OECD Regional Development Working Papers

Subnational purchasing power of parity in OECD countries: estimates based on the Balassa-Samuelson hypothesis

By: Alex Costa, Jaume Garcia, Josep Lluís Raymond and Daniel Sánchez-Serra

Due to the lack of Purchasing Power Parities (PPPs) at regional level, regional Gross Domestic Product (GDP) figures have been traditionally adjusted using national PPPs. The simplifying assumption that all regions of a country have the same cost of living, and implicitly that there are no regional differences in prices, might lead to regional GDP figures (adjusted for national PPPs) that are biased and might limit the design and implementation of regional policies. This paper tries to overcome this problem by estimating PPPs at subnational level (TL2 regions) for OECD countries through a new method which uses publicly available data and is based on the Balassa-Samuelson hypothesis.

JEL codes: C20, E31, O47, R10
Keywords: Regional Purchasing Power Parity, regional price levels, Balassa-Samuelson hypothesis

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Introduction

The cost of goods and services varies across countries and regions. Territorial price differences have been long discussed in the literature (Kokoski (1991[1]); McMahon (1991[2]); McMahon and Chang (1991[3]); Moulton (1995[4]); Walden (1998[5])). This literature has shown that prices differ not only across countries, but also across subnational territories inside a country and that differentials in the territorial price levels indicate differences in the cost of living.

Differences in the cost of living within countries have important implications for the welfare of territories (Roos, 2006, p. 1553[6]). Regional economic policies are usually sustained by economic analyses and studies which use macroeconomic statistical indicators measuring the region's economic performance and development (e.g. Gross Domestic Product per capita, disposable income, wages, etc.). Traditionally, these subnational macroeconomic indicators have been compared across countries by adjusting them using national exchange rates or Purchasing Power Parities (PPPs). However, these methods can lead to significantly distorted adjustments across the regions of a country. While PPPs take into account differences in price levels between countries they fail to account for differences in regional price levels, leading to biased economic figures at subnational level. Indeed, when adjusting macroeconomic figures, the use of an average national price deflator will lead to an artificial increase of the macroeconomic indicator in the better developed regions and a decrease in the lagging regions (Rokicki and Hewings, 2016, p. 171[7]). As a result, the inaccuracy or imprecision of regional economic levels might lead to a biased assessment and, consequently, a bad policy design.

To date, a number of national statistical offices and academic works have been able to estimate regional price levels within countries. Concretely, the ONS (Ball and Fenwick, 2003[8]) developed estimates of regional price levels for the NUTS 1 regions in the United Kingdom for the years 2000 and 2003. Since then, the ONS only made one other attempt to estimate regional price indices for the year 2010 (ONS, 2011[9]). Brandt and Holz (2006[10]) estimated provincial-level price deflators in China for the years 1984-2002. Roos (2006[6]) estimated price levels for 440 German districts (Kreise) and 16 states (Bundesländer) for the year 2002. Later on, Kosfeld, Eckey and Lauridsen (2008[11]) following Roos (2006[6]) approach, estimated regional price indices for German NUTS 3 regions between 1995 and 2004. At the same time, Aten and D'souza (2008[12]) estimated regional prices in 38 areas of the United States (U.S.) for the years 2005 and 2006. Later on, Aten, Figueroa and Martin (2012[13]) provided regional price estimates for the U.S. states and Metropolitan areas between 2006 and 2010. Since then, the Bureau of Economic Analysis (BEA) provides annual estimates of regional price parities for all U.S. states and Metropolitan areas. Istat (2008[14]), in collaboration with the Guglielmo Tagliacarne Institute and the Union of Italian Chambers of Commerce, estimated spatial price indices for capital cities in Italian regions for the year 2006. Later on, and based on these indices, the Bank of Italy (Cannari and Iuzzolino, 2009[15]) estimated regional price indices for all NUTS 2 in Italy. In the Czech Republic, regional price levels (NUTS 2) were estimated by Musil et al. (2012[16]), Čadil et al. (2014[17]) provided estimates for smaller Czech regions (NUTS 3) for the year 2007, while Kocourek, Šimanová and Šmída (2016[18]) estimated regional price levels at District level (LAU 1). Matzka and Nachbagauer (2009[19]) estimated regional price indices in Austrian NUTS 2 for the year 2008. In Spain, Costa, López and Raymond (2015[20]) estimated regional prices in 17 Spanish regions (NUTS 2) for the year 2012. Rokicki (2015[21]) estimated regional price levels in Poland at the NUTS 2 and

NUTS 3 for the years 2000 and 2011. Kolcunová (2015[22]) estimated regional prices (NUTS 2) in 12 European countries. Later on, Janský and Kolcunová (2017[23]) estimated regional prices (NUTS 2) in 28 EU countries.

Eurostat and the OECD have developed a standard methodology for the computation of PPPs. This method is based on the EKS (Éltetö-Köves-Szulc) method which requires data concerning the volume and prices of consumer goods and services in a territory (European Union / OECD, 2012[24]). Despite the existence of this method and the possibility to apply it also at subnational level, it is often not possible due to the lack of homogeneous subnational data (prices and volume of goods and services) across countries. In fact, national Consumer Price Index collections, as well as specific price collections implemented across countries, seem to differ in terms of the regional consumption basket data gathered, as well as on the scope of regional prices observed (Čadil and Mazouch, 2011, p. 2[25]).

Despite the need for regional price indices at the international level and the initiatives mentioned previously, no homogeneous methodology has been developed for all OECD countries. Due to this lack of data, international subnational economic analyses are currently done by adjusting regional economic indicators using national PPPs. In order to overcome this limitation, the main goal of this study is to estimate PPPs for more than 300 TL2 regions in OECD countries between 2000 and 2016, subject to data availability. This goal has been achieved by estimating regional price indices across OECD regions according to the Balassa-Samuelson hypothesis[1] and using subnational time series on prices from the U.S. Bureau of Economic Analysis (2008-2016) and economic and demographic subnational figures from the OECD Regional Database (2000-2016).

The approach followed in this work aims at contributing to the topic of regional price levels by using an indirect method applied to OECD countries. The subnational PPPs estimated and the method used in this paper are a relevant contribution to the literature on this topic for several reasons. Firstly, the method applied here uses publicly available data at the international level and does not require the collection of new information on, for instance, the volume and prices of consumer goods and services in a given territory, which is required when computing Consumer Price Indices. Secondly, the results derived from the application of this method are internationally comparable, since the method applied and the data used are homogeneous across subnational entities. Thirdly, the method can be easily replicated over time as soon as new raw data become available. Finally, these estimates allow to adjust macroeconomic subnational measures traditionally adjusted with national PPPs, thus helping to better assess regional development and to better implement adequate policy interventions at subnational level.

This paper is divided into four sections. Following the introduction, section 2 presents the estimation method used, with reference to its theoretical basis, the databases used and the estimates of the models that allow obtaining regional prices and regional PPPs (available in Annex B). Section 3 summarises the practical relevance of the results derived from Section 2. It zooms into year 2016 to show the effect of adjusting regional per capita GDP figures with the estimated subnational PPPs compared to figures adjusted with national PPPs. It also analyses the effect on regional convergence when adjusting regional per capita GDP figures between 2000 and 2016 with subnational PPPs. Section 4 presents the conclusions.

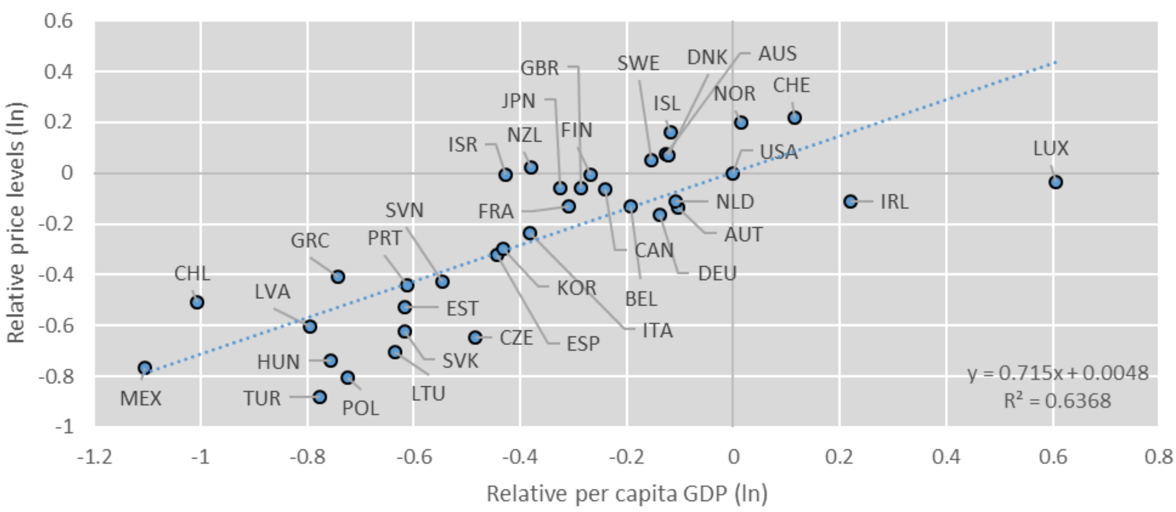
[1] According to the Balassa-Samuelson, countries with a higher level of income per capita tend to have higher price levels. For more details, see section 2.1.

1 An approach to estimate PPPs at subnational level in OECD countries

Conceptual framework

According to the so-called Balassa-Samuelson effect (Balassa (1964[26]) and Samuelson (1964[27])), countries with a higher level of income per capita tend to have higher price levels. The Balassa-Samuelson hypothesis states that, richer countries (or territories) show higher levels of productivity in the production of tradable goods (industrial or marketable goods) than poorer countries, thus giving rise to higher wages in the tradable sector. However, and given the fact that wages tend to equalise between the sectors producing tradable and non-tradable goods (services, in general), the prices of non-tradable goods will also be higher in rich countries than in poorer countries. Therefore, the general level of prices will be higher in rich countries. Figure 1 confirms this relationship at the OECD level.

Figure 1. Relationship between price levels and per capita Gross Domestic Product in OECD countries (2016)



Note: Both variables are expressed in natural logarithm as relative to the United States levels. Price levels are constructed by dividing Purchasing Power Parities by exchange rates.
Source: OECD National Accounts (2019) and Prices and Purchasing Power Parity Statistics (2019).

In more formal terms, let us consider a simplified example of only two countries, the domestic one "the richest" and the foreign one "the poorest", and two types of goods, industrial or tradable and services or non- tradable. Obviously, the real world is constituted of more than the two sectors presented in this example (one fully tradable and the other fully non- tradable). Indeed, all goods produced will be partly tradable, and partly non-tradable. However, following the logic of Balassa-Samuelson, the two-sector model provides a justification for a positive correlation between price levels and GDP per capita as shown below.

If P_I are the prices of domestic industrial products and P_I^* are the prices of foreign industrial products that are fully tradable goods without transport costs, competition will make both prices equal ($P_I = P_I^*$). However, productivity in the industrial sector will be higher in the richest than in the poorest country. If Π_I and Π_I^* are the respective productivities, the following inequality will be fulfilled: $\Pi_I > \Pi_I^*$. Considering that there is correspondence between wages and productivity in the industrial sector, the following will be verified: $W_I = \Pi_I$; $W_I^* = \Pi_I^*$.

However, and due to an effect derived from competition, wages in the industrial sector will tend to extend to the services sector. If this were not the case, to the extent that productivity in industry grows faster than in services, wages in this sector would also grow at a faster pace than in services. This would originate a transfer in the supply of labour from services to industry. The shortage of people willing to work in services and the abundance of people willing to work in industry would lead to an equalisation of salaries in both sectors. In this case, wages in the richest country will be $W = \Pi_I$; while the wages in the poorest country will be $W^* = \Pi_I^*$, since equality of wages is assumed in both sectors.

Focusing now on the services sector and assuming that prices in services are determined by the ratio between wages and productivity, the following equalities will be verified: $P_S = {W}/{\Pi_S}$; $P_S^* = {W^*}/{\Pi_S^*}$ $P_S^* = \frac{W^*}{\Pi_S^*}$. Let us assume also that productivity in services is the same in the richest country as in the poorest country. Therefore, if W is greater than W^* and productivity in the services sector is the same, the price of services in the poorest country will be lower than the price of services in the richest country and the following inequality will occur $P_S = {W}/{\Pi_S} > {W^*}/{\Pi_S^*} = P_S^* P_S^* = \frac{W^*}{\Pi_S^*}$.

