

Spatial Adjustment Factors for the United Kingdom

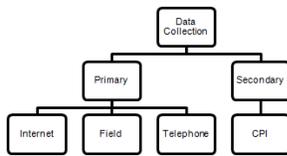
Introduction

To calculate the Purchasing Power Parity of each country, all 28 EU member states are regulated by Eurostat to conduct 6 surveys covering consumer goods and services over 3 years. The surveys collect prices of around 2500 items. They are conducted within the capital city of each country, owing to the cost burden and time and effort burden on a country-wide data collection exercise.

London, overall, being the most expensive city in the UK, requires the use of Spatial Adjustment Factors to convert London prices to UK average national prices. As such, the Spatial Adjustment Factors project is carried out every 6 years to be applied to prices that are collected in London.

For the country-wide collection exercise, 550 items, covering 167 item groups (Basic Headings) were studied.

Data Collection and Sampling



To calculate the SAFs, several approaches to acquiring data were used. Where possible, secondary data was obtained from data collected for use in the computation of the Consumer Prices Index (CPI). One years worth of CPI data was used, to remove any effect of seasonality. This was checked to ensure that the price of items were comparable across regions.

Primary data collection focused on those items which had no spatial information, had a relatively high weight, or made a relatively large impact in the final indices.

Sampling of locations for the production of SAFs was completed using hotspot analysis, to identify clusters of shopping centers in the UK. The map below shows the locations sampled for the purpose of data collection.

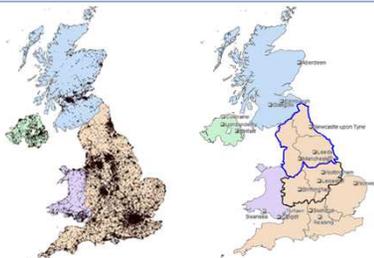


Figure 1. Shopping centre hotspots. Figure 2. Sampled Locations.

Methodology

Spatial price indices must fulfill key assumptions:

- **Characteristicity:** the indices must reflect the true price differences between the relevant regions.
- **Transitivity:** for all locations (Ls, in our case, all 7 UK regions) the following equation must hold¹

$$I_{jk} \equiv I_{jl} \cdot I_{lk}$$

Transitivity example:



Indices are transitive if the direct comparison of Wales to London yields the same result as the indirect comparison via the North East.

If $I_{W,L}=1.05$, $I_{W,NE}=1.02$, $I_{NE,L}=1.0294117$
 $1.05=1.02*1.0294117$, therefore the indices are transitive.

EKS Method(Éltető-Köves-Szulc)

The EKS method was used to fulfill these two considerations as much as possible, and also allows the use of items which are not priced in all regions (due to their unavailability).

The method was designed in order to produce transitive indices while retaining as much characteristicity as possible. The EKS equation is given by

$$EKS_{jk} = \prod_{l=1}^M [I_{jl} \cdot I_{lk}]^{1/M}$$

where I_{jk} denotes the Jevons price index number for region k with region j as the base.¹

Therefore, the average price for each item was calculated in each of the 7 geographical regions

- Unweighted arithmetic mean
- CPI Items
 - 12 months data
 - Average price for each month calculated
 - 12 month average taken to weight each month equally

EKS was used to calculate each bilateral regional comparison. The weighted geometric mean of the EKS is used to calculate a UK price level. The SAF was calculated as a ratio of London to UK adjustment Factor.

SAF < 1, implies London is more expensive than rest of the UK

SAF > 1, implies rest of UK is more expensive than London

SAF = 1, implies national pricing

Table 1. Example of Items with SAF > 1, < 1, = 1

Item	SAF
Passenger transport by air	1.28
Plants and flowers	0.71
Postal services	1

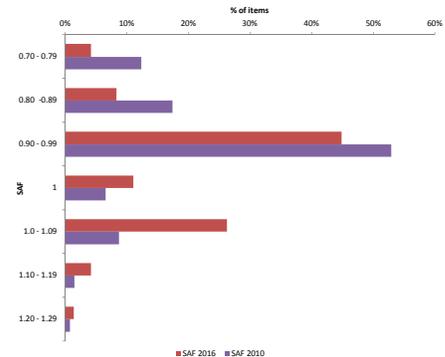


Chart 1. Percentage of items grouped by SAF and compared with 2010 results.**

Note: In 2016 there were more items than in 2010 hence the use of a percentage comparison.

** This data is provisional and therefore restricted

Results

As a result, SAFs were produced for 167 groups of items (Basic Headings)

For examples, refer to table 1.

16 Basic Headings with a SAF of 1

- This could be due to National pricing (where store or product price is the same across all regions of the UK. e.g. Apple products are the same price irrespective of where they are purchased)
- Market dominance by a retailer or service provider is another reason for universally priced items. e.g. Postal products and services
- Eurostat guidelines e.g. Motor vehicles

48 Basic Headings with SAF > 1
103 Basic Headings with SAF < 1

Conclusions

The 2016 SAFs present a message of increased convergence towards national pricing and consistency across regional markets. This is in keeping with improved consumer awareness through access to information and alternative outlets such as the internet, and the increased dominance of market leading companies, who are typically large in size and have a strong presence across all regions of UK.

With the majority of items having a SAF < 1, it can be concluded that London is still relatively more expensive than the rest of the UK for many consumer goods and services.

To note, this poster is a guide to the methodology employed in the calculation of SAFs. Actual results may vary.

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References and links

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2. <http://ec.europa.eu/eurostat/purchasing-power-parities>
3. Purchasing Power Parities and the Real Size of World Economies: A Comprehensive Report of the 2011 International Comparison Program- World Bank