

Innovative methods for capturing quality change

Case studies on **Information Services** and
Architecture and Engineering Services

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Context

- It is essential for deflators to be comparing like-with-like products and services
- Accounting for quality change in services is particularly difficult
 - Services are often intangible, perishable and unique
 - Rapid technological advancements have led to brand-new services not yet adequately captured by current classification systems

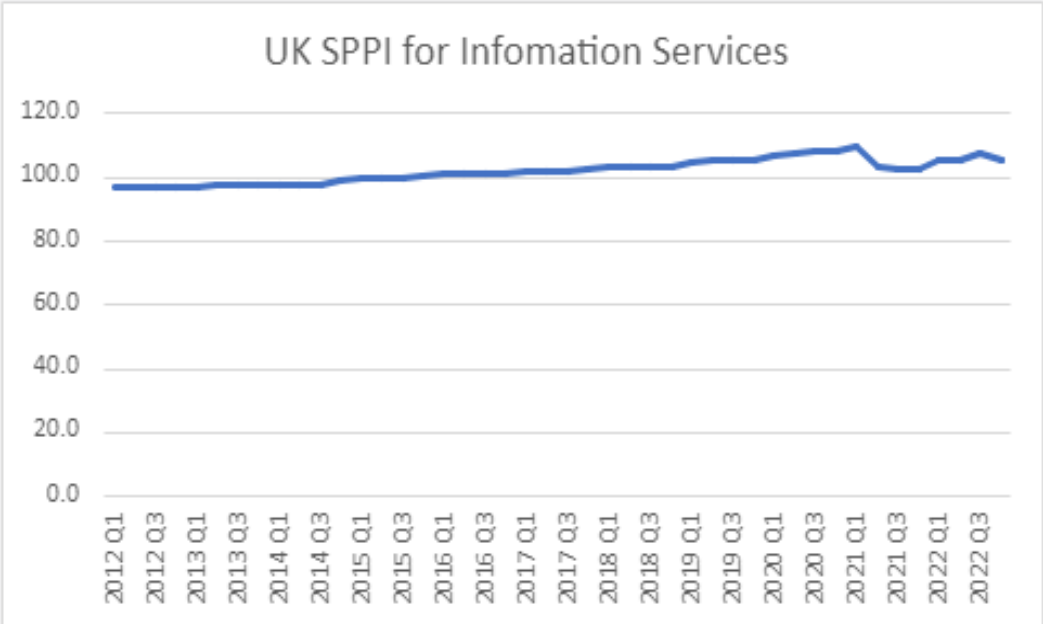
Introduction to case studies

- We have investigated quality change in two services that have experienced significant quality improvements:
 - CPA J63 (Information Services)
 - Rise of cloud computing
 - CPA M71.1 (Architecture and Engineering Services)
 - Use of technologies such as BIM, drones and digital twins

Case study 1

CPA J63 – Information Services

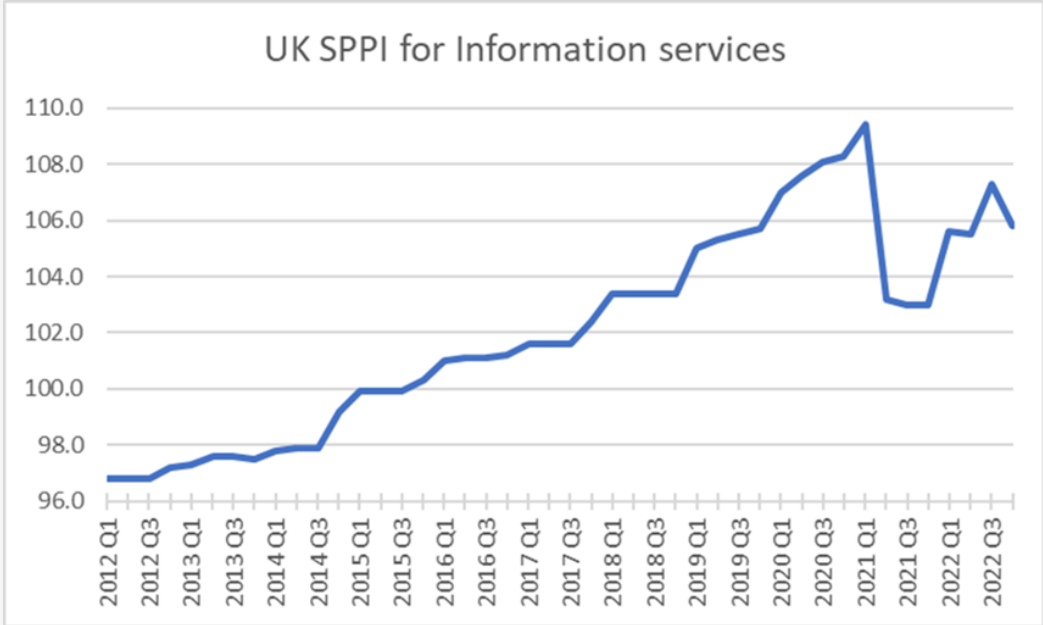
Case study 1 - CPA J63 (Information Services)



