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# Import and Export Service Producer Price Indices in the UK National Accounts

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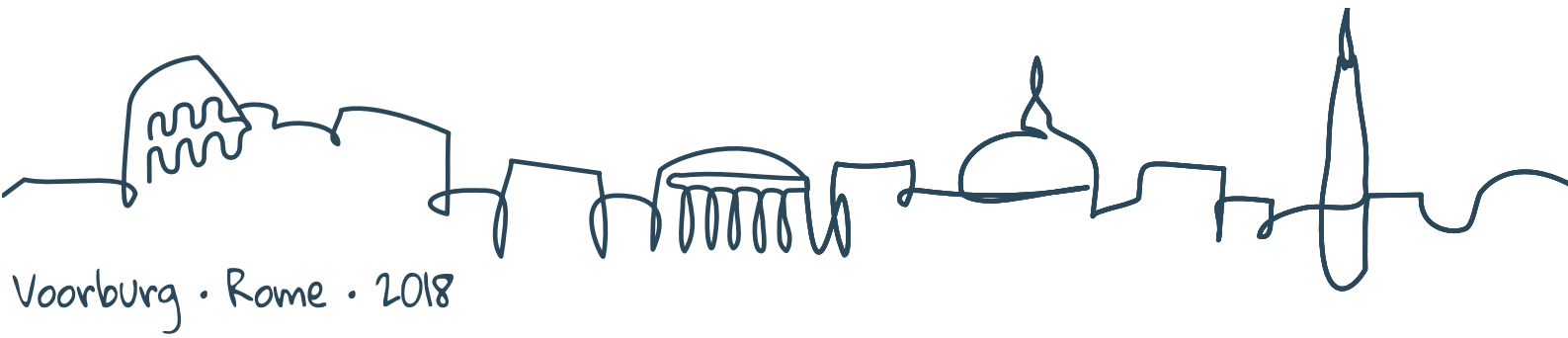


# INTRODUCTION

## 1. Purpose of this paper

This paper analyses key issues which have been identified in the deflators used in the production of Trade in Services Volumes in the UK National Accounts, provide an update of ongoing and recently completed development work and invites comment and collaboration for further improvements.

## 2. Current practices

Trade statistics have become of increasing importance in the UK in recent times. This has caused ONS to re-focus on the statistics under production and areas where they can be improved, including in relation to deflators. This paper particualrly focuses on the defaltors used for traded services, either imports or exports.

Obviously prices of comparable like-for-like traded services through time can be difficult to observe. Whilst none of these methods are based on directly observed export or import prices ONS deploys internationally recognised alternatives, classified as B-methods against the Eurostat criteria. All of the deflators can be categorised into 3 methods of calculation:

1. Use of GDP(O) deflators
2. Use of Weight Modified Consumer Price Indices (WMCPIs)
3. Combination of 1 & 2

### 2.1 Use of GDP(O) deflators

In this approach an implied deflator from GDP(O) for an equivalent service, or one deemed suitable, is selected and this is used for deflation.

No adjustment is made to the deflator in an attempt to represent trade prices or to take account of exchange rates etc. This practise also results in deflators for import and export measures for each service being identical. The fundamental logic is that as the service is delivered in a mode equivalent to the same service delivered for the domestic market, at least in basic prices the cost drivers are equivalent.

### 2.2 Use of Weight Modified Consumer Price Indicies (WMCPIs)

In this approach countries are identified with which the UK conducts a significant amount of trade. The aggregate Consumer Price Index (CPI) from each of these countries are then adjusted by the local currency to pound sterling exchange rate. These adjusted indices are then weighted together by the revenue generated by trade of the service in question with each of the countries included in the model.

### 2.3 Combination of Methods1 & 2

This method simply takes a selected GDP(O) deflator, as per section 2.1, calculates a WMCPI deflator, as specified in section 2.2, and weights them together equally to produce the trade deflator for the service in question.

## 3. Issues with these methods

### 3.1 Issues with use of GDP(O) deflators

The main issue with the use of GDP(O) deflators is the fact that these do not represent import or export prices, rather the prices of domesticly provisioned services. This is particularly relevent for import prices as, while export prices are likely to be influenced in some respect by domestic price change, there is little reason to expect that import prices should be influenced in the same way.

The use of these deflators also fails to take into acount that transactions take place in currencies other than pound sterling. This also results in the use of the same deflator for import and exports of a particular service.

### 3.2 Issues with WMCPI deflators

The most obvious issue with these deflators is the use of CPI data to produce measures of trade volume. CPIs are a domestic measure of consumer price change and are not designed to give an indication of trade prices. It is also worth noting that the aggregate CPI is used, which reflects all products and services purchased, rather than being specific to the service in question.

