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Consumer Price Indices
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**SYSTEM OF REGIONAL CONSUMER PRICE INDICES COMPILATION IN
POLAND**

Invited paper submitted by the Polish Central Statistical Office*

I. INTRODUCTION

1. In Poland attempts to investigate regional price dynamics have been undertaken several times, but the first surveys were just experimental, meant to evaluate consumer price differentiation among selected bigger agglomerations. In the eighties of the previous century it was undertaken to measure the CPI in ten larger voivodships – administrative regions (out of 49 according to the administrative division of the country valid at that time). However, this research was not continued because of the modifications of the CPI measurement methodology which were then the first priority. In the mid-nineties the possibility to prepare a

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pilot survey on consumer prices by voivodship was considered again, but it was given up because of the difficulties of getting a representative sample for each of the 49 voivodships.

2. The new administrative division of the country into 16 voivodships introduced on January 1st, 1999 allowed sample representativeness on the regional level. The decentralisation of the governing system of the country led to significantly increased demand from the local governments and self-governments for information on the development of consumer prices in a particular region.

3. Preparatory works started in 1999, which provided the basis for regional CPI measurement to be introduced from 2000. Regional CPI compilation in Poland is carried out centrally by the Central Statistical Office (CSO) in Warsaw. The organisation of the survey is as follows: in each voivodship there is a regional statistical office (RSO) with its Questionnaire Survey Division responsible for both retail price survey and household budget surveys (HBS) in the region. Interviewers who record retail prices are employees of the regional statistical offices. RSOs provide the data to be used for the measurements of the national and regional CPIs.

II. NATIONAL AND REGIONAL CPIs

4. Regional price indices are calculated according to the same formula and principles as those adopted for the measurement of the CPI at the national level. For both CPIs (national and regional) the Classification of Individual Consumption by Purpose is applied, i.e. its version adapted to the requirements of Harmonised Consumer Price Indices (COICOP/HICP). The sample of consumer goods and services for each voivodship is based on the same list of representative items. Weighting systems are derived from the same statistical sources for both CPI types of which the HBS forms the basis, while information from national accounts and trade statistics is also used.

III. PRICE RECORDINGS

5. The survey is conducted on the basis of a purposively selected sample. Retail prices are recorded in about 28 thousand trading outlets selected in 309 price survey areas in 16 voivodships. The number of price survey areas per voivodship ranges between 8 and 41 depending on the size of voivodship.

6. The price survey area can be a town, part of a large city, a local community (gmina) or a district. In rural areas CPI measurement is not carried out due to the small number of shops or service points or other types of outlets, the significant costs if the number of surveyed areas is increased, and the relatively small assortment of goods and services available in existing village shops. The division into price survey areas was made by the CSO in co-operation with the RSOs. Price survey areas are selected with regard to the number of population (Table 2), the economic importance of the region (industry, farming or tourism), distance from the supply sources and the density of the trading and service network. The outlets selected for the survey reflect the diversity of the trading networks in the price survey area so that the prices

are recorded in shops, department stores, supermarkets, hypermarkets and also such trade points like pharmacies, petrol stations, hairdressing salons, health centres, etc. Prices are also recorded in outlets situated in market-places or open-air markets. Price recording takes place in trading outlets situated in the centre of the town (district) as well as in the outskirts. Even if a big trading centre, hypermarket or market, which provides a source of supply for the inhabitants of the price survey area, is situated in the suburbs or outskirts outside the administrative border it is also included in the selection. It is recommended to record the prices in the selected outlets for at least a year. This means that the RSOs have to carefully the selection criteria given by the CSO.

7. The list of goods and services centrally designed for the price survey includes about 1.8 thousand representative items. It is valid for the whole year and obligatory in all the price survey areas. The list consists of goods and services, which are commonly purchased and recognised to be representative. Some products from the list are given tight descriptions with all their qualitative traits and a detailed name, brand, type and model. However, the majority of representative items have general specifications, i.e. only name of the group, the purpose and possibly the basic material are specified. Further details are added to the description in the regional statistical offices, namely, when the staff supervising the price survey in co-operation with the interviewers select particular goods and services with regard to the specific nature of the local market.

8. The frequency and time of price recording are uniform in all the regions. Records are made between 1st and 25th of each month. Information on the prices of vegetables and fruits is collected three times during a month (once every 10 days), while that on the remaining foodstuffs, non-alcoholic and alcoholic beverages and tobacco products - twice a month (in the first and second half). Prices of all the other products from the list are recorded once a month. The records are scheduled by the RSOs in a way ensuring equal time intervals between the records as well as efficient data recording, checking and analysis as well as non-delayed transfer to the CSO. In addition to the regional price surveys carried out by the RSOs, there are also observations of country-wide uniform prices which are directly conducted by the CSO. The results of these observations are also taken into account for calculating both indices at the national and regional levels.

IV. CALCULATION PROCEDURE

9. On the basis of the records and information on uniform prices it is possible to calculate the monthly average prices of all representative items. It is done for each voivodship as:

- arithmetic averages, which take into account the number of records concerning goods and services the prices of which are recorded by interviewers,
- arithmetic averages weighted by number of days in a month during which particular prices were valid – for goods and services with country-wide uniform prices.