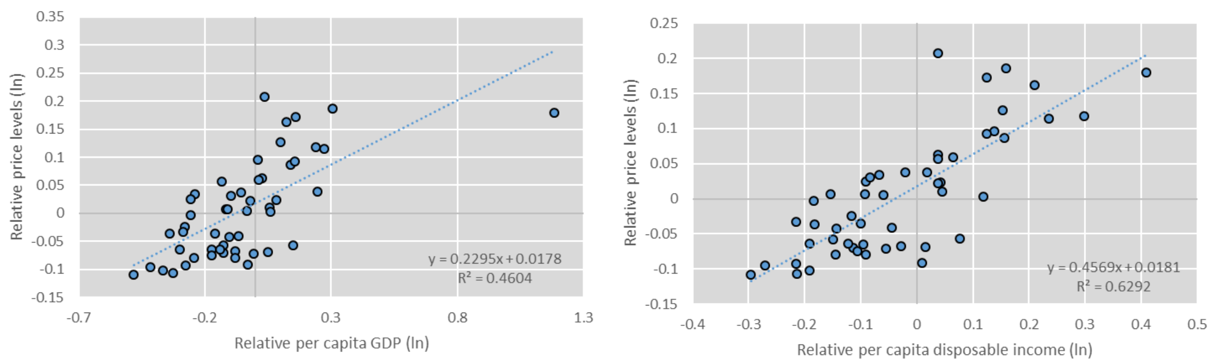
Since average prices in a country are a weighted average of prices of industrial and services products, prices in the rich country will be $P = (1-\lambda)P_I + \lambda P_S$, while prices in the poor country will be $P^* = (1-\lambda^*)P_I + \lambda^* P_S^*$. Here λ and λ^*correspond to the weight of services in Gross Domestic Product (GDP) in the rich country and in the poor country, respectively. Only in the case where the structure of GDP is the same in both countries, namely, $\lambda = \lambda^*$ would the following hold: $P > P^*$. However, if the weight of services in GDP is higher in rich countries than in poor ones, then the previous inequalities will be reinforced.

Based on this example, it is presented how productivity differentials in the tradable goods would lead to wage differentials across territories. Additionally, these wage differentials also lead to differences in the price of services and consequently differences in prices across territories. According to Tang (2007, p. 6[28]), high price of services in developed countries are mainly explained by the relative high demand of services respect to the supply. Similarly, Karádi and Koren (2008, p. 2[29]) state that the scarcity of land available in urban areas will limit the supply of services (e.g. housing) and will therefore explain increases in prices in certain areas leading to price differences across cities and across countries.

When extending this analysis to the regional level, the positive relationship between prices and the weight of services in the GDP structure is also verified. Indeed, when using state level data from the U.S. Bureau of Economic Analysis and splitting GDP figures into three components, agriculture, industry and services, it can be observed that the higher the share of the services sector, the higher the prices. Similarly, states in which the services sector accounts for a greater share of the GDP appear to be those characterized by higher prices.

Additionally, considering that salaries are the main component of household disposable income levels, it seems that there is a higher positive correlation between price levels and income levels than between price levels and GDP per capita. When using state figures on GDP per capita, price and per capita income levels from the U.S. Bureau of Economic Analysis, it can be observed that the elasticity is lower between regional prices and GDP per capita than between regional prices and per capita household disposable income levels (Figure 2). Additionally, the explanatory capacity of the former is lower than the latter. Based on these results, it is plausible to think that in the same country there are income transfers that weaken the relationship between GDP and household disposable income and, consequently, also the relationship between GDP per capita and price levels.

Figure 2. Relationship between price levels and GDP/Income per capita in 51 U.S. states (2016)



Note: Both variables (per capita GDP and per capita disposable income) are expressed relative to the national value. Price levels refer to the variable SAIRPD Implicit Price Deflators by state (October, 2019).
Source: Bureau of Economic Analysis (2019).

Regional data used, data source and territorial coverage

The data used in this paper were mainly collected from the OECD Regional Database and the U.S. Bureau of Economic Analysis (BEA). The BEA is the only official statistical agency that offers a series of prices parities by state with temporal continuity and with the standard dissemination degree of official statistics. Although there are other approaches to regional prices, they all lack continuity and have been developed in the context of isolated studies, even those in which official statistical offices participate. The data used for the estimations were 2008-2016 time series of regional price parities, available at the time of writing this text. Time series data at regional level for all OECD countries (between 2000 and 2016) have been obtained from the OECD Regional Database, while national figures were obtained from the OECD National Accounts Database. The former provides a unique set of comparable statistics at regional level. The set of variables used to compute the regional prices are Regional Household Income, Regional economic structure of GDP (percentage weight of services and industrial sector in total Gross Value Added), as well as regional GDP in current prices and population. The OECD National Accounts Database provides Purchasing Power Parities at national level.

The current analysis is carried out through a cross section of more than 300 OECD large regions[2] across OECD countries. Countries such as Iceland, Israel, as well as French overseas territories, were excluded

[2] Large regions refer to the 2016 Territorial Level 2 (TL2) regions, which according to the (OECD, 2017[31]) consists of the first administrative tier of subnational government, for example, the Ontario Province in Canada.

from this analysis due to the lack of regional data on the weight (percentage) of services and industry in total Gross Value Added at regional and national level.

Methodology and results

Taking into account the theoretical framework presented in section 2.1, and considering the availability of regional data from the U.S. Bureau of Economic Analysis (for more details see section 2.2), the process used to estimate regional prices in OECD countries was developed in three steps[3]:

- *Step 1*: The relationship between state prices and state household disposable income per capita including also data on the industrial composition of the GDP by State in the United States is defined by the following function:

$$\ln P_{it} = \beta_0 + \beta_1 \ln HDIpc_{it} + \beta_2 Ind_{it} + \beta_3 Serv_{it} + u_{it} \qquad (1)$$

where P_{it} are the prices in Purchasing Power Parities of the state "*i*" in the period "*t*", $HDIpc_{it}$ is the corresponding value of the available household disposable income per capita, Ind_{it} is the weight of the industry[4] and $Serv_{it}$ the weight of the services[5] over GDP in each state "i" in the period "t".

Based on data from 50 U.S. states and the federal District of Columbia, two approaches were considered to estimate this equation (Table 1). A first approach (Pooled OLS, presented as Model 1) was used to simply pool the data from all regions in the United States, estimating the variance and covariance matrix of the beta coefficients through a robust method that takes into account the autocorrelation within each state (clustered standard errors[6]). The second approach (Between group estimator, presented as Model 2) consisted of regressing the averages of the explanatory variables against the averages of the regional prices of the states in the United States[7].

Table 1 shows that for both approaches (Model 1 and Model 2) the price-income elasticity is estimated to be around 0.3, which means that a 10% difference in nominal income between states tends to become a real difference in income of the order of 7%, given that the remaining 3% is absorbed by higher prices. These results also show that the states with the greatest weight of services are those that tend to have higher price levels, followed by the states in which industry has a greater weight[8]. Given that both approaches provide similar results it was decided to use the results of Model 2 in Step 2.

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[3] The model presented in this section is in line with the Balassa-Samuelson hypothesis and omits other variables that might explain regional prices differences (e.g. rent, tourism,..) which might not be easily available globally at the subnational level.

[4] The industry sector comprises categories C to F of ISIC 3.

[5] The service sector comprises categories G to G of ISIC 3.

[6] Robust standard errors that account for heteroscedasticity across clusters of states.

[7] The main objective of the regressions presented in Table 1 is not to obtain estimators of the coefficients of the regression equation to which a causal interpretation can be given, but only to estimate a model that enables us to get a forecast after taking into account the information that is available for the countries that form part of the OECD sample.

[8] These results have also been confirmed when including as an independent variable the share of urban population in each state. In fact, it is confirmed that, ceteris paribus, the more rural states tend to show lower price levels. Moreover, it should be noted that when the same equations are estimated using GDP per capita instead of income, the estimated elasticity is reduced, but the simple predictions obtained using GDP or income are practically coincident given that the lower Price-to-GDP elasticity is compensated by a greater inter-state variability in GDP than in income.

Table 1. Estimation results of the relationship between state prices and state household disposable income per capita

Dependent variable: Regional prices in U.S. states (in natural logarithm), 2008-2016

e	Model 1: Pooled OLS (clustered standard errors)		Model 2: Between-group estimator	
Constant	3.407	***	-3.301	***
	(0.192)		(0.263)	
Regional household income (in natural logarithm)	0.318	***	0.316	***
	(0.034)		(0.043)	
Share of GVA of industry of the region	0.914	***	1.015	***
	(0.209)		(0.283)	
Share of GVA of service of the region	1.275	***	1.385	***
	(0.195)		(0.266)	
n. obs.	469		469	
R^2	0.749		0.749	
R^2- within			0.008	
R^2- between			0.769	
Root MSE	0.042			
F-test	55.6	***	52.1	***
n. groups			51	

Note: 1. In Module 1, Std. Err. adjusted for 51 clusters. 2. Robust standard errors (Module 1) and Standard errors (Module 2) in parentheses. 3. Asterisks represent p-values: p<0.10 (*), p<0.05 (**), p<0.01 (***).
Source: Own elaboration based on the U.S. BEA and OECD Regional database.

- *Step 2*: OECD regional prices are estimated based on the relationship between price level, income level and composition of the GDP derived from *Step 1*. This step will be the result of three subsequent steps:
    - *Step 2.1*: Obtaining the unadjusted prices of region "*h"* that belongs to country "*J"* in period "*t*", by directly using the estimated equation to predict prices (Model 2):

    $$\hat{p}_{Jht} = exp\left(Const + \hat{\beta}_1 lnHDIpc_{Jht} + \hat{\beta}_2 Ind_{Jht} + \hat{\beta}_3 Serv_{Jht}\right) \qquad (2)$$

    - *Step 2.2*: This step consists in obtaining the price levels after adjusting them with the adjustment factor. This Step is necessary to guarantee the internal consistency of the estimates. The price adjustment factor is thus obtained to ensure that the weighted sum of the regional price levels matches the reference national price levels. The procedure is as follows:

    $$p_{Jt} = \tau_{Jt} \sum_{h=1}^{H} w_{Jht} \cdot \hat{p}_{Jht} \qquad (3)$$

    where, p_{Jt} refers to the price level of country J in period t; w_{Jht} refers to the weight of the GDP in region "h" over GDP in country "J"; and $\tau_{Jt} = {p_{Jt}}\Big/{\sum_{h=1}^{H} w_{Jht} \cdot \hat{p}_{Jht}}$ is the adjustment factor.

    - *Step 2.3*: Obtaining adjusted regional prices. For each country and each year the sum of the weighted regional price levels must coincide with the price level of the country in PPPs.

$$\hat{p}^*_{Jht} = \tau_{Jt} \cdot \hat{p}_{Jht} = \tau_{Jt} \cdot \exp(Const + \hat{\beta}_1 lnHDIpc_{Jht} + \hat{\beta}_2 Ind_{Jht} + \hat{\beta}_3 Serv_{Jht}) \quad (4)$$

- *Step 3*: OECD regional price parity indices (regional PPPs) are estimated by using the adjusted regional prices derived from Step 2 and the PPPs at national level.

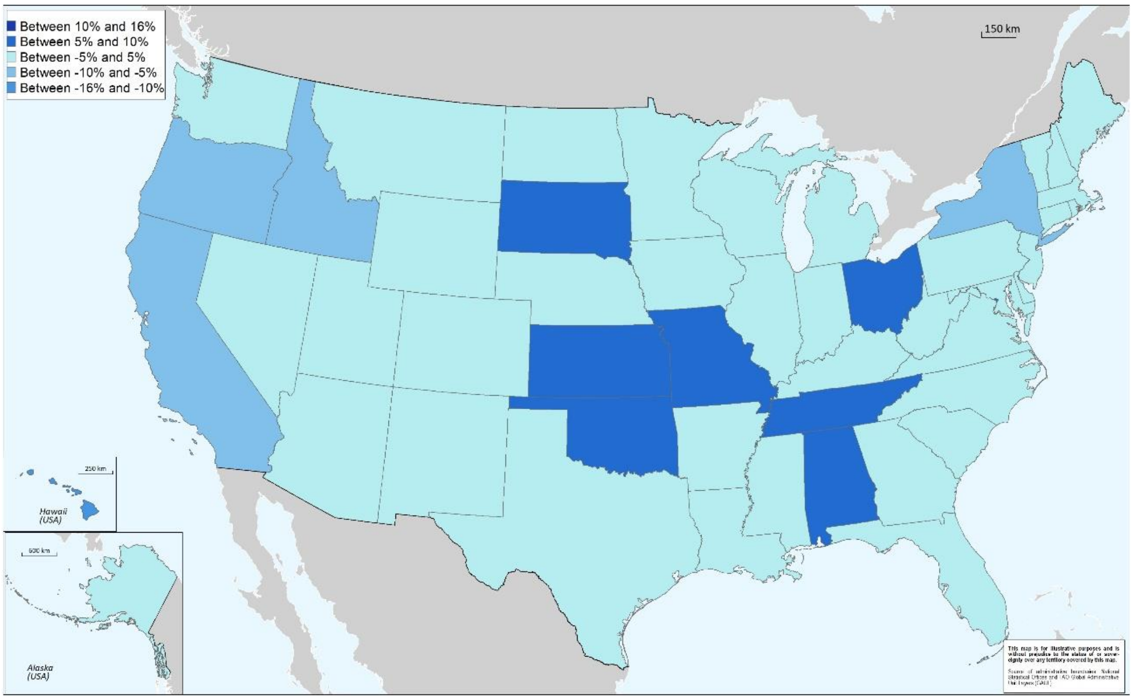
  $$PPP_{Jht} = \hat{p}^{*}_{Jht} * PPP_{Jt} \qquad (5)$$

  where PPP_{Jht} refers to the PPPs at regional level (in \$), $\hat{p}^{*}_{Jht}$ refers to the adjusted regional price derived from Step 2, and PPP_{Jt} refers to the PPPs at national level (in \$).

