# Modelling of Regional Price Levels in the Districts of the Czech Republic

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**Abstract.** The aim of this article is to suggest and apply methods for estimation of the regional price levels in Czech districts. Its purpose is to provide an instrument for more precise and more realistic comparison of regional standard of living of households across the regions of the Czech Republic. The article contributes to solution of the often discussed problem of nominal income indicators as benchmark of social-economic disparities. Nominal indicators provide distorted information about social and economic position of inhabitants of a region because they do not reflect the regional differences in the costs of living. Authors use basic set of regional price levels in 36 districts (LAU1) processed by original authors´ certified methodology. This set of the basic results – regional price levels - has been further extended to whole Czech Republic by using econometric modelling methods. The results reflect regional price level differences in twelve CZ-COICOP Headings - market prices of goods, services, as well as housing and rentals. The findings underpin the need for a more accurate specification of economic and social disparities on a lower regional level.

**Keywords:** regional price levels, real incomes, LAU1, standard of living.

**JEL Classification:** C44
**AMS Classification:** 90C15

## 1 Introduction

The regional policies of the European Union (EU) are targeted among others at sustainable development of regions and improving the citizen's quality of life. The regional convergence has been one of the major issues of economic analyses, while almost a third of the EU budget is set aside for the cohesion policy. The primary indicator for assessment of regional economic performance is the regional gross domestic product compared on the European level in so-called purchasing parity standard (PPS). The PPS is calculated by the Eurostat within the Eurostat-OECD International Comparison Program on the national level and as such it does not take into account the differences in price levels across the regions. [3] Although the regional price levels may constitute an important factor when assessing the economic development of a region, this issue has until recently not received much attention either in the world, in the EU, or in the Czech Republic. [4]

The first attempts to measure the regional price levels in the Czech Republic have been carried out by Musil et al. [17] and Čadil et al. [4] The aim of this paper is to update and rectify their results using slightly more advanced methods of calculation and data processing.

The purpose of this paper is to suggest and apply methods for estimation of the regional price levels in Czech districts (LAU1) as an instrument for estimating the real standard of living in the Czech regions. Authors use basic set of regional price levels in 36 districts processed by original authors´ certified methodology. This set of basic results – regional price levels - has been further extended to whole Czech Republic by using econometric modelling methods. The results reflect regional differences in market prices of goods, services, as well as housing and rentals. The findings underpin the need for a more accurate specification of economic and social disparities on a lower regional level.

## 2 Importance and topicality

The need to measure regional price levels originated in the new concept of regional policies which should be generally directed more at the people living in the region than at the area of the region. [7] The problem is, the nominal income indicators provide distorted information about social and economic position of inhabitants of a

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region because they do not reflect the regional differences in the costs of living. After all, even Kahoun [9] and Viturka [25] admit the price levels can vary locally and regionally, especially due to different prices of services and real estate.

In the last ten years, the issue of regional price levels has been addressed by several authors, whose works are often based on regionalization of national price indexes. In the European countries, the attempts to regionalize the price indexes are usually hindered by insufficient or random investigation of prices in the respective regions. At present, the regional price levels are systematically measured and published in the USA, in the UK, and in Australia.

In Germany, the published estimates of regional price levels are based on price survey carried out in 50 German cities in 1994. The first German author, who exploited the price investigation from the viewpoint of regional price levels, was Ströhl. [24] His followers, Schultze [23], Kosfeld et al. [14]), Kosfeld and Eckey [13], and Roos [21,22] look for possible ways of price level estimation in the regions where they have explanatory data at their disposal. They frequently apply econometric modelling and complement the calculation of regional price levels with a real estate price index. [13] [14] [20]
Other, often one-off efforts of regional price levels calculations have been carried out in Italy in Pittau et al. [18], China in Brandt and Holz [2] or Gong and Meng [8], Austria in Matzka and Nachbagauer [16] or also in Slovakia in Radvanský and Fuchs. [19]

In the Czech Republic, the regional price levels were estimated by Musil et al. [17] on a common consumer basket and by Čadil et al. [4] on a set of regional consumer baskets. They applied the Eurostat-OECD International Comparison Program methods with a certain simplification. They used a national concept (rather than domestic) and calculated the regional price levels for the Czech regions (NUTS 3) based on the historical data from 2007. [17] [4]