There are also some issues with the application of the exchange rate adjustment. The current adjustment model can be referred to in two parts. For countries that do not use the Euro as their main currency, the model adjusts the CPI of each country from the local currency of the country to the US Dollar and then into pound Sterling. The assumption is that this is intended to model the fact that in international trade reserve currencies are generally used, rather than local currencies; with the dollar being the most predominately used. The issue is that given the exchange rates used are all for the same time period, this is equivalent to converting from or to the local currency from or to pound Sterling; with the initial conversion to dollars being rendered redundant.

Assuming that the import/export transaction took place in dollars, this method is unlikely to reflect the transaction that we are interested in for the UK perspective of the accounts. We are interested in the amount paid by a UK importer and the amount received by a UK exporter. As such, we would only be interested in the pound sterling equivalent of the transaction.

For countries that use the Euro as their main currency, the approach taken is slightly different. The CPIs of these countries are only adjusted by the Euro to pound sterling conversion. The reason for this difference in approach is unknown.

However, both approaches suffer from one further issue. They both assume that all transactions only take place in one currency, i.e. Euros if a country has adopted the Euro and dollars if it has not. Transactions taking place in pound sterling are not represented at all.

Data on transactions in the service sector does not exist, though we do have some data for trade in goods. Whilst the data is fairly limited, ONS analysis indicates that the majority of trade undertaken by UK companies is carried out in 3 currencies, the US Dollar, the Euro and Pound Sterling. These conclusions are based on an analysis of the EPI and IPI samples and show the currency in which the price of the products we are observing are agreed. This is essentially a snap shot of the surveys at around 2016, so we cannot say how this may have changed over time. The addition of a question to trade surveys to collect this data in future has been discussed, but this is still in early stages.

The results of the analysis can be seen in figure 1. It should be noted that:

- The results of this analysis only represent the responses given to the IPI and EPI surveys and not neccesarily trade of all goods.
- The IPI only reflects imports of products and materials to be used for further processing in the manufacturing sector.

**Figure 1: Proportion of import and export currency transaction by EU and Non-EU**

| | Imports from EU | Imports from Non-EU | Exports to EU | Exports to Non-EU |
|---|---|---|---|---|
| Sterling | 52.2 | 39.5 | 38.9 | 50.6 |
| Euro | 39.5 | 12.9 | 46.0 | 4.9 |
| US Dollar | 7.3 | 40.1 | 13.7 | 39.9 |
| Other | 1.0 | 7.5 | 1.4 | 4.6 |

The methods also fail to capture any hedging activities of companies. It is likely that in at least some industries companies would look to buy currencies that they regularly trade in when their value is favourable and to use them at a later date. However, very little data exists to inform on how common this activity is, though industry consultations have suggested it is significant.

### 3.3 Issues with combination of methods 1 & 2.

Where this method is used the results of methods 1 and 2 are aggregated, with equal weights to form a deflator. It is not clear, however how the decision was made about which services to use this approach for, or why an arbitrary 50:50 weighting was considered appropriate.

This approach would essentially have all of the same issues as methods 1 and 2.

## 4. Services Export Price Index (SEPI) Development

It is clearly preferable to source actual prices for traded services, so as part of the UK Office for National Statistics commitment to improving calculation of trade volumes in the service sector, development has begun on a new collection of export price change in the service sector.

A pilot survey has been developed which builds on the development of the Annual Survey of Goods and Services (ASGS), which provides detailed export turnover data for UK service providers. The methodologies for sample selection and calculating weighting patterns expand upon developments made in the domestic Services Producer Price Index (SPPI) and the Export Price Index (EPI).

A pilot survey will be dispatched in November of this year. If publishable data is produced it is likely to be released, as an experimental output, around the middle of 2020.

The main purpose of this pilot is to investigate the possibility of conducting a more in-depth survey, for use in deflation of Trade in Services, in future.

As it will be some time before data is available to be used in the calculation of trade volumes, development work is being undertaken to make improvements in the meantime.

## 5. Improvements made and development in progress

### 5.1 Improvements to WMCPI calculation

Improvements have recently been made to the calculations of the WMCPIs to address some of the concerns raised in section 3.2. These changes will feed into the calculation of the accounts in the latter half of 2019.

Firstly, the adjustment for exchange rates has been modified significantly. Instead of modifying the CPIs by the local currency of each country, a model is used that assumes transactions happen in 3 currencies; pound sterling, US Dollars and the Euro. For Sterling transaction there is no exchange rate conversion occurring and therefore no exchange rate adjustment should be applied. For the other trading currencies an index is created for transactions in each currency. These adjusted indices are then used to create an index for trade with countries within Europe and an index for the Rest of the World (RoW).

