

PCE in IMPEC model – constructing a database

1. Introduction

In the 20 years history of the IMPEC model PCE (personal consumption expenditures) equations have been estimated many times. Number of categories distinguished varied from 1 to 18. The maximum number of categories (18) is not very high according to standards of Inforum type models. For example, number of equations in US model is 93, Spanish - 42, Japanese – 85. The reason of the comparatively small number of categories in the Polish model has been the lack of data. In the middle of 90-ties equations of 18 PCE categories were estimated using Almon's PADS system (see Almon 1996). The first results were presented for the Inforum Conference in Bertinoro in 1997. Refined results were presented for the Macromodels conference in 1999 and published in the conference proceedings (Plich 2000). That time not much attention was paid to present the methodology of constructing of time series being the base for the estimations.

PADS gives a possibility of using groups and subgroups concept to estimate cross-elasticities. To use this advantage, however, many categories of PCE should be distinguished. Otherwise, substitution and complementarity effects cannot be separated. Our experiences showed that the 18 categories, distinguished in the IMPEC model, seemed to be too little. This is the reason why a more detailed disaggregation of PCE had to be considered. In this paper we concentrate on the methodology of the disaggregation. Period taken into account starts in 1980, ends in 2001 and number of categories distinguished equals 108 (see paragraph 4).

The final number of 108 categories is a compromise between our goal to get as many categories as possible and the necessity of linking different classifications and data sources resulting from data scarcity (see paragraph 3). Another item, which we had to have in mind in this context, is the present classification used by Central Statistical Office in Poland (GUS) for PCE, i.e. Classification of Individual Consumption by Purpose (COICOP). It is used starting from 1998 (see paragraph 2). The consistency of our data with COICOP warrants fewer troubles in constructing PCE database in the subsequent years.

As the source data for PCE decomposition both published and unpublished information from GUS has been used. Generally it covered consumption and price indices. The procedure of decomposition can be split into several stages:

1. First, a decomposition of PCE in current prices was done. Consumption published in National Accounts (NA) was used as the starting point for this decomposition. In the period under consideration (1980-2001) level of details varied from 3 to 45 categories of consumption and classifications were changed several times. The decomposition was done based on household budgets surveys (HBS). Each of 108 categories can be classified as "original" (taken from NA) or "estimated" (based on HBS)
2. Next, for each of 108 consumption categories price index was applied. For the "original" categories deflators from NA were used. Prices for the "estimated" ones were estimated using GUS yearly publication titled "Price indices of goods and services".
3. Having consumption in current prices and price indices, constant prices consumption was estimated for 108 categories.

4. Because sources of data used for this decomposition are incompatible with regards to classifications as well as level of details some correction procedures had to be established. Their purpose was to get consistency of 108 categories with data taken from NA. This means that both current and constant prices total consumption given as sum of 108 categories must be equal to the consumption given in NA. Also all sub-sums of disaggregated consumption must be equal to adequate consumption category taken from NA.
5. A special correction procedure was applied for the period 1990-1994. In this period only 3 consumption categories in NA were distinguished and therefore HBS data had to be used to a wide extent. Graphs of some consumption categories revealed significant “jumps” in 1990 and 1995 which were caused by differences between the consumption structure in NA and HBS.

2. Source data characteristics

2.1. National Accounts

The national accounting system is composed of a number of mutually linked macroeconomic accounts permitting coherent data to be obtained regarding on the one hand income, i.e. sources of financing expenditures and on the other hand data concerning production and its distribution between final consumption, gross capital formation and balance of exchange with abroad (GUS 2001: 530). Usually the consumption is connected with expenditures, thus we put an equal sign between final consumption and expenditures for consumption purposes. Expenditures are borne by entities who participate in transactions, which take place in the national economy. These entities are divided into 6 sectors:

1. non-financial corporation sector
2. financial corporation sector
3. general government sector (GG)
4. household sector (HH)
5. non-profit institutions sector (NPI)
6. rest of the world¹

In the national accounts several different categories of consumption are distinguished. They result from using different classification criteria and particularly from distinguishing between different financing as well as supplying forms of goods and services to be consumed (see Table 1).

The consumption expenditures may be borne by three different sectors: households, non-profit institutions and general government. Consumption expenditures borne by households (i.e. financed by private income) are called “individual consumption expenditures” and these borne by two other sectors are called “social transfers in kind supplied to HH”. Although expenditures borne by NPI and GG are also called “consumption in the sector”, we have to keep in mind, the NPI and GG sectors are only financing a part of the consumption of the HH sector.

The sum of expenditures borne by HH and NPI is called “private consumption”. Sum of private consumption and social transfers in kind financed by GG is called “actual consumption”

¹ Detailed definitions of sectors are in each statistical yearbook – for instance GUS 2002: 534.

or “individual consumption”. The word *individual* means here goods and services supplied in kind directly to specific, individual households².