- In 2022, CPA J63 accounted for 0.4% of GDP(O)
- Our SPPI only includes items classified under J63.11
- We believe cloud computing services should mostly be captured within J63.11

63		Information service activities	
	63.1	Data processing, hosting and related activities; web portals	
		63.11 Data processing, hosting and related activities	6311
		63.12 Web portals	6312
	63.9	Other information service activities	
		63.91 News agency activities	6391
	63.99 Other information service activities n.e.c.	6399	

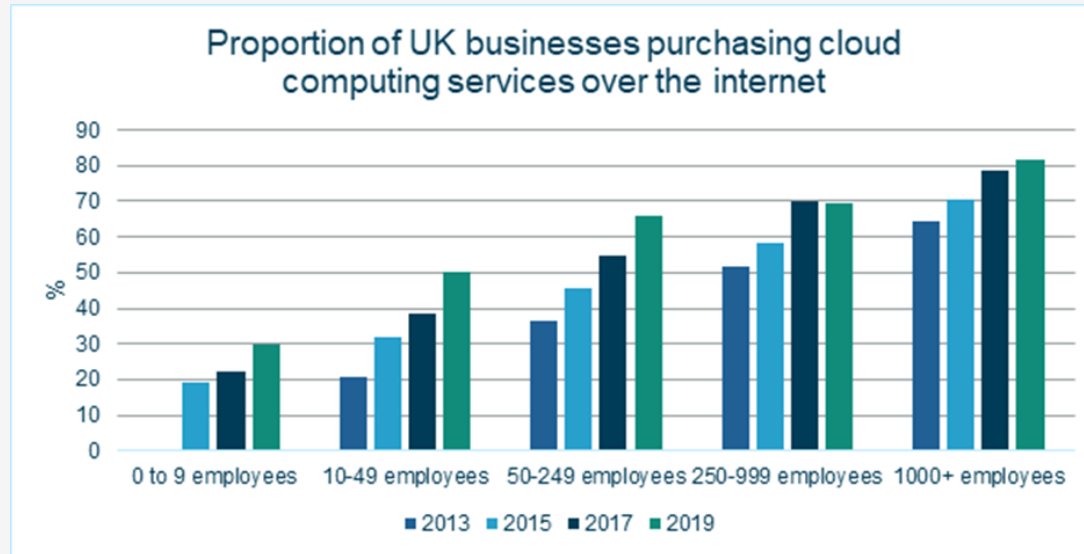
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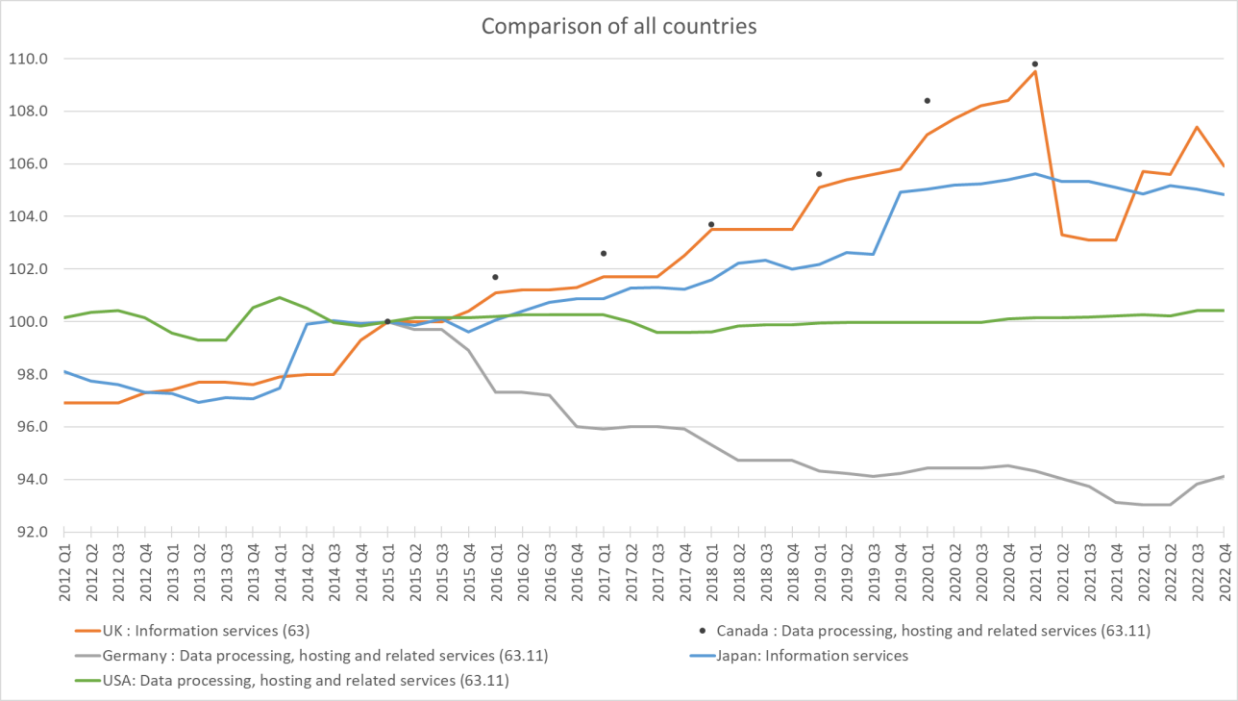
Quality change in Information Services



