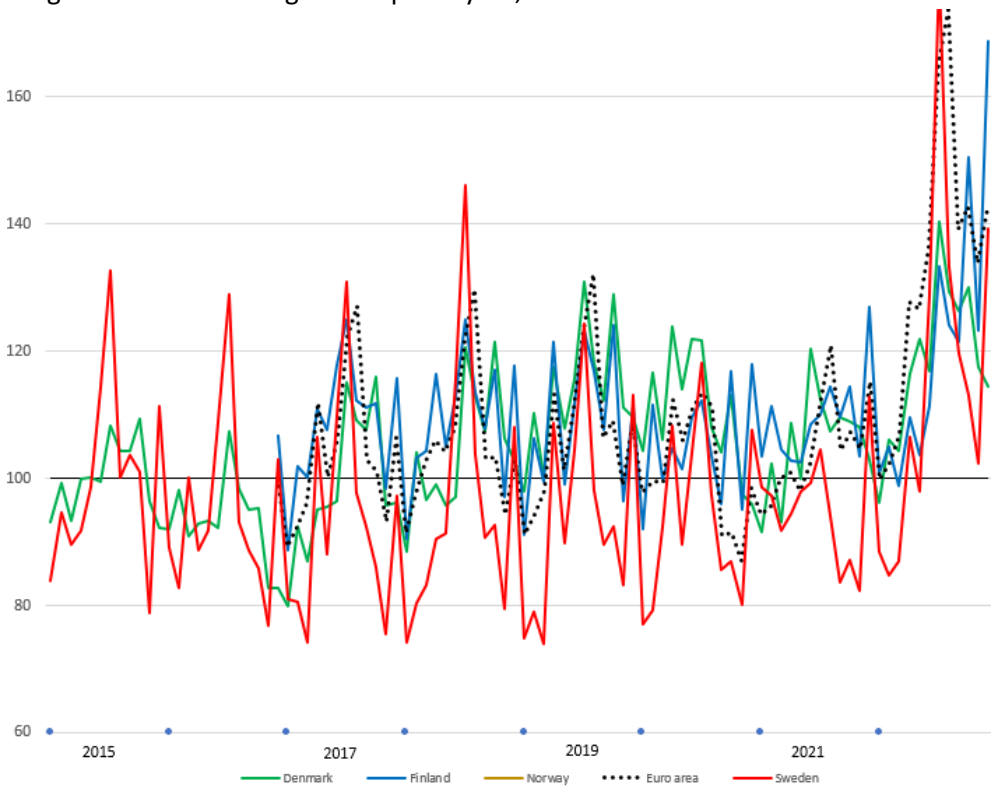
	073 Transport services	0733 Passenger transport by air	07331 Domestic flights	'07332 International flights
Switzerland	92,1	68,1		68,1
Spain	97,7	85,2	88,3	83,1
Austria	101,5	94,5		94,5
Belgium	106,3	95,6		95,6
France	103,5	99,0	93,9	101,1
Sweden	**118,2**	**102,8**	**130,0**	**95,3**
Norway	112,7	105,1		
Netherlands	107,1	106,0		106,0
Estonia	97,5	106,5		106,5
Euro-area	105,9	106,7	112,0	104,7
Denmark	104,7	108,3[3]	79,0[3]	105,5[3]
Luxembourg	63,0	110,3		110,3
Finland	102,6	111,0	128,7	109,3
Germany	108,4	111,1	105,1	111,6

Diagram 07331 Passenger transport by air, Domestic 2015 – 2022



[3] Looks like some kind of error that both domestic and international flight have lower indexes than transport by air.

Diagram 07332 Passenger transport by air, International 2015 – 2022



The Swedish price indexes are very volatile, Denmark has less variation, not to mention Germany.

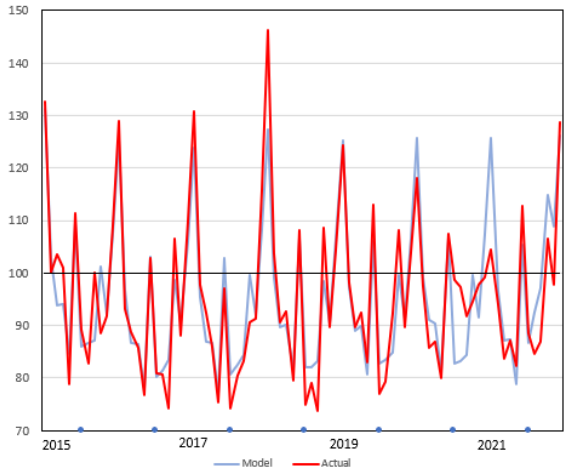
Table Ratio between highest and lowest index for Air transports, per country and year. Average 2015 - 2021

Country	´0733 Passenger transport by air	07331 Domestic flights	07332 International flight
Germany	1,10	1,06	1,11
Spain	1,13	1,10	1,17
Belgium	1,25		1,25
Denmark	1,30	1,35	1,32
Finland	1,33	1,41	1,34
France	1,36	1,27	1,40
Euro-area	1,38	1,40	1,38
Austria	1,47		1,47
Norway	1,49		
Estonia	1,56		1,56
Luxembourg	1,57		1,57
Sweden	**1,57**	**1,48**	**1,67**
Switzerland	1,58		1,58
Netherlands	1,77		1,77

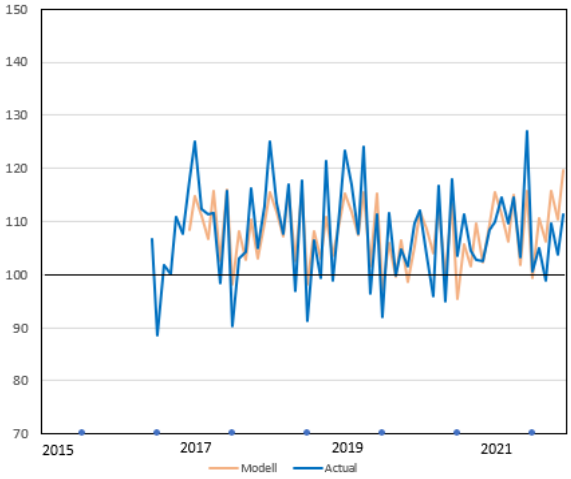
There are not only seasonal variations but the irregularities are the highest in HICP for many countries. The largest impact is seen for Luxembourg, the Netherlands, Austria and Sweden. Prices vary in France, but regularly.