Estimated regional prices for the United States offer similar results compared to the official price levels derived from the BEA[9]. Figure 3 presents the magnitude and the location of the percentage difference between the regional prices estimated by the BEA and the national prices, as well as the percentage differences between the regional prices estimated by the BEA and the ones derived from this study. This Figure shows that the typical percentage point difference between the estimated prices derived from this study and the ones reported by the BEA at subnational level are between 5% and -5%. Slightly larger in-sample relative errors (between -5% and -10% as well as between 5% and 10%) seem to be located in eastern and western states such as California, Idaho, Oregon, New York, as well as central states such as Alabama, Kansas, Missouri, Ohio, South Dakota and Tennessee. However, the number of states showing a significant relative error seem to be considerable when comparing regional prices reported by the BEA and the national official price levels (Figure 3).

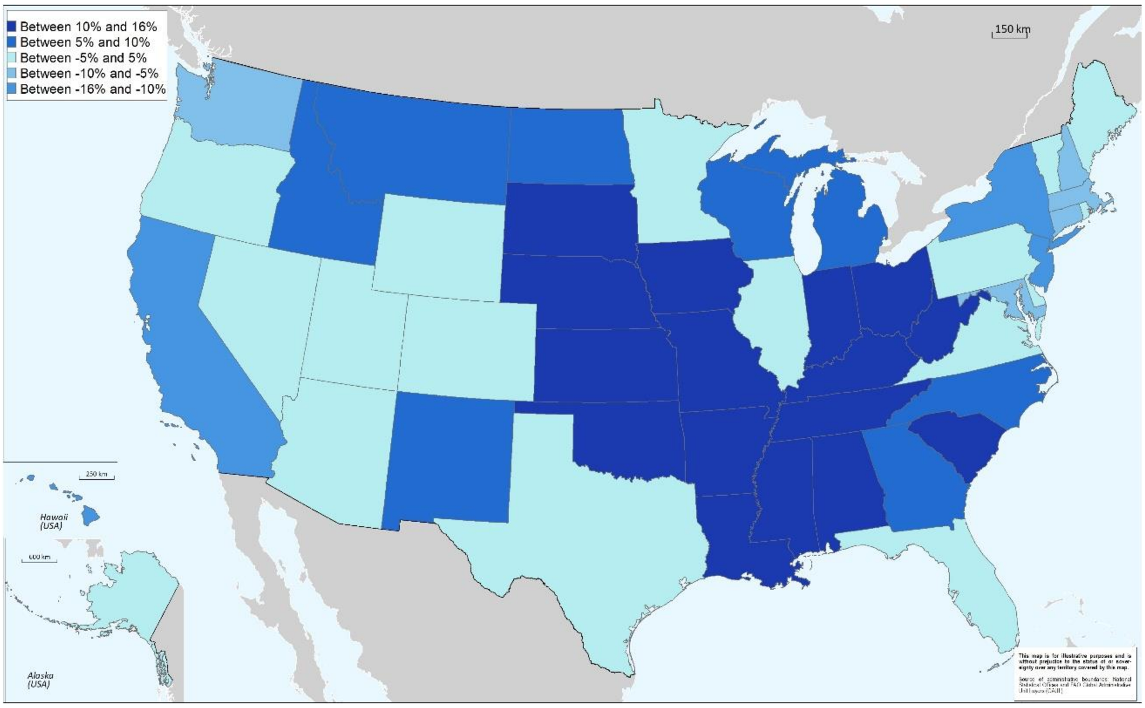
Figure 3. Difference between estimated and official prices in the United States (6)

Percentage point difference between estimated and BEA subnational prices



[9] Cross-validation was also implemented to evaluate the good fit of the model independently of the sample used. The cross-validation was carried out by using a random sample of 75% of the states to estimate the price levels of the remaining 25%. This process was repeated ten times. Results of this exercise confirm that the estimated model offers unbiased estimated when comparing them with the official prices derived from the BEA. Some additional robustness checks of the estimates are available in Annex A.

Percentage point difference between BEA subnational prices and National prices

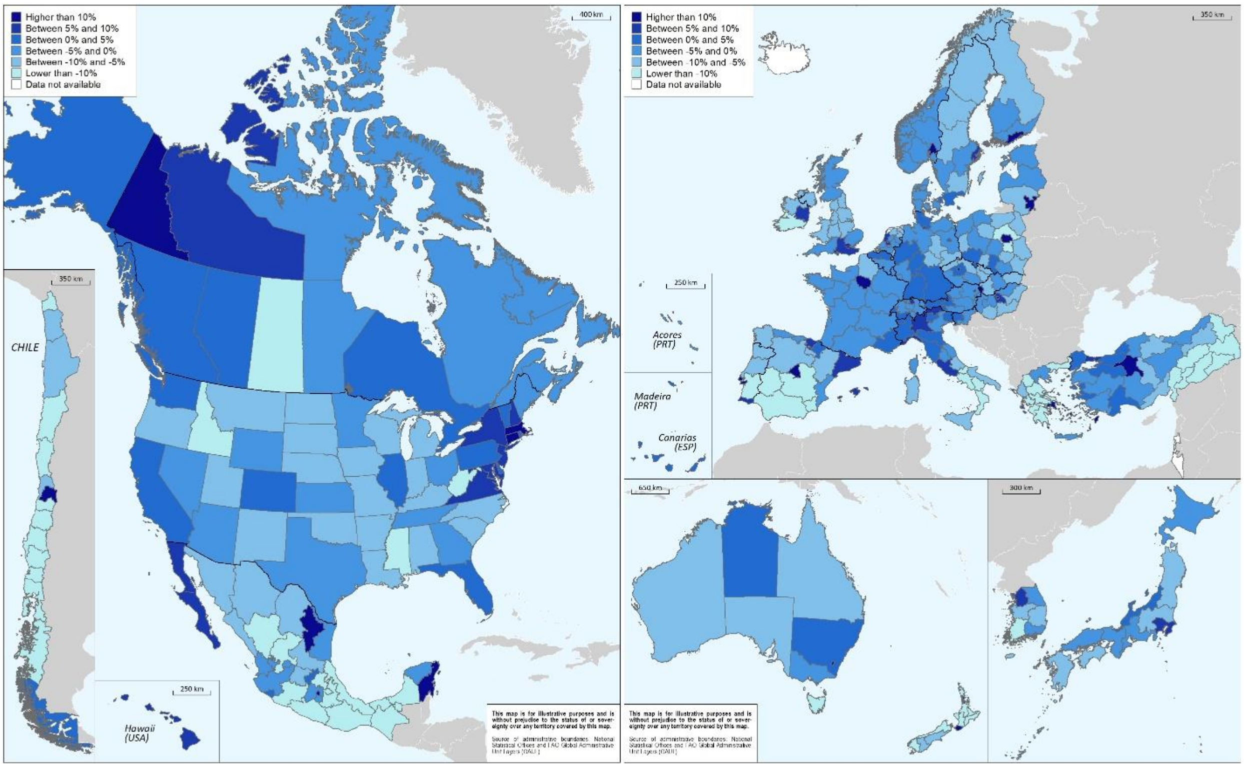


Note: Deviations are expressed in percentage. Deviations in the first map are the result of ((estimated regional PPP-official PPP) / official PPP) while deviations in the second map are the result of ((National PPP – official PPP) / official PPP).
Source: Own elaboration based on data from the U.S. BEA.

Regional PPPs derived from this study confirm the existence of subnational price differentials across regions in OECD countries. Indeed, these estimates prove that the cost of goods and services varies not only across countries but also across regions. Figure 4 presents the differences, expressed in percentage, between the estimated PPPs indices at regional level and the national ones. Deviations from the national PPPs imply differences in purchasing power of a "basket of goods" across regions. Positive differences in the cost of living seem to be higher in urban regions while negative differences in the cost of living appear in more rural areas. Therefore, the cost of living in capital cities seems to be higher than in rural areas. For example, the 2016 regional PPP for Madrid is 15% above the national average while the regional PPP is 15% below in regions such as Extremadura and Castilla-La Mancha. In France, the region Île-de-France displays regional PPPs that are 10% above the national average while the region Hauts-de-France accounts for regional PPPs which are 5% below the national average.

Figure 4. Deviations between Regional and National PPPs in OECD countries, 2016

Deviations are expressed in percentages



Note: 1. Deviations are expressed in percentage ((estimated regional PPP-national PPP) / national PPP). 2. Data refer to the year 2016 with the exception of Chile (2012), Japan (2014), Switzerland (2013) and Turkey (2014). Data not available for Iceland and Israel.
Source: Own elaboration.

Comparison with previous results

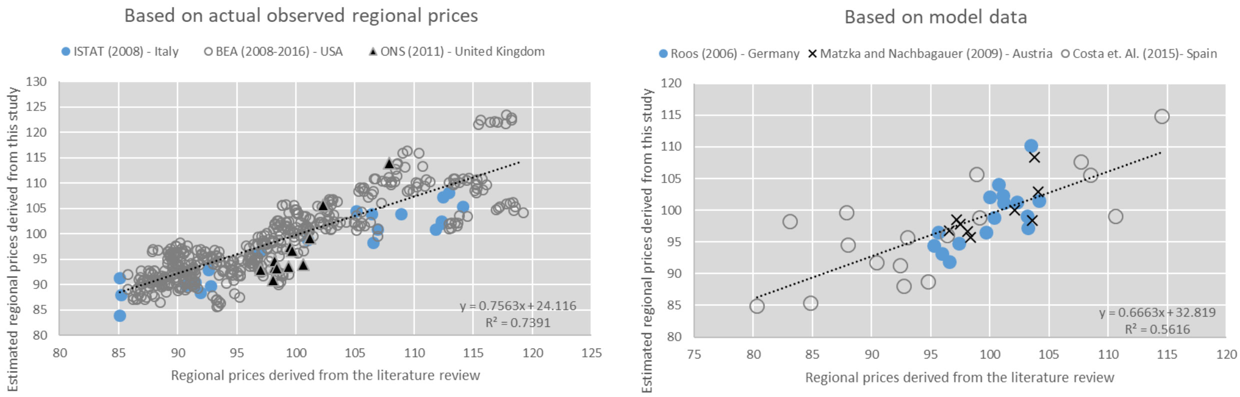
To date, only a limited number of studies have been able to estimate prices at regional level (TL2). These studies are mainly focused on European countries, and can be divided in two main groups. On the one hand, there are studies where National Statistical Offices developed a methodology in accordance with the Eurostat/OECD guide and using actual observed prices such as Istat (2008[14]) in Italy, ONS (2011[9]) in the United Kingdom and Aten, Figueroa and Martin (2012[13]) and then followed by the BEA in the United States. On the other hand, there are academic papers where regional price indices are identified based on model data, such as Roos (2006[6]) in Germany, Matzka and Nachbagauer (2009[19]) in Austria, and Costa, López and Raymond. (2015[20]) in Spain[10].

Estimated regional PPPs derived from this study are in line with the results presented in previous studies. Figure 5 shows that there is a high correlation between the regional prices derived from the literature review and the regional prices derived from this study. Dispersion of results is inevitable since regional prices are not estimated using the same method or disseminated by a single official statistical agency or researcher, however, the results obtained show a positively correlation and with a high fit. When analyzing the

[10] Other studies presented in the introduction of this article have not been analysed in this section due to discrepancies in the NUTS classification. While this study uses NUTS 2016 classification most of the studies presented in the introduction section use NUTS 2013 classification.

correlation with the different studies individually (Figure 6) it can be observed that most of the correlations between the current results and those from previous studies are between 0.7 and 1.

