

# Price and volume measurement of goods and services affected by Digitalisation

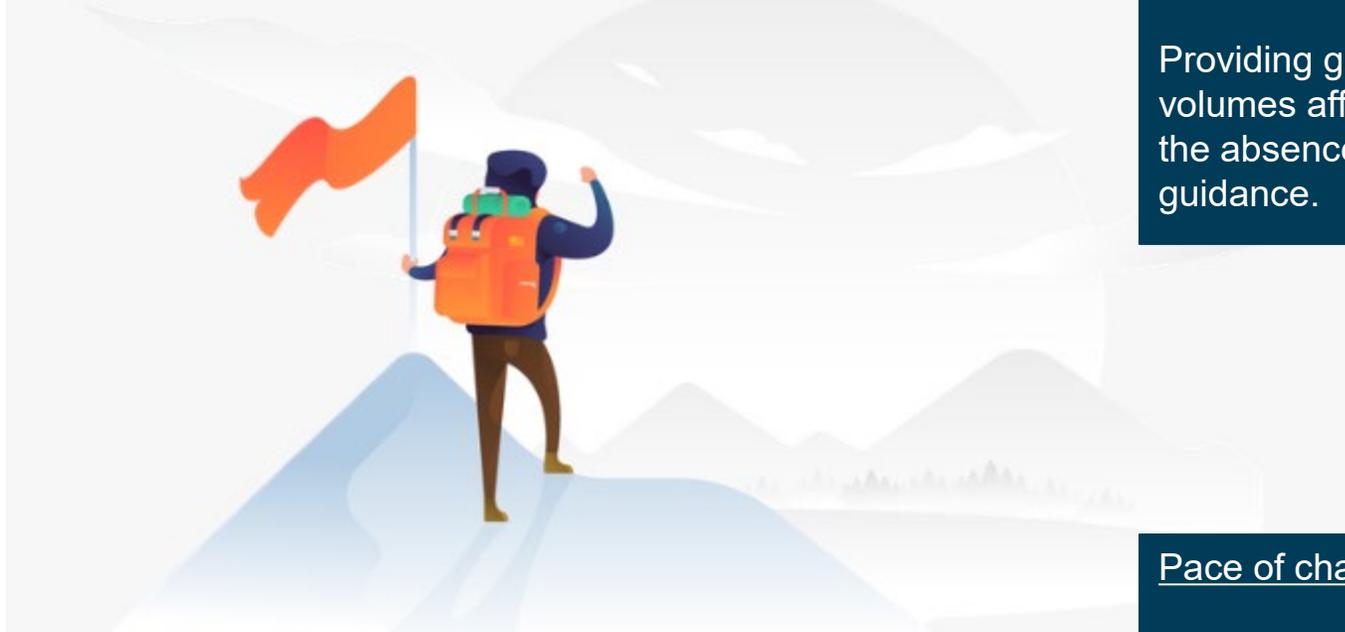
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**September 2020**

# Digitalisation – a complex field



## Context – guidance

Providing guidance on prices and volumes affected by digitalisation in the absence of comprehensive guidance.

## Macro-issues

Digitalisation increases the pace of innovation across digital sectors and traditional sectors, which can be hard to anticipate.

## Data collection

Digitalisation presents access to new data sources which require new methods – e.g. scanner data

## Pace of change in classifications etc

Alignment with other guidance notes and changing classifications

## Industry-specific issues

Individual sectors undergoing radical transformation in short time periods.

Lots of existing guidance in lots of different places.  
Signposting as well as identifying best practice / new solutions

## New Goods v Changing Goods

Defining when a good is 'new' or a update of an existing good.



# Model of the Guidance

Attempted to structure guidance on a product-by-product basis to give a view of both:

- **Best practice**
- **Acceptable models** where countries may not have the data, or the ability to collect new data for the best practice model

**Differentiate between existing goods and services**, where countries have evidence of best practice (e.g. ICT hardware), and **new products** where we need to find new methods / data sources, (e.g. cloud computing) as well as reflecting current thinking about the classification / changes in classification of these products.

Recognised need to react to i) decisions on digital supply-use table, ii) decisions on data as an asset, iii) decisions on free digital products

Not going into detail on each product.