# 3 Methods and data sources

The process of *RPI* construction for 36 Czech districs (using original data from the extensive price surveys in 36 districts carried out by Czech statistical office) was certified by the Ministry of Regional Development of the Czech Republic in December 2015. [10] It is based on the Eurostat-OECD International Comparison Program methods. Results for 36 districts have been published in database of the research project "Regional price index as indicator of real social and economic disparities". [26]

The aim of further research is to design and apply econometric model that enable to extend the results to whole Czech Republic. We followed a procedure similar to Roos [21], but estimated the partial regional price levels for each of the twelve CZ-COICOP Headings, where CZ-COICOP 01 represents Food and non-alcoholic beverages, 02 - Alcoholic beverages, tobacco and narcotics, 03 - Clothing and footwear, 04 - Housing, water, electricity, gas and other fuels, 05 - Furnishings, household equipment and routine household maintenance, 06 - Health, 07 - Transport, 08 - Communication, 09 - Recreation and culture, 10 - Education, 11 - Restaurants and hotels, 12 - Miscellaneous goods and services.

We tested nearly fifty indicators available for the period 2011–2013 for all 78 districts (LAU 1) of the Czech Republic. However, neither average wage, nor net disposable household incomes were available at the time of estimation on the LAU 1 level. Data on average income after taxation were provided by the General Financial Directorate of the Czech Republic.

All the data used for our estimates were recalculated so that they express the average share of a certain district when bilaterally compared to all other districts in the Czech Republic.

The outcomes of our estimations are summed up in the following set of equations (1) – (12). All the parameters were proved significant at the 95% confidence level. All the models passed the Durbin-Watson test on residuals autocorrelation.

$$RPI_{COI01} = 0.991 - 0.020dens + 0.048income - 0.018BU_A \quad (1)$$

$$RPI_{COI02} = -0.184pop_{dis} + 0.037income + 1.091BU_{ind} + 0.055BU_G \quad (2)$$

$$RPI_{COI03} = -2.727 - 0.344pop_{dis} + 0.094income + 4.105BU_{ind} - 0.127BU_C \quad (3)$$

$$RPI_{COI04} = 0.721 + 0.292house - 0.023BU_L \quad (4)$$

$$RPI_{COI05} = 0.961 + 0.148pop_{dis} - 0.107BU_G \quad (5)$$

$$RPI_{COI06} = 1.952 - 0.977pop_{15-64} + 0.013pop_{>20K} + 0.055inc_{aver} - 0.062phys \quad (6)$$

$$RPI_{COI07} = 0.906 - 0.040road_{1st} + 0.135BU_H \quad (7)$$

$$RPI_{COI08} = 1.035 - 0.011 dens - 0.022 pop_{<5K} \quad (8)$$

$$RPI_{COI09} = 0.984 - 0.038 dens - 0.013 accom + 0.066 BU_{corp} \quad (9)$$

$$RPI_{COI10} = 0.527 + 0.268 pop_{dis} + 0.193 income \quad (10)$$

$$RPI_{COI11} = 0.864 - 0.031 accom + 0.157 BU_{R} \quad (11)$$

$$RPI_{COI12} = 0.936 - 0.025 road_{2nd} + 0.083 BU_{G} \quad (12)$$

where $RPI_{COI}$ are the partial regional price level indexes for CZ-COICOP Headings, predictors are explained in the table bellow.