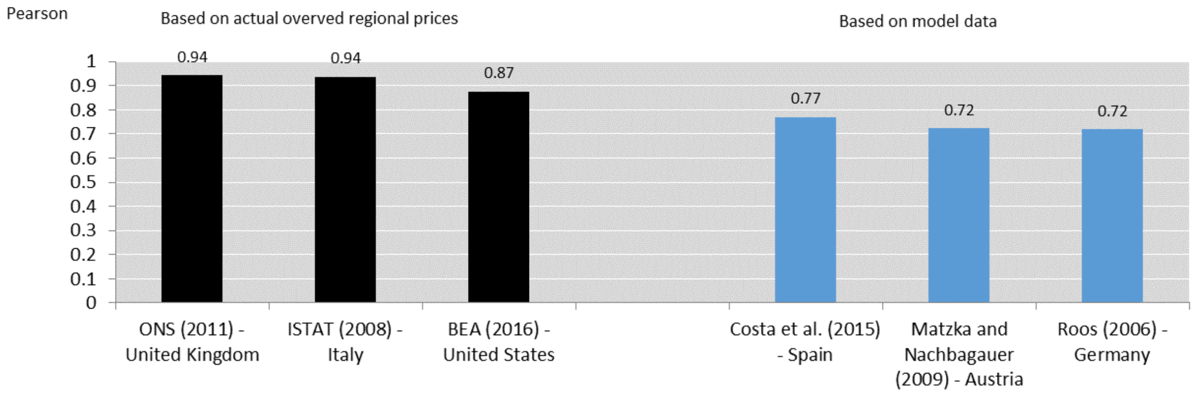
Figure 5. Correlation between regional prices derived from the literature review and regional prices derived from this work



Note: Figures presented in this chart are in accordance with the reference year of all the studies.
Source: Own elaboration.

Additionally, the current results do not show any significant differences when compared with regional prices derived from actual observations and modeled data. Moreover, the correlations between the regional prices obtained from this study and the ones offered by the statistical offices on the basis of statistical methodologies have high correlations (e.g. ISTAT r = 0.95, ONS r = 0.94 and BEA r=0.87)[11].

Figure 6. Correlation between regional prices derived from the literature review and regional prices derived from this study



Note: Figures presented in this chart are in accordance with the reference year of all the studies.
Source: Own elaboration.

[11] Percentage point difference analysis in Italy and the United Kingdom is available in Annex A. for the United States please refer to Figure 3

2 Relevance of the results

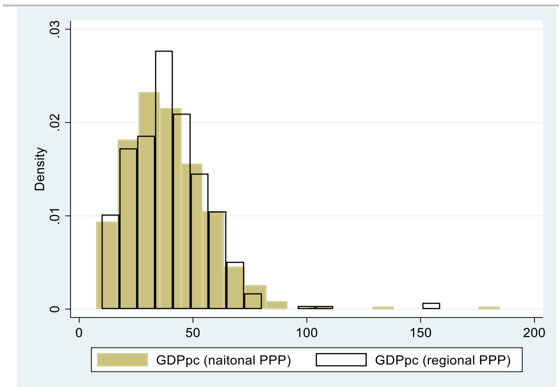
The basic purpose of regional PPPs is to enable the comparison of macroeconomic figures at the regional level in real prices. The following sections show some applications of the use of subnational PPPs estimates when adjusting regional macroeconomic figures.

Effects on the per capita GDP

Regional GDP is typically adjusted using national PPPs, however the cost of goods and services varies across regions. As such, the adjustment of regional GDP figures with national PPPs might lead to an artificial increase of the GDP in the most developed areas and a decrease in the lagging regions. Indeed, as Table 2 shows, the application of regional PPPs derived from this study to GDP per capita figures shows lower kurtosis, lower skewness and lower variance and range than the ones obtained when applying the national PPPs. However, they show similar mean values.

Table 2. Histogram and descriptive statistics of GDP per capita adjusted with national and regional PPPs, 2016

Histogram



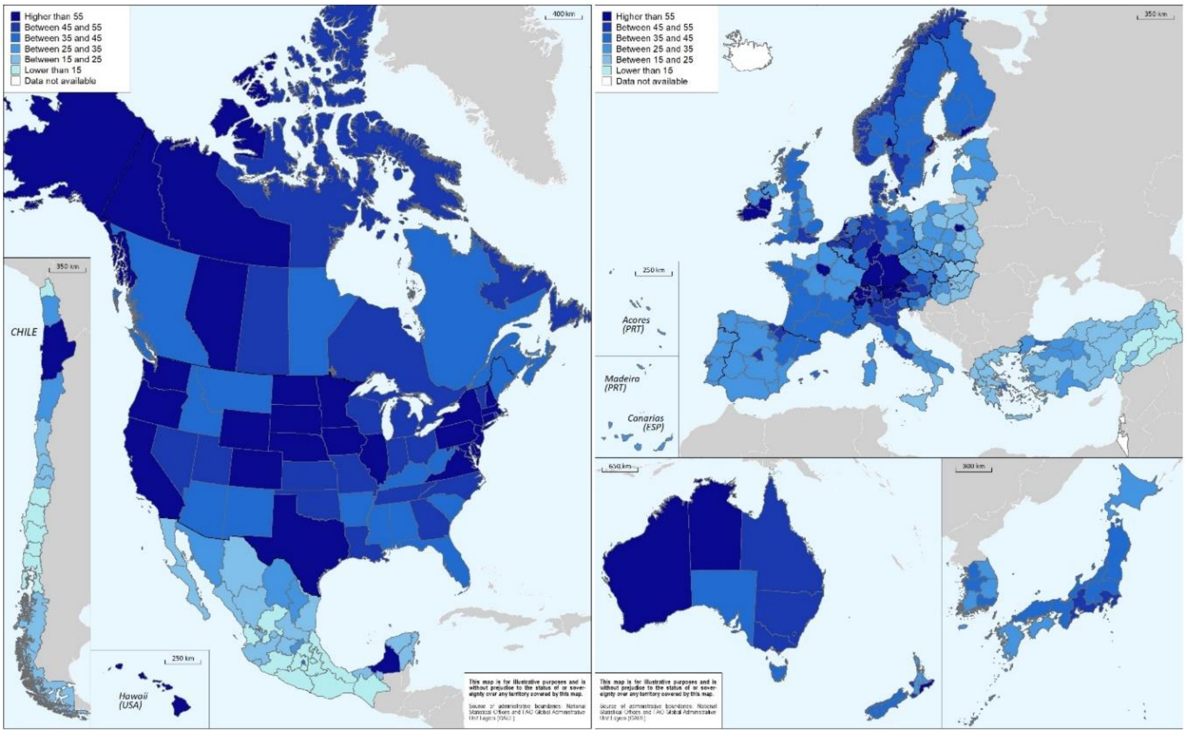
Descriptive statistics	GDP per capita adjusted with	
	National PPPs	Estimated regional PPPs
Observations	378	378
Mean	38.93	39.65
Std. Dev.	18.95	17.86
Variance	358.93	318.92
Skewness	1.85	1.7
Kurtosis	12.92	11.38
Min GDP	7.484	9.83
Max GDP	184.82	158.59
Range (Max-Min)	177.33	148.76

Note: Data refer to the year 2016 with the exception of Chile (2012), Japan (2014), Switzerland (2013) and Turkey (2014). Data not available for Iceland and Israel. GDP per capita figures are expressed in thousands of USD dollars.
Source: Own elaboration.

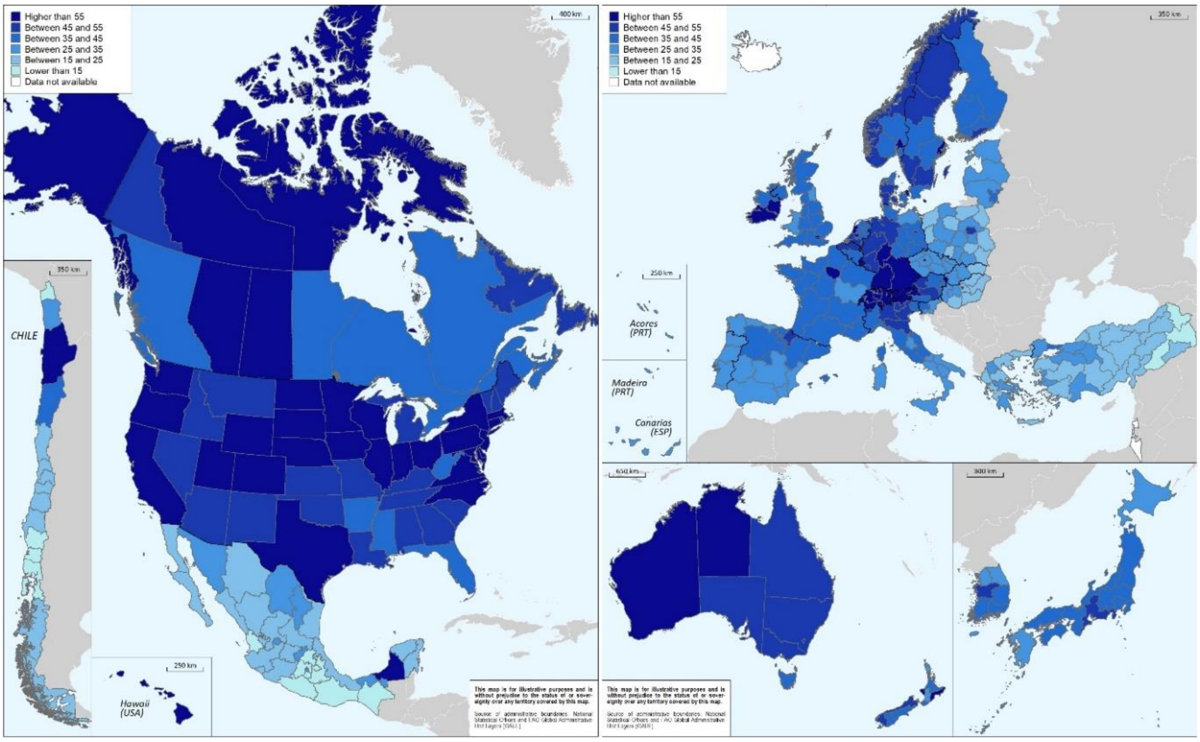
The differences derived from the application of national or regional prices can be seen in Figure 7. These maps show clearly that when adjusting GDP per capita figures with national PPPs, some of the rural regions appear to be poorest than when applying estimated regional ones. For example, the state South Australia, with a GDP around USD 42 000 appear to be richer after adjusting GDP per capita figures with regional PPPs (above USD 45 000). In contrast, we also observe that wealthy regions (e.g. Yukon region in Canada and Madrid region in Spain), after applying the regional PPPs, appear less well off than when national PPPs were applied.

Figure 7. Per capita GDP in OECD regions (2016)

Adjusted with national PPPs



Adjusted with estimated regional PPPs derived from this work



Note: Data refer to the year 2016 with the exception of Chile (2012), Japan (2014), Switzerland (2013) and Turkey (2014). Data not available for Iceland and Israel.
Source: Own elaboration.

Effects on regional convergence

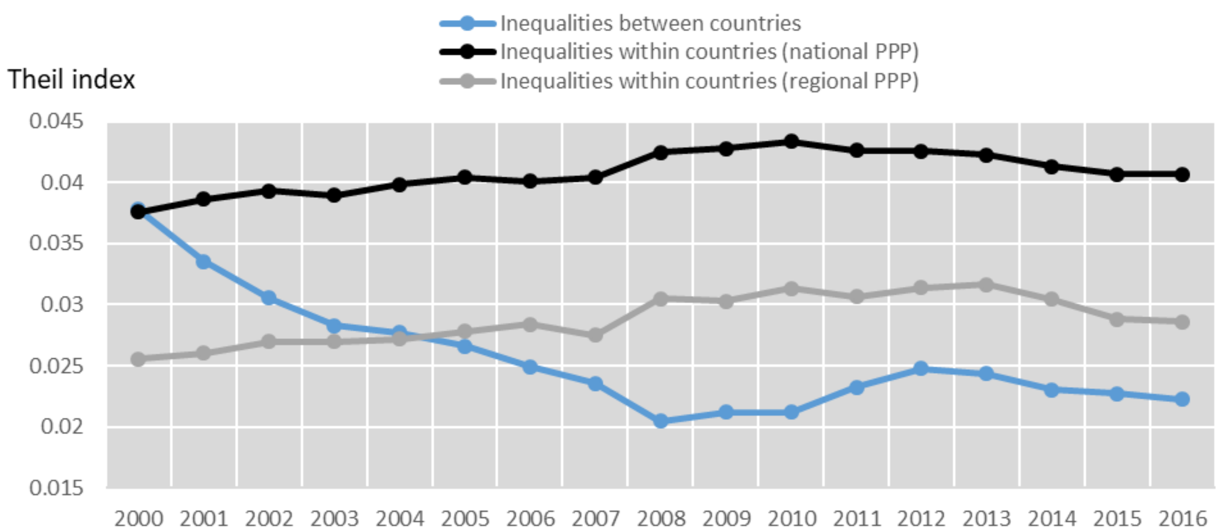
Over the past decade, national disparities in GDP per capita have been decreasing while regional ones have been increasing. Figure 8 shows the evolution of the differences in real GDP per capita within and between countries between the years 2000 and 2016[12]. These data show that regional differences have risen while national ones have declined during the period taken into account. This evidence is consistent with the findings of Blöchliger, Bartolini and Stossberg (2016, p. 6[30])who observe that OECD countries are converging while regions are diverging.