# Prices and Volumes

Volume measures (Real GDP) are typically calculated by **deflating nominal values with a price index**

Digitalisation raises questions about the ability of existing methods to **properly measure** both:

- 1. Nominal values**—capturing the value of digital goods and services in a timely fashion, and classifying this appropriately and
- 2. Price indexes**—properly accounting for
  - Quality change
  - The new ways that goods and services are delivered to final user

# Nominal output

Traditional surveys used to collect nominal GDP might **miss or mis-classify the output** of digital products.

Countries are encouraged to consider:

- **More-frequent updates** of traditional surveys to rapidly fold in new entities
- **Alternative data sources** to cover areas missed in traditional surveys.
  - Establishment surveys will miss sharing economy activity. Household surveys may need to be expanded for this purpose.
  - Third-party market research firms that collect the data for providers of new digital products
  - Watching for early signals / warning signs
- **Other novel ways** to fill in the gaps. For example, in the case of globalisation of production:
  - Where producers are foreign entities, it may be most efficient and effective for international organisations or the national statistical agency in the territory in which the platform or provider is located to collect the relevant data from them
  - Countries could look to domestic estimates with substitute mirror trade data for particular categories produced by the host NSO in that territory
  - NSIs need to be working with sector experts to secure insight to base revisions to methods on.

# State of Play for Deflators

## **New models of existing digital goods and services**

- Quality adjustment generally is possible
- Hedonics is the gold standard (but some products present specific challenges)
- Some goods and services may be merging – need to reflect how to reflect price changing as bundling occurs

## **Entirely new digital goods and services**

- Quality adjustment is difficult, but
- Early introduction of new technology products in price indices is important, as many technology products display rapidly falling prices in their early years in the market.
- Countries are encouraged to ‘over-sample’ low weight new digital goods and services in samples earlier to provide data on early price evolution.

## **Traditional goods and services affected by digitalisation**

- The increasing digital content and attendant quality improvements in traditional goods also requires quality adjustment (e.g. cars)
- New ways of providing traditional services requires special handling, though there is no consensus on how this is best done (outlet substitution bias)
  - UBER, AirBnB
  - Retail services: online purchases

# Price Indices

Across all the areas outlined where fast-moving quality change is a result of the process of digitalization, countries are advised to review:

The **frequency** with which they update their survey collections, to ensure they continue to capture the rapidly changing nature of these product classes and

The **level** at which data is collected and deflation takes place to create volume estimates.

- Often, being able to deflate at more granular levels within the product classification and weighting these at more aggregated levels will be an important component of delivering more robust estimates

# Rapidly changing non-survey price data

Online prices tend to :

- Move differently than in-store prices.
- Quickly and more frequently adjust to the market in response to changing market forces.
- Respond to consumer behaviour through algorithmic pricing using parameters for calendar effects; weather; competitor prices, etc.

Scanner data sets contain variety quantities sold and revenue received by the retailer for these varieties

- Reflect discounts and buy-one-get-one-free type deals.
- Covers full time period of reporting period

Gathering guidance from wider landscape of manuals, particularly chapter 10 of the CPI Manual (2020).

# Questions

1. Can any country provide further insights on how they assemble current price data on nominal output of digital products which overcomes the challenges of rapid product development, and potentially rapid shifts in price and weight in the basket?
2. Can any country provide evidence around the three approaches identified to measure current price data for digital products produced overseas:
  - a. international organisation or NSI in the territory collects the relevant data and disseminates via data sharing arrangements to other agencies.
  - b. collaborating with specialized third-party market research firms to collect the input data and then make the necessary adjustments to compile national accounts.
  - c. Countries could look to domestic estimates with substitute mirror trade data for particular categories produced by the host NSO in that territory
3. Can any country provide evidence on existing best practice guidance on how to deflate existing well defined goods and services which have been affected by digitalisation?
4. Can any country provide evidence on the deflation of databases (dependent on the treatment of data)?
5. The GN provides options and analysis of options for telecommunications services, which propose bringing the treatment of this service in line with electricity. Opinions on this treatment are requested.
6. The GN discusses how to treat the instance where one room in a home is rented out through Airbnb. Should this room be excluded in the calculation of the imputed rental price, or should an adjustment be applied, and does this affect the weight of owner-occupied housing in the CPI?
7. The GN discusses cloud computing and recommend using quality adjusted price indexes to deflate values developed using hedonic models which capture the variety of attributes. We would appreciate any information from NSOs which have attempted such an approach, or any alternatives.