The whole consumption of goods and services supplied by GG sector is called “public consumption”. It can be realized in two forms; as individual consumption in form (as transfers mentioned earlier) and in form of “collective consumption” which does not have individual recipients but is being supplied commonly, to the whole nation. This sort of consumption can be considered only in the GG sector, because it is assumed the NPI sector supplies only individual consumption. Sum of private consumption and public consumption is called “corrected actual consumption”.

Table 1. Classification of actual consumption (corrected consumption) in the households sector by different criteria*

Criteria	Expenditures' bearing sector			
	HH		NPI	GG
Financing or supplying form	Individual consumption (financed by private income)	Own consumption**	Social transfers in kind	Collective consumption
Way of supplying	Actual consumption (individual)			
Kind of consumption	Private consumption		Public consumption	

* In bold categories detailed published in the statistical yearbook.

** Own consumption of agricultural products originating from own production; includes also the value of housing services inclusive estimated depreciation of residential buildings and the imputed rents in non-rental buildings.

Source: Prepared by the authors, based on the Statistical Yearbook 2001

Consumption in the NA is shown in details according to the classification of consumption by purpose. In the case of GG sector the classification is called Classification of the Functions of Government (COFOG), in case of the NPI sector its name is Classification of the Purposes of Non-Profit Institutions Serving Households (COPNI), and in case of the households sector – COICOP. The last one is to show detailed data of actual consumption and individual consumption and the two consumption categories are published in the Statistical Yearbooks (SY). The COICOP classification has a five levels structure. The first one (two digits level) contains 12 divisions and the second one (three digits level) includes 45 groups. The next two levels (four and five digits) are sums of categories from the lowest, six-digit level which contains ca. 300 units (see point 3.2).

2.2. Household budgets

The household budget surveys are of significant importance for social statistics system and are a meaningful source of information for analyzing the level of living conditions. They provide information about revenues, expenses, consumption, furnishing of households with durable goods and other living conditions of specified population groups as well as about the differentiation between basic socio-economic groups of households.

² Individual consumption in the households sector means mainly consumption financed by personal income and the own production is of marginal importance.

The household budget surveys have a quite long tradition. In Poland this tradition reaches the turn of the 19th and 20th century. In that time only papers of budgets of individual families from the lowest social groups had been done by individual researchers. In the 20-ties and 30-ties of the 20th century the household budget surveys have been entered by GUS, research institutions and local government institutions. This allowed to include in the survey up to tens of households. This were only fragmentary researches, concentrated on selected groups of population, held on small samples and only in some regions of the country.

After WW II the household budget surveys have been continued by GUS. Starting from 1957 GUS carries on with researches based on a representative sample (see GUS 1999: 17 and farther).

In the last few decades the methodology of the survey have been changed regarding the selection of the sample and its exchange. From this point of view one can distinguish four periods (see GUS 1999: 11):

1. 1957-1971 – branch approach, continuous method,
2. 1973-1982 – geographical approach, continuous method,
3. 1982-1992 – geographical approach, quarterly rotation method,
4. from 1992 – geographical approach, monthly rotation method.

The branch approach has a two stage selection procedure. At the first stage institutions (plants, companies ...) are selected. At the second stage, employees are a randomly selected and their households participate in the survey. In the geographical approach subject to selection are households (dwellings) inhabiting on the territory of previously selected enumeration areas (or its sets prepared for the National Census purposes).

The continuous method consists in surveying one and the same household for the whole year or even longer. Using the rotation method the household under survey are being exchanged. In case of quarterly rotation household are being exchanged every quarter and in case of monthly rotation – every month.

In 1993 a process of adapting the methodology of the household budget surveys to the recommendations of EUROSTAT started. The subject to modifications was also the classification of revenues and expenses in the scope of consumption expenditures. As early as 1998 consumption expenditures are grouped accordingly to 1996 COICOP/HBS³ classification. This classification differs from the previous one. A new classification of revenues and expenses was implemented – this changed the scheme of presentation and names of lots of categories as well as definitions of such categories like disposable income, expenditures and expenditures on consumer goods and services.

All this alternations causes that the results of the household budget survey are not directly comparable in time. This remark do not concern the way of sampling (which has no influence on the data comparability), but changes in classifications. However, it is possible to reassemble some categories of consumption expenditures, so that the particular groups of expenditures are homogenous over time.

The data are presented by GUS as monthly average⁴ expenditures on consumer goods and services per capita in household in Polish currency (złoty) and from 1995 in new Polish currency (PLN). After the denomination process data are rounded up to 1 grosz (0,01 PLN) what equals 100 old zł, whereas the data from previous years were rounded up to 1 old zł. From

³ Classification of Individual Consumption by Purpose for Household Budget Survey.

⁴ Until 1982 yearly averages were shown.

the point of view of goals to be achieved this matter is rather trivial, because we are only interested in the structure of the consumption expenditures and not on the nominal data itself.

2.3. *Prices in the national economy*

Data on price changes of consumption by categories were necessary to compute consumption in constant prices. The data were obtained from two GUS publications: "Prices in the National Economy"⁵ and from the chapter "Prices" of the SY. The first one is an annual publication which is issued starting from 1989. In the 80-ties it was published three times (in 1984, 1985, 1988) and did not cover all years with the same precision which is needed for our research (see point 4.2).