[E-Commerce and ICT Activity, ONS, 2021](#)

- Rise of cloud computing services over the last few decades
- Cloud market in the UK was estimated to be worth over £35 billion by 2023 – a 73% rise from 2019
- Challenge in understanding exactly where this should be classified in CPA 2.1

International comparison



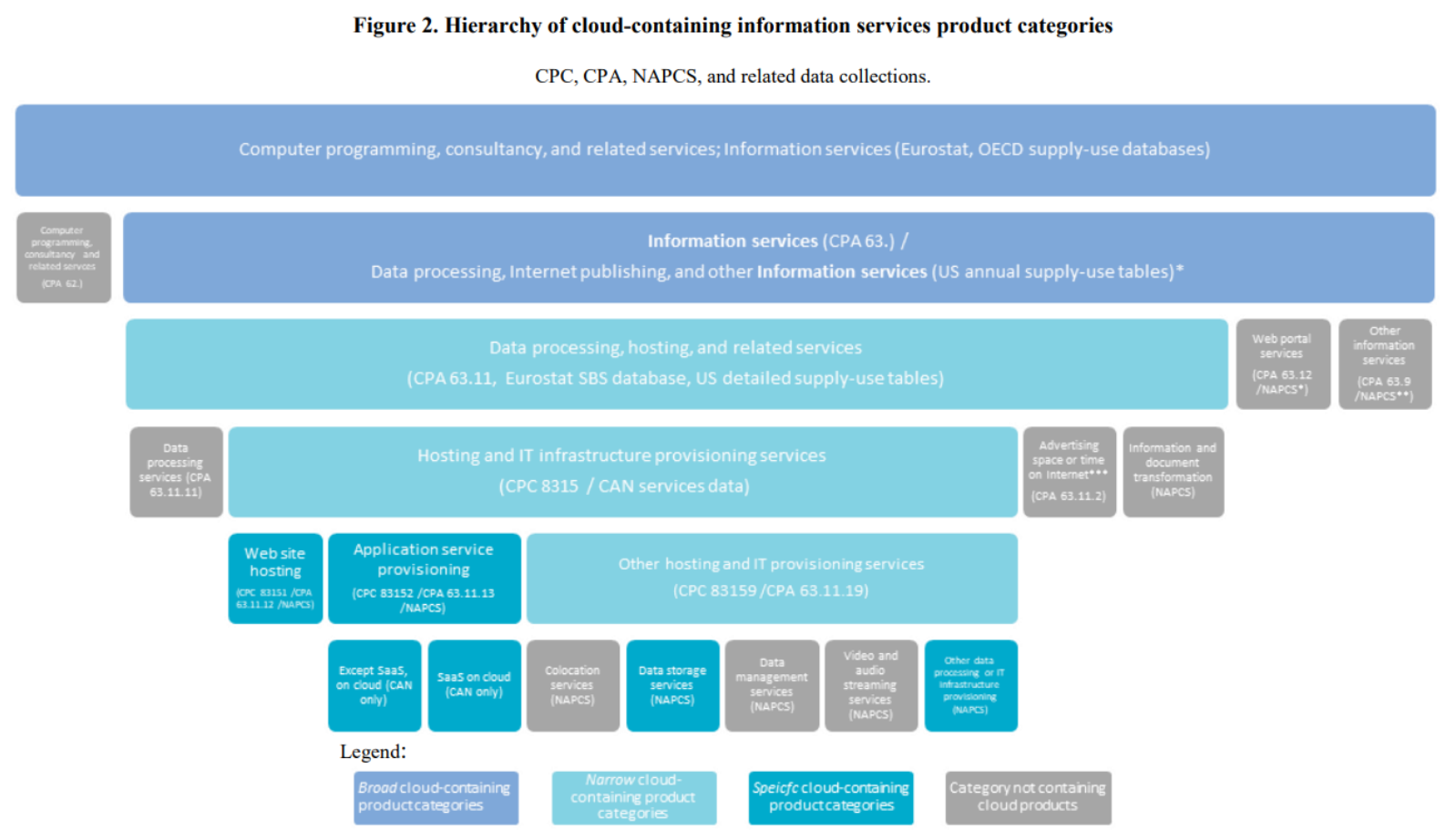
- Undertook an in-depth international comparison across six countries; Canada, Germany, Ireland, Japan, Norway and USA.
- There does not appear to be an internationally standard method or trend