Diagram Actual and modelled values for 07332 International flights

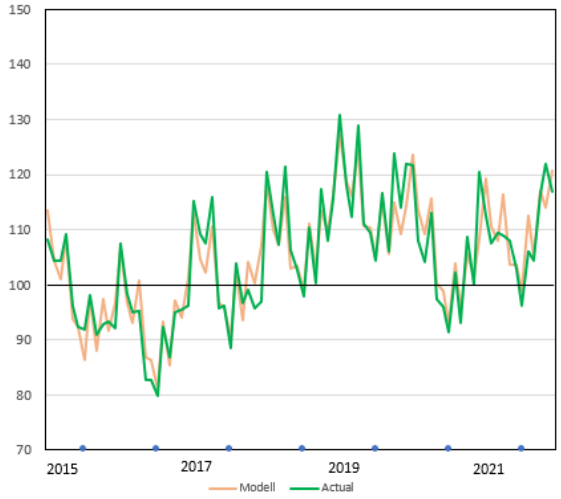
Sweden RMSD = 5,8



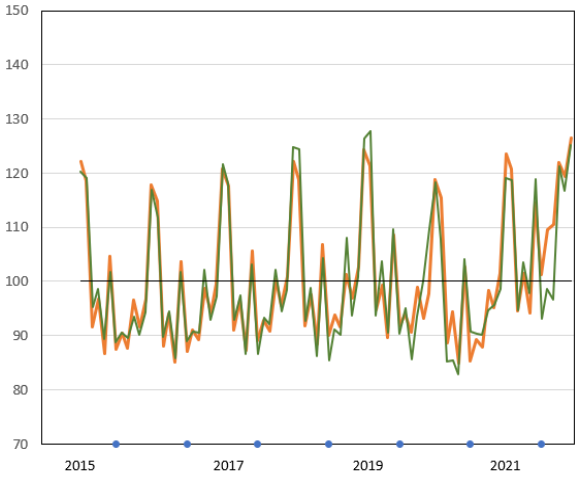
Finland RMSD = 5,0



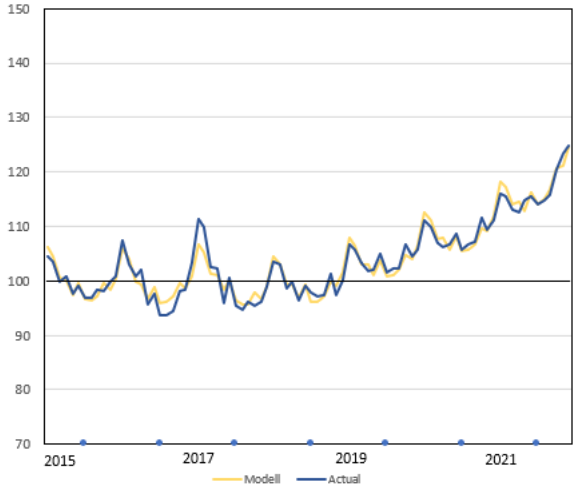
Denmark RMSD = 1,6



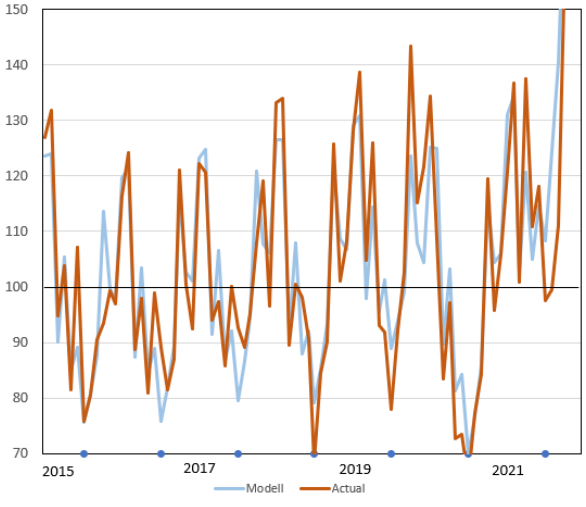
France RMSD = 2,5



Germany RMSD = 1,6



The Netherlands RMSD = 7,3



08202 Mobile telephone equipment and other electronic products

Norway differs clearly from Sweden, Finland and Denmark with high indexes, over 100,0. SCB changed method for mobile telephones and personal computers from 2022, making the comparison less interesting.

Table Average index 2021 (2015 = 100)

	08202 Mobile telephone equipment	0911 Equipment for the reception, recording and reproduction of sound and picture	0912 Photographic and cinematographic equipment and optical instruments	09131 Personal computers
Sweden	**37,3**	**68,9**	**91,0**	**57,5**
Finland	38,0	57,6	87,6	75,7
Spain	49,3	82,5	85,0	65,9
Denmark	73,9	70,2	98,7	50,9
Luxembourg	62,5	67,2	85,3	91,0
France	59,5	83,2	84,1	80,2
Estonia	32,2	93,2	132,0	58,5
Switzerland		66,2	101,4	70,3
Netherlands	47,9	83,7	114,0	74,7
Euro-area	63,8	78,5	101,0	87,6
Belgium	78,6	78,9	93,9	100,1
Austria	73,8	96,9	90,0	100,3
Germany	82,6	81,0	116,8	86,9
Norway	**105,3**	**106,2**	**120,8**	**101,0**

Diagram 08202 Mobile telephone equipment 2015 – 2022

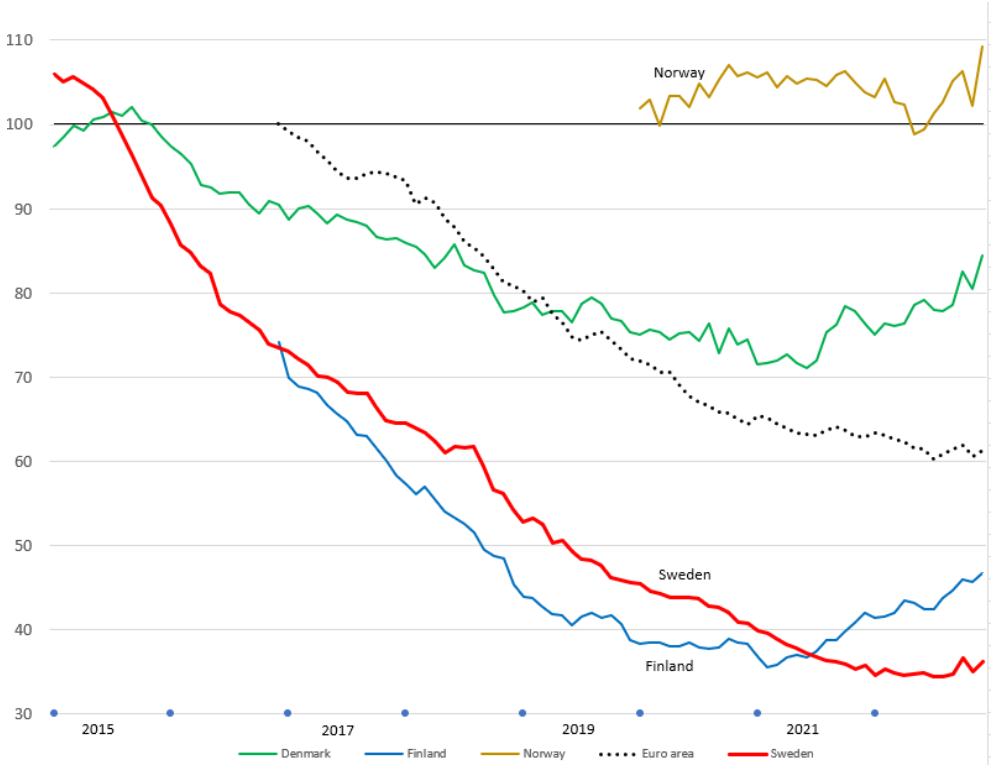


Diagram 0911 Equipment for the reception, recording and reproduction of sound and picture 2015 – 2022

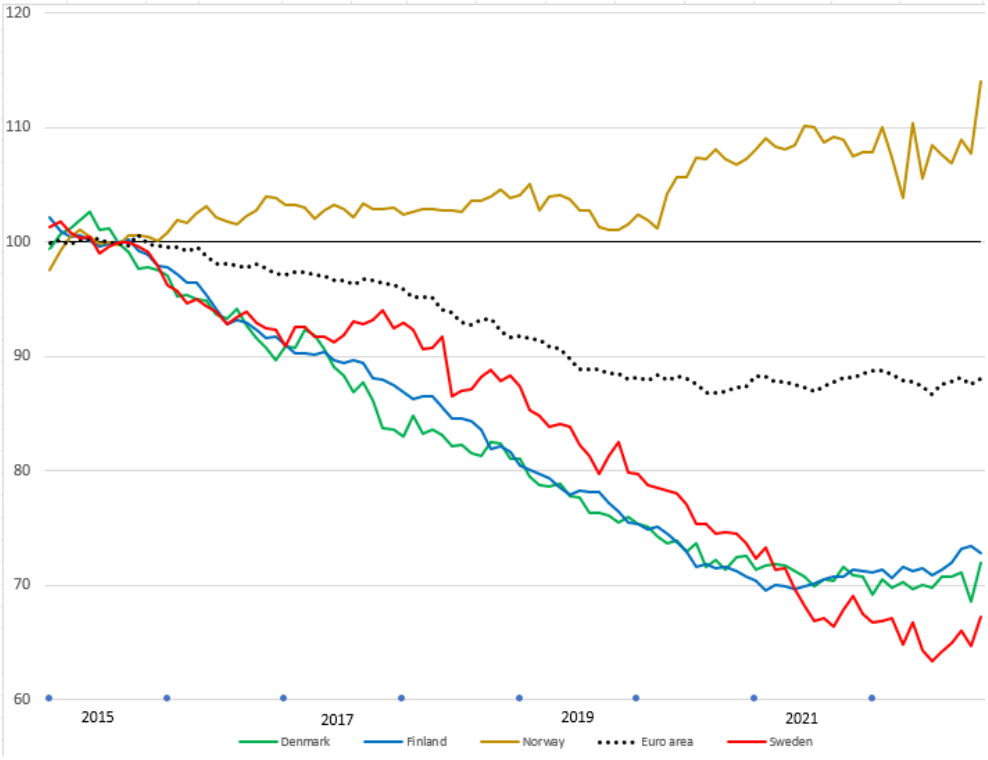


Diagram 0912 Photographic and cinematographic equipment and optical instruments 2015 – 2022