The publications show dynamics of prices in the basic sectors of the national economy i.e. agriculture, industry, construction, retail trade, transport, storage and communication as well as foreign trade. Important for us will be the data regarding the retail trade and especially price indices of the particular expenditures categories as well as prices of selected representatives⁶ of consumer goods and services, which are used in order to calculate price indices on the lowest aggregation level. The grouping of goods and services prices from the year 1999 is based on Classification of Individual Consumption by Purpose adapted to needs of the Harmonized Indices of Consumer Prices classification (COICOP/HICP).

Source of information on the calculated price indices are quotations of market and administrative prices conducted by price collectors throughout the country, which is divided into 310⁷ price survey regions. Once the monthly average prices of representatives are obtained, their price indices in the particular regions can be calculated as a relation of the monthly average price to the average price from the previous year. The next step is to calculate the all-Polish price indices of representatives as geometrical averages of prices indices of representatives from all regions and on its base (also using the geometrical average) price indices of goods and services from the lowest aggregation level⁸. Further, price indices on higher aggregation level can be calculated applying the system of weights, which is based on the structure of households' expenditures from the year preceding the one under the survey. The structure of expenditures is derived from the HBS (see e.g. GUS 2001: 15, 21-23).

3. Level of details of the source data

The starting point in constructing a PCE data base is data from the NA. This data has to be disaggregated accordingly to their relevant structure obtained from the HBS. At the same time a data base on prices' deflators for the distinguished categories has to be built. Below, availability of source data in the particular years is considered. This will give us knowledge to what extent HBS and own estimates of prices indices have been used in building the PCE data.

⁵ This title is consequently used from 1996. Previously to titles were shiftily used: *Changes of prices in the National Economy* and *Changes of retail prices*.

⁶ The number of representatives is permanently growing, e.g. in 1996 – 1 470, and in 2000 – ca. 1 800.

⁷ The number of price survey regions in the year 2000; the number does not vary much, e.g. in 1996 – 307. There are over 28 thousand selected sales outlets.

⁸ 301 such basic groups were distinguished in 2000. There were 287 such groups in 1998 and 1999.

3.1. Consumption in the National Accounts

Generally, data referring consumption in the NA have been taken from the SY, but for the period from 1995 to 2000 more detailed information from unpublished sources were available⁹. The data is given in current and constant prices but its number of categories presented in SY had been changed in the period taken into account. We can distinguish three different periods (see Table 2):

1. up to 1989 – 35 categories,
2. 1990 – 1998 – 5 categories,
3. 1995 – 2000 – 45 categories
4. 2001 – 12 categories

The consumption for the period 1980-1989 has been split in the SY into 35 categories and the applied classification matches the one used for the HBS. There are 9 consumption categories of foodstuff, separately alcoholic beverages and tobacco as well as 24 categories of non-foodstuffs and services in this classification. Also, the indices in constant prices on a year to year bases have been presented. This allows to calculate the consumption in constant prices and price deflators for all categories.

In the period 1990-1998 the presentation was limited to only 5 general categories which are the following: foodstuff, alcoholic beverages, non-foodstuff, services and depreciation of residential buildings. In practice this means that only three categories can be used for our data base. Therefore, three of them, i.e. non-foodstuff, services and depreciation of residential buildings, had to be combined into one group. That kind of partition and especially the split into goods and services is not coherent with the COICOP classification (see point 3.2). This makes us to use the data from the household budgets in a wider scope than in the previous years.

Table 2. Differences in the number of available categories in the period taken into account

Period	Number of categories in current prices		Number of categories in constant prices
	Data source		Data source
	Unpublished data	SY	SY
1980-1989	–	35	35
1990-1994	–	5	5
1995-1997	45	12	5
1998-2000	45	12	12
2001	–	12	12

Source: prepared by the authors

The five-categories presentation have been carried on until 1997. In 1998 GUS implemented the COICOP classification. Consumption in the COICOP version have been recalculated for the years 1995-1997 retrospectively but only in current prices. Data presented in the SY are from the two-digit level of the COICOP, i.e. 12 categories are distinguished. Disaggregation of consumption in current prices for the years 1995-2000 is based on unpublished, more detailed GUS data, showing 45 categories of consumption which corresponds with the three-digit level of COICOP.

⁹ For the moment of preparing this paper data including 45 categories for the year 2001 have been not available yet. We will include it during the next update of the data base.

Indices in constant prices accordingly to COICOP have been calculated starting from 1998. However, in this case only 12 COICOP categories are available.

Data for the year 2001 have been available only in the 12 categories scheme in current as well as in constant prices. Thus, a different disaggregation method has been applied then for the period 1995-2000 – a method which uses the household budgets in a wider scope.