| | |
|---|---|
| $pop_{15\text{-}60}$ | share of population in the age from 15 to 60 years |
| $pop_{<5K}$ | share of population living in cities of less than 5,000 inhabitants |
| $pop_{>20K}$ | share of population living in cities of more than 20,000 inhabitants |
| $pop_{dis}$ | share of population living in the district city |
| *dens* | specific population density |
| *income* | share of average income of economically active person in the district to an average income in the Czech Republic |
| *accom* | share of accommodation capacity (number of beds) to population |
| *phys* | count of physicians per 100,000 inhabitants |
| *house* | average market price of a dwelling |
| $road_{1st}$ | number of kilometres of 1st class roads per 10,000 inhabitants |
| $road_{2nd}$ | number of kilometres of 2nd class roads per 10,000 inhabitants |
| $BU_{corp}$ | number of corporations based in the district per 1,000 inhabitants |
| $BU_{ind}$ | number of individual business units based in the district per 1,000 inhabitants |
| $BU_{A}$ | number of business units operating in agriculture, forestry, and fishery per 1,000 inhabitants |
| $BU_{C}$ | number of business units operating in the field of manufacturing per 1,000 inhabitants |
| $BU_{G}$ | number of business units operating in wholesale and retail trade per 1,000 inhabitants |
| $BU_{H}$ | number of business operating in transportation and storage per 1,000 inhabitants |
| $BU_{L}$ | number of business units operating in the field of real estate activities per 1,000 inhabitants |
| $BU_{R}$ | number of business units operating in the field of arts, entertainment, and recreation per 1.000 inhabitants |

The aggregation of the twelve fractional regional price level indexes for each CZ-COICOP Heading to the overall value of regional price level index followed a procedure analogical to aggregation of the *RPI* itself. [10]

# 4 Results

The results of our calculations are summed up in the Table 1 bellow. It is apparent that the differences in the regional price levels are to the highest extent influenced by the CZ-COICOP Heading 04 (Housing, Water, Gas, Electricity, and Other Fuels), Heading 10 (Education), and Heading 11 (Restaurants and Hotels) – i.e. immobile commodities.