International comparison

What quality adjustment is used?

Canada	Does not at the moment, planning to quality adjust the cloud computing component of the Information Services index using hedonic methods.
Germany	Price change taken as quality change for a new product, Overlap or Direct Price comparison depending on available information.
Ireland	Bridged overlap.
Japan	Does not at the moment, possibility of using some indicators like the number of unique users, page views, and viewing times.
Norway	Firms have the option to replace services that have changed quality and missing prices will be imputed.
USA	Respondents will be asked to provide cost data for quality adjustment.

Classification challenges

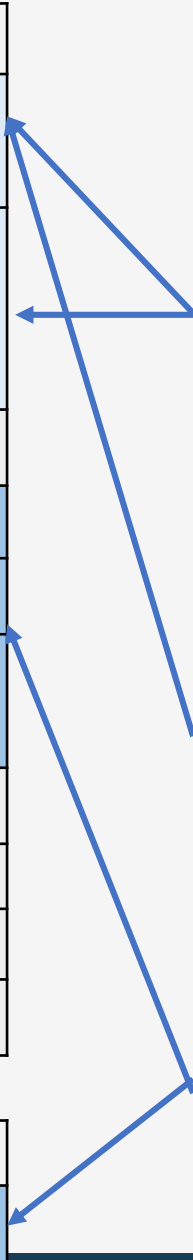


Source: OECD, Working Party on Measurement and Analysis of the Digital Economy, Measuring Cloud Services use by businesses

CPA J63 components
63.11 - Data processing, hosting, and related services
63.11.1 - Data processing, hosting, application services and other IT infrastructure provisioning services
63.11.11 - Data processing services
63.11.12 - Web hosting services
63.11.13 - Application service provisioning
63.11.19 - Other hosting and IT infrastructure provisioning services
63.11.2 - Advertising space or time in Internet
63.12 – Web portals
63.91 – News agency activities
63.99 – Other information service activities