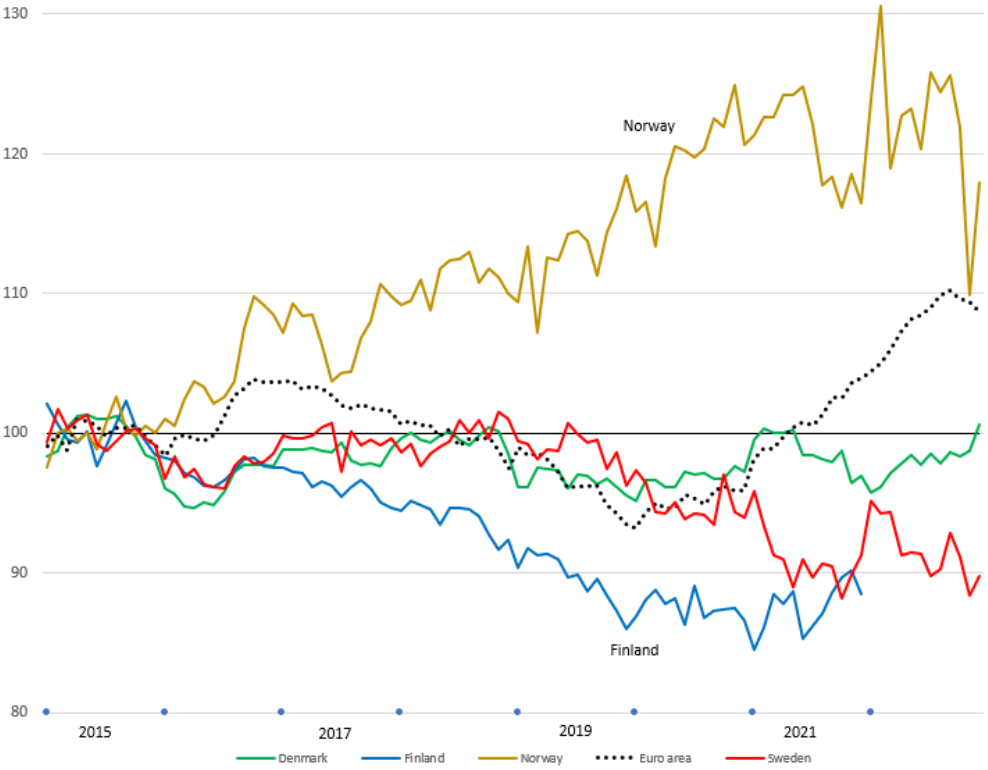
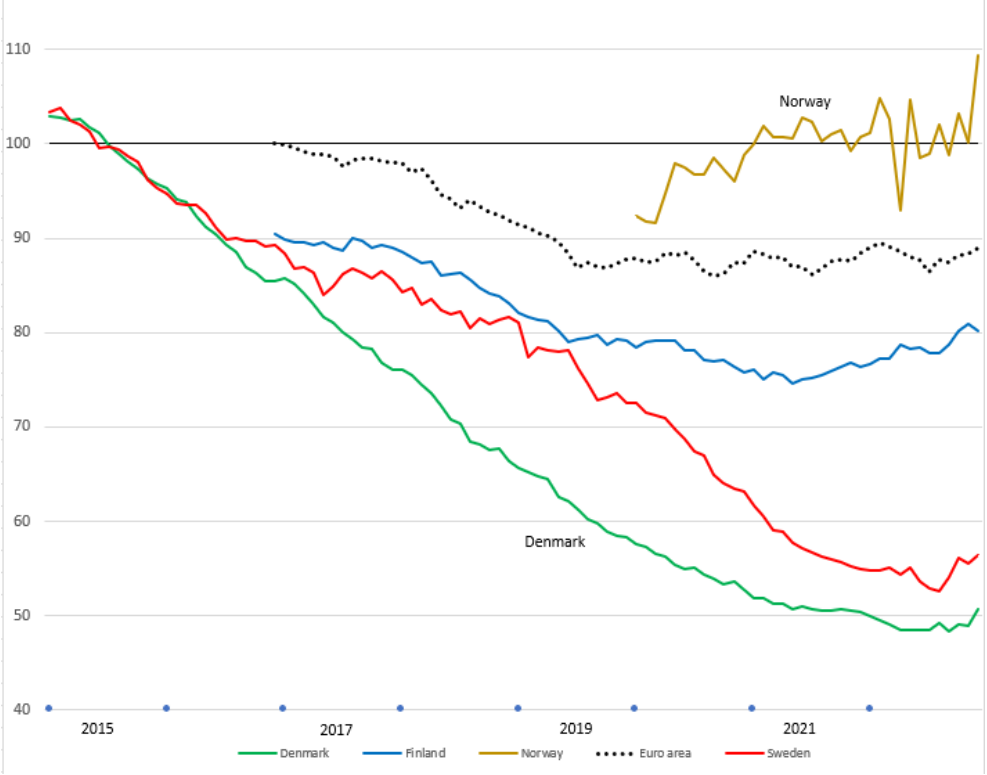


Diagram 09131 Personal computers 2015 – 2022



092 Other major durables for recreation and culture

France is the country with a strong seasonal impact, which is seen in Euro-area. From May to September the prices are clearly higher, from 2020 onwards the high prices begins in April.

Diagram 092 Other major durables for recreation and culture 2015 – 2022

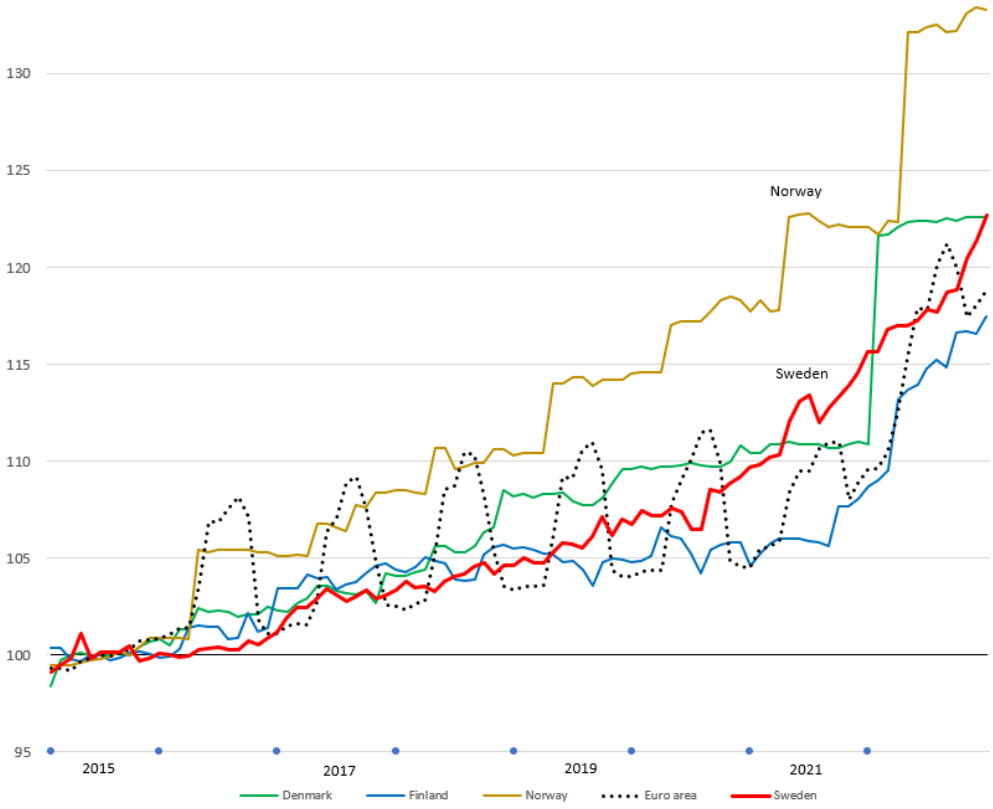


Table Average index 2021 (2015 = 100) for 092 Other major durables for recreation and culture