Furthermore, for the year 2001, in comparison with previous ones, changes in the subjective scope of the institutional sectors have been introduced: the definition of small businesses changed. In the previous years natural persons conducting economic activity employing up to 5 persons have been included to the HH sector. Starting from 2001 this limit was moved up to 9 employees. This change caused an increase of household numbers and an overestimation of consumption in comparison to the previous years. Due to this changes consumption in the SY for the year 2000 has been presented in two variants – in accordance to the new and old definition. It turned out, the change causes a difference in consumption by 1,53% and it “belongs to” expenditures on goods and services other than food, alcoholic beverages and tobacco (see GUS 2002: 538-540). Therefore the values of some categories for the year 2001 were corrected downwards, in proportion to the changes resulting from the year 2000.

3.2. *Household expenditures based on budget surveys*

The household survey data used for the decomposition of consumption were the average household expenditures on consumer goods and services. This data was also the unpublished one. The disaggregation level in the publications of the household budget survey was not sufficient for the construction of PCE database.

In paragraph 2.2 we have mentioned all methodological alternations in the households expenditures. But these were not the only ones. Also the number and definitions of particular consumption expenditures have been changed. Reasons of these changes can be classified into two main groups:

- appearance of new goods and services; they have to be added to existing consumption categories or new categories have to be separated – this depends on the current or expected consumption level of these new products;
- changes in structure of consumption – some products are being marginalized or sometimes even disappear from the market and other ones shares grow.

These general facts are caused by evolutionary changes in the consumption structure and results from changes in consumers' taste, fashion trends, size and demographical structure changes of population, migrations, technological development creating new products and services. Strong changes in consumption structure have been observed in Poland in the last decade. The biggest influence on it had the transition of the economy, which caused that households gained an easier access to a bigger variety of goods and services that had been a lack or even did not exist on the market before.

All these methodological and “market” changes caused that in the basic classification of household expenditures in the HBS, the number of distinguished categories¹⁰ has been raised from 252 in 1992 to 314 in 2001. Changes of number of categories which have been distinguished in the HBS is presented in Appendix 1. One should bear in mind that equal number of categories presented in the Appendix does not mean exactly the same classification. The

¹⁰ This numbers does not include expenses spent on private agriculture farms. Apart from this taxes and fees, financial and other positions have been shown in details since 1993, but have not been taken into account.

reason is that categories from the six-digit level may contain different goods and services, which may have different names or even have been moved between groups.

The classification remained unchanged in the period 1980-1992. Starting in 1993 changes have been introduced every year especially in grouping of data on different aggregation levels. Most of them are caused by implementing the COICOP classification. In comparison with the previous classification, COICOP uses a different way of linking goods and services to particular consumption categories. Basic difference consists in dividing the economy in the old classification into the material and non-material sphere. According to this convention all so-called material goods and services are being purchased in the material sphere. Other services belongs to the non-material sphere. In the COICOP classification services are linked to goods which they are connected to, because goods and services are classified according to the purpose of consumption. However, goods and services are separated on the six-digit level but this is not the aim as such of the classification.

The shared purpose of the consumption expenditures is set only on the two highest level of aggregation. Expenditures on goods and services on lower levels does not represent the purpose as such but serve the purpose of groups from the two highest level (Rainer 1997). This means the grouping on the lowest six-digit level is unrestricted concerning the amount of categories being distinguished and the linking of certain goods and services to groups within the sense of the classification. This seems to be necessary because of the specific of the consumption in different countries. Using this option the COICOP was changed several times in the years 1998-2001. An example of this may be expenditures on “consumption bones” which were separated from “other meats” and linked in portions to the different kind of meats.

3.3. *Price indices*

Publication concerning prices presents only for chosen years (namely 1981 and 1984-1986) price indices for categories from the lowest aggregation level matching the one used in HBS. Data for the year 1982 is not as detailed but detailed enough for our purposes (see point 4). For the rest of the years the number of groups for which price indices were published is much lower. Therefore, it was necessary to estimate the missing indices (see point 4.2). Another difficulty is that in different years indices have not been presented for the same groups.

Generally speaking, the estimation of missing indices was based on prices of representatives of goods and services, which yearly averages are being published by GUS. The number of representatives amounts ca. 1500, but only ca. 150 of them are being published. Due to the limited access to representatives few different estimation methods have been applied (see 4.2).

4. **Building time series of consumption**

In this paragraph we will introduce the methodology of PCE disaggregation (its steps have been shown in point 1.2). The difficulties that had to be gone through, resulted from different classifications and different disaggregation levels of source data.

4.1. *Consumption in current prices*

The first step was calculating consumption in current prices. Data from NA and HBS was used, but first homogenous consumption categories for HBS data had to be created. These categories had to be coherent with categories used in NA.

In order to do so detailed data for categories from the earlier mentioned six-digit level were needed. These categories can not be divided into smaller elements. The second important source of information were instructions concerning the organizing and reporting system of the HBS, which include a detailed list of goods and services in all of the categories. Then it was possible, on the one hand, to unify different classifications in the period being under consideration, and on the other to keep a high level of consumptions' decomposition as well as to find common categories in certain years. This was reached by coding the categories from the six-digit level in a way, which allowed adding some categories that belonged to a group of expenditures being a homogenous consumption category in the whole period.