CPA J58 components
58.2 – Software publishing services

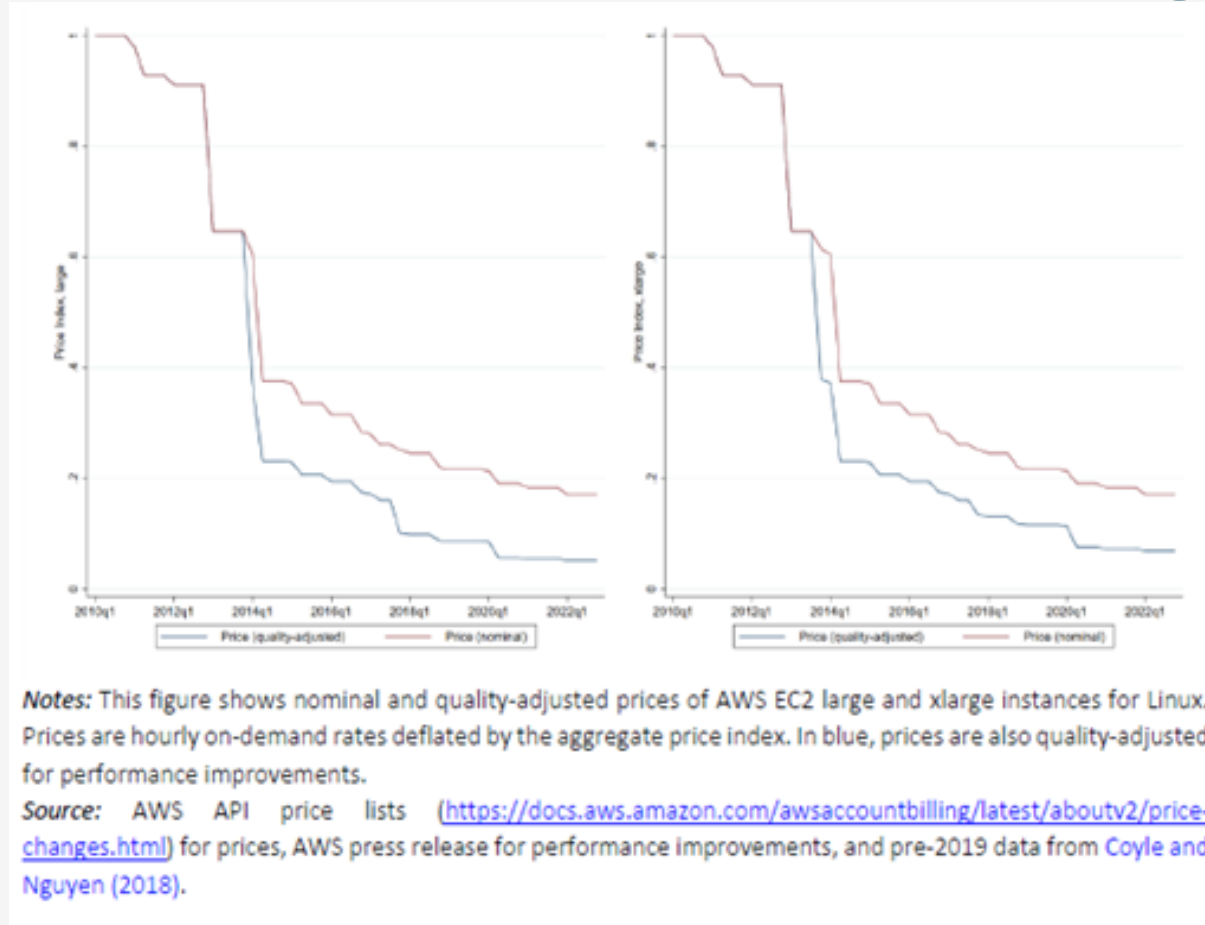
Cloud computing components
Infrastructure as a Service (IaaS) (28% of UK market)
Platform as a Service (PaaS) (9% of UK market)
Software as a Service (SaaS) (63% of UK market)