Country	2021	2022
Spain	101,8	
Austria	102,5	107,4
Switzerland	102,9	106,4
Belgium	106,5	111,4
Finland	106,5	114,3
Euro-area	108,6	116,6
Germany	109,2	119,7
France	109,5	113,8
Netherlands	110,3	119,4
Denmark	110,8	122,3
Luxembourg	112,0	122,4
Sweden	**112,6**	**118,4**
Norway	121,2	130,0

0931 Games, toys and hobbies, 0941 Recreational and sporting services and 0951 Books

Table Average index 2021 (2015 = 100)

	0931 Games, toys and hobbies	0941 Recreational and sporting services	0951 Books
Finland	83,6	102,6	104,5
Spain	82,9	109,5	107,9
France	92,0	106,5	103,4
Luxembourg	103,8	111,2	93,9
Switzerland	98,8	103,1	111,6
Euro-area	98,8	110,8	107,0
Germany	106,5	111,9	110,2
Belgium	103,1	113,8	114,0
Sweden	**103,2**	**111,4**	**120,5**
Austria	109,6	119,0	109,0
Netherlands	114,2	111,6	114,2
Norway	110,8	118,8	118,7
Estonia	107,4	134,5	109,7
Denmark	107,7	111,6	162,5

Diagram 0931 Games, toys and hobbies 2015 – 2022

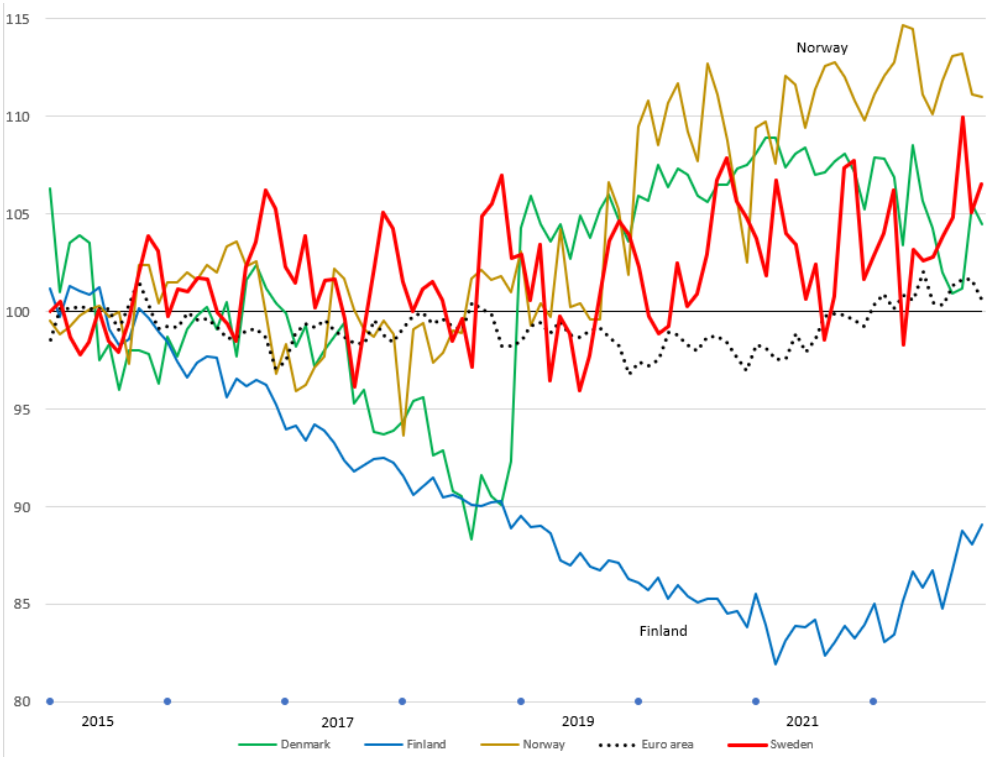


Diagram 0941 Recreational and sporting services 2015 – 2022

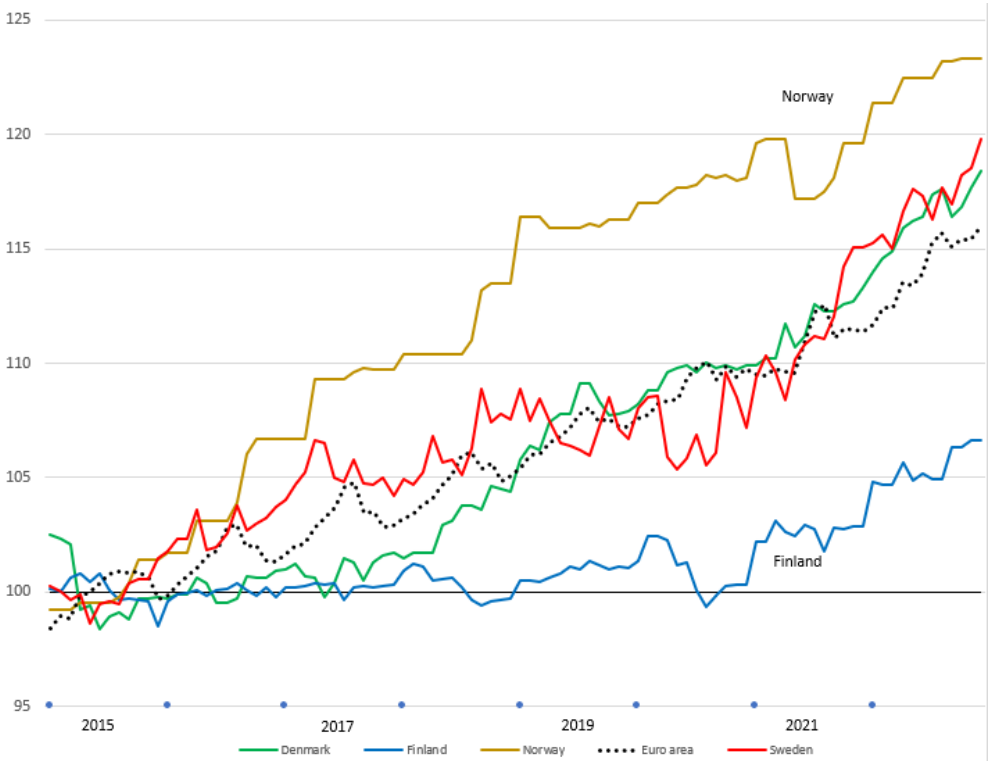


Diagram 0951 Books 2015 – 2022

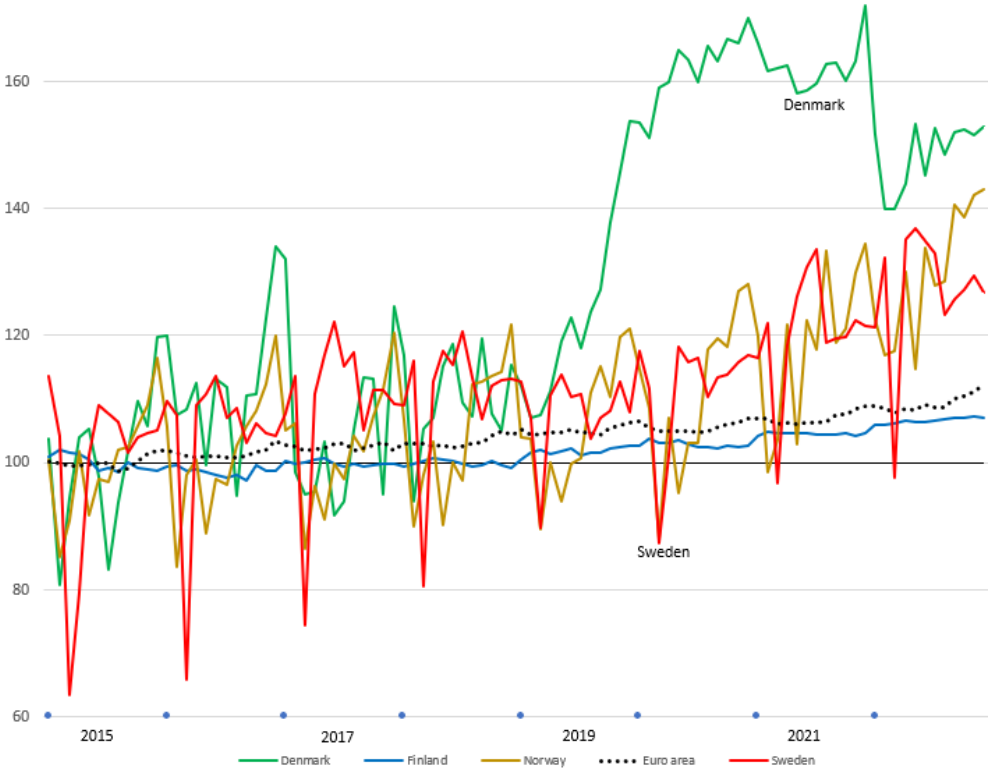


Diagram Actual and modelled values for 0951 Books

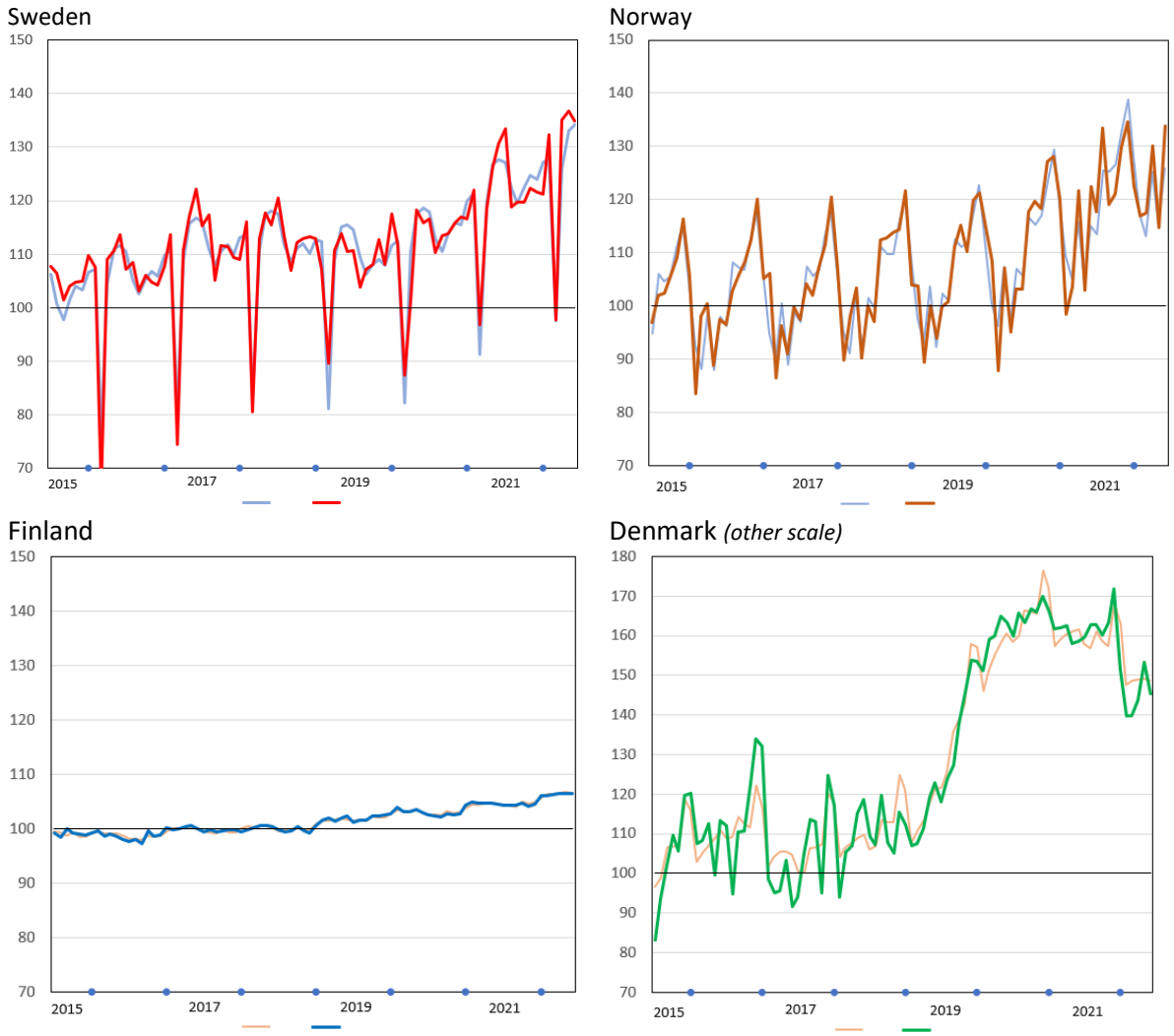