10. Then for each representative item in the price survey area an index is calculated by referring its average monthly price to the average price from the past year. Regional CPIs for all the representative items are estimated, similarly like national price indices, as geometric averages of price relations of the representative items from all the survey areas in the voivodship in which prices are recorded. This means that price relations for each item are calculated according to the formula:

$$I_{t/o}^n = \left[\prod_{r=1}^R \frac{p_t^{nr}}{p_o^{nr}} \right]^{1/R} = \left[\prod_{r=1}^R i_{t/o}^{nr} \right]^{1/R}$$

where:

p_t^{nr} - the price of "n" product recorded by the interviewer in "t" month in "r" area,

p_o^{nr} - the price of "n" product recorded by the interviewer in "t" month in the base period "u" (i.e. previous year) in "r" area,

R - number of areas in which prices were recorded for "n" products; max R = 41 for prices recorded by interviewers or R = 1 for country-wide uniform prices.

11. The indices for the lowest level of the weighting system aggregation are measured on the basis of price developments of particular representative items using the geometric average formula as shown below:

$$I_{t/o}^g = \left[\prod_{n=1}^N I_{t/o}^n \right]^{1/N}$$

where:

N - number of products representing elementary aggregate "G".

12. The price indices at higher levels of aggregation for a given voivodship are calculated with the use of the weighting system.

V. WEIGHTING SYSTEM

13. Regional CPIs are measured according to the Laspeyre's formula, using as weighting system the annual households expenditure structure from the year preceding the year of the survey, broken down by voivodship. In 2002 more than 32 000 selected households were subject to household budget surveys. In order to design the weighting system for the regional CPI purposes it was necessary to use the information on the average per capita monetary consumer expenditure of households. The weighting system illustrates the structure of

consumer purchases of households in a given voivodship. However, considering the fact that respondents tend to underestimate their expenditure on catering, alcohol and tobacco, some necessary corrections are made based on trade statistics and national accounts data. The same adjusting coefficients for all voivodships are used.

14. Weighting systems are fixed for each month of the whole year, with the exception of household expenditure of apparent seasonal nature, i.e. vegetables and fruit. Their shares in the weighting system are constant over the months but their internal structure is variable, accounting for the diversified structure of household expenditure in particular months. Breaking down the total expenditure for fruit and vegetables into lower aggregates is based on HBS data on the quantity of goods purchased and their average annual prices. This means that applying big shares to weights on seasonal goods in the months when the information on their prices is missing can be avoided. The method also limits the influence of rapid price changes of seasonal goods on the general index of price variation in months when the purchases of these goods by households are very low. For seasonal adjusting of weighting systems national data are used because of the lack of information on the quantities of seasonal goods purchases by voivodship. The detailed breakdown of the weighting system for each voivodship is the same as for the whole country, i.e. 12 COICOP headings and all the 3- and 4-digit levels.

VI. FREQUENCY, TIMING, SCOPE AND APPLICATION OF PUBLICATIONS

15. Total CPI for each voivodship are published only quarterly (not monthly as national CPI is) within 65 calendar days after each quarter as a press release. Following the users' demand stipulated for in the respective legislation, the press release includes price indices for a given quarter in relation to the previous quarter. Quarterly indices by voivodship are mainly used on a regional scale, e.g. for calculation of index of the reproduction cost of dwellings. Indices for other periods (as e.g. annual) and for more detailed aggregates are published in number of paper publications and on the CSO website illustrating regional price development.

Table 1. Price indices of consumer goods and services by voivodship

Specification	2000	2001	2002
	previous year = 100		
Poland	110.1	105.5	101.9
Dolnoslaskie	109.7	105.5	101.9
Kujawsko-pomorskie	110.1	105.5	101.6
Lubelskie	110.3	105.3	101.6
Lubuskie	109.2	105.2	101.9
Lodzkie	109.7	105.0	101.8
Malopolskie	110.5	105.2	101.9
Mazowieckie	109.7	105.4	102.4
Opolskie	109.9	105.5	101.8
Podkarpackie	109.6	105.5	102.0
Podlaskie	110.7	105.1	101.7
Pomorskie	110.2	105.7	101.8
Slaskie	109.6	105.4	101.6
Swietokrzyskie	110.2	105.3	101.9
Warminsko-mazurskie	110.4	105.4	101.3
Wielkopolskie	110.2	105.3	101.7
Zachodniopomorskie	110.0	105.4	101.8

Table 2. Population by voivodship (2002 Census data)

Voivodship	Population (in thous.)
<i>Poland</i>	38230.1
<i>Dolnoslaskie</i>	2907.2
Kujawsko-pomorskie	2069.3
<i>Lubelskie</i>	2199.1
Lubuskie	1008.9
Lodzkie	2612.9
Malopolskie	3232.4
Mazowieckie	5124.0
Opolskie	1065.1
Podkarpackie	2103.8
<i>Podlaskie</i>	1208.6
Pomorskie	2179.9
Slaskie	4742.9
Swietokrzyskie	1297.5
Warminsko-mazurskie	1428.4
Wielkopolskie	3351.9
Zachodniopomorskie	1698.2

Chart 1. Price indices of consumer goods and services for years 2000-2002 by voivodship