Using an index of cloud computing prices

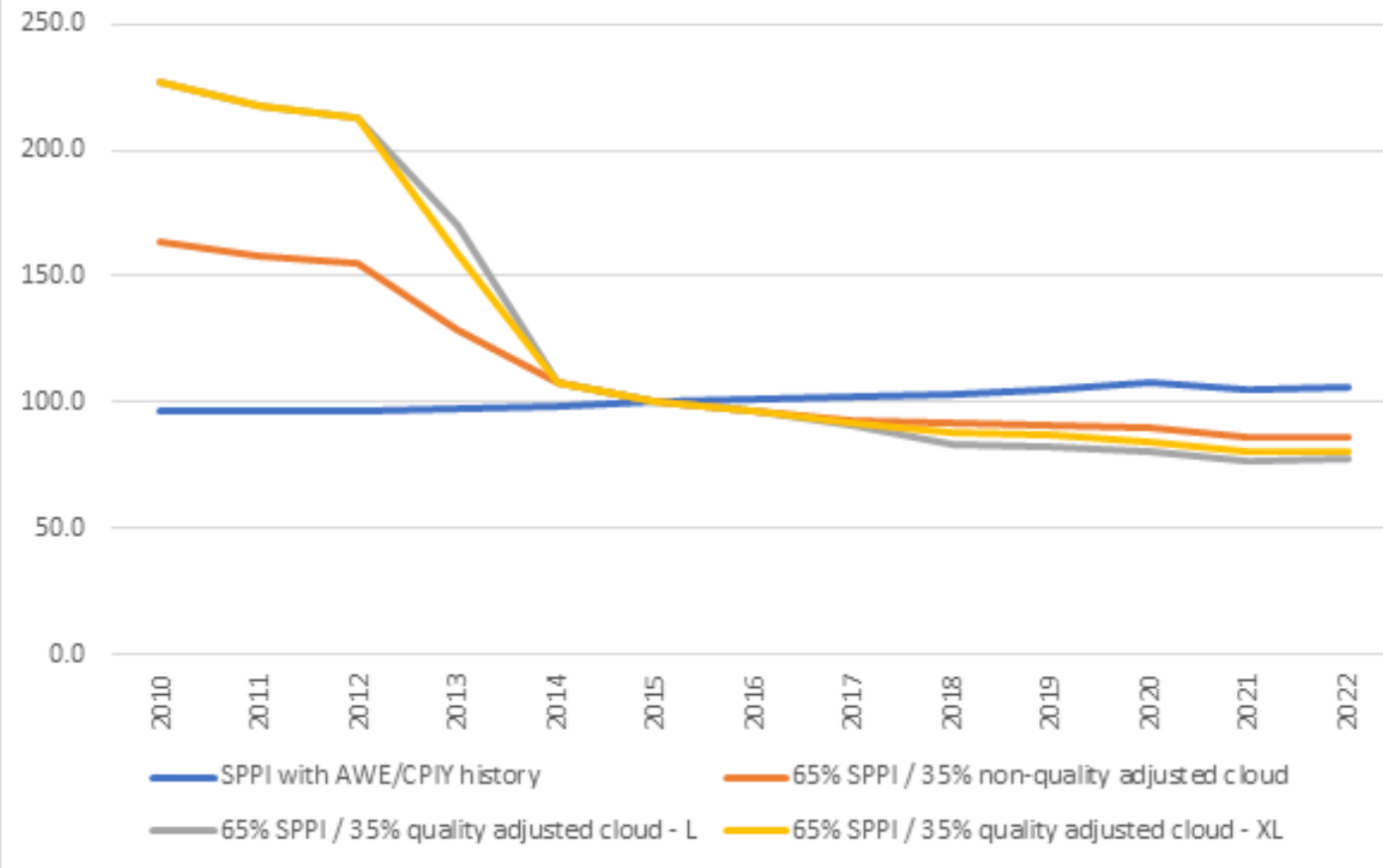
- ONS's deflators team met with a couple of experts in the area, who:
 - Were surprised by the upward trend in our SPPI
 - Suggested that the period from 2007 onwards would be the most important period to account for cloud computing
 - Felt that the issues with the sample were the biggest problem
- Professor Dame Diane Coyle suggested using data from her work constructing a price index for cloud computing services to deflate the cloud computing component of J63

Using an index of cloud computing prices



Coyle and Nguyen (2018) and Coyle and Hampton (2023)