Table Ratio between highest and lowest index for games, toys and hobbies, recreational and sporting services and books, per country and year. Average 2015 - 2021

Country	0931 Games, toys and hobbies	0941 Recreational and sporting services	0951 Books
Finland	1,03	1,02	1,02
Belgium	1,02	1,02	1,03
Euro-area	1,03	1,03	1,02
Spain	1,04	1,03	1,02
France	1,05	1,03	1,01
Switzerland	1,03	1,01	1,08
Luxembourg	1,04	1,02	1,06
Austria	1,04	1,03	1,05
Germany	1,04	1,04	1,05
Netherlands	1,05	1,04	1,07
Estonia	1,04	1,05	1,13
Denmark	**1,06**	**1,03**	**1,32**
Norway	**1,07**	**1,02**	**1,39**
Sweden	**1,09**	**1,03**	**1,52**

094 Recreational and cultural services

France is the country with a strong seasonal impact, which is seen in Euro-area. May – September the prices are clearly higher, from 2020 onwards the high prices begins in April.

Diagram 094 Recreational and cultural services 2015 – 2022

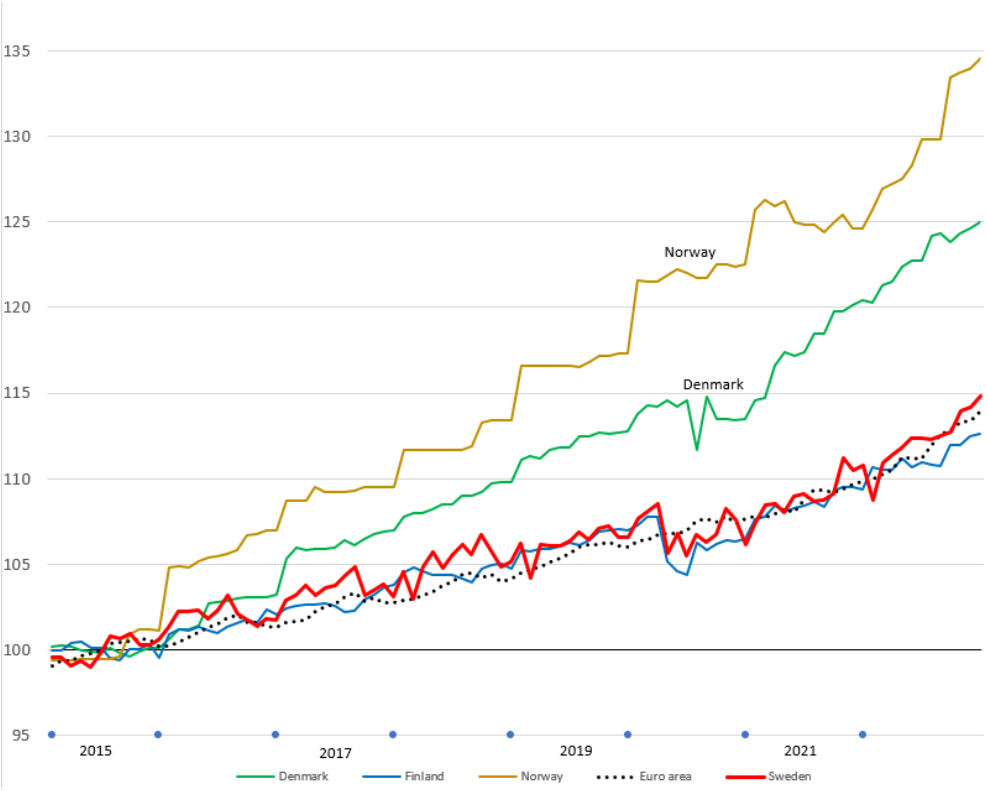


Table Average index 2021 (2015 = 100) for 094 Recreational and cultural services

Country	2021	2022
Switzerland	102,9	104,3
Spain	105,6	108,9
Germany	107,9	111,5
Finland	108,6	111,3
France	108,7	110,2
Euro-area	108,8	111,9
Sweden	**109,1**	**112,3**
Belgium	110,2	115,1
Luxembourg	110,4	115,8
Netherlands	112,8	115,0
Austria	117,5	122,2
Denmark	117,9	123,1
Norway	125,2	130,0
Estonia	136,9	152,3