The result of grouping is a table with 108 categories of household expenditures¹¹. This table was used to calculate the structure of household expenditures within categories being bigger aggregates, which were relevant to categories in the NA. Next step was to make a decomposition of the category from the NA using the structure based on the HBS. In this way we received disaggregated values of consumption equaling the NA data in current prices.

4.2. *Price indices*

As next step, price indices for each of the 108 created categories we had to be found. In case price indices of a category have not been published they had to be estimated. Depending on the access to data several methods of estimation have been applied (in brackets – symbols used for the methods):

- using prices of representatives (R),
- using a weighted average from the rest of indices being a part of one and the same category of a higher aggregation level for which a price index was published (X),
- using price indices of a higher aggregation level for a category of a lower one - used in case the two above listed methods could not be applied (K),
- using price indices of a category being the dominant part within one of the 108 categories for the whole category (U),
- using several of the mentioned methods for one category (M).

For the first method an auxiliary table was created. It contained yearly average prices of goods and services which were considered as representatives for a consumption category in HBS. If few representatives fit to one category an average was calculated using geometrical average. Basing on the average prices for a certain category, price indices for each year was calculated¹². Additional calculations were also necessary for some categories, because of changes in units of measurement over time.

¹¹ On this stage we did not pay attention on the possibilities of finding price indices for created categories. Our main goal was to achieve the highest possible level of PCE disaggregation.

¹² This procedure is coherent with the one used by GUS. The only difference is the calculation order, however from mathematical point of view both methods are equal. GUS, first calculates price indices of representatives and using the geometrical average derives from them the category index, here first the geometrical average of representatives' prices was calculated and then the index.

The same representatives was used over the whole period if only it was possible. It was not the case of some durable goods when new models appeared on the market. It was possible, however, to smooth the prices changes with the help of overlapped “new” and “old” numbers.

Failure of the smoothing procedure means that a price jump shows a market situation a consumer had to do with.

The second technique was applied when a certain category consisted of subcategories and not for all of them price indices were available. In this case the price index for lacking elements was calculated applying the converted formula for a weighted average using HBS consumption structure from the previous year as weights¹³.

Detailed information about the method being applied in order to calculate price indices for each of 108 distinguished categories are gathered in Appendix 2.

As it was mentioned before, consumption data in current prices within NA for the period 1995-1997 was published by GUS for 12 categories, while consumption in constant prices as well as deflators for only 5 categories. In order to homogenize the scheme of consumption disaggregation in the years 1995-2001 we decided to estimate the deflators for the years 1995-1997 using prices indices of categories from higher levels taken from GUS’ publications (see point 2.3.).

4.3. Consumption in constant prices

Consumption in constant prices was calculated by dividing elements of time series of consumption in current prices by the appropriate price indices. Then a correction procedure was used to balance the detailed constant price data with data available in. In this way the consistency with NA data in constant prices have been achieved.

Finally, consumption in current prices for 108 categories were divided by consumption in constant prices and thus consumption deflators for all PCE categories was computed.

4.4. Special correction for period 1990-1994

In the paragraph 3.1 it was mentioned that in NA three periods of PCE data availability can be distinguished. For the middle period i.e. the years 1990-1994 only three categories of PCE have been available. This is why for this period HBS has to be involved in a much wider scope than in the two other. As result of that, consumption for certain categories significantly differs in this period from the level observed in the previous (1989) and following (1995) years. Therefore, each of the 108 PCE categories have been corrected applying information of the share of a category in the “edged” years (i.e. 1989 and 1995) as well as its dynamics observed in HBS for that period. This means, the indices (on the year to year basis) of the 108 categories in the period 1990-1994 are products of indices from HBS and a correction factor, which assumes different values in the considered years.

Next, all categories have been balanced to the “true” PCE values of NA.

¹³ Exception is the year 1980 for which the structure of the same year was applied. We do not have the HBS data for 1979.

5. Conclusions

The result of the research is a unique PCE data base for Poland. It includes consumption in both current and constant prices as well as the consumption deflators. Number of PCE categories in the database comes to 108 and cover the period 1980-2001. Additionally, data can be automatically aggregated to four levels of aggregation, i.e. 12, 18, 34 categories which correspond to:

- COICOP classification published in SY since 1995 (12 categories),
- IMPEC model PCE current classification (18),
- PCE classification used in the SY in the 80-ties (34).

The database can be easily updated in future. To extend the base for the following years, data from the NA presented in SY will be sufficient, however the more detailed, unpublished ones would be better. Also HBS data containing details on products consumption is necessary.

One must have in mind, however, that PCE database presented here is burdened with several errors of both objective and subjective kind. The objective ones concern the methodology as well as classifications used by GUS in source data. The subjective ones are connected with simplifications used by the authors to compile PCE database presented in this paper and which are mainly due to lack of more precise data.

However, in the authors' opinion these errors are not of major importance, so they rather not cause serious troubles. The time series gathered in the database can be used for PCE equations estimation not causing bias or deterioration of their parameters.