Overall, in the OECD area, regional disparities are smaller when applying the estimated regional PPPs derived from this study than when applying national PPPs (Figure 8). The application of regional PPPs deflators (instead of national average) lowers the overall level of inequalities since it reduces the real per capita GDP in wealthier regions and it increases it in the less developed ones (e.g. from a Theil index of 0.038 to 0.026 in the year 2010). A conclusion which is supported by Rokicki and Hewings (2016[7])showing similar evidence for Poland and the United States. This evidence proves the overestimation of regional disparities when using national PPPs deflators.

Disparities within countries (when adjusting with regional PPPs derived from this study) are higher than disparities between countries. Disparities between countries were higher than disparities within countries from the year 2000 to the year 2003. However, a shift of this trend has been observed between the year 2004 and 2005, a moment where disparities within countries and disparities between countries were identical. Since then, disparities within countries have been always more important than between countries (Figure 8).

Figure 8. Regional disparities across a selection of OECD countries (2000-2016)

Theil inequality index of GDP per capita



Note: 1. The Theil index measures inequality in GDP per capita between all TL2 OECD regions analysed. It breaks down the overall inequality into inequality due to differences within countries and inequality due to discrepancies between countries.
2. Countries were selected based on data availability. The sample covers 21 OECD countries with a complete data series between the year 2000 and 2016. The list of countries considered are: Australia, Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Korea, the Netherlands, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, the United Kingdom and the United States.
Source: Own elaboration based on data from OECD National Accounts (2019) and OECD Regional Database (2019).

[12] The countries and period used in the analysis were selected according to the data availability. The sample used in the analysis covers 21 OECD countries and all of them have a complete data series between the year 2000 and 2016.

Conclusions

This paper aimed to estimate subnational Purchasing Power Parities in OECD countries, and therefore to overcome the current lack of international data in this field. Based on the Balassa-Samuelson hypothesis and using publicly available data from the OECD and the U.S. Bureau of Economic Analysis, it was possible to estimate regional prices for a time series of more than ten years and for more than 300 OECD large regions (TL2).

Estimated regional PPPs derived from this study are in line with the results derived from a limited number of national statistical offices or academic works. Despite the slight dispersion observed, the results obtained are highly correlated with the regional prices obtained from other studies.

Our analysis suggests that the cost of goods and services varies across regions within a country. Differentials in the cost of living have important implications on the welfare of territories. In this line, it has been shown that the adjustment of nominal GDP per capita figures by using the estimated regional price deflators (PPPs) lowers the measures of real GDP per capita in the more developed regions and increases it in the lagging regions (compared to the results obtained when national price deflators are used). This suggests that adjusting macroeconomic figures with regional PPPs has the potential to affect assessments of regional convergence of regions.

These new estimates underline the importance of account for price differentials when assessing regional economic disparities. In this respect, National Statistical Offices of all OECD countries are requested to intensify their efforts to produce regional PPPs. This would dramatically improve the support that statistics could provide to well-design regional development policy initiatives.

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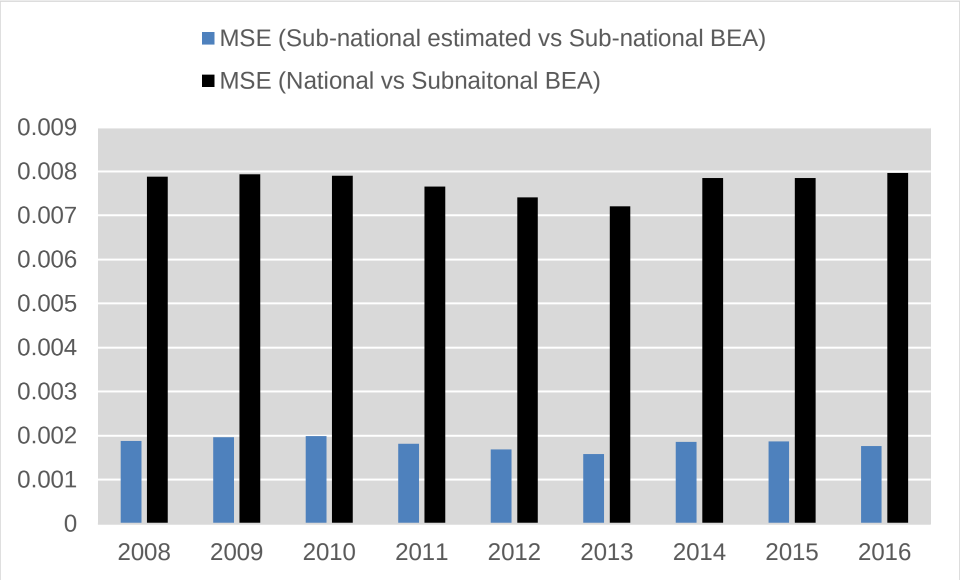
Annex A. Robustness checks of the Model described in section 2.3.

This section presents some statistical checks that provide additional evidence around the estimation method and the estimates derived from this work.

Figure 9 presents the Mean Square Error (MSE) of the differences between the regional prices estimated by the BEA and the national prices, as well as the MSE of the differences between the regional prices estimated by the BEA and the ones derived from this study. This Figure shows that the MSE are substantially reduced when regional prices are equalised to the ones estimated by the BEA. On the contrary, MSE are larger when equalising them to the national prices.

Figure 9. Mean Square Errors (MSE) of the difference between prices in the United States (2008-2016)

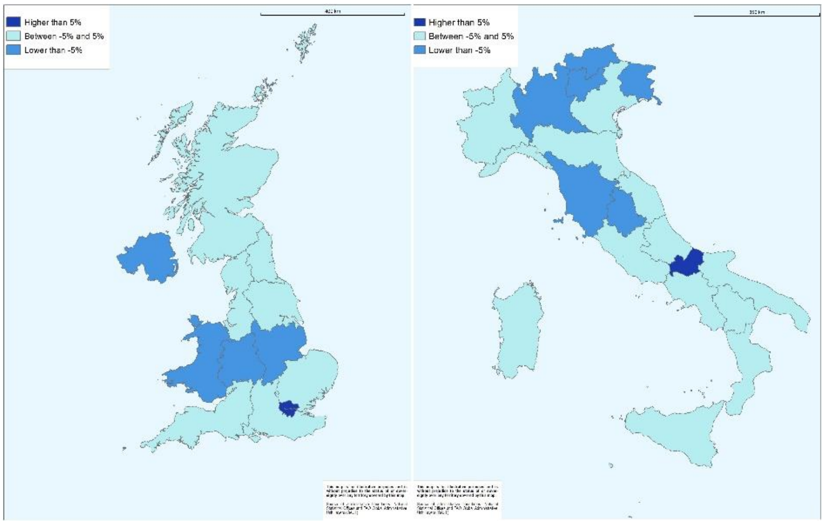


Note: The MSE is a measure of the quality of an estimator and refers to the average of the square of the errors between two samples (e.g. the average squared difference between the estimated prices levels and the actual prices reported by the BEA).
Source: Own elaboration based on data from the BEA (2019) and National Accounts (2019).

Figure 10 presents the magnitude and the location of the percentage difference between the regional prices estimated by the ONS (2011[9]) and Istat (2008[14]) and the ones derived from this study. This Figure shows that the typical percentage point difference in the United Kingdom and Italy are between 5% and -5%. Slightly larger out-sample relative errors (lower than -5% and higher than 5%) seem to be located in central regions in the United Kingdom such as East and West Midlands and Wales as well as London and Northern Ireland. In Italy, regions with relative large out-sample relative errors are observed in northern regions such as Lombardy, Trentino-Alto Adige and Friuli-Venezia Giulia as well as in central regions such as Tuscany, Umbria and Molise.

Figure 10. Difference between estimated and official prices in the United Kingdom and Italy

Percentage point difference between estimated and official subnational prices.



Note: Deviations are expressed in percentage and are the result of ((estimated regional PPP-official PPP) / official PPP).
Source: Own calculations based on ONS (2011[9]) and Istat (2008[14]) estimates.

Annex B. Regional figures in OECD countries

Table 3. Regional figures in OECD countries (2016 or latest year available)

	Country	ID Region	Region	Year	Regional prices (Step 1)	National Price Parity Indices	Estimated regional price parity index (Step 3)	Per capita GDP adjusted using national PPPs	Per capita GDP adjusted using regional PPPs	Difference between regional per capita GDP
1	Austria	AT11	Burgenland (AT)	2016	98.15	87.78	86.16	36.25	36.93	0.68
2	Austria	AT12	Lower Austria	2016	98.76	87.78	86.69	42.34	42.88	0.53
3	Austria	AT13	Vienna	2016	106.12	87.78	93.15	62.75	59.13	-3.62
4	Austria	AT21	Carinthia	2016	97.18	87.78	85.3	43.29	44.55	1.26
5	Austria	AT22	Styria	2016	96.75	87.78	84.93	46.37	47.92	1.56
6	Austria	AT31	Upper Austria	2016	96.6	87.78	84.79	52.84	54.7	1.86
7	Austria	AT32	Salzburg	2016	103.32	87.78	90.7	62.12	60.12	-2
8	Austria	AT33	Tyrol	2016	100.53	87.78	88.24	55.48	55.18	-0.29
9	Austria	AT34	Vorarlberg	2016	99.99	87.78	87.77	56.2	56.2	0
10	Australia	AU1	New South Wales	2016	104.36	107.41	112.09	51.64	49.49	-2.16
11	Australia	AU2	Victoria	2016	99.23	107.41	106.58	46.55	46.91	0.36
12	Australia	AU3	Queensland	2016	94.41	107.41	101.4	46.76	49.53	2.77
13	Australia	AU4	South Australia	2016	92.74	107.41	99.61	41.96	45.25	3.29
14	Australia	AU5	Western Australia	2016	93.6	107.41	100.53	66.16	70.68	4.53
15	Australia	AU6	Tasmania	2016	86.74	107.41	93.16	38.92	44.87	5.95
16	Australia	AU7	Northern Territory	2016	103.87	107.41	111.57	72.57	69.86	-2.71
17	Australia	AU8	Australian Capital Territory	2016	134.33	107.41	144.28	66.02	49.15	-16.87
18	Belgium	BE1	Brussels Capital Region	2016	103.33	87.78	90.7	80.54	77.94	-2.6
19	Belgium	BE2	Flemish Region	2016	100.47	87.78	88.19	48.76	48.53	-0.23
20	Belgium	BE3	Wallonia	2016	97.91	87.78	85.94	34.28	35.01	0.73
21	Canada	CA10	Newfoundland and Labrador	2016	96.16	93.98	90.38	47.89	49.81	1.91
22	Canada	CA11	Prince Edward Island	2016	93.72	93.98	88.08	34.55	36.87	2.32
23	Canada	CA12	Nova Scotia	2016	97.81	93.98	91.92	35.21	36	0.79
24	Canada	CA13	New Brunswick	2016	96.63	93.98	90.82	36.25	37.52	1.26
25	Canada	CA24	Quebec	2016	95.58	93.98	89.83	38.64	40.42	1.78
26	Canada	CA35	Ontario	2016	102.5	93.98	96.33	45.72	44.6	-1.11
27	Canada	CA46	Manitoba	2016	95.8	93.98	90.03	41.03	42.83	1.8
28	Canada	CA47	Saskatchewan	2016	89.97	93.98	84.56	53.41	59.37	5.95
29	Canada	CA48	Alberta	2016	101.1	93.98	95.02	57.52	56.9	-0.63
30	Canada	CA59	British Columbia	2016	102.78	93.98	96.6	43.46	42.28	-1.18
31	Canada	CA60	Yukon	2016	112.76	93.98	105.98	56.35	49.97	-6.38
32	Canada	CA61	Northwest Territories	2016	107.54	93.98	101.08	82.47	76.69	-5.79
33	Canada	CA62	Nunavut	2016	98.5	93.98	92.58	54.37	55.2	0.83
34	Switzerland	CH01	Lake Geneva Region	2013	100.04	140.86	140.92	57.97	57.94	-0.02
35	Switzerland	CH02	Espace Mittelland	2013	97.18	140.86	136.89	55.3	56.9	1.6
36	Switzerland	CH03	Northwestern Switzerland	2013	98.61	140.86	138.91	63.03	63.91	0.89
37	Switzerland	CH04	Zürich	2013	107.89	140.86	151.98	74.24	68.81	-5.43
38	Switzerland	CH05	Eastern Switzerland	2013	95.32	140.86	134.27	53.18	55.79	2.61
39	Switzerland	CH06	Central Switzerland	2013	99.67	140.86	140.4	59.49	59.68	0.2