Table Ratio between highest and lowest index for 094 Recreational and cultural services, per country and year. Average 2015 – 2022

Country	Average
Estonia	1,047
Switzerland	1,008
Spain	1,017
Luxembourg	1,016
Austria	1,026
France	1,018
Belgium	1,032
Netherlands	1,029
Germany	1,019
Denmark	1,023
Finland	1,016
Norway	1,013
Euro-area	1,017
Sweden	**1,027**

096 Package holidays

Diagram 096 Package holidays 2015 – 2022

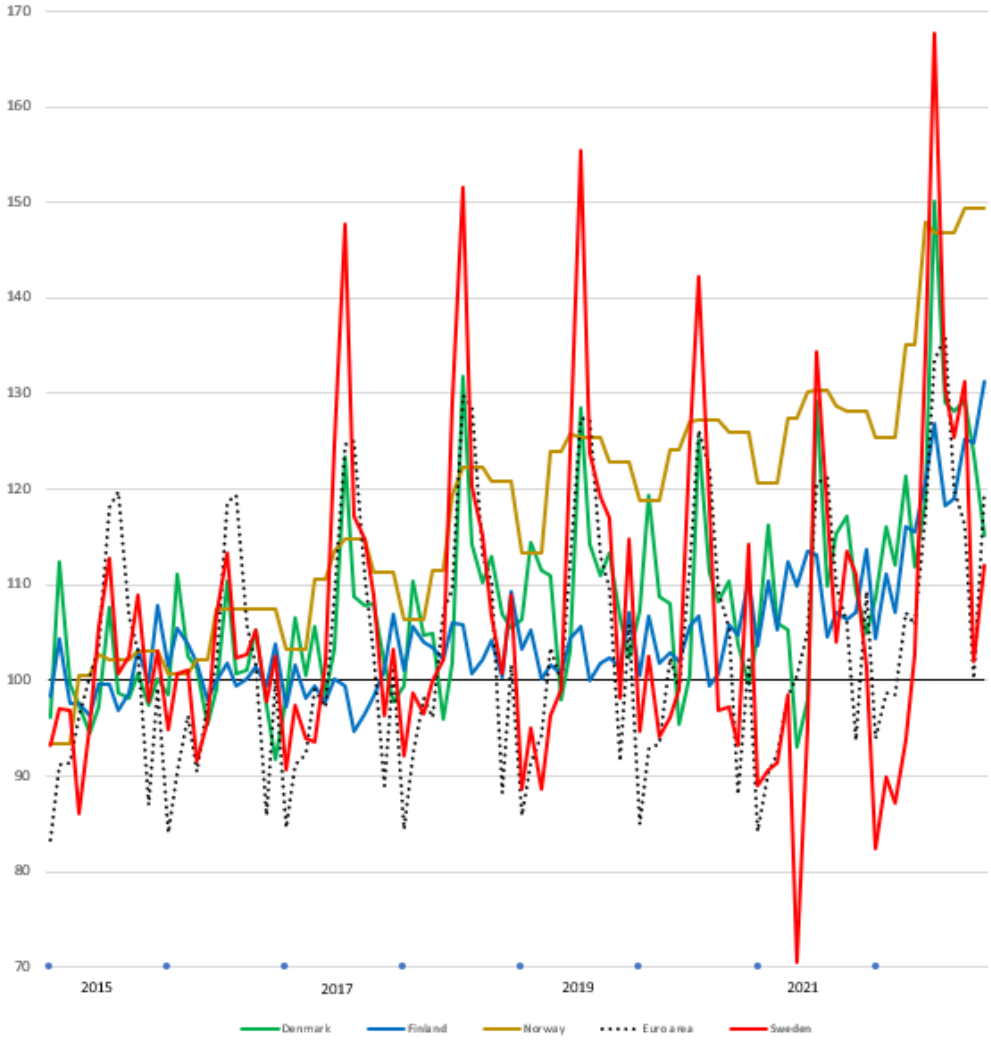


Table Average index 2021 and 2022 (2015 = 100) for 096 Package holidays

Country	2021	2022
Switzerland	68,1	83,8
Spain	85,2	90,7
Austria	94,5	121,2
Belgium	95,6	108,0
France	99,0	121,6
Sweden	**102,8**	**109,4**
Norway	105,1	128,5
Netherlands	106,0	166,9
Estonia	106,5	124,8
Euro-area	106,7	133,4
Denmark	108,3	119,4
Luxembourg	110,3	131,5
Finland	111,0	123,0
Germany	111,1	124,0

Table Ratio between highest and lowest index for 096 Package holidays, per country and year. Ave. 2015 - 2021

Country	2021
Finland	1,10
Norway	1,10
Switzerland	1,19
Luxembourg	1,20
Estonia	1,23
Belgium	1,25
Spain	1,26
Austria	1,26
Denmark	1,29
France	1,36
Netherlands	1,39
Euro-area	1,48
Sweden	**1,57**
Germany	**1,76**

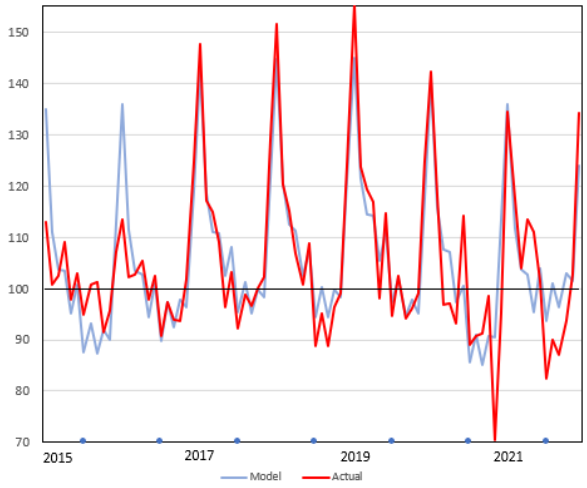
Table Irregular variation by RMSE 2015-2019

Country	
Norway	1,5
Finland	1,7
Belgium	2,2
Spain	2,5
Denmark	3,0
Netherlands	2,1
Euro-area	2,2
Germany	**3,3**
Sweden	**6,5**

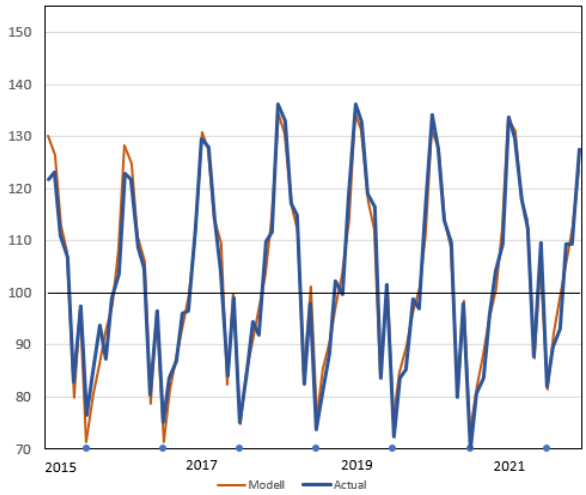
Germany has larger ratios between top and bottom prices during a year than Sweden but the Swedish index series is not as regular as the German.