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Comment [P1]: Z przedstawionego wyżej opisu danych źródłowych oraz sposobu ich przetwarzania wynika, iż otrzymane spożycie w cenach stałych obarczone jest różnego rodzaju błędami obiektywnymi jak i subiektywnymi. Jak już wcześniej zauważyliśmy, wykorzystane zostały dwa źródła danych: RN i BGD. Te drugie są wynikiem badania próby wylosowanej metodą reprezentacyjną, co oznacza możliwość ich uogólniania na całą zbiorowość. Mimo wszystko są one jednak obarczone błędami o charakterze nielosowym. Dotyczy to przede wszystkim zaniżenia dochodów i wydatków na niektóre towary tj. alkohol, tytoń i wyroby cukiernicze, żywnie w placówkach gastronomicznych (GUS, 2001a, lub dowolne wydanie). Poza tym istnieją różnice metodologiczne pomiędzy RN a BGD. Tam gdzie było to możliwe staraliśmy się wprowadzać odpowiednie korekty

Comment [P2]: Jeśli chodzi o indeksy cen w latach 80-tych to należy wziąć pod uwagę, iż wspomniana szczegółowa ich prezentacja dla kilku lat z tego okresu przedstawia zmiany cen w gospodarce uspołecznionej nie uwzględniając zmian cen na targowiskach, bazarach i tzw. czarnego rynku, na których ceny charakteryzowały się własną dynamiką i własnym poziomem. Oprócz tego, indeksy cen będące wynikiem własnych obliczeń dokonanych na podstawie reprezentantów oparte są na niewielkim ich odsetku. Publikowanych, bowiem jest w zależności od lat 8-10% wszystkich reprezentantów jakie gromadzi GUS.

Comment [P3]: Nie można również sprowadzić danych do porównywalności w sytuacji, kiedy np. w 1998 r. zmieniono granicę wieku różniącą dzieci od dorosłych z 13 na 15 lat. Dotyczy to wydatków na odzież i obuwie. Również nieodwracalną utratą informacji jest wspomniane już przesunięcie poszczególnych towarów i usług pomiędzy kategoriami. Nie są to oczywiście kluczowe zmiany powodujące istotne zaburzenia wyników jednak należy o nich pamiętać.

Comment [P4]: 1. Bank danych o spożyciu prywatnym ???
1.1. Konwencje nazewnictwa szeregów
1.2. Typowe agregacje
1.3. Podstawowe struktury spożycia???

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- Plich M., 1993b, Oszacowanie macierzy konwersji 19 rodzajów spożycia prywatnego na 43 sektory produkcji zgodne z SNA. Opracowanie w ramach projektu KBN 1 0140 91 01. Materiały IEiS.
- Plich M. 2000, System of Demand Functions for Poland - New Estimates. W: *Proceedings of AMFET'99 Conference - Modelling Economies in Transition*, Absolwent, Łódź: 161-185.
- Plich M., 2002. Budowa i zastosowanie wielosektorowych modeli ekonomiczno-ekologicznych. Wydawnictwo UŁ, Łódź.
- Proceedings of the 3rd World INFORUM Conference, 1997. Absolwent, Łódź.
- Rainer R., 1997. Basic principles for development of correspondence tables: linking the CPC Version 1.0 to COICOP. Austrian Central Statistical Office
- Shengchu P., (red.), 2002. Inforum Model: Modelling and Applications. Proceedings of the 7th World INFORUM Conference. China Financial and Economic Publishing House, Beijing.

Appendix 1. Changes in number of categories of six-digit level in the period 1980-2001.