40	Switzerland	CH07	Ticino	2013	96.06	140.86	135.32	62.93	65.5	2.58
41	Chile	CL01	Tarapacá	2012	91.96	71.38	65.64	26.9	29.25	2.35
42	Chile	CL02	Antofagasta	2012	93.07	71.38	66.43	68.61	73.71	5.11
43	Chile	CL03	Atacama	2012	86.16	71.38	61.5	34.26	39.76	5.51
44	Chile	CL04	Coquimbo	2012	82.12	71.38	58.62	15.86	19.32	3.45
45	Chile	CL05	Valparaíso	2012	92.73	71.38	66.19	17.14	18.49	1.34
46	Chile	CL06	O'Higgins	2012	77.26	71.38	55.15	18.96	24.54	5.58
47	Chile	CL07	Maule	2012	76.61	71.38	54.68	11.54	15.06	3.52
48	Chile	CL08	Bío-Bío	2012	85.17	71.38	60.8	12.88	15.12	2.24
49	Chile	CL09	Araucanía	2012	82.57	71.38	58.94	9.09	11.01	1.92
50	Chile	CL10	Los Lagos	2012	83.06	71.38	59.28	11.55	13.91	2.36
51	Chile	CL11	Aysén	2012	89.53	71.38	63.91	16.59	18.53	1.94
52	Chile	CL12	Magallanes y Antártica	2012	103.27	71.38	73.71	23.55	22.81	-0.74
53	Chile	CL13	Santiago Metropolitan	2012	114.04	71.38	81.4	21.84	19.15	-2.69
54	Chile	CL14	Los Rios	2012	78.27	71.38	55.87	11.54	14.75	3.2
55	Chile	CL15	Arica y Parinacota	2012	86.25	71.38	61.56	11.13	12.91	1.77
56	Czech Republic	CZ01	Prague	2016	121.68	52.41	63.78	73.94	60.77	-13.17
57	Czech Republic	CZ02	Central Bohemian Region	2016	100.47	52.41	52.66	32.82	32.66	-0.15
58	Czech Republic	CZ03	Southwest	2016	95.22	52.41	49.91	30.91	32.46	1.55
59	Czech Republic	CZ04	Northwest	2016	93.5	52.41	49.01	25.05	26.79	1.74
60	Czech Republic	CZ05	Northeast	2016	94.79	52.41	49.68	29.25	30.86	1.61
61	Czech Republic	CZ06	Southeast	2016	97.67	52.41	51.19	32.5	33.28	0.78
62	Czech Republic	CZ07	Central Moravia	2016	93.36	52.41	48.93	28.76	30.81	2.05
63	Czech Republic	CZ08	Moravia-Silesia	2016	94.17	52.41	49.36	29.2	31.01	1.81
64	Germany	DE1	Baden-Württemberg	2016	100.13	85.56	85.66	57.26	57.19	-0.07
65	Germany	DE2	Bavaria	2016	101.07	85.56	86.47	57.98	57.37	-0.61
66	Germany	DE3	Berlin	2016	102.88	85.56	88.02	48.09	46.75	-1.34
67	Germany	DE4	Brandenburg	2016	95.62	85.56	81.8	35.19	36.8	1.61
68	Germany	DE5	Bremen	2016	99.98	85.56	85.54	62.29	62.3	0.01
69	Germany	DE6	Hamburg	2016	109.31	85.56	93.52	82.22	75.22	-7.01
70	Germany	DE7	Hesse	2016	103.32	85.56	88.39	56.87	55.04	-1.83
71	Germany	DE8	Mecklenburg-Vorpommern	2016	95.57	85.56	81.76	33.16	34.7	1.54
72	Germany	DE9	Lower Saxony	2016	96.91	85.56	82.91	45.6	47.06	1.46
73	Germany	DEA	North Rhine-Westphalia	2016	101.32	85.56	86.68	48.79	48.15	-0.64
74	Germany	DEB	Rhineland-Palatinate	2016	98.25	85.56	84.06	44.69	45.49	0.8
75	Germany	DEC	Saarland	2016	97.13	85.56	83.1	45.02	46.35	1.33
76	Germany	DED	Saxony	2016	94.8	85.56	81.11	37.75	39.82	2.07
77	Germany	DEE	Saxony-Anhalt	2016	92.3	85.56	78.97	34.4	37.27	2.87
78	Germany	DEF	Schleswig-Holstein	2016	101.93	85.56	87.2	40.94	40.16	-0.77
79	Germany	DEG	Thuringia	2016	93.73	85.56	80.19	36.05	38.46	2.41
80	Denmark	DK01	Capital (DK)	2016	104.71	107.43	112.49	66.15	63.18	-2.97
81	Denmark	DK02	Zealand	2016	98.54	107.43	105.86	35.05	35.57	0.52
82	Denmark	DK03	Southern Denmark	2016	96.9	107.43	104.1	45.72	47.18	1.46
83	Denmark	DK04	Central Jutland	2016	97.99	107.43	105.27	45.72	46.65	0.94
84	Denmark	DK05	Northern Jutland	2016	97.19	107.43	104.41	42.95	44.19	1.24
85	Estonia	EE00	Estonia	2016	100	58.89	58.89	31.09	31.09	0
86	Greece	EL30	Attica	2016	110.53	66.67	73.68	36.97	33.45	-3.52
87	Greece	EL41	North Aegean	2016	100.16	66.67	66.77	20.81	20.78	-0.03

88	Greece	EL42	South Aegean	2016	113.8	66.67	75.87	29.77	26.16	-3.61
89	Greece	EL43	Crete	2016	95.39	66.67	63.59	23.03	24.15	1.11
90	Greece	EL51	Eastern Macedonia, Thrace	2016	89.62	66.67	59.75	19.03	21.23	2.2
91	Greece	EL52	Central Macedonia	2016	95.62	66.67	63.75	21.45	22.43	0.98
92	Greece	EL53	Western Macedonia	2016	85.42	66.67	56.95	23.83	27.9	4.07
93	Greece	EL54	Epirus	2016	92.38	66.67	61.59	19.59	21.21	1.62
94	Greece	EL61	Thessaly	2016	86.58	66.67	57.72	21.05	24.32	3.26
95	Greece	EL62	Ionian Islands	2016	107.72	66.67	71.81	25.26	23.45	-1.81
96	Greece	EL63	Western Greece	2016	86.49	66.67	57.66	20.03	23.16	3.13
97	Greece	EL64	Central Greece	2016	82.52	66.67	55.02	24.54	29.74	5.2
98	Greece	EL65	Peloponnese	2016	88.22	66.67	58.81	22.6	25.61	3.02
99	Spain	ES11	Galicia	2016	92.85	73.33	68.09	32.28	34.77	2.49
100	Spain	ES12	Asturias	2016	98.89	73.33	72.52	31.44	31.79	0.35
101	Spain	ES13	Cantabria	2016	98	73.33	71.87	32.7	33.37	0.67
102	Spain	ES21	Basque Country	2016	106.69	73.33	78.24	47.88	44.88	-3
103	Spain	ES22	Navarra	2016	100.27	73.33	73.53	45.29	45.17	-0.12
104	Spain	ES23	La Rioja	2016	93.15	73.33	68.31	38.48	41.31	2.83
105	Spain	ES24	Aragon	2016	94.98	73.33	69.65	39.87	41.98	2.11
106	Spain	ES30	Madrid	2016	115.01	73.33	84.34	49.95	43.43	-6.52
107	Spain	ES41	Castile and León	2016	94.67	73.33	69.43	34.08	36	1.92
108	Spain	ES42	Castile-La Mancha	2016	84.59	73.33	62.04	28.65	33.87	5.22
109	Spain	ES43	Extremadura	2016	84.62	73.33	62.05	25.32	29.93	4.6
110	Spain	ES51	Catalonia	2016	105.08	73.33	77.06	43.75	41.64	-2.11
111	Spain	ES52	Valencia	2016	95.64	73.33	70.14	32.01	33.46	1.46
112	Spain	ES53	Balearic Islands	2016	106.24	73.33	77.91	38.87	36.59	-2.28
113	Spain	ES61	Andalusia	2016	87.95	73.33	64.5	26.99	30.69	3.7
114	Spain	ES62	Murcia	2016	88.83	73.33	65.14	30.08	33.86	3.78
115	Spain	ES63	Ceuta	2016	103.4	73.33	75.83	29.38	28.41	-0.97
116	Spain	ES64	Melilla	2016	99.72	73.33	73.12	26.84	26.92	0.08
117	Spain	ES70	Canary Islands	2016	100.07	73.33	73.39	30.28	30.25	-0.02
118	Finland	FI19	Western Finland	2016	95.31	100	95.31	38.7	40.61	1.9
119	Finland	FI1B	Helsinki-Uusimaa	2016	110.13	100	110.13	57.78	52.46	-5.32
120	Finland	FI1C	Southern Finland	2016	96.4	100	96.4	38.44	39.88	1.44
121	Finland	FI1D	Eastern and Northern Finland	2016	92.87	100	92.87	36.16	38.93	2.77
122	Finland	FI20	Åland	2016	110.55	100	110.55	52.02	47.06	-4.96
123	France	FR1	Île-de-France	2016	110.5	87.78	96.99	71.45	64.66	-6.79
124	France	FRB	Centre - Val de Loire	2016	97.11	87.78	85.24	34.63	35.66	1.03
125	France	FRC	Bourgogne-Franche-Comté	2016	97.42	87.78	85.52	33.17	34.04	0.88
126	France	FRD	Normandy	2016	95.71	87.78	84.02	34.96	36.53	1.57
127	France	FRE	Hauts-de-France	2016	94.75	87.78	83.17	33.19	35.03	1.84
128	France	FRF	Grand Est	2016	96.19	87.78	84.43	34.65	36.02	1.37
129	France	FRG	Pays de la Loire	2016	96.32	87.78	84.55	37.97	39.42	1.45
130	France	FRH	Brittany	2016	96.15	87.78	84.4	35.64	37.07	1.43
131	France	FRI	Nouvelle-Aquitaine	2016	95.29	87.78	83.65	35.37	37.12	1.75
132	France	FRJ	Occitanie	2016	97.17	87.78	85.3	35.34	36.36	1.03
133	France	FRK	Auvergne-Rhône-Alpes	2016	99.37	87.78	87.23	40.7	40.96	0.26
134	France	FRL	Provence-Alpes-Côte d'Azur	2016	100.12	87.78	87.89	39.17	39.12	-0.05
135	France	FRM	Corsica	2016	97.29	87.78	85.4	34.34	35.29	0.96
136	Hungary	HU11	Budapest	2016	115.97	47.82	55.45	54.53	47.02	-7.51
137	Hungary	HU12	Pest	2016	107.78	47.82	51.54	21.69	20.12	-1.56
138	Hungary	HU21	Central Transdanubia	2016	96.01	47.82	45.91	25.4	26.46	1.06
139	Hungary	HU22	Western Transdanubia	2016	96.41	47.82	46.1	29.28	30.37	1.09
140	Hungary	HU23	Southern Transdanubia	2016	94.25	47.82	45.07	17.58	18.66	1.07