Diagrams Actual and modelled values for 096 Package holidays

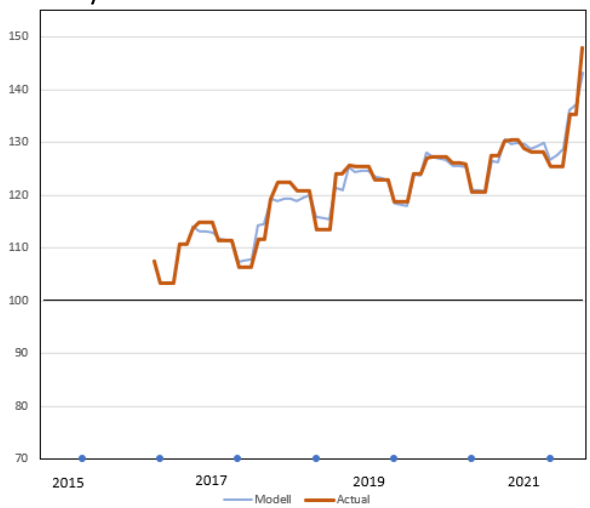
Sweden



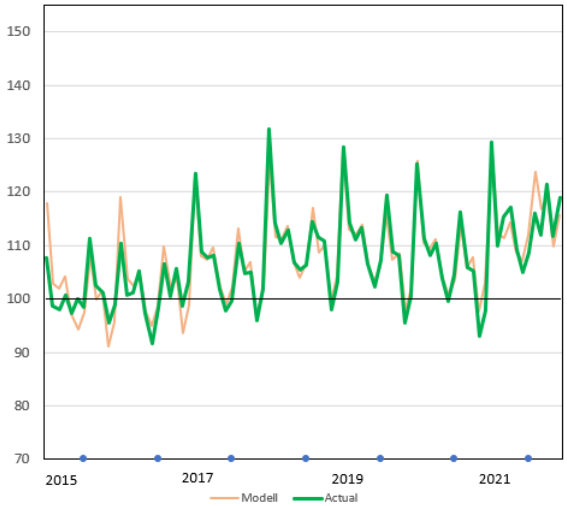
Germany



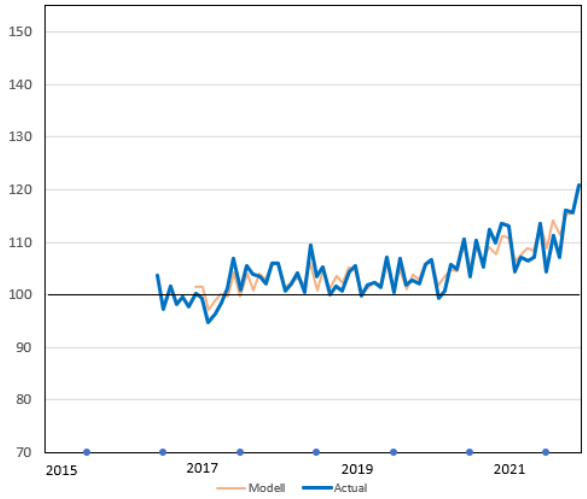
Norway



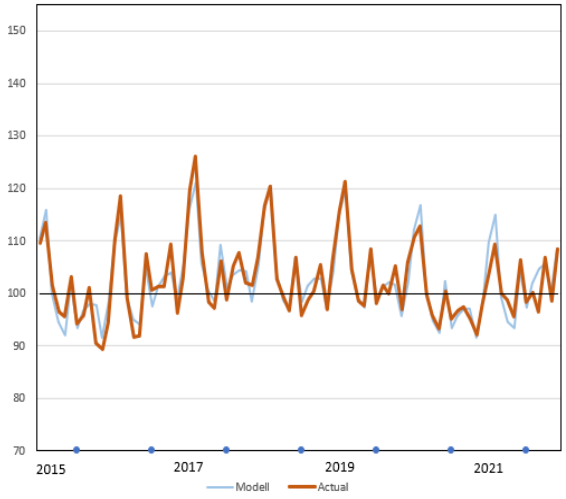
Denmark



Finland



Spain



111 Catering services

Diagram 111 Catering services 2015 – 2022

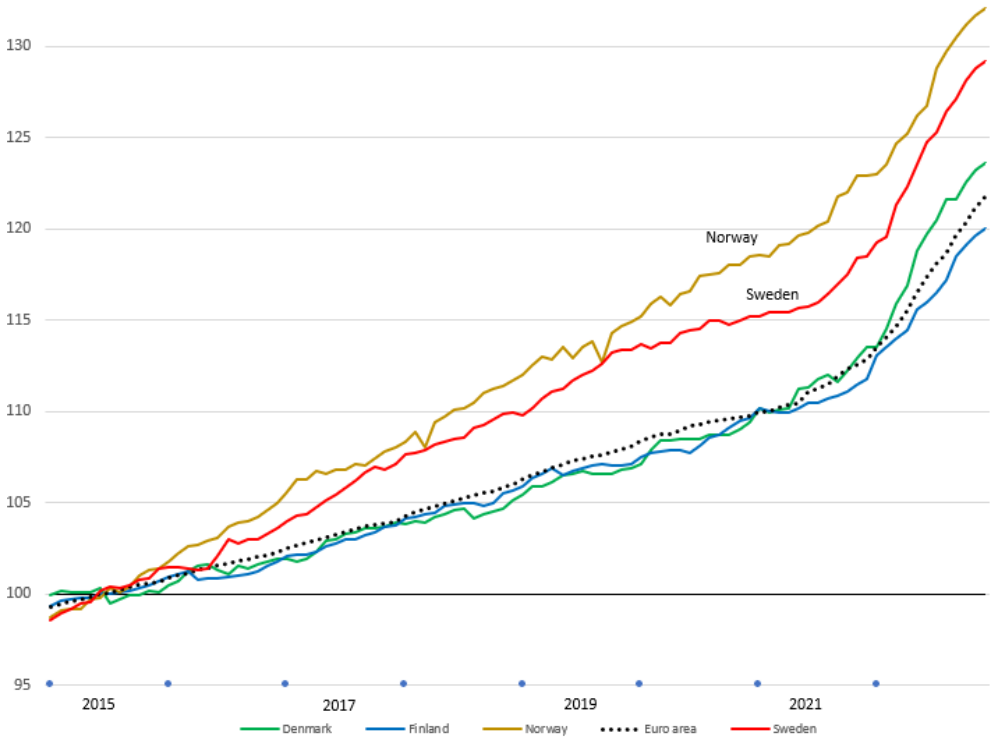


Table Average index 2021 (2015 = 100) for catering services

Country	2021
Switzerland	103,5
France	108,0
Spain	109,6
Finland	110,6
Euro-area	111,2
Denmark	111,4
Luxembourg	114,0
Germany	114,9
Belgium	115,7
Sweden	**116,4**
Netherlands	118,0
Norway	120,4
Austria	120,5
Estonia	124,8

Table Ratio between highest and lowest index for catering services, per country and year. Average 2015 - 2021

Country	Mean ratio
Switzerland	1,006
Spain	1,014
France	1,014
Finland	1,015
Euro-area	1,016
Denmark	1,018
Luxembourg	1,021
Germany	1,022
Netherlands	1,023
Belgium	1,024
Sweden	**1,026**
Austria	1,029
Norway	1,030
Estonia	1,037