| Code | District | *RPI* | COI01 | COI02 | COI03 | COI04 | COI05 | COI06 | COI07 | COI08 | COI09 | COI10 | COI11 | COI12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CZ0100 | Praha | **1.172** | 1.012 | 1.007 | 1.059 | 1.424 | 1.007 | 1.047 | 1.158 | 1.009 | 1.105 | 1.480 | 1.117 | 1.133 |
| CZ0201 | Benešov * | **1.025** | 1.003 | 1.012 | 1.057 | 1.063 | 1.014 | 0.997 | 1.039 | 0.996 | 1.008 | 1.035 | 1.007 | 0.976 |
| CZ0202 | Beroun * | **1.051** | 1.016 | 1.008 | 1.026 | 1.116 | 1.000 | 0.993 | 1.103 | 0.993 | 1.022 | 1.074 | 1.029 | 1.036 |
| CZ0203 | Kladno | **1.046** | 1.004 | 0.995 | 0.984 | 1.108 | 0.988 | 1.055 | 1.030 | 0.986 | 1.010 | 1.220 | 1.044 | 1.084 |
| CZ0204 | Kolín | **1.040** | 1.037 | 1.019 | 1.062 | 1.062 | 0.976 | 1.029 | 1.008 | 1.005 | 1.066 | 1.096 | 1.019 | 1.044 |
| CZ0205 | Kutná Hora * | **1.013** | 1.009 | 1.004 | 1.010 | 1.057 | 0.999 | 1.023 | 0.997 | 1.001 | 1.008 | 0.968 | 0.980 | 0.948 |
| CZ0206 | Mělník * | **1.044** | 1.007 | 1.001 | 1.016 | 1.114 | 1.001 | 0.981 | 1.067 | 1.004 | 1.014 | 1.056 | 1.002 | 1.066 |
| CZ0207 | Mladá Boleslav * | **1.026** | 1.022 | 1.009 | 1.007 | 1.091 | 0.985 | 0.997 | 0.971 | 1.003 | 1.023 | 1.081 | 1.015 | 0.983 |
| CZ0208 | Nymburk | **1.023** | 1.022 | 1.015 | 1.028 | 1.096 | 1.011 | 0.942 | 0.984 | 1.012 | 0.991 | 1.054 | 0.931 | 0.960 |
| CZ0209 | Praha-východ * | **1.110** | 1.059 | 1.049 | 1.147 | 1.244 | 1.000 | 1.059 | 1.131 | 0.989 | 1.031 | 1.140 | 1.052 | 1.105 |
| CZ020A | Praha-západ * | **1.129** | 1.056 | 1.042 | 1.137 | 1.308 | 1.008 | 1.072 | 1.137 | 0.979 | 1.048 | 1.204 | 1.072 | 1.116 |
| CZ020B | Příbram | **1.028** | 1.010 | 0.989 | 1.056 | 1.037 | 1.005 | 1.074 | 1.029 | 0.998 | 1.040 | 1.027 | 1.026 | 1.043 |
| CZ020C | Rakovník * | **1.005** | 0.999 | 0.991 | 0.975 | 1.024 | 0.992 | 0.978 | 1.000 | 0.999 | 1.025 | 0.979 | 0.994 | 0.984 |
| CZ0311 | České Budějovice | **1.027** | 1.033 | 0.987 | 1.045 | 1.035 | 1.026 | 0.979 | 1.020 | 1.001 | 1.059 | 1.051 | 1.067 | 0.987 |
| CZ0312 | Český Krumlov * | **0.972** | 0.982 | 0.980 | 1.014 | 0.954 | 1.037 | 0.957 | 0.966 | 0.988 | 0.960 | 0.995 | 0.940 | 0.954 |
| CZ0313 | Jindřichův Hradec * | **0.968** | 0.992 | 0.989 | 1.004 | 0.966 | 1.012 | 1.005 | 0.905 | 0.999 | 0.984 | 0.974 | 0.940 | 0.919 |
| CZ0314 | Písek * | **0.990** | 1.002 | 0.997 | 1.016 | 0.984 | 1.017 | 1.042 | 0.932 | 1.009 | 0.999 | 1.020 | 1.015 | 0.969 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CZ0315 | Prachatice * | **0.969** | 0.969 | 0.986 | 1.014 | 0.946 | 1.027 | 0.967 | 0.956 | 0.993 | 0.975 | 0.940 | 0.973 | 0.949 |