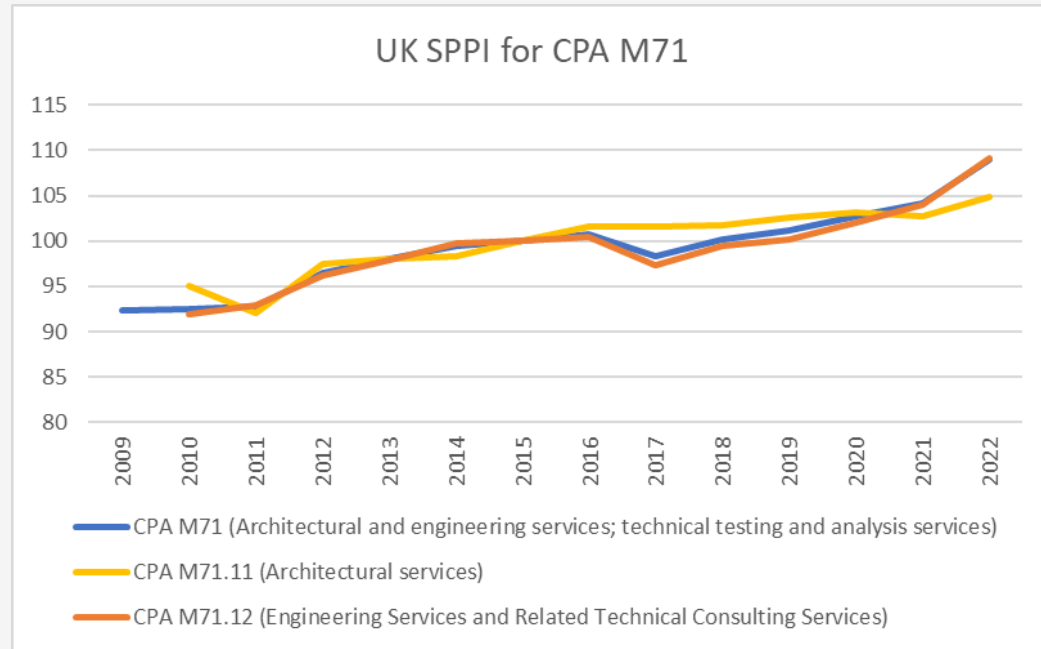
Effect of using 65% current SPPI and 35% Coyle and Hampton index, 2015=100



Case study 2

CPA M71.1 – Architecture and Engineering services

Case study 2 - CPA M71.1 (Architecture and Engineering Services)



- CPA M71 accounts for 1.16% of GDP and 4.83% of the service sector
- Current pricing method is time-based
- Exact contracts are unknown
- Quality change is not accounted for

Quality change in Architecture and Engineering Services

- Recent technological advancements like drones, BIM and digital twins have increased productivity and decreased costs
 - Drones – used in surveying improve accuracy
 - Digital twins – enables real time monitoring
 - BIM – allows collaboration between businesses and clients

Sample

CPA 4 dig	Sample composition	Coverage	CPA 6 dig
Architectural Services (71.11)	38 observations	19.5% coverage	Building project architectural advisory services (71.11.24)
	33 suppliers		Project site master planning services (71.11.33)
			Landscape architectural services (71.11.41)
Engineering Services and Related Technical Consulting Services (71.12)	69 observations	52.8% coverage	Engineering advisory services (71.12.11)
	55 suppliers		Engineering services for building projects (71.12.12)
			Engineering services for industrial and manufacturing projects (71.12.17)
			Project management services for construction projects (71.12.20)
			Geophysical services (71.12.32)

International comparison

- Undertook an in-depth international comparison across six countries; Germany, The Netherlands, USA, Canada, Japan, Australia, and New Zealand
- All countries (except Canada) experienced significant increase in their SPPI compared to the UK
- Majority use model pricing
- None explicitly account for quality change

Options to account for quality change

- Change of pricing method
 - Model pricing implicitly accounts for quality change
 - Used by majority of the countries we researched
- Make explicit quality adjustment
 - Have decided against this for now
- Implications for construction – where should quality change be captured?

Findings and conclusions

Common challenges and options

1. Sample size

- CPA J63
 - 23 specific services
 - Only J63.11 (Data processing, hosting and related services) currently included in the SPPI for J63
- CPA M71.1
 - 107 observations
 - Low coverage – 19.5% for M71.11 and 52.8% for M71.12

Common challenges and options

2. Change in services being provided over time and how to account for this in classification

- CPA J63
 - Cloud computing services
- CPA M71.1
 - Development of technology such as BIM

Next steps

- Improving sample and coverage of SPPIs
- Explore changes to pricing method for Architecture and Engineering
- Build understanding of cloud computing use and prices
- Investigate possibility of deflating components of these services (e.g. cloud computing services) at a lower level
- Acting in response to classification updates e.g. ISIC revisions which will classify J63 differently