Table RMSD 2015 – 2019 for COICOP groups and Swedish CPI-weights 2019

Coicop	Product group	CPI weight 2019	Spain	Luxem-bourg	Austria	France	Belgium	Nether-lands	Ger-many	Den-mark	Finland	Norway	Euro area	Sweden	Prop of Swedish MSD
011	Food	123,33	0,3	0,2	0,2	0,2	0,3	0,3	0,3	0,2	0,3	0,3	0,2	0,2	2,6%
0112	Meat		0,2	0,5	0,6	0,2	0,3	0,6	0,5	0,6	1,1	1,0	0,2	0,5	
01161	Fresh or chilled fruit		4,6	1,8	1,3	2,1	2,7	1,4	1,6	1,7	2,0	2,2	1,2	2,0	
01162	Fresh or chilled vegetables other than potatoes and other tubers		3,1	4,0	2,5	4,5	3,0	2,4	5,4	1,8	5,5	1,8	2,8	5,2	
012	Non-alcoholic beverages	14,67	0,4	0,4	0,6	0,2	0,5	0,5	0,4	1,0	0,9	1,0	0,2	0,7	0,3%
02.1	Alcoholic beverages	21,66													
02.2	Alcoholic beverages	14,34													
031	Clothing	38,27	0,7	1,2	0,8	1,3	1,9	2,5	0,9	1,1	0,8	1,7	0,7	1,0	4,8%
0312	Garments		0,7	1,2	0,9	1,4	2,0	2,6	1,0	1,2	0,9	1,7	0,7	1,2	
03121	Garments for Men		0,8	1,2	0,9	1,3	1,7	2,7	1,1	1,1	0,8		0,8	1,4	
03122	Garments for Women		0,8	1,3	1,0	1,5	2,1	3,0	1,1	1,4	0,9		1,0	1,1	
032	Footwear	7,73	0,5	1,8	1,0	1,5	1,8	1,7	0,9	1,4	1,8	0,8	0,7	1,2	0,3%
0321	Shoes and other footwear		0,5	1,8	1,0	1,5	1,8	1,7	0,9	1,4	1,4	0,8	0,8	1,2	
043	Maintenance and repair of the dwelling	?	0,1	0,4	0,3	0,1	0,2	0,8	0,2	0,4	0,5	1,0	0,1	1,0	
044	Water supply and miscellaneous services relating to the dwelling	8,54	0,1	0,3	0,2	0,1	0,2	0,7	0,1	0,3	0,1	0,1	0,1	0,3	0,0%
045	Electricity, gas and other fuels	43,91	2,4	1,7	0,9	1,0	3,2	2,8	1,1	1,0	1,8	6,5	1,1	2,2	31,6%
0451	Electricity		3,5	1,2	1,0	0,9	3,5	5,3	0,6	1,5	2,6	7,6	0,8	3,0	
04 rest	Rest of 04	183,55													
051	Furniture and furnishings, carpets and other floor coverings	24,05	0,2	0,5	0,5	0,5	0,1	0,4	0,3	1,0	1,3	1,3	0,2	0,5	0,5%
05111	Household furniture		1,0	1,3	1,0	1,5	2,1	3,0	1,1	1,4	0,9		1,0	1,1	
052	Household textiles	6,39	0,4	1,2	0,7	0,6	0,8	1,2	0,4	1,4	0,9	3,0	0,3	1,4	0,2%
053	Household appliances	6,05	0,2	0,5	0,5	0,3	0,6	0,8	0,3	0,8	0,5	0,9	0,2	0,8	0,1%
0531	Major household appliances whether electric or not		0,3	0,6	0,6	0,3	0,7	1,1	0,3	0,9	0,6	1,1	0,2	0,8	
0532	Small electric household appliances		0,4	0,9	0,5	0,5	0,6	1,0	0,4	1,2	0,7	1,3	0,3	1,2	

Coicop	Product group	CPI weight 2019	Spain	Luxem-bourg	Austria	France	Belgium	Nether-lands	Ger-many	Den-mark	Finland	Norway	Euro area	Sweden	Prop of Swedish MSD
054	Glassware, tableware and household utensils	9,73	0,2	0,6	0,6	0,3	0,1	1,1	0,4	1,6	0,5	1,3	0,2	0,8	0,2%
055	Tools and equipment for house and garden	7,46	0,1	0,4	0,5	0,2	0,2	0,9	0,3	0,8	0,6	0,6	0,2	0,9	0,2%
056	Goods and services for routine household maintenance	9,32	0,1	0,3	0,5	0,2	0,5	0,4	0,3	0,5	0,3	1,4	0,1	0,5	0,1%
061	Medical products, appliances and equipment	17,17													
062	Out-patient services	16,83													
071	Purchase of vehicles	39,37	0,3	0,1	0,4	0,3	0,2	0,3	0,2	0,3	0,3	0,4	0,1	0,2	0,3%
07111	New motor cars		0,3	0,1	0,4	0,5	0,3	0,4	0,3	0,5	0,2		0,2	0,2	
07112	Second-hand motor cars		0,5	1,2	0,7	0,1	0,9	0,4	0,4	0,2	0,5		0,2	0,7	
0712	Motor cycles		0,2	0,4	0,7	0,2	0,2	0,6	0,4	1,2	0,1	0,5	0,2	0,5	
072	Operation of personal transport equipment	64,69	2,0	2,3	1,4	1,3	1,5	1,7	1,5	1,2	2,4	1,0	1,4	1,4	28,9%
0722	Petrol		3,0	3,5	3,0	3,0	3,3	2,7	3,3	3,1	5,7	2,9	3,0	3,6	
073	Transport services	31,94	0,5	3,0	2,1	1,0	0,8	2,3	0,4	1,3	1,9	2,1	0,7	1,6	8,4%
0733	Passenger transport by air		2,1	9,5	5,5	2,0	3,3	7,3	1,5	3,5	4,8	6,8	4,5	5,2	
07331	Domestic flights		1,7			1,8			1,7	4,1	9,6		2,9	5,7	
07332	International flights		3,1	9,5	5,5	2,5	3,3	7,3	1,6	3,4	5,0		2,9	5,8	
081	Postal services	1,27													
082-083	Telephone and telefax equipment and services	35,73													
08202	Mobile telephone equipment		0,9	0,7	9,4	0,7	0,7	2,0	1,2	1,0	0,7		0,7	0,7	0,2%

Coicop	Product group	CPI weight 2019	Spain	Luxem-bourg	Austria	France	Belgium	Nether-lands	Ger-many	Den-mark	Finland	Norway	Euro area	Sweden	Prop of Swedish MSD
091	Audio-visual, photographic and information processing equipment	17,48	0,3	0,4	0,8	0,2	0,5	0,9	0,5	0,8	0,4	0,7	0,3	0,9	0,8%
0911	Equipment for the reception, recording and reproduction of sound and picture		0,3	0,8	1,5	0,4	0,9	1,8	0,6	1,8	0,7	1,1	0,3	1,4	
0912	Photographic and cinematographic equipment and optical instruments		1,1	0,8	1,8	0,7	0,8	1,8	0,8	0,9	0,9	1,7	0,6	0,9	
0913	Information processing equipment		0,6	0,5	1,2	0,5	0,6	0,9	0,8	0,6	0,5	1,2	0,4	0,7	
09131	Personal computers		0,6	0,8	1,5	0,6	0,8	1,0	0,8	0,3	0,4		0,4	0,8	
092	Other major durables for recreation and culture	8,29	0,4	0,6	1,8	3,3	0,3	0,6	0,3	0,5	0,5	0,5	1,1	0,3	0,0%
093	Other recreational items and equipment, gardens and pets	28,75													
0931	Games, toys and hobbies		0,5	0,9	0,9	0,5	0,3	1,2	1,1	1,9	0,5	1,9	0,5	1,2	0,5%
094	Recreational and cultural services	48,17	0,3	0,3	0,5	0,3	0,7	0,4	0,2	0,3	0,4	0,3	0,1	0,5	2,3%
0941	Recreational and sporting services		0,5	0,4	0,7	0,5	0,2	0,5	0,5	0,5	0,4	0,6	0,2	0,7	
095	Newspapers, books and stationery	10,33													
0951	Books		0,3	1,3	1,3	0,2	0,6	2,5	1,1	6,8	0,3	3,6	0,4	3,4	0,4%
096	Package holidays	10,98	2,5	1,9	2,4	5,0	2,2	2,1	3,3	3,0	1,7	1,5	2,2	6,5	16,8%
10	Education	4,00													
111	Catering services	64,63	0,1	0,2	0,1	0,1	0,2	0,3	0,1	0,2	0,2	0,3	0,0	0,2	0,6%
112	Accommodation services	10,37													
12	Miscellaneous goods and services	71,00													
	Total:	1000												0,17	100,0%
00	All items													0,23	