141	Hungary	HU31	Northern Hungary	2016	95.11	47.82	45.48	17.52	18.42	0.9
142	Hungary	HU32	Northern Great Plain	2016	92.05	47.82	44.02	16.95	18.41	1.46
143	Hungary	HU33	Southern Great Plain	2016	92.39	47.82	44.18	19	20.57	1.57
144	Ireland	IE04	Northern and Western	2016	93.21	90	83.89	32.99	35.39	2.4
145	Ireland	IE05	Southern	2016	89.69	90	80.72	86.79	96.77	9.98
146	Ireland	IE06	Eastern and Midland	2016	108.33	90	97.49	74.8	69.06	-5.75
147	Italy	ITC1	Piedmont	2016	102.5	78.89	80.86	41.87	40.85	-1.02
148	Italy	ITC2	Aosta Valley	2016	104.15	78.89	82.16	48.16	46.24	-1.92
149	Italy	ITC3	Liguria	2016	106.81	78.89	84.26	43.65	40.87	-2.78
150	Italy	ITC4	Lombardy	2016	106.04	78.89	83.66	51.97	49.01	-2.96
151	Italy	ITF1	Abruzzo	2016	93.21	78.89	73.53	33.76	36.22	2.46
152	Italy	ITF2	Molise	2016	89.4	78.89	70.53	27.5	30.76	3.26
153	Italy	ITF3	Campania	2016	89.67	78.89	70.74	25.05	27.93	2.89
154	Italy	ITF4	Apulia	2016	90.06	78.89	71.05	25.39	28.19	2.8
155	Italy	ITF5	Basilicata	2016	83.44	78.89	65.82	29.19	34.98	5.79
156	Italy	ITF6	Calabria	2016	88.5	78.89	69.81	23.51	26.57	3.06
157	Italy	ITG1	Sicily	2016	90.55	78.89	71.43	24.16	26.68	2.52
158	Italy	ITG2	Sardinia	2016	92.69	78.89	73.13	28.43	30.67	2.24
159	Italy	ITH1	Province of Bolzano-Bozen	2016	105.55	78.89	83.27	59.76	56.62	-3.14
160	Italy	ITH2	Province of Trento	2016	100.37	78.89	79.18	49.42	49.24	-0.18
161	Italy	ITH3	Veneto	2016	99.62	78.89	78.59	45.2	45.37	0.17
162	Italy	ITH4	Friuli-Venezia Giulia	2016	102.06	78.89	80.52	42.64	41.78	-0.86
163	Italy	ITH5	Emilia-Romagna	2016	102.68	78.89	81.01	48.69	47.42	-1.27
164	Italy	ITI1	Tuscany	2016	101.34	78.89	79.94	42.25	41.69	-0.56
165	Italy	ITI2	Umbria	2016	98.67	78.89	77.84	34.08	34.54	0.46
166	Italy	ITI3	Marche	2016	97.74	78.89	77.1	37.48	38.35	0.87
167	Italy	ITI4	Lazio	2016	105.32	78.89	83.09	45.44	43.15	-2.3
168	Japan	JPA	Hokkaido	2014	95.11	97.26	92.51	33.04	34.74	1.7
169	Japan	JPB	Tohoku	2014	93.77	97.26	91.2	35.6	37.97	2.37
170	Japan	JPC	Northern-Kanto, Koshin	2014	92.89	97.26	90.35	40.08	43.14	3.07
171	Japan	JPD	Southern-Kanto	2014	107.27	97.26	104.33	47.57	44.34	-3.22
172	Japan	JPE	Hokuriku	2014	104.09	97.26	101.24	37.48	36.01	-1.47
173	Japan	JPF	Toukai	2014	96.07	97.26	93.44	45.41	47.27	1.86
174	Japan	JPG	Kansai region	2014	99.85	97.26	97.12	37.89	37.95	0.06
175	Japan	JPH	Chugoku	2014	97.24	97.26	94.58	37.83	38.9	1.07
176	Japan	JPI	Shikoku	2014	94.74	97.26	92.15	34.52	36.44	1.92
177	Japan	JPJ	Kyushu, Okinawa	2014	93.98	97.26	91.41	31.75	33.78	2.03
178	Korea	KR01	Capital Region (KR)	2016	106.86	74.33	79.43	37.18	34.79	-2.39
179	Korea	KR02	Gyeongnam Region	2016	95.17	74.33	70.74	38.07	40	1.93
180	Korea	KR03	Gyeongbuk Region	2016	91.77	74.33	68.21	33.56	36.57	3.01
181	Korea	KR04	Jeolla Region	2016	89.19	74.33	66.29	33.72	37.8	4.09
182	Korea	KR05	Chungcheong Region	2016	90.63	74.33	67.37	44.3	48.88	4.58
183	Korea	KR06	Gangwon Region	2016	96.73	74.33	71.9	31.84	32.91	1.08
184	Korea	KR07	Jeju	2016	92	74.33	68.39	31.84	34.6	2.77
185	Luxembourg	LU00	Luxembourg	2016	100	96.67	96.67	106.32	106.32	0
186	Latvia	LV00	Latvia	2016	100	54.44	54.44	25.92	25.92	0
187	Mexico	ME01	Aguascalientes	2016	96.3	46.52	44.79	24.16	25.09	0.93
188	Mexico	ME02	Baja California Norte	2016	107.52	46.52	50.02	22.03	20.49	-1.54
189	Mexico	ME03	Baja California Sur	2016	109.21	46.52	50.8	24.28	22.23	-2.05
190	Mexico	ME04	Campeche	2016	83.84	46.52	39	55.03	65.64	10.61
191	Mexico	ME05	Coahuila	2016	94.61	46.52	44.01	28.21	29.82	1.61
192	Mexico	ME06	Colima	2016	102.3	46.52	47.59	19.03	18.6	-0.43
193	Mexico	ME07	Chiapas	2016	76.14	46.52	35.42	7.48	9.83	2.35
194	Mexico	ME08	Chihuahua	2016	93.04	46.52	43.28	21.31	22.9	1.59
195	Mexico	ME09	Federal District (MX)	2016	131.15	46.52	61.01	44.28	33.76	-10.52

196	Mexico	ME10	Durango	2016	86.88	46.52	40.41	16.2	18.64	2.45
197	Mexico	ME11	Guanajuato	2016	94.54	46.52	43.97	16.64	17.6	0.96
198	Mexico	ME12	Guerrero	2016	86.57	46.52	40.27	9.21	10.63	1.43
199	Mexico	ME13	Hidalgo	2016	87.31	46.52	40.62	12.41	14.21	1.8
200	Mexico	ME14	Jalisco	2016	98.04	46.52	45.61	20.65	21.06	0.41
201	Mexico	ME15	Mexico	2016	99.24	46.52	46.16	12.07	12.17	0.09
202	Mexico	ME16	Michoacan	2016	81.58	46.52	37.95	12.44	15.25	2.81
203	Mexico	ME17	Morelos	2016	97.11	46.52	45.17	13.73	14.14	0.41
204	Mexico	ME18	Nayarit	2016	95.15	46.52	44.26	13.41	14.1	0.68
205	Mexico	ME19	Nuevo Leon	2016	110.06	46.52	51.2	33.47	30.41	-3.06
206	Mexico	ME20	Oaxaca	2016	83.43	46.52	38.81	8.54	10.24	1.7
207	Mexico	ME21	Puebla	2016	88.29	46.52	41.07	12.3	13.93	1.63
208	Mexico	ME22	Queretaro	2016	102.76	46.52	47.8	26.75	26.04	-0.72
209	Mexico	ME23	Quintana Roo	2016	118.01	46.52	54.89	22.89	19.39	-3.49
210	Mexico	ME24	San Luis Potosi	2016	90.41	46.52	42.06	17.61	19.48	1.87
211	Mexico	ME25	Sinaloa	2016	93.2	46.52	43.35	17.55	18.83	1.28
212	Mexico	ME26	Sonora	2016	94.37	46.52	43.9	27.03	28.64	1.61
213	Mexico	ME27	Tabasco	2016	85.75	46.52	39.89	22.91	26.72	3.81
214	Mexico	ME28	Tamaulipas	2016	99.6	46.52	46.33	19.24	19.32	0.08
215	Mexico	ME29	Tlaxcala	2016	87.25	46.52	40.58	10.46	11.99	1.53
216	Mexico	ME30	Veracruz	2016	88.18	46.52	41.02	13.4	15.2	1.8
217	Mexico	ME31	Yucatan	2016	95.63	46.52	44.48	15.77	16.49	0.72
218	Mexico	ME32	Zacatecas	2016	83.27	46.52	38.73	14.14	16.98	2.84
219	Netherlands	NL11	Groningen	2016	91.94	90	82.74	49.62	53.97	4.35
220	Netherlands	NL12	Friesland	2016	94.88	90	85.39	35.22	37.12	1.9
221	Netherlands	NL13	Drenthe	2016	94	90	84.6	35.16	37.4	2.24
222	Netherlands	NL21	Overijssel	2016	95.63	90	86.06	42.61	44.56	1.95
223	Netherlands	NL22	Gelderland	2016	98.36	90	88.52	43.12	43.83	0.72
224	Netherlands	NL23	Flevoland	2016	97.53	90	87.78	38.59	39.57	0.98
225	Netherlands	NL31	Utrecht	2016	108.39	90	97.55	62.54	57.7	-4.84
226	Netherlands	NL32	North Holland	2016	107.43	90	96.68	67.76	63.08	-4.68
227	Netherlands	NL33	South Holland	2016	99.78	90	89.8	51.63	51.75	0.11
228	Netherlands	NL34	Zeeland	2016	92.05	90	82.85	40.9	44.43	3.53
229	Netherlands	NL41	North Brabant	2016	97.81	90	88.02	51.73	52.89	1.16
230	Netherlands	NL42	Limburg (NL)	2016	94.8	90	85.32	45.31	47.8	2.48
231	Norway	NO01	Oslo and Akershus	2016	111.13	122.02	135.61	68.87	61.97	-6.9
232	Norway	NO02	Hedmark and Oppland	2016	96.55	122.02	117.81	38.67	40.05	1.38
233	Norway	NO03	South-Eastern Norway	2016	98.66	122.02	120.38	39.27	39.81	0.54
234	Norway	NO04	Agder and Rogaland	2016	96.55	122.02	117.82	49.24	51	1.76
235	Norway	NO05	Western Norway	2016	95.24	122.02	116.21	50.53	53.06	2.53
236	Norway	NO06	Trøndelag	2016	96.63	122.02	117.91	47.39	49.04	1.65
237	Norway	NO07	Northern Norway	2016	90.07	122.02	109.9	46.61	51.75	5.14
238	New Zealand	NZ11	Northland Region	2016	81.74	102.08	83.45	27.83	34.04	6.22
239	New Zealand	NZ12	Auckland Region	2016	110.26	102.08	112.56	43.13	39.12	-4.02
240	New Zealand	NZ13	Waikato Region	2016	86.51	102.08	88.31	33.68	38.93	5.25
241	New Zealand	NZ14	Bay of Plenty Region	2016	88.63	102.08	90.47	34.55	38.98	4.43
242	New Zealand	NZ15	Gisborne Region	2016	84.42	102.08	86.18	133.88	158.59	24.71
243	New Zealand	NZ17	Taranaki Region	2016	80.87	102.08	82.56	47	58.12	11.12
244	New Zealand	NZ18	Manawatu-Wanganui Region	2016	86.28	102.08	88.08	29.06	33.68	4.62
245	New Zealand	NZ19	Wellington Region	2016	112.03	102.08	114.37	47.75	42.62	-5.13
246	New Zealand	NZ21	Tasman-Nelson-Marlborough	2016	82.49	102.08	84.21	43.4	52.61	9.21
247	New Zealand	NZ23	Canterbury Region	2016	93.5	102.08	95.45	38.38	41.04	2.67
248	New Zealand	NZ24	Otago Region	2016	92.37	102.08	94.3	36.19	39.17	2.99
249	New Zealand	NZ25	Southland Region	2016	75.62	102.08	77.19	37.76	49.93	12.17
250	Poland	PL21	Lesser Poland	2016	99.67	44.92	44.78	25.13	25.21	0.08