| CZ0316 | Strakonice | **0.978** | 1.032 | 0.979 | 0.941 | 0.955 | 1.022 | 0.970 | 0.917 | 1.011 | 0.990 | 0.928 | 0.982 | 0.978 |
| CZ0317 | Tábor | **1.001** | 1.002 | 0.994 | 1.071 | 0.977 | 0.990 | 0.976 | 1.001 | 0.995 | 0.992 | 0.964 | 1.076 | 1.030 |
| CZ0321 | Domažlice * | **0.980** | 0.995 | 0.993 | 0.959 | 0.946 | 0.991 | 0.985 | 0.986 | 0.990 | 1.019 | 0.978 | 1.023 | 0.961 |
| CZ0322 | Klatovy | **0.960** | 0.977 | 0.989 | 0.962 | 0.914 | 1.018 | 1.006 | 0.945 | 1.005 | 0.999 | 0.993 | 1.029 | 0.946 |
| CZ0323 | Plzeň-město | **1.038** | 1.013 | 1.005 | 0.994 | 1.071 | 0.986 | 0.975 | 1.039 | 1.001 | 0.999 | 1.268 | 1.073 | 1.080 |
| CZ0324 | Plzeň-jih * | **0.993** | 1.003 | 0.999 | 0.989 | 0.991 | 0.998 | 0.984 | 0.980 | 0.988 | 1.013 | 0.981 | 0.987 | 0.971 |
| CZ0325 | Plzeň-sever * | **1.000** | 1.001 | 1.006 | 1.014 | 1.017 | 0.998 | 1.001 | 0.990 | 0.978 | 0.998 | 1.011 | 0.966 | 0.978 |
| CZ0326 | Rokycany * | **1.016** | 1.007 | 1.007 | 1.001 | 1.016 | 0.996 | 0.993 | 1.085 | 0.990 | 1.011 | 1.020 | 1.003 | 1.004 |
| CZ0327 | Tachov * | **0.977** | 0.982 | 0.983 | 0.946 | 0.932 | 0.992 | 0.942 | 1.044 | 1.005 | 1.036 | 0.967 | 0.971 | 0.960 |
| CZ0411 | Cheb | **0.971** | 0.999 | 1.012 | 0.930 | 0.907 | 0.990 | 0.980 | 0.997 | 1.006 | 1.024 | 0.980 | 1.020 | 0.999 |
| CZ0412 | Karlovy Vary | **0.995** | 0.993 | 1.014 | 1.133 | 0.947 | 1.029 | 0.971 | 1.052 | 1.002 | 1.021 | 1.124 | 0.921 | 1.022 |
| CZ0413 | Sokolov * | **0.961** | 0.979 | 0.992 | 0.975 | 0.896 | 0.986 | 0.967 | 0.999 | 0.996 | 0.973 | 0.963 | 0.991 | 0.982 |
| CZ0421 | Děčín | **0.993** | 1.007 | 0.961 | 0.991 | 0.915 | 1.019 | 1.013 | 1.048 | 1.016 | 1.014 | 0.918 | 1.017 | 1.108 |
| CZ0422 | Chomutov * | **0.949** | 0.992 | 0.989 | 0.971 | 0.848 | 0.984 | 0.999 | 0.981 | 1.015 | 0.988 | 0.967 | 1.001 | 0.987 |
| CZ0423 | Litoměřice * | **0.994** | 0.998 | 0.996 | 1.008 | 0.975 | 1.003 | 0.997 | 1.012 | 1.000 | 1.008 | 0.991 | 0.998 | 0.983 |
| CZ0424 | Louny * | **0.972** | 1.001 | 0.995 | 0.983 | 0.929 | 0.990 | 0.978 | 0.960 | 1.009 | 1.014 | 0.899 | 0.997 | 0.956 |
| CZ0425 | Most * | **0.946** | 0.981 | 0.996 | 0.975 | 0.836 | 0.970 | 1.031 | 0.986 | 1.004 | 0.972 | 1.049 | 1.009 | 1.015 |
| CZ0426 | Teplice | **1.000** | 1.010 | 1.000 | 0.970 | 0.969 | 0.975 | 1.015 | 1.074 | 1.001 | 0.989 | 0.942 | 1.011 | 1.027 |
| CZ0427 | Ústí nad Labem | **0.973** | 0.976 | 0.994 | 0.941 | 0.938 | 0.909 | 0.984 | 1.038 | 1.017 | 0.988 | 1.032 | 0.943 | 1.026 |
| CZ0511 | Česká Lípa * | **0.981** | 0.994 | 1.001 | 0.987 | 0.953 | 0.998 | 0.991 | 0.979 | 1.008 | 0.977 | 0.960 | 0.971 | 0.999 |