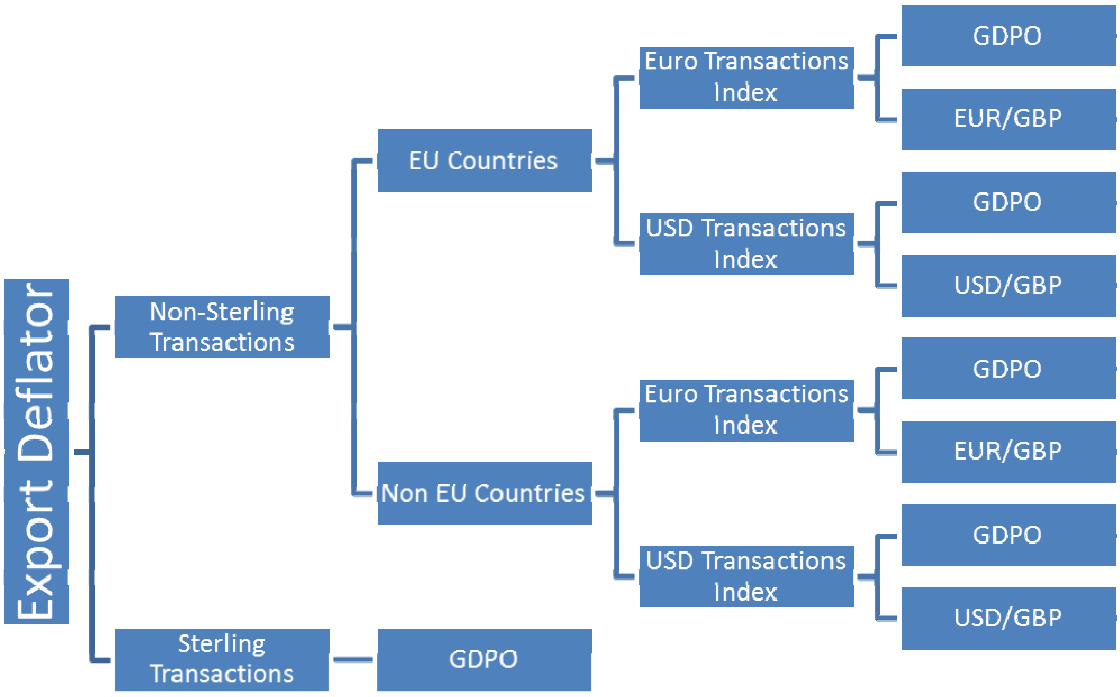
As data is not available on transactions in the service sector, the data highlighted in figure 1, for trade in goods, is used as a proxy for the service sector. Broadly speaking, in both cases around 50% of transactions are thought to take place in pound sterling. For transactions with companies within Europe a further 30% of transactions are thought to happen in Euros and around 20% in US dollars. Transactions with companies in the rest of the world comprise of around 40% US Dollars and 10% in Euros. The small amount, between 1% and 5% of transactions in other

currencies are ignored. Note that these values are by volume and are based on the limited data available.

Secondly, modifications have also been made to the use of foreign CPIs in our *export* measures. In short, we have concluded that it is preferable to substitute these with domestic GDP(O) deflators; as these are considered more likely to be subject to similar pressures as export prices. These are then adusted for exchange rates as per the methods described in the previous paragraph. For *imports* we continue to use foreign CPIs.

These two changes in methodology are illustrated in figure two below.

**Figure 2: High-Level Illustration of the Proposed Methods for Export WMCPIs**




Note that “other” currencies have been ignored for now, as they make up a relatively small proportion of transactions and there was no one dominant currency within this sector. The model takes the EU as representative of Europe, as the breakdown of the data indicated that patterns were similar for these countries.

## 6. Future work and developments

The scope of future devlopments is currently being defined. The following, as well as other areas for improvement, are being considered:

**Investigation of Hedging**

The improvements to the application of exchange rates made to the WMCPI calculations still does not take hedging activities into consideration. This has been raised as a potentially improtant development, so we are keen to investigate the impacts of this and ways in which it's impact can be included in the methodology.

**Further improvement of exchange rate adjustments**
As highlighted in this paper, there are a number of service products that are deflated using domestic GDP(O) deflators. One simple, but possibly highly impactful, improvement that we want to consider is adjusting these by similar methods as the improved WMCPIs.

**Improvements to TiS systems**.
As part of the development work we are doing, we would also be interested in investigating the introduction of an improved TiS system.

We would be very interested in collaborating with our international colleagues on any of these developments.

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