251	Poland	PL22	Silesia	2016	103.64	44.92	46.56	28.63	27.62	-1
252	Poland	PL41	Greater Poland	2016	99.05	44.92	44.5	30.09	30.38	0.29
253	Poland	PL42	West Pomerania	2016	99.22	44.92	44.57	23.27	23.46	0.18
254	Poland	PL43	Lubusz	2016	93.14	44.92	41.84	23.24	24.95	1.71
255	Poland	PL51	Lower Silesia	2016	100.77	44.92	45.27	30.73	30.5	-0.23
256	Poland	PL52	Opole region	2016	94.87	44.92	42.62	22.74	23.97	1.23
257	Poland	PL61	Kuyavian-Pomerania	2016	94.9	44.92	42.63	22.56	23.77	1.21
258	Poland	PL62	Warmian-Masuria	2016	91.03	44.92	40.89	19.82	21.77	1.95
259	Poland	PL63	Pomerania	2016	98.94	44.92	44.45	26.91	27.2	0.29
260	Poland	PL71	Lodzkie	2016	97.2	44.92	43.67	25.63	26.37	0.74
261	Poland	PL72	Swietokrzyskie	2016	93.63	44.92	42.06	19.76	21.11	1.34
262	Poland	PL81	Lublin Province	2016	94.1	44.92	42.27	19.01	20.2	1.19
263	Poland	PL82	Podkarpacia	2016	92.15	44.92	41.4	19.68	21.35	1.68
264	Poland	PL84	Podlaskie	2016	90.63	44.92	40.71	19.86	21.91	2.05
265	Poland	PL91	Warsaw	2016	122.15	44.92	54.87	60.1	49.2	-10.9
266	Poland	PL92	Mazowiecki region	2016	86.09	44.92	38.67	23.48	27.28	3.8
267	Portugal	PT11	North (PT)	2016	93.68	64.44	60.37	26.34	28.11	1.78
268	Portugal	PT15	Algarve	2016	105.57	64.44	68.03	33.17	31.42	-1.75
269	Portugal	PT16	Central Portugal	2016	92.69	64.44	59.73	27.01	29.14	2.13
270	Portugal	PT17	Metropolitan area of Lisbon	2016	112.57	64.44	72.54	41.04	36.46	-4.58
271	Portugal	PT18	Alentejo	2016	86.86	64.44	55.97	28.85	33.22	4.37
272	Portugal	PT20	Azores	2016	95.01	64.44	61.23	27.79	29.25	1.46
273	Portugal	PT30	Madeira	2016	102.41	64.44	65.99	29.59	28.89	-0.69
274	Sweden	SE11	Stockholm	2016	109.38	105.14	115	69.33	63.39	-5.94
275	Sweden	SE12	East Middle Sweden	2016	97.16	105.14	102.15	42.39	43.63	1.24
276	Sweden	SE21	Småland with Islands	2016	93.35	105.14	98.15	42.32	45.33	3.01
277	Sweden	SE22	South Sweden	2016	100.01	105.14	105.15	42.07	42.06	0
278	Sweden	SE23	West Sweden	2016	98.9	105.14	103.98	48.27	48.81	0.54
279	Sweden	SE31	North Middle Sweden	2016	92.69	105.14	97.45	39.75	42.88	3.14
280	Sweden	SE32	Central Norrland	2016	91.44	105.14	96.14	41.43	45.31	3.88
281	Sweden	SE33	Upper Norrland	2016	93.16	105.14	97.95	44.36	47.61	3.26
282	Slovenia	SI03	Eastern Slovenia	2016	95.6	65.56	62.67	27.36	28.62	1.26
283	Slovenia	SI04	Western Slovenia	2016	104.72	65.56	68.65	39.62	37.84	-1.79
284	Slovak Republic	SK01	Bratislava Region	2016	124.16	53.33	66.22	75.38	60.71	-14.67
285	Slovak Republic	SK02	West Slovakia	2016	94.16	53.33	50.22	28.97	30.77	1.8
286	Slovak Republic	SK03	Central Slovakia	2016	96.19	53.33	51.3	24.86	25.84	0.98
287	Slovak Republic	SK04	East Slovakia	2016	94.17	53.33	50.23	21.65	22.99	1.34
288	Turkey	TR10	Istanbul	2014	106.66	50.23	53.57	39.98	37.48	-2.5
289	Turkey	TR21	Thrace	2014	101.61	50.23	51.04	27.31	26.88	-0.43
290	Turkey	TR22	Southern Marmara - West	2014	98.2	50.23	49.33	21.62	22.02	0.4
291	Turkey	TR31	Izmir	2014	103.67	50.23	52.07	28.53	27.52	-1.01
292	Turkey	TR32	Southern Aegean	2014	98.44	50.23	49.44	21.56	21.9	0.34
293	Turkey	TR33	Northern Aegean	2014	97.72	50.23	49.08	19.78	20.25	0.46
294	Turkey	TR41	Eastern Marmara - South	2014	103.37	50.23	51.92	27.36	26.47	-0.89
295	Turkey	TR42	Eastern Marmara - North	2014	100.38	50.23	50.42	31.65	31.53	-0.12
296	Turkey	TR51	Ankara	2014	110.84	50.23	55.67	33.69	30.4	-3.29
297	Turkey	TR52	Central Anatolia - West and South	2014	96.75	50.23	48.6	19.53	20.19	0.66
298	Turkey	TR61	Mediterranean region - West	2014	101.65	50.23	51.06	25.61	25.19	-0.42

299	Turkey	TR62	Mediterranean region - Middle	2014	93.31	50.23	46.87	18.45	19.77	1.32
300	Turkey	TR63	Mediterranean region - East	2014	84.47	50.23	42.43	14.85	17.59	2.73
301	Turkey	TR71	Central Anatolia - Middle	2014	93.88	50.23	47.15	16.68	17.77	1.09
302	Turkey	TR72	Central Anatolia - East	2014	97.41	50.23	48.93	18.72	19.22	0.5
303	Turkey	TR81	Western Black Sea - West	2014	100.21	50.23	50.33	17.1	17.06	-0.04
304	Turkey	TR82	Western Black Sea - Middle and East	2014	96.61	50.23	48.53	17.15	17.76	0.6
305	Turkey	TR83	Middle Black Sea	2014	94.31	50.23	47.37	16.04	17.01	0.97
306	Turkey	TR90	Eastern Black Sea	2014	98.2	50.23	49.32	16.93	17.24	0.31
307	Turkey	TRA1	Northeastern Anatolia - West	2014	92.93	50.23	46.68	15.52	16.71	1.18
308	Turkey	TRA2	Northeastern Anatolia - East	2014	81.33	50.23	40.85	9.86	12.13	2.26
309	Turkey	TRB1	Eastern Anatolia - West	2014	89.57	50.23	44.99	14.38	16.06	1.67
310	Turkey	TRB2	Eastern Anatolia - East	2014	78.77	50.23	39.56	9.9	12.57	2.67
311	Turkey	TRC1	Southeastern Anatolia - West	2014	83.74	50.23	42.06	15.89	18.98	3.09
312	Turkey	TRC2	Southeastern Anatolia - Middle	2014	77.17	50.23	38.76	10.29	13.33	3.04
313	Turkey	TRC3	Southeastern Anatolia - East	2014	75.93	50.23	38.14	11.46	15.09	3.63
314	United Kingdom	UKC	North East England	2016	91.81	94.59	86.85	31.44	34.25	2.8
315	United Kingdom	UKD	North West England	2016	94.13	94.59	89.04	37.22	39.54	2.32
316	United Kingdom	UKE	Yorkshire and The Humber	2016	92.17	94.59	87.19	33.76	36.63	2.87
317	United Kingdom	UKF	East Midlands	2016	91.96	94.59	86.99	34.36	37.36	3
318	United Kingdom	UKG	West Midlands	2016	92.5	94.59	87.5	35.56	38.45	2.88
319	United Kingdom	UKH	East of England	2016	99.15	94.59	93.79	38.57	38.9	0.33
320	United Kingdom	UKI	Greater London	2016	115.64	94.59	109.39	76.03	65.75	-10.28
321	United Kingdom	UKJ	South East England	2016	105.09	94.59	99.41	46.24	44	-2.24
322	United Kingdom	UKK	South West England	2016	97.55	94.59	92.28	37.12	38.05	0.93
323	United Kingdom	UKL	Wales	2016	90.17	94.59	85.29	31.1	34.49	3.39
324	United Kingdom	UKM	Scotland	2016	95.73	94.59	90.56	39.83	41.61	1.78
325	United Kingdom	UKN	Northern Ireland	2016	90.52	94.59	85.63	32.98	36.44	3.45
326	United States	US01	Alabama	2016	91.11	100	91.11	42.3	46.43	4.13
327	United States	US02	Alaska	2016	103.63	100	103.63	67.97	65.59	-2.38
328	United States	US04	Arizona	2016	95.18	100	95.18	44.27	46.51	2.24
329	United States	US05	Arkansas	2016	90.74	100	90.74	40.62	44.76	4.14
330	United States	US06	California	2016	103.48	100	103.48	66.74	64.5	-2.25
331	United States	US08	Colorado	2016	102.84	100	102.84	58.34	56.73	-1.61
332	United States	US09	Connecticut	2016	112.81	100	112.81	72.45	64.22	-8.23
333	United States	US10	Delaware	2016	103.95	100	103.95	75	72.15	-2.85
334	United States	US11	District of Columbia	2016	121.65	100	121.65	184.82	151.93	-32.89
335	United States	US12	Florida	2016	100.13	100	100.13	44.83	44.77	-0.06

336	United States	US13	Georgia	2016	95.45	100	95.45	51.51	53.97	2.46
337	United States	US15	Hawaii	2016	105.38	100	105.38	59.27	56.24	-3.02
338	United States	US16	Idaho	2016	87.9	100	87.9	40.7	46.3	5.6
339	United States	US17	Illinois	2016	102.25	100	102.25	62.02	60.65	-1.37
340	United States	US18	Indiana	2016	90.4	100	90.4	52.34	57.9	5.56
341	United States	US19	Iowa	2016	91.08	100	91.08	59.15	64.94	5.79
342	United States	US20	Kansas	2016	95.85	100	95.85	51.78	54.03	2.24
343	United States	US21	Kentucky	2016	90.94	100	90.94	44.34	48.75	4.42
344	United States	US22	Louisiana	2016	92.94	100	92.94	50.57	54.42	3.84
345	United States	US23	Maine	2016	96.96	100	96.96	44.57	45.97	1.4
346	United States	US24	Maryland	2016	108.4	100	108.4	63.48	58.56	-4.92
347	United States	US25	Massachusetts	2016	110.31	100	110.31	74.12	67.19	-6.93
348	United States	US26	Michigan	2016	94.02	100	94.02	49.35	52.49	3.14
349	United States	US27	Minnesota	2016	98.14	100	98.14	61.37	62.54	1.16
350	United States	US28	Mississippi	2016	87.18	100	87.18	36.34	41.68	5.34
351	United States	US29	Missouri	2016	94.87	100	94.87	49.11	51.76	2.66
352	United States	US30	Montana (US)	2016	90.38	100	90.38	44.51	49.25	4.74
353	United States	US31	Nebraska	2016	94.11	100	94.11	61.57	65.42	3.85
354	United States	US32	Nevada	2016	99.55	100	99.55	49.77	49.99	0.23
355	United States	US33	New Hampshire	2016	107.26	100	107.26	57.83	53.92	-3.92
356	United States	US34	New Jersey	2016	109.71	100	109.71	64.08	58.41	-5.67
357	United States	US35	New Mexico	2016	93.91	100	93.91	44.88	47.79	2.91
358	United States	US36	New York	2016	109.8	100	109.8	75.62	68.87	-6.75
359	United States	US37	North Carolina	2016	92.83	100	92.83	51.36	55.32	3.96
360	United States	US38	North Dakota	2016	94.18	100	94.18	70.75	75.12	4.38
361	United States	US39	Ohio	2016	95.12	100	95.12	53.91	56.68	2.77
362	United States	US40	Oklahoma	2016	94.24	100	94.24	46.23	49.05	2.82
363	United States	US41	Oregon	2016	92.07	100	92.07	56.02	60.84	4.83
364	United States	US42	Pennsylvania	2016	100.56	100	100.56	56.29	55.98	-0.31
365	United States	US44	Rhode Island	2016	104.84	100	104.84	54.4	51.88	-2.51
366	United States	US45	South Carolina	2016	92.75	100	92.75	42.31	45.62	3.31
367	United States	US46	South Dakota	2016	92.85	100	92.85	56.12	60.45	4.32
368	United States	US47	Tennessee	2016	97.08	100	97.08	49.91	51.41	1.5
369	United States	US48	Texas	2016	95.41	100	95.41	57.31	60.07	2.76
370	United States	US49	Utah	2016	93.76	100	93.76	51.79	55.24	3.45
371	United States	US50	Vermont	2016	101.94	100	101.94	49.88	48.93	-0.95
372	United States	US51	Virginia	2016	105.46	100	105.46	58.58	55.55	-3.03
373	United States	US53	Washington	2016	101.58	100	101.58	65.48	64.46	-1.02
374	United States	US54	West Virginia	2016	89.58	100	89.58	39.84	44.48	4.63
375	United States	US55	Wisconsin	2016	94.99	100	94.99	54.23	57.09	2.86
376	United States	US56	Wyoming	2016	98.14	100	98.14	65.53	66.77	1.24
377	Iceland	IS01	Capital Region	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
378	Iceland	IS02	Other Regions	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
379	Israel	IL01	Jerusalem District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
380	Israel	IL02	Northern District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
381	Israel	IL03	Haifa District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
382	Israel	IL04	Central District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
383	Israel	IL05	Tel Aviv District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
384	Israel	IL06	Southern District	2016	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
385	Lithuania	LT01	Vilnius Region	2016	112.39	49.45	55.57	43.94	39.09	-4.84
386	Lithuania	LT02	Central and Western Lithuania	2016	93.89	49.45	46.43	24.73	26.34	1.61

Note: Data refer to the year 2016 with the exception of Chile (2012), Japan (2014), Switzerland (2013) and Turkey (2014). Data not available for Iceland and Israel.
Source: Own elaboration.