| CZ0512 | Jablonec n. Nisou * | **0.991** | 0.991 | 1.006 | 0.973 | 0.984 | 1.011 | 1.038 | 0.988 | 1.000 | 0.962 | 1.053 | 1.001 | 0.995 |
| CZ0513 | Liberec | **1.043** | 0.994 | 1.007 | 1.069 | 1.076 | 1.030 | 1.049 | 1.042 | 1.010 | 1.033 | 1.089 | 1.052 | 1.063 |
| CZ0514 | Semily * | **1.001** | 0.997 | 1.008 | 1.029 | 1.036 | 1.017 | 0.987 | 0.982 | 0.997 | 0.949 | 1.037 | 0.960 | 0.980 |
| CZ0521 | Hradec Králové | **1.056** | 1.016 | 1.022 | 1.003 | 1.164 | 0.977 | 1.051 | 1.040 | 1.028 | 0.993 | 1.033 | 1.064 | 0.982 |
| CZ0522 | Jičín * | **1.004** | 1.005 | 1.005 | 0.985 | 1.024 | 0.998 | 0.983 | 0.992 | 1.002 | 1.007 | 1.009 | 0.992 | 0.968 |
| CZ0523 | Náchod | **0.983** | 1.001 | 1.005 | 0.990 | 0.985 | 0.977 | 1.064 | 0.977 | 0.995 | 0.984 | 0.948 | 0.950 | 0.944 |
| CZ0524 | Rychnov n. Kněž. * | **0.996** | 1.002 | 1.005 | 1.009 | 1.000 | 0.997 | 0.998 | 0.983 | 0.998 | 0.994 | 0.989 | 0.985 | 0.979 |
| CZ0525 | Trutnov * | **0.983** | 0.994 | 1.000 | 1.029 | 0.993 | 1.006 | 1.009 | 0.957 | 1.002 | 0.938 | 1.026 | 0.904 | 0.991 |
| CZ0531 | Chrudim | **0.977** | 1.017 | 1.001 | 0.953 | 0.957 | 0.973 | 0.985 | 0.966 | 0.994 | 1.028 | 0.988 | 1.027 | 0.915 |
| CZ0532 | Pardubice | **1.046** | 1.016 | 1.026 | 1.072 | 1.055 | 1.012 | 1.047 | 1.049 | 1.008 | 1.045 | 1.154 | 1.100 | 1.069 |
| CZ0533 | Svitavy * | **0.974** | 0.997 | 0.994 | 0.973 | 0.965 | 0.994 | 0.965 | 0.931 | 0.997 | 0.993 | 0.907 | 0.973 | 0.948 |
| CZ0534 | Ústí nad Orlicí * | **0.983** | 1.000 | 1.006 | 0.990 | 0.973 | 0.986 | 0.986 | 0.948 | 1.001 | 0.988 | 0.950 | 1.000 | 0.974 |
| CZ0631 | Havlíčkův Brod * | **0.973** | 0.999 | 0.987 | 0.965 | 0.952 | 1.011 | 0.997 | 0.941 | 1.002 | 1.002 | 0.968 | 0.989 | 0.933 |
| CZ0632 | Jihlava | **0.986** | 0.997 | 1.007 | 1.010 | 0.948 | 0.999 | 1.076 | 1.039 | 1.009 | 0.989 | 0.901 | 0.953 | 1.002 |
| CZ0633 | Pelhřimov * | **0.978** | 0.997 | 0.993 | 0.989 | 0.959 | 1.011 | 0.996 | 0.969 | 0.997 | 1.003 | 0.997 | 0.968 | 0.933 |
| CZ0634 | Třebíč * | **0.973** | 0.996 | 0.982 | 0.945 | 0.944 | 1.011 | 0.995 | 0.971 | 0.997 | 1.002 | 0.902 | 0.987 | 0.949 |
| CZ0635 | Žďár nad Sázavou | **0.967** | 1.000 | 0.991 | 1.000 | 0.943 | 0.993 | 0.939 | 0.969 | 0.994 | 0.981 | 0.978 | 0.900 | 0.963 |
| CZ0641 | Blansko * | **0.996** | 0.997 | 0.989 | 0.952 | 1.024 | 1.001 | 0.994 | 0.977 | 0.988 | 0.987 | 0.908 | 0.992 | 0.977 |
| CZ0642 | Brno-město | **1.091** | 1.021 | 1.013 | 0.991 | 1.221 | 1.015 | 1.016 | 0.991 | 0.999 | 1.041 | 1.171 | 1.164 | 1.121 |