Name of consumption category in 108 categories classification	1980-92	1993	1994	1995	1996	1997	1998	1999	2000	2001
Rice	1	1	1	1	1	1	1	1	1	1
Rye bread	1	1	1	1	1	1	1	1	1	1
Wheaten bread	1	1	1	1	1	1	1	1	1	1
Mixed grain bread	1	1	1	1	1	1	1	1	1	1
Noodle	1	1	1	1	1	1	1	1	1	1
Cookies & crispbread	1	1	1	1	1	1	1	1	1	1
Flour	1	1	1	1	1	1	1	1	1	1
Cereals	1	1	1	1	1	1	2	2	2	2
Bovine meat	1	1	1	1	1	1	1	1	1	1
Veal meat	1	1	1	1	1	1	1	1	1	1
Swine meat	1	1	1	1	1	1	1	1	1	1
Sheep, goat & other meat	2	1	1	1	1	2	2	2	2	2
Chicken	1	1	1	1	1	1	1	1	1	1
Other poultry	1	1	1	1	1	1	1	1	1	1
HQ coldcuts & sausages	2	2	2	2	2	2	1	1	1	1
Other coldcuts & canned meat	4	2	3	3	3	3	4	4	4	4
Other processed meat	1	1	1	1	1	1	1	1	1	1
Pluck & giblets	2	1	1	1	1	1	1	1	1	1
Salt-water fishes	2	1	1	1	1	1	1	2	2	2
Fresh-water fishes	1	1	1	1	1	2	2	2	2	2
Processed & canned fishes	1	1	1	1	1	4	4	4	4	4
Milk & milk-based beverages	1	1	1	1	1	5	5	5	5	5
Preserved milk	1	1	1	1	1	1	1	1	1	1
Curd	1	1	1	1	1	1	1	1	1	1
Cheese	1	1	1	1	1	1	1	1	1	1
Cream	1	1	1	1	1	1	1	1	1	1
Eggs	1	1	1	1	1	1	1	1	1	1
Butter	1	1	1	1	1	1	1	1	1	1
Margarine & other vegetable fats	1	1	1	1	1	1	1	1	1	1
Olive & edible oils	1	1	1	1	1	2	2	2	2	2
Other edible animal fats	1	1	1	1	1	1	1	1	1	1
Citrus fruits, bananas & other fruits	2	1	1	1	1	3	3	3	3	3
Apples	1	1	1	1	1	1	1	1	1	1
Peach	1	1	1	1	1	1	1	1	1	1
Plum	1	1	1	1	1	1	1	1	1	1
Other stone fruits & nuts	1	1	1	1	1	2	2	2	2	2
Berries	1	1	1	1	1	1	1	1	1	1
Processed & dried fruits	2	2	2	2	2	3	3	3	4	4
Lettuce	1	1	1	1	1	1	1	1	1	1
Cabbage	1	1	1	1	1	1	1	1	1	1
Cauliflowers	1	1	1	1	1	1	1	1	1	1
Tomato	1	1	1	1	1	1	1	1	1	1
Cucumber	1	1	1	1	1	1	1	1	1	1
Beetroot	1	1	1	1	1	1	1	1	1	1
Carrot	1	1	1	1	1	1	1	1	1	1
Onion	1	1	1	1	1	1	1	1	1	1
Mushrooms	1	1	1	1	1	1	1	1	1	1
Pulse	1	1	1	1	1	1	1	1	1	1
Other & processed vegetables	5	4	4	4	4	9	9	9	10	10
Potatoes	1	1	1	1	1	1	1	1	1	1
Sugar	1	1	1	1	1	1	1	1	1	1
Honey	1	1	1	1	1	1	1	1	1	1
Chocolate	1	1	1	1	1	1	1	1	1	1
Confectionary & other sugar products	4	1	1	1	1	4	4	4	4	4
Other food products	3	2	2	2	2	5	5	5	5	5
Coffee	1	1	1	1	1	1	1	1	1	1
Tea	1	1	1	1	1	1	1	1	1	1
Cocoa & powdered chocolate	1	1	1	1	1	1	1	1	1	1
Non-alcoholic beverages	1	1	1	1	1	1	4	5	5	5
Spirits & wine	3	2	2	2	2	2	3	3	3	3
Beer	1	1	1	1	1	1	1	1	1	1
Tobacco	1	1	1	1	1	1	4	4	4	4
Clothing materials	6	1	1	1	1	1	1	1	1	1
Garments for men	8	2	2	2	2	2	2	2	2	2
Underwear for men	2	1	1	1	1	1	1	1	1	1
Socks & stocking for men	1	1	1	1	1	1	1	1	1	1
Garments for women	8	2	2	2	2	2	2	2	2	2
Underwear for women	2	1	1	1	1	1	1	1	1	1
Socks & stocking for women	1	1	1	1	1	1	1	1	1	1
Garments for children	8	2	2	2	2	2	2	2	2	2
Underwear for children	2	1	1	1	1	1	1	1	1	1
Socks & stocking for children	1	1	1	1	1	1	1	1	1	1
Other clothings & accessories	11	5	5	5	5	5	3	3	3	3
Clothing services	2	2	2	2	2	2	2	2	2	2
Footwear for men	5	2	2	2	2	2	1	1	1	1
Footwear for women	6	3	3	3	3	3	1	1	1	1
Footwear for children	5	2	2	2	2	2	1	1	1	1
Footwear services	1	1	1	1	1	1	1	1	1	1
Rental, water sup.&other serv.for dwel.	3	4	5	5	5	5	9	8	8	8
Maintenance of the dwelling	4	5	5	5	5	5	2	2	2	2
Furniture & furnishing	1	1	1	1	1	1	1	1	1	1
Household textiles & other equipment	5	4	4	4	4	4	5	5	5	5
Carpets & floor coverings	2	1	1	1	1	1	1	1	1	1
Refrigerators & freezers	1	1	1	1	1	1	1	1	1	1
Washing & drying machines	1	2	2	2	2	2	1	1	1	1
Cookers, heaters & other appliances	4	6	6	6	6	6	7	7	7	7
Cleaning equipment	2	1	1	1	1	1	1	1	1	1
Sewing & knitting machines	1	1	1	1	1	1	1	1	1	1
Glasswear, tablewear & household	5	6	6	6	6	6	5	5	5	5
Tools & equipment for house & garden	2	1	1	1	1	1	4	4	4	4
Other goods & services for household	2	4	4	4	4	4	6	6	6	6
Electricity	1	1	1	1	1	1	1	1	1	1
Gas	1	1	1	1	1	1	2	2	2	2
Liquid & solid fuels	3	2	2	2	2	2	5	5	5	5
Hot water & heat energy	1	2	2	2	2	2	2	2	2	2
Health & social protection	4	8	8	8	8	8	14	15	14	13
Purchase of vehicles	3	4	4	4	4	4	4	4	5	5
Operation of personal transport equip-	4	5	6	6	6	6	5	5	5	5
Transport services	3	5	5	5	5	5	6	8	8	8
Communication	1	2	2	2	2	2	4	4	4	4
Recreation, culture equipment & durables	13	18	19	19	19	19	21	31	31	32
Recreational & cultural services	5	4	4	4	4	4	8	8	8	8
Newspapers, books & stationary	4	5	6	6	6	6	8	8	8	8
Package holidays	6	3	3	3	3	3	3	3	3	3
Education	3	3	3	3	3	3	7	8	11	12
Restaurants & hotels	4	4	5	5	5	5	4	5	5	5
Personal care	6	6	6	6	6	6	7	7	7	7
Other goods & services	6	14	20	20	20	20	18	18	17	17
Total number of categories	25	22	23	23	23	23	28	30	30	31