| CZ0643 | Brno-venkov * | **1.026** | 1.010 | 1.001 | 0.986 | 1.074 | 1.006 | 1.018 | 1.037 | 0.979 | 1.005 | 0.970 | 0.998 | 1.026 |
| CZ0644 | Břeclav * | **0.993** | 0.992 | 0.988 | 0.964 | 0.990 | 1.002 | 0.975 | 1.020 | 0.992 | 0.994 | 0.888 | 0.948 | 1.027 |
| CZ0645 | Hodonín | **0.993** | 1.001 | 1.004 | 0.985 | 0.986 | 1.018 | 0.990 | 0.972 | 1.000 | 0.986 | 0.958 | 0.997 | 1.010 |
| CZ0646 | Vyškov * | **1.007** | 0.999 | 0.993 | 0.982 | 1.023 | 1.011 | 0.991 | 1.002 | 0.998 | 1.006 | 0.925 | 1.006 | 1.012 |
| CZ0647 | Znojmo | **0.982** | 1.009 | 1.000 | 1.008 | 0.940 | 1.030 | 1.005 | 0.947 | 0.991 | 0.986 | 0.833 | 1.000 | 1.020 |
| CZ0711 | Jeseník * | **0.972** | 0.976 | 0.991 | 1.037 | 0.918 | 1.034 | 0.964 | 0.982 | 0.989 | 0.964 | 0.957 | 0.948 | 1.063 |
| CZ0712 | Olomouc | **1.009** | 0.986 | 0.994 | 1.005 | 1.017 | 1.000 | 0.960 | 1.042 | 1.000 | 1.002 | 0.959 | 1.084 | 0.997 |
| CZ0713 | Prostějov * | **0.992** | 1.001 | 0.999 | 0.968 | 0.973 | 0.993 | 1.018 | 1.003 | 0.993 | 0.999 | 0.926 | 1.041 | 0.978 |
| CZ0714 | Přerov | **0.990** | 0.992 | 1.012 | 0.971 | 0.996 | 0.993 | 0.973 | 0.961 | 1.004 | 0.964 | 0.992 | 1.063 | 0.985 |
| CZ0715 | Šumperk | **0.970** | 0.971 | 1.007 | 1.020 | 0.962 | 1.028 | 1.010 | 0.946 | 1.002 | 0.967 | 0.805 | 1.022 | 0.925 |
| CZ0721 | Kroměříž * | **0.994** | 1.002 | 0.991 | 0.969 | 0.979 | 1.006 | 0.986 | 1.006 | 1.005 | 1.001 | 0.937 | 1.014 | 1.000 |
| CZ0722 | Uherské Hradiště | **1.015** | 1.002 | 1.016 | 0.969 | 1.037 | 1.015 | 1.009 | 0.980 | 0.978 | 1.016 | 0.928 | 1.020 | 1.052 |
| CZ0723 | Vsetín | **1.002** | 0.991 | 0.999 | 1.006 | 1.038 | 1.010 | 1.024 | 0.989 | 0.998 | 0.950 | 0.937 | 0.907 | 1.026 |
| CZ0724 | Zlín | **1.038** | 1.007 | 1.002 | 0.989 | 1.112 | 0.983 | 0.972 | 1.030 | 0.998 | 0.995 | 1.115 | 0.989 | 1.044 |
| CZ0801 | Bruntál | **0.938** | 0.938 | 0.991 | 0.988 | 0.901 | 0.992 | 0.990 | 0.915 | 1.015 | 0.944 | 0.879 | 0.945 | 0.950 |
| CZ0802 | Frýdek-Místek * | **0.995** | 0.997 | 1.000 | 0.989 | 1.002 | 0.988 | 1.001 | 0.985 | 0.997 | 0.977 | 0.979 | 0.975 | 1.016 |
| CZ0803 | Karviná | **0.976** | 0.990 | 0.994 | 1.013 | 0.959 | 0.987 | 1.026 | 0.962 | 1.001 | 0.949 | 0.926 | 0.954 | 0.995 |
| CZ0804 | Nový Jičín | **0.979** | 0.957 | 0.984 | 0.982 | 0.948 | 1.001 | 1.031 | 0.966 | 1.024 | 1.021 | 1.056 | 0.997 | 1.038 |
| CZ0805 | Opava | **1.009** | 0.984 | 1.003 | 0.907 | 1.061 | 0.970 | 0.926 | 1.045 | 1.002 | 0.970 | 0.962 | 1.053 | 0.987 |
| CZ0806 | Ostrava-město | **1.007** | 0.992 | 1.005 | 1.008 | 1.015 | 0.978 | 1.039 | 1.043 | 1.020 | 1.021 | 1.079 | 0.956 | 0.986 |

**Table 1** Regional Price-Level Index (*RPI*) at LAU1 Level and Its Breakdown to CZ-COICOP Headings

**Note:** results for districts with asterisks * are based on estimates
**Source:** authors' calculations based on (CZSO [5])

Regional price-level results also reflect themselves well in the structurally affected and economically weak regions (lower price levels in Teplice, Karviná, Nový Jičín, and in Hodonín, Znojmo, Přerov, Šumperk, Bruntál). Ostrava and Opava remain very close to the mean value. The cartogram in Figure 1 indicates the regional price levels for LAU1 regions.

# 5 Conclusion

The purpose of Regional Price-level Index is to enable an assessment of spatial differences in the costs of living of an average household. In terms of spatial comparison, the index needs to include all relevant expenditures which can indicate interregional differences and which are purchased by households. These are mainly goods and services which cannot be provided supra-regionally (common food, local services) and market prices of rentals and real estate. The immobile commodities (housing, education, accommodation, catering) represent the main source of regional price-level differences.

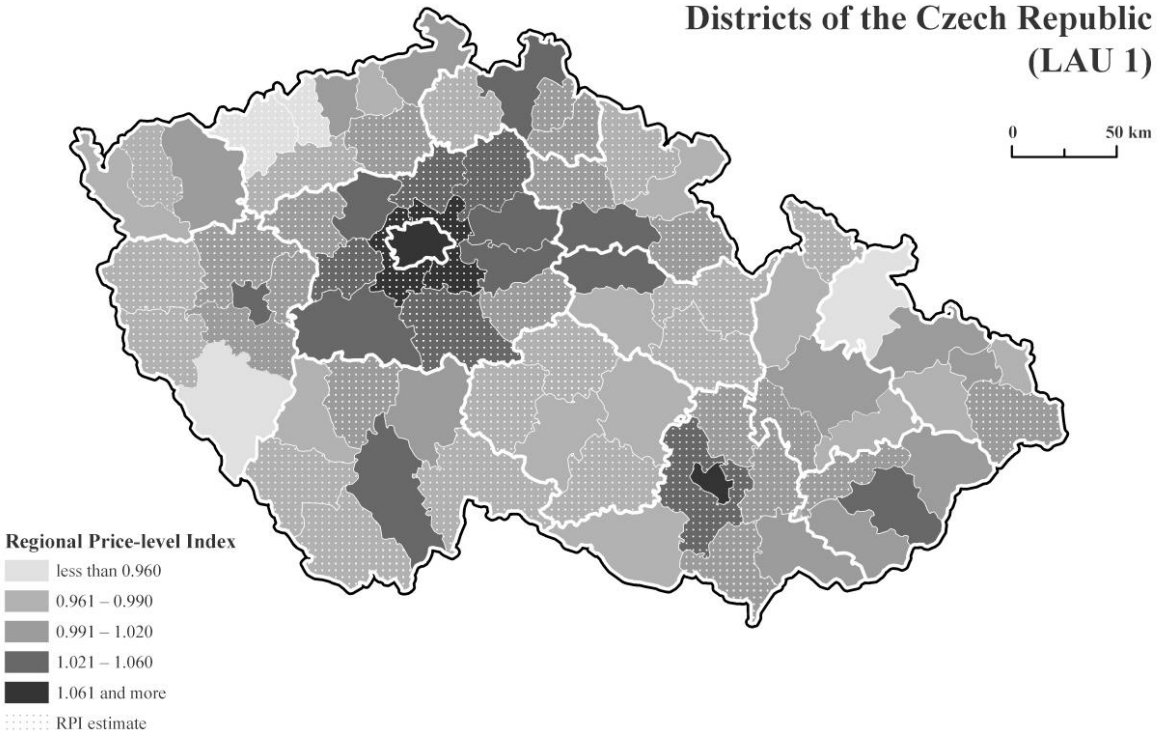


**Figure 1** Regional Price-Level Index (*RPI*) at LAU1 level

**Source:** authors' own calculations and processing based on (ARCDATA [1], CZSO [5])

The purpose of the RPI, however, is also a source of its shortcoming. It should be used and applied carefully, because it is clear, the average household is not a household of unemployed, or of pensioners. The social status is usually connected with a consumer behavior, differing significantly from the consumer behavior of an average household. Therefore, it should be strictly used together with or applied to average income indicators (average wage in a certain region, average net disposable household income, etc.)

The real income indicator would make the state and development of social and economic disparities on the regional and sub-regional levels more precise. [25] [15] [9]

According to the preliminary results of Kocourek and Šimanová [12] and Kocourek et al. [11], the real regional disparities in the income of households in the Czech Republic are smaller than so far published nominal ones, which is consistent with findings of Čadil et al. [4] Therefore, it seems very useful (if not necessary) to measure or at least estimate the price levels on the most detailed scale available. Significant differences in cost of living can be identified even within the former districts in the Czech Republic (LAU 1), a price level homogeneity on the level of NUTS 3 or NUTS 2 is therefore another very strong and hardly justifiable precondition.

Although on the lower levels of territorial division (LAU 1 and smaller) the income indicators are also very difficult to measure or reliably estimate, even the regional price-level index alone seems to provide a very important information.

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