Appendix 2. Methods of price indices estimation.

Name of consumption category in 108 categories classification	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
Rice	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Rye bread	K	I	K	I	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Wheaten bread	R	I	R	I	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Mixed grain bread	R	I	R	I	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Noodle	R	I	I	I	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Cookies & crispbread	X	I	I	X	I	I	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flour	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Cereals	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Bovine meat	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Veal meat	K	I	K	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Swine meat	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Sheep, goat & other meat	K	X	K	K	X	X	X	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Chicken	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Other poultry	K	I	K	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
HQ coldcuts & sausages	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Other coldcuts & canned meat	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Other processed meat	K	I	K	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Pluck & giblets	K	I	K	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Salt-water fishes	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Fresh-water fishes	I	I	I	X	I	I	I	X	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Processed & canned fishes	K	I	I	K	I	I	I	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K
Milk & milk-based beverages	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Preserved milk	K	I	K	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Curd	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Cheese	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Cream	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Eggs	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Butter	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Margarine & other vegetable fats	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	I	I	I
Olive & edible oils	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Other edible animal fats	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Citrus fruits, bananas & other fruits	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Apples	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Peach	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Plum	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Other stone fruits & nuts	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Berries	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Processed & dried fruits	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Lettuce	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Cabbage	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Cauliflowers	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Tomato	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Cucumber	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Beetroot	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Carrot	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Onion	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Mushrooms	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Pulse	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Other & processed vegetables	K	X	X	K	X	X	X	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Potatoes	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sugar	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Honey	R	I	I	R	I	I	I	R	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Chocolate	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Confectionary & other sugar products	M	X	M	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Other food products	M	X	M	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Coffee	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Tea	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Cocoa & powdered chocolate	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Non-alcoholic beverages	K	I	I	K	I	I	I	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K
Spirits & wine	M	X	M	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Beer	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Tobacco	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Clothing materials	I	X	I	I	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Garments for men	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Underwear for men	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Socks & stocking for men	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Garments for women	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Underwear for women	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Name of consumption category in 108 categories classification	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Socks & stocking for women	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Garments for children	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Underwear for children	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Socks & stocking for children	R	I	R	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Other clothings & accessories	M	X	M	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Clothing services	I	X	I	I	X	X	X	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Footwear for men	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Footwear for women	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Footwear for children	R	X	R	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Footwear services	I	X	I	I	X	X	X	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Rental, water supply & other services for the dwelling	M	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Maintenance of the dwelling	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Furniture & furnishing	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Household textiles & other equipment	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Carpets & floor coverings	R	X	X	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Refrigerators & freezers	R	I	I	R	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	R	R
Washing & drying machines	R	I	I	R	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	R	R	R
Cookers, heaters & other appliances	U	X	X	U	X	X	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cleaning equipment	R	X	X	R	X	X	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Sewing & knitting machines	R	I	I	R	I	I	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Glasswear, tablewear & household utensils	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Tools & equipment for house & garden	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Other goods & services for household maintenance	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Electricity	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Gas	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Liquid & solid fuels	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Hot water & heat energy	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Health & social protection	M	X	M	M	X	X	X	M	M	M	M	M	M	M	U	U	U	U	U	U	U	U
Purchase of vehicles	I	X	X	I	X	X	X	I	I	I	I	I	K	K	K	K	K	K	K	I	I	I
Operation of personal transport equipment	M	X	M	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Transport services	I	X	I	I	X	X	X	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Communication	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Recreation, culture equipment & durables	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Recreational & cultural services	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Newspapers, books & stationary	U	X	X	U	X	X	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Package holidays	U	X	X	U	X	X	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Education	U	X	X	U	X	X	X	U	U	U	U	U	U	U	U	U	U	U	U	I	I	I
Restaurants & hotels	K	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Personal care	M	X	X	M	X	X	X	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Other goods & services	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K

Explanations of symbols for methods of price indices estimation:

I - index

K - applying of indices from higher levels of aggregation for lower levels

M- using of several methods

R - on the base of representatives

U - on the base of dominant element index

X - on the base of “reversed” weighted average of higher level category